Definitions of Managed Objects for the DS3/E3 Interface Type

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 memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it describes objects used for managing DS3 and E3
   interfaces. This document is a companion to the documents that
   define Managed Objects for the DS0, DS1/E1/DS2/E2 and Synchronous
   Optical Network/Synchronous Digital Hierarchy (SONET/SDH) Interface
   Types. This document obsoletes RFC 2496.

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1. The Internet Standard Management Framework

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

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

1.1. Changes from RFC 2496

   The changes from [RFC2496] are the following:

     (1) The dsx3FracIfIndex SYNTAX matches the description range.

     (2) Reference was added to Circuit Identifier object.

     (3) Usage of ifStackTable section was updated.

     (4) Align the DESCRIPTION clauses of few statistic objects with
         the near end definition, the far end definition and with
         [RFC3593].

     (5) Add new value, dsx3M13, to dsx3LineType.

1.2. **Changes from RFC 1407**

   The changes from RFC 1407 are the following:

   (1) The Fractional Table has been deprecated.

   (2) This document uses SMIv2.

   (3) Values are given for ifTable and ifXTable.

   (4) Example usage of ifStackTable is included.

   (5) dsx3IfIndex has been deprecated.

   (6) The definition of valid intervals has been clarified for the
        case where the agent proxied for other devices. In
        particular, the treatment of missing intervals has been
        clarified.

   (7) An inward loopback has been added.

   (8) Additional lineStatus bits have been added for Near End in
        Unavailable Signal State, Carrier Equipment Out of Service.

   (9) A read-write line Length object has been added.

   (10) Added a lineStatus last change, trap and enabler.

   (11) Textual Conventions for statistics objects have been used.

   (12) A new object, dsx3LoopbackStatus, has been introduced to
        reflect the loopbacks established on a DS3/E3 interface and
        the source to the requests. dsx3LoopbackConfig continues to
        be the desired loopback state while dsx3LoopbackStatus
        reflects the actual state.

   (13) A dual loopback has been added to allow the setting of an
        inward loopback and a line loopback at the same time.

   (14) An object has been added to indicated whether or not this is
        a channelized DS3/E3.

   (15) A new object has been added to indicate which DS1 is to set
        for remote loopback.

[1.3](#). Companion Documents

>   This document is a companion to the documents that define
>   Managed Objects for the DS0 [[RFC2494](#)], DS1/E1/DS2/E2
>   [[RFC3895](#)], and Synchronous Optical Network/Synchronous
>   Digital Hierarchy (SONET/SDH) [[RFC3592](#)] Interface Types.

[2](#). Overview

These objects are used when the particular media being used to
realize an interface is a DS3/E3 interface. At present, this applies
to these values of the ifType variable in the Internet-standard MIB:

      ds3 (30)

The DS3 definitions contained herein are based on the DS3
specifications in ANSI T1.102-1987 [[ANSI-T1.102](#)], ANSI T1.107-1988
[[ANSI-T1.107](#)], ANSI T1.107a-1990 [[ANSI-T1.107a](#)], and ANSI T1.404-1989
[[ANSI-T1.404](#)]. The E3 definitions contained herein are based on the
E3 specifications in CCITT G.751 [[CCITT-G.751](#)] and ETSI T/NA(91)18
[ETSI-T/NA(91)18].

[2.1](#). Use of ifTable for DS3 Layer

Only the ifGeneralInformationGroup needs to be supported.

```
        ifTable Object     Use for DS3 Layer
     ===============================================================
        ifIndex            Interface index.

        ifDescr            See interfaces MIB [RFC2863]

        ifType             ds3(30)

        ifSpeed            Speed of line rate
                           DS3 - 44736000
                           E3  - 34368000

        ifPhysAddress      The value of the Circuit Identifier.
                           If no Circuit Identifier has been assigned
                           this object should have an octet string
                           with zero length.

        ifAdminStatus      See interfaces MIB [RFC2863]

        ifOperStatus       See interfaces MIB [RFC2863]

        ifLastChange       See interfaces MIB [RFC2863]
```

          ifName   See interfaces MIB [RFC2863]

          ifLinkUpDownTrapEnable   Set to enabled(1).

          ifHighSpeed   Speed of line in Mega-bits per second
                              (either 45 or 34)

          ifConnectorPresent Set to true(1) normally, except for
                                cases such as DS3/E3 over AAL1/ATM where
                                false(2) is appropriate

2.2. Usage Guidelines

2.2.1. Usage of ifStackTable

   The object dsx3IfIndex has been deprecated. This object previously
   allowed a very special proxy situation to exist for Routers and CSUs.
   This section now describes how to use ifStackTable to represent this
   relationship.

   The paragraphs discussing dsx3IfIndex and dsx3LineIndex have been
   preserved in Appendix A for informational purposes.

   The ifStackTable is used in the proxy case to represent the
   association between pairs of interfaces, e.g., this DS3 is attached
   to that DS3. This use is consistent with the use of the ifStackTable
   to show the association between various sub-layers of an interface.
   In both cases entire PDUs are exchanged between the interface pairs -
   in the case of a DS3, entire DS3 frames are exchanged; in the case of
   PPP and HDLC, entire HDLC frames are exchanged. This usage is not
   meant to suggest the use of the ifStackTable to represent Time
   Division Multiplexing (TDM) connections in general.

   External&Internal interface scenario: the SNMP Agent resides on a
   host external from the device supporting DS3/E3 interfaces (e.g., a
   router). The Agent represents both the host and the DS3/E3 device.

Example:

A shelf full of CSUs connected to a Router. An SNMP Agent residing
on the router proxies for itself and the CSU. The router has also an
Ethernet interface:

```
      +-----+
  |   |     |
  |   |     |              +--------------------+
  |E  |     |   44.736 MBPS |   ds3 M13    Line#A | ds3 C-bit Parity
  |t  |  R  |--------------+ - - - - -  - - -  - +------>
  |h  |     |              |              |
  |e  |  O  |   44.736 MBPS |   ds3 M13    Line#B | ds3 C-bit Parity
  |r  |     |--------------+ - - - - - - - - - +------>
  |n  |  U  |              |              |
  |e  |     |   44.736 MBPS |   ds3 M13    Line#C | ds3 C-bit Parity
  |t  |  T  |--------------+ - - - -- -- - - - - +------>
  |   |     |              |              |
  |-----|  E  |   44.736 MBPS |   ds3 M13    Line#D | ds3 C-bit Parity
  |   |     |--------------+ -   - - - -- - - - - +------>
  |   |  R  |              |_____|
  |   |     |
  |   +-----+
```

The assignment of the index values could for example be:

```
        ifIndex   Description
        1         Ethernet
        2         Line#A Router
        3         Line#B Router
        4         Line#C Router
        5         Line#D Router
        6         Line#A CSU Router
        7         Line#B CSU Router
        8         Line#C CSU Router
        9         Line#D CSU Router
        10        Line#A CSU Network
        11        Line#B CSU Network
        12        Line#C CSU Network
        13        Line#D CSU Network
```

The ifStackTable is then used to show the relationships between the
various DS3 interfaces.

```
        ifStackTable Entries

        HigherLayer    LowerLayer
        2              6
        3              7
        4              8
        5              9
        6              10
        7              11
        8              12
        9              13
```

If the CSU shelf is managed by itself by a local SNMP Agent, the
situation would be identical, except the Ethernet and the 4 router
interfaces are deleted. Interfaces would also be numbered from 1 to
8.

```
        ifIndex  Description
        1        Line#A CSU Router
        2        Line#B CSU Router
        3        Line#C CSU Router
        4        Line#D CSU Router
        5        Line#A CSU Network
        6        Line#B CSU Network
        7        Line#C CSU Network
        8        Line#D CSU Network

        ifStackTable Entries

        HigherLayer    LowerLayer
        1              5
        2              6
        3              7
        4              8
```

2.2.2. Usage of Channelization for DS3, DS1, DS0

An example is given here to explain the channelization objects in the
DS3, DS1, and DS0 MIBs to help the implementor use the objects
correctly. Treatment of E3 and E1 would be similar, with the number
of DS0s being different depending on the framing of the E1.

Assume that a DS3 (with ifIndex 1) is Channelized into DS1s (without
DS2s). The object dsx3Channelization is set to enabledDs1. When
this object is set to enabledDS1, 28 ifEntries of type DS1 will be
created by the agent. If dsx3Channelization is set to disabled, then
the DS1s are destroyed.

Assume the entries in the ifTable for the DS1s are created in channel
order and the ifIndex values are 2 through 29. In the DS1 MIB, there
will be an entry in the dsx1ChanMappingTable for each ds1. The
entries will be as follows:

```
        dsx1ChanMappingTable Entries

        ifIndex   dsx1Ds1ChannelNumber    dsx1ChanMappedIfIndex
        1         1                       2
        1         2                       3
        ......
        1         28                      29
```

In addition, the DS1s are channelized into DS0s. The object
dsx1Channelization is set to enabledDS0 for each DS1. There will be
24 DS0s in the ifTable for each DS1. Assume the entries in the
ifTable are created in channel order and the ifIndex values for the
DS0s in the first DS1 are 30 through 53. In the DS0 MIB [[RFC2494](#)],
there will be an entry in the dsx0ChanMappingTable for each DS0. The
entries will be as follows:

```
        dsx0ChanMappingTable Entries

        ifIndex   dsx0Ds0ChannelNumber  dsx0ChanMappedIfIndex
        2         1                     30
        2         2                     31
        ......
        2         24                    53
```

[2.2.3](#). Usage of Channelization for DS3, DS2, DS1

An example is given here to explain the channelization objects in the
DS3 and DS1 MIBs to help the implementor use the objects correctly.

Assume that a DS3 (with ifIndex 1) is Channelized into DS2s. The
object dsx3Channelization is set to enabledDs2. There will be 7 DS2s
(ifType of DS1) in the ifTable. Assume the entries in the ifTable
for the DS2s are created in channel order and the ifIndex values are
2 through 8. In the DS1 MIB [[RFC3895](#)], there will be an entry in the
dsx1ChanMappingTable for each DS2. The entries will be as follows:

```
        dsx1ChanMappingTable Entries

        ifIndex   dsx1Ds1ChannelNumber   dsx1ChanMappedIfIndex
        1         1                      2
        1         2                      3
        ......
        1         7                      8
```

In addition, the DS2s are channelized into DS1s. The object
dsx1Channelization is set to enabledDS1 for each DS2. There will be
4 DS1s in the ifTable for each DS2. Assume the entries in the
ifTable are created in channel order and the ifIndex values for the
DS1s in the first DS2 are 9 through 12, then 13 through 16 for the
second DS2, and so on. In the DS1 MIB, there will be an entry in the
dsx1ChanMappingTable for each DS1. The entries will be as follows:

```
        dsx1ChanMappingTable Entries

        ifIndex    dsx1Ds1ChannelNumber  dsx1ChanMappedIfIndex
        2          1                     9
        2          2                     10
        2          3                     11
        2          4                     12
        3          1                     13
        3          2                     14
        ...
        8          4                     36
```

[2.2.4](#). Usage of Loopbacks

This section discusses the behaviour of objects related to loopbacks.

The object dsx3LoopbackConfig represents the desired state of
loopbacks on this interface. Using this object a Manager can
request:
    LineLoopback
    PayloadLoopback (if ESF framing)
    InwardLoopback
    DualLoopback (Line + Inward)
    NoLoopback

The remote end can also request lookbacks either through the FDL
channel if ESF or inband if D4. The loopbacks that can be requested
this way are:

    LineLoopback
    PayloadLoopback (if ESF framing)
    NoLoopback

To model the current state of loopbacks on a DS3 interface, the
object dsx3LoopbackStatus defines which loopback is currently applied
to an interface. This object, which is a bitmap, will have bits
turned on which reflect the currently active loopbacks on the
interface as well as the source of those loopbacks.

The following restrictions/rules apply to loopbacks:

The far end cannot undo loopbacks set by a manager.

A manager can undo loopbacks set by the far end.

Both a line loopback and an inward loopback can be set at the same
time. Only these two loopbacks can co-exist and either one may be
set by the manager or the far end. A LineLoopback request from the
far end is incremental to an existing Inward loopback established by
a manager. When a NoLoopback is received from the far end in this
case, the InwardLoopback remains in place.

2.3. Objectives of this MIB Module

There are numerous things that could be included in a MIB for DS3/E3
signals: the management of multiplexors, CSUs, DSUs, and the like.
The intent of this document is to facilitate the common management of
all devices with DS3/E3 interfaces. As such, a design decision was
made up front to very closely align the MIB with the set of objects
that can generally be read from DS3/E3 devices that are currently
deployed.

2.4. DS3/E3 Terminology

The terminology used in this document to describe error conditions on
a DS3 interface as monitored by a DS3 device are based on the late
but not final draft of what became the ANSI T1.231 standard [ANSI-
T1.231]. If the definition in this document does not match the
definition in the ANSI T1.231 document, the implementer should follow
the definition described in this document.

2.4.1. Error Events

Bipolar Violation (BPV) Error Event
      A bipolar violation error event, for B3ZS(HDB3)-coded signals,
      is the occurrence of a pulse of the same polarity as the
      previous pulse without being part of the zero substitution
      code, B3ZS(HDB3). For B3ZS(HDB3)-coded signals, a bipolar
      violation error event may also include other error patterns
      such as: three(four) or more consecutive zeros and incorrect
      polarity (See T1.231 section 7.1.1.1.1).

Excessive Zeros (EXZ) Error Event
        An EXZ is the occurrence of any zero string length equal to or
        greater than 3 for B3ZS, or greater than 4 for HDB3 (See T1.231
        section 7.1.1.1.2).

Line Coding Violation (LCV) Error Event
        This parameter is a count of both BPVs and EXZs occurring over
        the accumulation period. An EXZ increments the LCV by one
        regardless of the length of the zero string. (Also known as
        CV-L. See T1.231 section 7.4.1.1.)

P-bit Coding Violation (PCV) Error Event
        For all DS3 applications, a coding violation error event is a
        P-bit Parity Error event. A P-bit Parity Error event is the
        occurrence of a received P-bit code on the DS3 M-frame that is
        not identical to the corresponding locally-calculated code (See
        T1.231 section 7.1.1.2.1).

C-bit Coding Violation (CCV) Error Event
        For C-bit Parity and SYNTRAN DS3 applications, this is the
        count of coding violations reported via the C-bits. For C-bit
        Parity, it is a count of CP-bit parity errors occurring in the
        accumulation interval. For SYNTRAN, it is a count of CRC-9
        errors occurring in the accumulation interval (See T1.231
        section 7.1.1.2.2).

2.4.2. Performance Parameters

   All performance parameters are accumulated in fifteen minute
   intervals and up to 96 intervals (24 hours worth) are kept by an
   agent. Fewer than 96 intervals of data will be available if the
   agent has been restarted within the last 24 hours. In addition,
   there is a rolling 24-hour total of each performance parameter.

   There is no requirement for an agent to ensure fixed relationship
   between the start of a fifteen minute interval and any wall clock;
   however some agents may align the fifteen minute intervals with
   quarter hours.

   Performance parameters are of types PerfCurrentCount,
   PerfIntervalCount and PerfTotalCount. These textual conventions are
   all Gauge32, and they are used because it is possible for these
   objects to decrease. Objects may decrease when Unavailable Seconds
   occurs across a fifteen minutes interval boundary. See Unavailable
   Seconds discussion later in this section.

Line Errored Seconds (LES)
        A Line Errored Second is a second in which one or more CV
        occurred OR one or more LOS defects. (Also known as ES-L.
        See T1.231 section 7.4.1.2.)

P-bit Errored Seconds (PES)
        An PES is a second with one or more PCVs OR one or more Out
        of Frame defects OR a detected incoming AIS. This gauge is
        not incremented when UASs are counted. (Also known as ESP-P.
        See T1.231 section 7.4.2.2.)

P-bit Severely Errored Seconds (PSES)
        A PSES is a second with 44 or more PCVs OR one or more Out of
        Frame defects OR a detected incoming AIS. This gauge is not
        incremented when UASs are counted. (Also known as SESP-P.
        See T1.231 section 7.4.2.5.)

C-bit Errored Seconds (CES)
        An CES is a second with one or more CCVs OR one or more Out
        of Frame defects OR a detected incoming AIS. This count is
        only for the SYNTRAN and C-bit Parity DS3 applications. This
        gauge is not incremented when UASs are counted. (Also known
        as ESCP-P. See T1.231 section 7.4.2.2.)

C-bit Severely Errored Seconds (CSES)
        A CSES is a second with 44 or more CCVs OR one or more Out of
        Frame defects OR a detected incoming AIS. This count is only
        for the SYNTRAN and C-bit Parity DS3 applications. This
        gauge is not incremented when UASs are counted. (Also known
        as SESCP-P. See T1.231 section 7.4.2.5.)

Severely Errored Framing Seconds (SEFS)
        A SEFS is a second with one or more Out of Frame defects OR a
        detected incoming AIS. This item is not incremented during
        unavailable seconds. (Also known as SAS-P. See T1.231
        section 7.4.2.6.)

Unavailable Seconds (UAS)
        UAS are calculated by counting the number of seconds that the
        interface is unavailable. The DS3 interface is said to be
        unavailable from the onset of 10 contiguous PSESs, or the
        onset of the condition leading to a failure (see Failure
        States). If the condition leading to the failure was
        immediately preceded by one or more contiguous PSESs, then
        the DS3 interface unavailability starts from the onset of
        these PSESs. Once unavailable, and if no failure is present,
        the DS3 interface becomes available at the onset of 10
        contiguous seconds with no PSESs. Once unavailable, and if a

failure is present, the DS3 interface becomes available at
the onset of 10 contiguous seconds with no PSESs, if the
failure clearing time is less than or equal to 10 seconds.
If the failure clearing time is more than 10 seconds, the DS3
interface becomes available at the onset of 10 contiguous
seconds with no PSESs, or the onset period leading to the
successful clearing condition, whichever occurs later. With
respect to the DS3 error counts, all counters are incremented
while the DS3 interface is deemed available. While the
interface is deemed unavailable, the only count that is
incremented is UASs.

Note that this definition implies that the agent cannot
determine until after a ten second interval has passed
whether a given one-second interval belongs to available or
unavailable time. If the agent chooses to update the various
performance statistics in real time then it must be prepared
to retroactively reduce the PES, PSES, CES, and CSES counts
by 10 and increase the UAS count by 10 when it determines
that available time has been entered. It must also be
prepared to adjust the PCV, CCV, and SEFS count as necessary
since these parameters are not accumulated during unavailable
time. Similarly, it must be prepared to retroactively
decrease the UAS count by 10 and increase the PES, CES, PCV,
and CCV counts as necessary upon entering available time. A
special case exists when the 10 second period leading to
available or unavailable time crosses a 900 second statistics
window boundary, as the foregoing description implies that
the PCV, CCV, PES, CES, PSES, CSEC, SEFS, and UAS counts for
the PREVIOUS interval must be adjusted. In this case
successive GETs of the affected dsx3IntervalPSESs and
dsx3IntervalUASs objects will return differing values if the
first GET occurs during the first few seconds of the window.

The agent may instead choose to delay updates to the various
statistics by 10 seconds in order to avoid retroactive
adjustments to the counters. A way to do this is sketched in
Appendix B.

In any case, a linkDown trap shall be sent only after the agent has
determined for certain that the unavailable state has been entered,
but the time on the trap will be that of the first UAS (i.e., 10
seconds earlier). A linkUp trap shall be handled similarly.

According to [ANSI-T1.231] unavailable time begins at the _onset_ of
10 contiguous severely errored seconds -- that is, unavailable time
starts with the _first_ of the 10 contiguous SESs. Also, while an
interface is deemed unavailable all counters for that interface are

frozen except for the UAS count. It follows that an implementation
which strictly complies with this standard must _not_ increment any
counters other than the UAS count -- even temporarily -- as a result
of anything that happens during those 10 seconds. Since changes in
the signal state lag the data to which they apply by 10 seconds, an
ANSI-compliant implementation must pass the one-second statistics
through a 10-second delay line prior to updating any counters. That
can be done by performing the following steps at the end of each one
second interval.

     i)   Read near/far end CV counter and alarm status flags from the
          hardware.

     ii) Accumulate the CV counts for the preceding second and compare
          them to the ES and SES threshold for the layer in question.
          Update the signal state and shift the one-second CV counts
          and ES/SES flags into the 10-element delay line. Note that
          far-end one-second statistics are to be flagged as "absent"
          during any second in which there is an incoming defect at the
          layer in question or at any lower layer.

     iii) Update the current interval statistics using the signal state
          from the _previous_ update cycle and the one-second CV counts
          and ES/SES flags shifted out of the 10-element delay line.

   This approach is further described in Appendix B.

2.4.3. Performance Defects

   Failure States:
          The Remote Alarm Indication (RAI) failure, in SYNTRAN
          applications, is declared after detecting the Yellow Alarm
          Signal on the alarm channel. See ANSI T1.107a-1990 [ANSI-
          T1.107a]. The Remote Alarm Indication failure, in C-bit
          Parity DS3 applications, is declared as soon as the presence
          of either one or two alarm signals are detected on the Far
          End Alarm Channel. See [ANSI-T1.107]. The Remote Alarm
          Indication failure may also be declared after detecting the
          far-end SEF/AIS defect (aka yellow). The Remote Alarm
          Indication failure is cleared as soon as the presence of the
          any of the above alarms are removed.

          Also, the incoming failure state is declared when a defect
          persists for at least 2-10 seconds. The defects are the
          following: Loss of Signal (LOS), an Out of Frame (OOF) or an
          incoming Alarm Indication Signal (AIS). The Failure State is
          cleared when the defect is absent for less than or equal to
          20 seconds.

Far End SEF/AIS defect (aka yellow)
        A Far End SEF/AIS defect is the occurrence of the two X-bits
        in a M-frame set to zero. The Far End SEF/AIS defect is
        terminated when the two X-bits in a M-frame are set to one.
        (Also known as SASCP-PFE. See T1.231 section 7.4.4.2.6)

Out of Frame (OOF) defect
        A DS3 OOF defect is detected when any three or more errors in
        sixteen or fewer consecutive F-bits occur within a DS3 M-
        frame. An OOF defect may also be called a Severely Errored
        Frame (SEF) defect. An OOF defect is cleared when reframe
        occurs. A DS3 Loss of Frame (LOF) failure is declared when
        the DS3 OOF defect is consistent for 2 to 10 seconds. The
        DS3 OOF defect ends when reframe occurs. The DS3 LOF failure
        is cleared when the DS3 OOF defect is absent for 10 to 20
        seconds. (See T1.231 section 7.1.2.2.1)

        An E3 OOF defect is detected when four consecutive frame
        alignment signals have been incorrectly received in there
        predicted positions in an E3 signal. E3 frame alignment
        occurs when the presence of three consecutive frame alignment
        signals have been detected.

Loss of Signal (LOS) defect
        The DS3 LOS defect is declared upon observing 175 +/- 75
        contiguous pulse positions with no pulses of either positive
        or negative polarity. The DS3 LOS defect is terminated upon
        observing an average pulse density of at least 33% over a
        period of 175 +/- 75 contiguous pulse positions starting with
        the receipt of a pulse. (See T1.231 section 7.1.2.1.1)

Alarm Indication Signal (AIS) defect
        The DS3 AIS is framed with "stuck stuffing." This implies
        that it has a valid M-subframe alignments bits, M-frame
        alignment bits, and P bits. The information bits are set to
        a 1010... sequence, starting with a one (1) after each M-
        subframe alignment bit, M-frame alignment bit, X bit, P bit,
        and C bit. The C bits are all set to zero giving what is
        called "stuck stuffing." The X bits are set to one. The DS3
        AIS defect is declared after DS3 AIS is present in contiguous
        M-frames for a time equal to or greater than T, where 0.2 ms
        <= T <= 100 ms. The DS3 AIS defect is terminated after AIS
        is absent in contiguous M-frames for a time equal to or
        greater than T. (See T1.231 section 7.1.2.2.3)

          The E3 binary content of the AIS is nominally a continuous
          stream of ones. AIS detection and the application of
          consequent actions, should be completed within a time limit
          of 1 ms.

[2.4.4](#). Other Terms

   Circuit Identifier
          This is a character string specified by the circuit vendor,
          and is useful when communicating with the vendor during the
          troubleshooting process (see M.1400 [[ITU-T-M.1400](#)] for
          additional information).

   Proxy

          In this document, the word proxy is meant to indicate an
          application which receives SNMP messages and replies to them
          on behalf of the devices which implement the actual DS3/E3
          interfaces. The proxy may have already collected the
          information about the DS3/E3 interfaces into its local
          database and may not necessarily forward the requests to the
          actual DS3/E3 interface. It is expected in such an
          application that there are periods of time where the proxy is
          not communicating with the DS3/E3 interfaces. In these
          instances the proxy will not necessarily have up-to-date
          configuration information and will most likely have missed
          the collection of some statistics data. Missed statistics
          data collection will result in invalid data in the interval
          table.

[3](#). Object Definitions

   DS3-MIB DEFINITIONS ::= BEGIN

   IMPORTS
        MODULE-IDENTITY, OBJECT-TYPE,
        NOTIFICATION-TYPE, transmission
            FROM SNMPv2-SMI   -- [[RFC2578](#)]
        DisplayString, TimeStamp, TruthValue
            FROM SNMPv2-TC   -- [[RFC2579](#)]
        MODULE-COMPLIANCE, OBJECT-GROUP,
        NOTIFICATION-GROUP
            FROM SNMPv2-CONF   -- [[RFC2580](#)]
        InterfaceIndex
            FROM IF-MIB   -- [[RFC2863](#)]
        PerfCurrentCount, PerfIntervalCount,
        PerfTotalCount
            FROM PerfHist-TC-MIB;   -- [[RFC3593](#)]

   ds3 MODULE-IDENTITY
        LAST-UPDATED "200409080000Z" -- September 08, 2004
        ORGANIZATION "IETF AToM MIB Working Group"
        CONTACT-INFO
          "WG charter:
             http://www.ietf.org/html.charters/atommib-charter.html

           Mailing Lists:
             General Discussion: atommib@research.telcordia.com
             To Subscribe: atommib-request@research.telcordia.com

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                   Ziv Tower, 24 Roul Walenberg
                   Tel Aviv, Israel, 69719

                   Tel: +9723 765 9969
          E-mail: orly_n@rad.com"

        DESCRIPTION
             "The is the MIB module that describes
              DS3 and E3 interfaces objects.

              Copyright (c) The Internet Society (2004). This
              version of this MIB module is part of RFC 3896;
              see the RFC itself for full legal notices."

        REVISION "200409080000Z" -- September 08, 2004

         DESCRIPTION
             "The RFC 3896 version of this MIB module.
              The key changes made to this MIB module
              since its publication in RFC 2496 are as follows:

          (1) The dsx3FracIfIndex SYNTAX matches the description range.

          (2) Reference was added to Circuit Identifier object.

          (3) Usage of ifStackTable section was updated.

          (4) Align the DESCRIPTION clauses of few statistic objects with
              thenear end definition, the far end definition and with
              RFC 3593.

          (5) Add new value, dsx3M13, to dsx3LineType."

          REVISION "199808012130Z"

DESCRIPTION
    "The RFC 2496 version of this MIB module.
     The key changes made to this MIB module
     since its publication in RFC 1407 are as follows:

  (1) The Fractional Table has been deprecated.

  (2) This document uses SMIv2.

  (3) Values are given for ifTable and ifXTable.

  (4) Example usage of ifStackTable is included.

  (5) dsx3IfIndex has been deprecated.

  (6) The definition of valid intervals has been clarified
       for the case where the agent proxied for other devices.
       In particular, the treatment of missing intervals has
       been clarified.

  (7) An inward loopback has been added.

  (8) Additional lineStatus bits have been added for Near End
       in Unavailable Signal State, Carrier Equipment Out of
       Service.

  (9) A read-write line Length object has been added.

  (10) Added a lineStatus last change, trap and enabler.

  (11) Textual Conventions for statistics objects have
       been used.

  (12) A new object, dsx3LoopbackStatus, has been introduced to
       reflect the loopbacks established on a DS3/E3 interface
       and the source to the requests. dsx3LoopbackConfig
       continues to be the desired loopback state while
       dsx3LoopbackStatus reflects the actual state.

  (13) A dual loopback has been added to allow the setting of
       an inward loopback and a line loopback at the same time.

  (14) An object has been added to indicated whether or not
       this is a channelized DS3/E3.

  (15) A new object has been added to indicate which DS1 is to
       set for remote loopback."

```
     REVISION "199301252028Z"
     DESCRIPTION
           "Initial version, published as RFC 1407."
     ::= { transmission 30 }


-- The DS3/E3 Near End Group

-- The DS3/E3 Near End Group consists of four tables:
--    DS3/E3 Configuration
--    DS3/E3 Current
--    DS3/E3 Interval
--    DS3/E3 Total


-- the DS3/E3 Configuration Table

dsx3ConfigTable OBJECT-TYPE
     SYNTAX  SEQUENCE OF Dsx3ConfigEntry
     MAX-ACCESS  not-accessible
     STATUS  current
     DESCRIPTION
           "The DS3/E3 Configuration table."
     ::= { ds3 5 }

dsx3ConfigEntry OBJECT-TYPE
     SYNTAX  Dsx3ConfigEntry
     MAX-ACCESS  not-accessible
     STATUS  current
     DESCRIPTION
           "An entry in the DS3/E3 Configuration table."
     INDEX   { dsx3LineIndex }
     ::= { dsx3ConfigTable 1 }

Dsx3ConfigEntry ::=
     SEQUENCE {
         dsx3LineIndex                      InterfaceIndex,
         dsx3IfIndex                        InterfaceIndex,
         dsx3TimeElapsed                    INTEGER,
         dsx3ValidIntervals                 INTEGER,
         dsx3LineType                       INTEGER,
         dsx3LineCoding                     INTEGER,
         dsx3SendCode                       INTEGER,
         dsx3CircuitIdentifier              DisplayString,
         dsx3LoopbackConfig                 INTEGER,
         dsx3LineStatus                     INTEGER,
         dsx3TransmitClockSource            INTEGER,
         dsx3InvalidIntervals               INTEGER,
         dsx3LineLength                     INTEGER,
         dsx3LineStatusLastChange           TimeStamp,
```

```
        dsx3LineStatusChangeTrapEnable         INTEGER,
        dsx3LoopbackStatus                     INTEGER,
        dsx3Channelization                     INTEGER,
        dsx3Ds1ForRemoteLoop                   INTEGER

}

dsx3LineIndex OBJECT-TYPE
    SYNTAX  InterfaceIndex
    MAX-ACCESS  read-only  -- read-only since originally an
                           -- SMIv1 index

    STATUS  current
    DESCRIPTION
            "This object should be made equal to ifIndex.  The
            next paragraph describes its previous usage.
            Making the object equal to ifIndex allows proper
            use of ifStackTable.

            Previously, this object was the identifier of a
            DS3/E3 Interface on a managed device.  If there is
            an ifEntry that is directly associated with this
            and only this DS3/E3 interface, it should have the
            same value as ifIndex.  Otherwise, number the
            dsx3LineIndices with an unique identifier
            following the rules of choosing a number that is
            greater than ifNumber and numbering the inside
            interfaces (e.g., equipment side) with even
            numbers and outside interfaces (e.g., network side)
            with odd numbers."
    ::= { dsx3ConfigEntry 1 }

dsx3IfIndex OBJECT-TYPE
    SYNTAX  InterfaceIndex
    MAX-ACCESS  read-only
    STATUS  deprecated
    DESCRIPTION
            "This value for this object is equal to the value
            of ifIndex from the Interfaces table of MIB II
            (RFC 1213)."
    ::= { dsx3ConfigEntry 2 }

dsx3TimeElapsed OBJECT-TYPE
    SYNTAX  INTEGER (0..899)
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The number of seconds that have elapsed since the
```

                        beginning of the near end current error-
                        measurement period. If, for some reason, such as
                        an adjustment in the system's time-of-day clock,
                        the current interval exceeds the maximum value,
                        the agent will return the maximum value."
                ::= { dsx3ConfigEntry 3 }

        dsx3ValidIntervals OBJECT-TYPE
                SYNTAX INTEGER (0..96)
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                        "The number of previous near end intervals for
                        which data was collected. The value will be 96
                        unless the interface was brought online within the
                        last 24 hours, in which case the value will be the
                        number of complete 15 minute near end intervals
                        since the interface has been online. In the case
                        where the agent is a proxy, it is possible that
                        some intervals are unavailable. In this case,
                        this interval is the maximum interval number for
                        which data is available."
                ::= { dsx3ConfigEntry 4 }

        dsx3LineType OBJECT-TYPE
                SYNTAX INTEGER {
                        dsx3other(1),
                        dsx3M23(2),
                        dsx3SYNTRAN(3),
                        dsx3CbitParity(4),
                        dsx3ClearChannel(5),
                        e3other(6),
                        e3Framed(7),
                        e3Plcp(8),
                        dsx3M13(9)
                    }
                MAX-ACCESS read-write
                STATUS current
                DESCRIPTION
                        "This variable indicates the variety of DS3 C-bit
                        or E3 application implementing this interface. The
                        type of interface affects the interpretation of
                        the usage and error statistics. The rate of DS3
                        is 44.736 Mbps and E3 is 34.368 Mbps. The
                        dsx3ClearChannel value means that the C-bits are
                        not used except for sending/receiving AIS. The
                        values, in sequence, describe:

```
                              TITLE:          SPECIFICATION:
                              dsx3M23         ANSI T1.107-1988
                              dsx3SYNTRAN     ANSI T1.107-1988
                              dsx3CbitParity  ANSI T1.107a-1990
                              dsx3ClearChannel ANSI T1.102-1987
                              e3Framed        CCITT G.751
                              e3Plcp          ETSI T/NA(91)18
                              dsx3M13         ANSI T1.107a-1990."

       REFERENCE
               "American National Standard for telecommunications
                   - digital hierarchy -
                   formats specification, ANSI T1.107- 1988.
                   ANSI T1.107a-1990.
                American National Standard for telecommunications
                   - digital hierarchy -
                   electrical interfaces, ANSI T1.102- 1987.
                CCITT - Digital Multiplex Equipment Operating at
                   the Third Order Bit Rate of 34 368 Kbit/s and
                   the Forth Order Bit Rate of 139 264 Kbit/s
                   and Using Positive Justification, G.751
                European Telecommunications Standards Institute
                   -- ETS '34M' --
                   Metropolitan Area Network Physical
                   Convergence Layer Procedure for
                   34.368 Megabits per Second, T/NA(91)18,
                   May 1991."
        ::= { dsx3ConfigEntry 5 }

  dsx3LineCoding OBJECT-TYPE
       SYNTAX  INTEGER {
                   dsx3Other(1),
                   dsx3B3ZS(2),
                   e3HDB3(3)
               }
       MAX-ACCESS  read-write
       STATUS  current
       DESCRIPTION
               "This variable describes the variety of Zero Code
               Suppression used on this interface, which in turn
               affects a number of its characteristics.
               dsx3B3ZS and e3HDB3 refer to the use of specified
               patterns of normal bits and bipolar violations
               which are used to replace sequences of zero bits
               of a specified length."
        ::= { dsx3ConfigEntry 6 }

  dsx3SendCode OBJECT-TYPE
```

```
        SYNTAX  INTEGER {
                dsx3SendNoCode(1),
                dsx3SendLineCode(2),
                dsx3SendPayloadCode(3),
                dsx3SendResetCode(4),
                dsx3SendDS1LoopCode(5),
                dsx3SendTestPattern(6)
                }
        MAX-ACCESS  read-write
        STATUS  current
        DESCRIPTION
                "This variable indicates what type of code is
                being sent across the DS3/E3 interface by the
                device.  (These are optional for E3 interfaces.)
                Setting this variable causes the interface to
                begin sending the code requested.
                The values mean:

                    dsx3SendNoCode
                        sending looped or normal data

                    dsx3SendLineCode
                        sending a request for a line loopback

                    dsx3SendPayloadCode
                        sending a request for a payload loopback
                        (i.e., all DS1/E1s in a DS3/E3 frame)

                    dsx3SendResetCode
                        sending a loopback deactivation request

                    dsx3SendDS1LoopCode
                        requesting to loopback a particular DS1/E1
                        within a DS3/E3 frame.  The DS1/E1 is
                        indicated in dsx3Ds1ForRemoteLoop.

                    dsx3SendTestPattern
                        sending a test pattern."
        ::= { dsx3ConfigEntry 7 }

   dsx3CircuitIdentifier OBJECT-TYPE
        SYNTAX  DisplayString (SIZE (0..255))
        MAX-ACCESS  read-write
        STATUS  current
        DESCRIPTION
                "This variable contains the transmission vendor's
                circuit identifier, for the purpose of
                facilitating troubleshooting."
```

```
        REFERENCE "ITU-T M.1400"
        ::= { dsx3ConfigEntry 8 }

   dsx3LoopbackConfig OBJECT-TYPE
        SYNTAX   INTEGER {
                    dsx3NoLoop(1),
                    dsx3PayloadLoop(2),
                    dsx3LineLoop(3),
                    dsx3OtherLoop(4),
                    dsx3InwardLoop(5),
                    dsx3DualLoop(6)
                }
        MAX-ACCESS   read-write
        STATUS   current
        DESCRIPTION
             "This variable represents the desired loopback
             configuration of the DS3/E3 interface.
             The values mean:

             dsx3NoLoop
               Not in the loopback state.  A device that is
               not capable of performing a loopback on
               the interface shall always return this as
               its value.

             dsx3PayloadLoop
               The received signal at this interface is looped
               through the device.  Typically the received signal
               is looped back for retransmission after it has
               passed through the device's framing function.

             dsx3LineLoop
               The received signal at this interface does not
               go through the device (minimum penetration) but
               is looped back out.

             dsx3OtherLoop
               Loopbacks that are not defined here.

             dsx3InwardLoop
               The sent signal at this interface is looped back
               through the device.

             dsx3DualLoop
               Both dsx1LineLoop and dsx1InwardLoop will be
               active simultaneously."
        ::= { dsx3ConfigEntry 9 }
```

```
   dsx3LineStatus OBJECT-TYPE
        SYNTAX  INTEGER (1..4095)
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "This variable indicates the Line Status of the
                interface.  It contains loopback state information
                and failure state information.  The dsx3LineStatus
                is a bit map represented as a sum, therefore, it
                can represent multiple failures and a loopback
                (see dsx3LoopbackConfig object for the type of
                loopback) simultaneously.  The dsx3NoAlarm must be
                set if and only if no other flag is set.

                If the dsx3loopbackState bit is set, the loopback
                in effect can be determined from the
                dsx3loopbackConfig object.
           The various bit positions are:
            1      dsx3NoAlarm         No alarm present
            2      dsx3RcvRAIFailure   Receiving Yellow/Remote
                                       Alarm Indication
            4      dsx3XmitRAIAlarm    Transmitting Yellow/Remote
                                       Alarm Indication
            8      dsx3RcvAIS          Receiving AIS failure state
           16      dsx3XmitAIS         Transmitting AIS
           32      dsx3LOF             Receiving LOF failure state
           64      dsx3LOS             Receiving LOS failure state
          128      dsx3LoopbackState   Looping the received signal
          256      dsx3RcvTestCode     Receiving a Test Pattern
          512      dsx3OtherFailure    any line status not defined
                                       here
         1024      dsx3UnavailSigState Near End in Unavailable
                                       Signal State
         2048      dsx3NetEquipOOS     Carrier Equipment Out of
                                       Service"
        ::= { dsx3ConfigEntry 10 }

   dsx3TransmitClockSource OBJECT-TYPE
        SYNTAX  INTEGER {
                   loopTiming(1),
                   localTiming(2),
                   throughTiming(3)
               }
        MAX-ACCESS  read-write
        STATUS  current
        DESCRIPTION
                "The source of Transmit Clock.
```

                loopTiming indicates that the recovered receive
                clock is used as the transmit clock.

                localTiming indicates that a local clock source is
                used or that an external clock is attached to the
                box containing the interface.

                throughTiming indicates that transmit clock is
                derived from the recovered receive clock of
                another DS3 interface."
         ::= { dsx3ConfigEntry 11 }

    dsx3InvalidIntervals OBJECT-TYPE
         SYNTAX INTEGER (0..96)
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                " The number of intervals in the range from 0 to
                dsx3ValidIntervals for which no data is available.
                This object will typically be zero except in cases
                where the data for some intervals are not
                available (e.g., in proxy situations)."
         ::= { dsx3ConfigEntry 12 }

    dsx3LineLength OBJECT-TYPE
         SYNTAX INTEGER (0..64000)
         UNITS "meters"
         MAX-ACCESS read-write
         STATUS current
         DESCRIPTION
                "The length of the ds3 line in meters. This
                object provides information for line build out
                circuitry if it exists and can use this object to
                adjust the line build out."
         ::= { dsx3ConfigEntry 13 }

    dsx3LineStatusLastChange OBJECT-TYPE
         SYNTAX TimeStamp
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                "The value of MIB II's sysUpTime object at the
                time this DS3/E3 entered its current line status
                state. If the current state was entered prior to
                the last re-initialization of the proxy-agent,
                then this object contains a zero value."
         ::= { dsx3ConfigEntry 14 }

    dsx3LineStatusChangeTrapEnable OBJECT-TYPE
         SYNTAX   INTEGER {
                         enabled(1),
                         disabled(2)
                     }
         MAX-ACCESS read-write
         STATUS   current
         DESCRIPTION
                "Indicates whether dsx3LineStatusChange traps
                should be generated for this interface."
         DEFVAL { disabled }
         ::= { dsx3ConfigEntry 15 }

    dsx3LoopbackStatus OBJECT-TYPE
         SYNTAX   INTEGER (1..127)
         MAX-ACCESS read-only
         STATUS   current
         DESCRIPTION
                "This variable represents the current state of the
                loopback on the DS3 interface. It contains
                information about loopbacks established by a
                manager and remotely from the far end.

                The dsx3LoopbackStatus is a bit map represented as
                a sum, therefore is can represent multiple
                loopbacks simultaneously.

                The various bit positions are:
                 1 dsx3NoLoopback
                 2 dsx3NearEndPayloadLoopback
                 4 dsx3NearEndLineLoopback
                 8 dsx3NearEndOtherLoopback
                16 dsx3NearEndInwardLoopback
                32 dsx3FarEndPayloadLoopback
                64 dsx3FarEndLineLoopback"
         ::= { dsx3ConfigEntry 16 }

    dsx3Channelization OBJECT-TYPE
         SYNTAX   INTEGER {
                         disabled(1),
                         enabledDs1(2),
                         enabledDs2(3)
                     }
         MAX-ACCESS read-write
         STATUS   current
         DESCRIPTION
                "Indicates whether this ds3/e3 is channelized or
                unchannelized. The value of enabledDs1 indicates

```
                 that this is a DS3 channelized into DS1s.  The
                 value of enabledDs3 indicated that this is a DS3
                 channelized into DS2s.  Setting this object will
                 cause the creation or deletion of DS2 or DS1
                 entries in the ifTable.  "
           ::= { dsx3ConfigEntry 17 }

     dsx3Ds1ForRemoteLoop  OBJECT-TYPE
           SYNTAX      INTEGER (0..29)
           MAX-ACCESS  read-write
           STATUS      current
           DESCRIPTION
                 "Indicates which DS1/E1 on this DS3/E3 will be
                 indicated in the remote ds1 loopback request.  A
                 value of 0 means no DS1 will be looped.  A value
                 of 29 means all DS1s/E1s will be looped."
           ::= { dsx3ConfigEntry 18 }

     -- the DS3/E3 Current Table


     dsx3CurrentTable OBJECT-TYPE
           SYNTAX  SEQUENCE OF Dsx3CurrentEntry
           MAX-ACCESS  not-accessible
           STATUS  current
           DESCRIPTION
                 "The DS3/E3 current table contains various
                 statistics being collected for the current 15
                 minute interval."
           ::= { ds3 6 }

     dsx3CurrentEntry OBJECT-TYPE
           SYNTAX  Dsx3CurrentEntry
           MAX-ACCESS  not-accessible
           STATUS  current
           DESCRIPTION
                 "An entry in the DS3/E3 Current table."
           INDEX   { dsx3CurrentIndex }
           ::= { dsx3CurrentTable 1 }

     Dsx3CurrentEntry ::=
           SEQUENCE {
               dsx3CurrentIndex            InterfaceIndex,
               dsx3CurrentPESs            PerfCurrentCount,
               dsx3CurrentPSESs           PerfCurrentCount,
               dsx3CurrentSEFSs           PerfCurrentCount,
               dsx3CurrentUASs            PerfCurrentCount,
               dsx3CurrentLCVs            PerfCurrentCount,
```

```
        dsx3CurrentPCVs                PerfCurrentCount,
        dsx3CurrentLESs                PerfCurrentCount,
        dsx3CurrentCCVs                PerfCurrentCount,
        dsx3CurrentCESs                PerfCurrentCount,
        dsx3CurrentCSESs               PerfCurrentCount
   }

dsx3CurrentIndex OBJECT-TYPE
    SYNTAX  InterfaceIndex
    MAX-ACCESS  read-only  -- read-only since originally an
                           -- SMIv1 index
    STATUS  current
    DESCRIPTION
            "The index value which uniquely identifies the
            DS3/E3 interface to which this entry is
            applicable.  The interface identified by a
            particular value of this index is the same
            interface as identified by the same value an
            dsx3LineIndex object instance."
    ::= { dsx3CurrentEntry 1 }

dsx3CurrentPESs OBJECT-TYPE
    SYNTAX  PerfCurrentCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The counter associated with the number of P-bit
            Errored Seconds."
    ::= { dsx3CurrentEntry 2 }

dsx3CurrentPSESs OBJECT-TYPE
    SYNTAX  PerfCurrentCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The counter associated with the number of P-bit
            Severely Errored Seconds."
    ::= { dsx3CurrentEntry 3 }

dsx3CurrentSEFSs OBJECT-TYPE
    SYNTAX  PerfCurrentCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The counter associated with the number of
            Severely Errored Framing Seconds."
    ::= { dsx3CurrentEntry 4 }
```

```
   dsx3CurrentUASs OBJECT-TYPE
       SYNTAX  PerfCurrentCount
       MAX-ACCESS  read-only
       STATUS  current
       DESCRIPTION
               "The counter associated with the number of
               Unavailable Seconds."
       ::= { dsx3CurrentEntry 5 }

   dsx3CurrentLCVs OBJECT-TYPE
       SYNTAX  PerfCurrentCount
       MAX-ACCESS  read-only
       STATUS  current
       DESCRIPTION
               "The counter associated with the number of Line
               Coding Violations."
       ::= { dsx3CurrentEntry 6 }

   dsx3CurrentPCVs OBJECT-TYPE
       SYNTAX  PerfCurrentCount
       MAX-ACCESS  read-only
       STATUS  current
       DESCRIPTION
               "The counter associated with the number of P-bit
               Coding Violations."
       ::= { dsx3CurrentEntry 7 }

   dsx3CurrentLESs OBJECT-TYPE
       SYNTAX  PerfCurrentCount
       MAX-ACCESS  read-only
       STATUS  current
       DESCRIPTION
               "The number of Line Errored Seconds."
       ::= { dsx3CurrentEntry 8 }

   dsx3CurrentCCVs OBJECT-TYPE
       SYNTAX  PerfCurrentCount
       MAX-ACCESS  read-only
       STATUS  current
       DESCRIPTION
               "The number of C-bit Coding Violations."
       ::= { dsx3CurrentEntry 9 }

   dsx3CurrentCESs OBJECT-TYPE
       SYNTAX  PerfCurrentCount
       MAX-ACCESS  read-only
       STATUS  current
       DESCRIPTION
```

               "The number of C-bit Errored Seconds."
         ::= { dsx3CurrentEntry 10 }

   dsx3CurrentCSESs OBJECT-TYPE
         SYNTAX PerfCurrentCount
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of C-bit Severely Errored Seconds."
         ::= { dsx3CurrentEntry 11 }

   -- the DS3/E3 Interval Table

   dsx3IntervalTable OBJECT-TYPE
         SYNTAX SEQUENCE OF Dsx3IntervalEntry
         MAX-ACCESS not-accessible
         STATUS current
         DESCRIPTION
               "The DS3/E3 Interval Table contains various
               statistics collected by each DS3/E3 Interface over
               the previous 24 hours of operation. The past 24
               hours are broken into 96 completed 15 minute
               intervals. Each row in this table represents one
               such interval (identified by dsx3IntervalNumber)
               and for one specific interface (identified by
               dsx3IntervalIndex)."
         ::= { ds3 7 }

   dsx3IntervalEntry OBJECT-TYPE
         SYNTAX Dsx3IntervalEntry
         MAX-ACCESS not-accessible
         STATUS current
         DESCRIPTION
               "An entry in the DS3/E3 Interval table."
         INDEX   { dsx3IntervalIndex, dsx3IntervalNumber }
         ::= { dsx3IntervalTable 1 }

   Dsx3IntervalEntry ::=
         SEQUENCE {
             dsx3IntervalIndex   InterfaceIndex,
             dsx3IntervalNumber   INTEGER,
             dsx3IntervalPESs   PerfIntervalCount,
             dsx3IntervalPSESs   PerfIntervalCount,
             dsx3IntervalSEFSs   PerfIntervalCount,
             dsx3IntervalUASs   PerfIntervalCount,
             dsx3IntervalLCVs   PerfIntervalCount,
             dsx3IntervalPCVs   PerfIntervalCount,
             dsx3IntervalLESs   PerfIntervalCount,

            dsx3IntervalCCVs   PerfIntervalCount,
            dsx3IntervalCESs   PerfIntervalCount,
            dsx3IntervalCSESs   PerfIntervalCount,
            dsx3IntervalValidData   TruthValue
        }

    dsx3IntervalIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only -- read-only since originally an
                               -- SMIv1 index
        STATUS current
        DESCRIPTION
                "The index value which uniquely identifies the
                DS3/E3 interface to which this entry is
                applicable. The interface identified by a
                particular value of this index is the same
                interface as identified by the same value an
                dsx3LineIndex object instance."
        ::= { dsx3IntervalEntry 1 }

    dsx3IntervalNumber OBJECT-TYPE
        SYNTAX INTEGER (1..96)
        MAX-ACCESS read-only -- read-only since originally an
                               -- SMIv1 index
        STATUS current
        DESCRIPTION
                "A number between 1 and 96, where 1 is the most
                recently completed 15 minute interval and 96 is
                the 15 minutes interval completed 23 hours and 45
                minutes prior to interval 1."
        ::= { dsx3IntervalEntry 2 }

    dsx3IntervalPESs OBJECT-TYPE
        SYNTAX PerfIntervalCount
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The counter associated with the number of P-bit
                Errored Seconds."
        ::= { dsx3IntervalEntry 3 }

    dsx3IntervalPSESs OBJECT-TYPE
        SYNTAX PerfIntervalCount
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The counter associated with the number of P-bit
                Severely Errored Seconds."

```
                   ::= { dsx3IntervalEntry 4 }

           dsx3IntervalSEFSs OBJECT-TYPE
               SYNTAX  PerfIntervalCount
               MAX-ACCESS  read-only
               STATUS  current
               DESCRIPTION
                       "The counter associated with the number of
                       Severely Errored Framing Seconds."
               ::= { dsx3IntervalEntry 5 }

           dsx3IntervalUASs OBJECT-TYPE
               SYNTAX  PerfIntervalCount
               MAX-ACCESS  read-only
               STATUS  current
               DESCRIPTION
                       "The counter associated with the number of
                       Unavailable Seconds.  This object may decrease if
                       the occurrence of unavailable seconds occurs across
                       an interval boundary."
               ::= { dsx3IntervalEntry 6 }

           dsx3IntervalLCVs OBJECT-TYPE
               SYNTAX  PerfIntervalCount
               MAX-ACCESS  read-only
               STATUS  current
               DESCRIPTION
                       "The counter associated with the number of Line
                       Coding Violations."
               ::= { dsx3IntervalEntry 7 }

           dsx3IntervalPCVs OBJECT-TYPE
               SYNTAX  PerfIntervalCount
               MAX-ACCESS  read-only
               STATUS  current
               DESCRIPTION
                       "The counter associated with the number of P-bit
                       Coding Violations."
               ::= { dsx3IntervalEntry 8 }

           dsx3IntervalLESs OBJECT-TYPE
               SYNTAX  PerfIntervalCount
               MAX-ACCESS  read-only
               STATUS  current
               DESCRIPTION
                       "The number of Line Errored  Seconds  (BPVs  or
                       illegal  zero  sequences)."
               ::= { dsx3IntervalEntry 9 }
```

    dsx3IntervalCCVs OBJECT-TYPE
         SYNTAX PerfIntervalCount
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                "The number of C-bit Coding Violations."
         ::= { dsx3IntervalEntry 10 }

    dsx3IntervalCESs OBJECT-TYPE
         SYNTAX PerfIntervalCount
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                "The number of C-bit Errored Seconds."
         ::= { dsx3IntervalEntry 11 }

    dsx3IntervalCSESs OBJECT-TYPE
         SYNTAX PerfIntervalCount
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                "The number of C-bit Severely Errored Seconds."
         ::= { dsx3IntervalEntry 12 }

    dsx3IntervalValidData OBJECT-TYPE
         SYNTAX TruthValue
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                " This variable indicates if the data for this
                interval is valid."
         ::= { dsx3IntervalEntry 13 }

   -- the DS3/E3 Total

   dsx3TotalTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dsx3TotalEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "The DS3/E3 Total Table contains the cumulative
                sum of the various statistics for the 24 hour
                period preceding the current interval."
        ::= { ds3 8 }

   dsx3TotalEntry OBJECT-TYPE
        SYNTAX Dsx3TotalEntry
        MAX-ACCESS not-accessible

             STATUS current
             DESCRIPTION
                     "An entry in the DS3/E3 Total table."
           INDEX   { dsx3TotalIndex }
             ::= { dsx3TotalTable 1 }

      Dsx3TotalEntry ::=
             SEQUENCE {
                 dsx3TotalIndex   InterfaceIndex,
                 dsx3TotalPESs   PerfTotalCount,
                 dsx3TotalPSESs   PerfTotalCount,
                 dsx3TotalSEFSs   PerfTotalCount,
                 dsx3TotalUASs   PerfTotalCount,
                 dsx3TotalLCVs   PerfTotalCount,
                 dsx3TotalPCVs   PerfTotalCount,
                 dsx3TotalLESs   PerfTotalCount,
                 dsx3TotalCCVs   PerfTotalCount,
                 dsx3TotalCESs   PerfTotalCount,
                 dsx3TotalCSESs   PerfTotalCount
             }

      dsx3TotalIndex OBJECT-TYPE
             SYNTAX InterfaceIndex
             MAX-ACCESS read-only -- read-only since originally an
                                    -- SMIv1 index
             STATUS current
             DESCRIPTION
                     "The index value which uniquely identifies the
                     DS3/E3 interface to which this entry is
                     applicable. The interface identified by a
                     particular value of this index is the same
                     interface as identified by the same value an
                     dsx3LineIndex object instance."
             ::= { dsx3TotalEntry 1 }

      dsx3TotalPESs OBJECT-TYPE
             SYNTAX PerfTotalCount
             MAX-ACCESS read-only
             STATUS current
             DESCRIPTION
                     "The counter associated with the number of P-bit
                     Errored Seconds, encountered by a DS3 interface in
                     the previous 24 hour interval. Invalid 15 minute
                     intervals count as 0."
             ::= { dsx3TotalEntry 2 }

      dsx3TotalPSESs OBJECT-TYPE
             SYNTAX PerfTotalCount

          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                  "The counter associated with the number of P-bit
                  Severely Errored Seconds, encountered by a DS3
                  interface in the previous 24 hour interval.
                  Invalid 15 minute intervals count as 0."
          ::= { dsx3TotalEntry 3 }

      dsx3TotalSEFSs OBJECT-TYPE
          SYNTAX PerfTotalCount
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                  "The counter associated with the number of
                  Severely Errored Framing Seconds, encountered by a
                  DS3/E3 interface in the previous 24 hour interval.
                  Invalid 15 minute intervals count as 0."
          ::= { dsx3TotalEntry 4 }

      dsx3TotalUASs OBJECT-TYPE
          SYNTAX PerfTotalCount
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                  "The counter associated with the number of
                  Unavailable Seconds, encountered by a DS3
                  interface in the previous 24 hour interval.
                  Invalid 15 minute intervals count as 0."
          ::= { dsx3TotalEntry 5 }

      dsx3TotalLCVs OBJECT-TYPE
          SYNTAX PerfTotalCount
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                  "The counter associated with the number of Line
                  Coding Violations encountered by a DS3/E3
                  interface in the previous 24 hour interval.
                  Invalid 15 minute intervals count as 0."
          ::= { dsx3TotalEntry 6 }

      dsx3TotalPCVs OBJECT-TYPE
          SYNTAX PerfTotalCount
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                  "The counter associated with the number of P-bit

```
            Coding Violations, encountered by a DS3 interface
            in the previous 24 hour interval. Invalid 15
            minute intervals count as 0."
    ::= { dsx3TotalEntry 7 }

dsx3TotalLESs OBJECT-TYPE
    SYNTAX  PerfTotalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The number of Line Errored  Seconds  (BPVs  or
            illegal  zero  sequences) encountered by a DS3/E3
            interface in the previous 24 hour interval.
            Invalid 15 minute intervals count as 0."
    ::= { dsx3TotalEntry 8 }

dsx3TotalCCVs OBJECT-TYPE
    SYNTAX  PerfTotalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The number of C-bit Coding Violations encountered
            by a DS3 interface in the previous 24 hour
            interval. Invalid 15 minute intervals count as 0."
    ::= { dsx3TotalEntry 9 }

dsx3TotalCESs OBJECT-TYPE
    SYNTAX  PerfTotalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The number of C-bit Errored Seconds encountered
            by a DS3 interface in the previous 24 hour
            interval. Invalid 15 minute intervals count as 0."
    ::= { dsx3TotalEntry 10 }

dsx3TotalCSESs OBJECT-TYPE
    SYNTAX  PerfTotalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The number of C-bit Severely Errored Seconds
            encountered by a DS3 interface in the previous 24
            hour interval. Invalid 15 minute intervals count
            as 0."
    ::= { dsx3TotalEntry 11 }
```

    -- The DS3 Far End Group

    -- The DS3 Far End Group consists of four tables :
    --   DS3 Far End Configuration
    --   DS3 Far End Current
    --   DS3 Far End Interval
    --   DS3 Far End Total

    -- The DS3 Far End Configuration Table

    dsx3FarEndConfigTable OBJECT-TYPE
        SYNTAX   SEQUENCE OF Dsx3FarEndConfigEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
                "The DS3 Far End Configuration Table contains
                configuration information reported in the C-bits
                from the remote end."
        ::= { ds3 9 }

    dsx3FarEndConfigEntry OBJECT-TYPE
        SYNTAX   Dsx3FarEndConfigEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
                "An entry in the DS3 Far End Configuration table."
       INDEX   { dsx3FarEndLineIndex }
        ::= { dsx3FarEndConfigTable 1 }

    Dsx3FarEndConfigEntry ::=
        SEQUENCE {
            dsx3FarEndLineIndex   InterfaceIndex,
            dsx3FarEndEquipCode   DisplayString,
            dsx3FarEndLocationIDCode   DisplayString,
            dsx3FarEndFrameIDCode   DisplayString,
            dsx3FarEndUnitCode   DisplayString,
            dsx3FarEndFacilityIDCode   DisplayString
        }

    dsx3FarEndLineIndex OBJECT-TYPE
        SYNTAX   InterfaceIndex
        MAX-ACCESS read-only -- read-only since originally an
                               -- SMIv1 index
        STATUS   current
        DESCRIPTION
                "The index value which uniquely identifies the DS3
                interface to which this entry is applicable. The
                interface identified by a particular value of this

                   index is the same interface as identified by the
                   same value an dsx3LineIndex object instance."
           ::= { dsx3FarEndConfigEntry 1 }

     dsx3FarEndEquipCode OBJECT-TYPE
         SYNTAX DisplayString (SIZE (0..10))
         MAX-ACCESS read-write
         STATUS current
         DESCRIPTION
                 "This is the Far End Equipment Identification code
                 that describes the specific piece of equipment.
                 It is sent within the Path Identification
                 Message."
           ::= { dsx3FarEndConfigEntry 2 }

     dsx3FarEndLocationIDCode OBJECT-TYPE
         SYNTAX DisplayString (SIZE (0..11))
         MAX-ACCESS read-write
         STATUS current
         DESCRIPTION
                 "This is the Far End Location Identification code
                 that describes the specific location of the
                 equipment. It is sent within the Path
                 Identification Message."
           ::= { dsx3FarEndConfigEntry 3 }

     dsx3FarEndFrameIDCode OBJECT-TYPE
         SYNTAX DisplayString (SIZE (0..10))
         MAX-ACCESS read-write
         STATUS current
         DESCRIPTION
                 "This is the Far End Frame Identification code
                 that identifies where the equipment is located
                 within a building at a given location. It is sent
                 within the Path Identification Message."
           ::= { dsx3FarEndConfigEntry 4 }

     dsx3FarEndUnitCode OBJECT-TYPE
         SYNTAX DisplayString (SIZE (0..6))
         MAX-ACCESS read-write
         STATUS current
         DESCRIPTION
                 "This is the Far End code that identifies the
                 equipment location within a bay. It is sent
                 within the Path Identification Message."
           ::= { dsx3FarEndConfigEntry 5 }

     dsx3FarEndFacilityIDCode OBJECT-TYPE

```
     SYNTAX  DisplayString (SIZE (0..38))
     MAX-ACCESS  read-write
     STATUS  current
     DESCRIPTION
             "This code identifies a specific Far End DS3 path.
             It is sent within the Path Identification
             Message."
     ::= { dsx3FarEndConfigEntry 6 }

-- The DS3 Far End Current

dsx3FarEndCurrentTable OBJECT-TYPE
     SYNTAX  SEQUENCE OF Dsx3FarEndCurrentEntry
     MAX-ACCESS  not-accessible
     STATUS  current
     DESCRIPTION
             "The DS3 Far End Current table contains various
             statistics being collected for the current 15
             minute interval.  The statistics are collected
             from the far end block error code within the C-
             bits."
     ::= { ds3 10 }

dsx3FarEndCurrentEntry OBJECT-TYPE
     SYNTAX  Dsx3FarEndCurrentEntry
     MAX-ACCESS  not-accessible
     STATUS  current
     DESCRIPTION
             "An entry in the DS3 Far End Current table."
     INDEX   { dsx3FarEndCurrentIndex }
     ::= { dsx3FarEndCurrentTable 1 }

Dsx3FarEndCurrentEntry ::=
     SEQUENCE {
         dsx3FarEndCurrentIndex        InterfaceIndex,
         dsx3FarEndTimeElapsed         INTEGER,
         dsx3FarEndValidIntervals      INTEGER,
         dsx3FarEndCurrentCESs         PerfCurrentCount,
         dsx3FarEndCurrentCSESs        PerfCurrentCount,
         dsx3FarEndCurrentCCVs         PerfCurrentCount,
         dsx3FarEndCurrentUASs         PerfCurrentCount,
         dsx3FarEndInvalidIntervals    INTEGER
     }

 dsx3FarEndCurrentIndex OBJECT-TYPE
     SYNTAX  InterfaceIndex
     MAX-ACCESS  read-only  -- read-only since originally an
                            -- SMIv1 index
```

```
        STATUS  current
        DESCRIPTION
                "The index value which uniquely identifies the DS3
                interface to which this entry is applicable.  The
                interface identified by a particular value of this
                index is identical to the interface identified by
                the same value of dsx3LineIndex."
        ::= { dsx3FarEndCurrentEntry 1 }

   dsx3FarEndTimeElapsed OBJECT-TYPE
        SYNTAX  INTEGER (0..899)
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "The number of seconds that have elapsed since the
                beginning of the far end current error-measurement
                period. If, for some reason, such as an adjustment
                in the system's time-of-day clock, the current
                interval exceeds the maximum value, the agent will
                return the maximum value."
        ::= { dsx3FarEndCurrentEntry 2 }

   dsx3FarEndValidIntervals OBJECT-TYPE
        SYNTAX  INTEGER (0..96)
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "The number of previous far end intervals for
                which data was collected.  The value will be 96
                unless the interface was brought online within the
                last 24 hours, in which case the value will be the
                number of complete 15 minute far end intervals
                since the interface has been online. In the case
                where the agent is a proxy, it is possible that
                some intervals are unavailable.  In this case,
                this interval is the maximum interval number for
                which data is available."
        ::= { dsx3FarEndCurrentEntry 3 }

  dsx3FarEndCurrentCESs OBJECT-TYPE
        SYNTAX  PerfCurrentCount
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "The counter associated with the number of Far End
                C-bit Errored Seconds."
        ::= { dsx3FarEndCurrentEntry 4 }
```

```
    dsx3FarEndCurrentCSESs OBJECT-TYPE
        SYNTAX  PerfCurrentCount
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "The counter associated with the number of Far End
                C-bit Severely Errored Seconds."
        ::= { dsx3FarEndCurrentEntry 5 }

    dsx3FarEndCurrentCCVs OBJECT-TYPE
        SYNTAX  PerfCurrentCount
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "The counter associated with the number of Far End
                C-bit Coding Violations reported via the far end
                block error count."
        ::= { dsx3FarEndCurrentEntry 6 }

    dsx3FarEndCurrentUASs OBJECT-TYPE
        SYNTAX  PerfCurrentCount
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                "The counter associated with the number of Far End
                unavailable seconds."
        ::= { dsx3FarEndCurrentEntry 7 }

    dsx3FarEndInvalidIntervals OBJECT-TYPE
        SYNTAX  INTEGER (0..96)
        MAX-ACCESS  read-only
        STATUS  current
        DESCRIPTION
                " The number of intervals in the range from 0 to
                dsx3FarEndValidIntervals for which no data is
                available.  This object will typically be zero
                except in cases where the data for some intervals
                are not available (e.g., in proxy situations)."
        ::= { dsx3FarEndCurrentEntry 8 }

    -- The DS3 Far End Interval Table

    dsx3FarEndIntervalTable OBJECT-TYPE
        SYNTAX  SEQUENCE OF Dsx3FarEndIntervalEntry
        MAX-ACCESS  not-accessible
        STATUS  current
        DESCRIPTION
                "The DS3 Far End Interval Table contains various
```

```
                statistics collected by each DS3 interface over
                the previous 24 hours of operation.  The past 24
                hours are broken into 96 completed 15 minute
                intervals."
         ::= { ds3 11 }

   dsx3FarEndIntervalEntry OBJECT-TYPE
        SYNTAX  Dsx3FarEndIntervalEntry
        MAX-ACCESS  not-accessible
        STATUS  current
        DESCRIPTION
                "An entry in the DS3 Far End Interval table."
        INDEX   { dsx3FarEndIntervalIndex,
                  dsx3FarEndIntervalNumber }
        ::= { dsx3FarEndIntervalTable 1 }

   Dsx3FarEndIntervalEntry ::=
        SEQUENCE {
            dsx3FarEndIntervalIndex      InterfaceIndex,
            dsx3FarEndIntervalNumber     INTEGER,
            dsx3FarEndIntervalCESs       PerfIntervalCount,
            dsx3FarEndIntervalCSESs      PerfIntervalCount,
            dsx3FarEndIntervalCCVs       PerfIntervalCount,
            dsx3FarEndIntervalUASs       PerfIntervalCount,
            dsx3FarEndIntervalValidData  TruthValue
        }

   dsx3FarEndIntervalIndex OBJECT-TYPE
        SYNTAX  InterfaceIndex
        MAX-ACCESS  read-only  -- read-only since originally an
                               -- SMIv1 index
        STATUS  current
        DESCRIPTION
                "The index value which uniquely identifies the DS3
                interface to which this entry is applicable.  The
                interface identified by a particular value of this
                index is identical to the interface identified by
                the same value of dsx3LineIndex."
         ::= { dsx3FarEndIntervalEntry 1 }

   dsx3FarEndIntervalNumber OBJECT-TYPE
       SYNTAX  INTEGER (1..96)
       MAX-ACCESS  read-only  -- read-only since originally an
                              -- SMIv1 index
       STATUS  current
       DESCRIPTION
                "A number between 1 and 96, where 1 is the most
                recently completed 15 minute interval and 96 is
```

```
            the 15 minutes interval completed 23 hours and 45
            minutes prior to interval 1."
    ::= { dsx3FarEndIntervalEntry 2 }

dsx3FarEndIntervalCESs OBJECT-TYPE
    SYNTAX  PerfIntervalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The counter associated with the number of Far End
            C-bit Errored Seconds encountered by a DS3
            interface in one of the previous 96, individual 15
            minute, intervals. In the case where the agent is
            a proxy and data is not available, return
            noSuchInstance."
    ::= { dsx3FarEndIntervalEntry 3 }

dsx3FarEndIntervalCSESs OBJECT-TYPE
    SYNTAX  PerfIntervalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The counter associated with the number of Far End
            C-bit Severely Errored Seconds."
     ::= { dsx3FarEndIntervalEntry 4 }

dsx3FarEndIntervalCCVs OBJECT-TYPE
     SYNTAX  PerfIntervalCount
     MAX-ACCESS  read-only
     STATUS  current
     DESCRIPTION
            "The counter associated with the number of Far End
            C-bit Coding Violations reported via the far end
            block error count."
    ::= { dsx3FarEndIntervalEntry 5 }

dsx3FarEndIntervalUASs OBJECT-TYPE
    SYNTAX  PerfIntervalCount
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
            "The counter associated with the number of Far End
            unavailable seconds."
     ::= { dsx3FarEndIntervalEntry 6 }

dsx3FarEndIntervalValidData OBJECT-TYPE
    SYNTAX  TruthValue
    MAX-ACCESS  read-only
```

```
      STATUS  current
      DESCRIPTION
             " This variable indicates if the data for this
             interval is valid."
      ::= { dsx3FarEndIntervalEntry 7 }

-- The DS3 Far End Total

dsx3FarEndTotalTable OBJECT-TYPE
     SYNTAX  SEQUENCE OF Dsx3FarEndTotalEntry
     MAX-ACCESS  not-accessible
     STATUS  current
     DESCRIPTION
             "The DS3 Far End Total Table contains the
             cumulative sum of the various statistics for the
             24 hour period preceding the current interval."
     ::= { ds3 12 }

dsx3FarEndTotalEntry OBJECT-TYPE
     SYNTAX  Dsx3FarEndTotalEntry
     MAX-ACCESS  not-accessible
     STATUS  current
     DESCRIPTION
             "An entry in the DS3 Far End Total table."
     INDEX   { dsx3FarEndTotalIndex }
     ::= { dsx3FarEndTotalTable 1 }

Dsx3FarEndTotalEntry ::=
     SEQUENCE {
         dsx3FarEndTotalIndex        InterfaceIndex,
         dsx3FarEndTotalCESs         PerfTotalCount,
         dsx3FarEndTotalCSESs        PerfTotalCount,
         dsx3FarEndTotalCCVs         PerfTotalCount,
         dsx3FarEndTotalUASs         PerfTotalCount
     }

dsx3FarEndTotalIndex OBJECT-TYPE
    SYNTAX  InterfaceIndex
    MAX-ACCESS  read-only  -- read-only since originally an
                           -- SMIv1 index
    STATUS  current
    DESCRIPTION
            "The index value which uniquely identifies the DS3
            interface to which this entry is applicable.  The
            interface identified by a particular value of this
            index is identical to the interface identified by
            the same value of dsx3LineIndex."
    ::= { dsx3FarEndTotalEntry 1 }
```

       dsx3FarEndTotalCESs OBJECT-TYPE
           SYNTAX PerfTotalCount
           MAX-ACCESS read-only
           STATUS current
           DESCRIPTION
                   "The counter associated with the number of Far End
                   C-bit Errored Seconds encountered by a DS3
                   interface in the previous 24 hour interval.
                   Invalid 15 minute intervals count as 0."
           ::= { dsx3FarEndTotalEntry 2 }

       dsx3FarEndTotalCSESs OBJECT-TYPE
           SYNTAX PerfTotalCount
           MAX-ACCESS read-only
           STATUS current
           DESCRIPTION
                   "The counter associated with the number of Far End
                   C-bit Severely Errored Seconds encountered by a
                   DS3 interface in the previous 24 hour interval.
                   Invalid 15 minute intervals count as 0."
           ::= { dsx3FarEndTotalEntry 3 }

       dsx3FarEndTotalCCVs OBJECT-TYPE
           SYNTAX PerfTotalCount
           MAX-ACCESS read-only
           STATUS current
           DESCRIPTION
                   "The counter associated with the number of Far End
                   C-bit Coding Violations reported via the far end
                   block error count encountered by a DS3 interface
                   in the previous 24 hour interval. Invalid 15
                   minute intervals count as 0."
           ::= { dsx3FarEndTotalEntry 4 }

       dsx3FarEndTotalUASs OBJECT-TYPE
           SYNTAX PerfTotalCount
           MAX-ACCESS read-only
           STATUS current
           DESCRIPTION
                   "The counter associated with the number of Far End
                   unavailable seconds encountered by a DS3 interface
                   in the previous 24 hour interval. Invalid 15
                   minute intervals count as 0."
           ::= { dsx3FarEndTotalEntry 5 }

       -- the DS3/E3 Fractional Table

       -- This table is deprecated.

```
dsx3FracTable OBJECT-TYPE
    SYNTAX   SEQUENCE OF Dsx3FracEntry
    MAX-ACCESS   not-accessible
    STATUS   deprecated
    DESCRIPTION
            "This table is deprecated in favour of using
            ifStackTable.

            Implementation of this table was optional.  It was
            designed for those systems dividing a DS3/E3 into
            channels containing different data streams that
            are of local interest.

            The DS3/E3 fractional table identifies which
            DS3/E3 channels associated with a CSU are being
            used to support a logical interface, i.e., an
            entry in the interfaces table from the Internet-
            standard MIB.

            For example, consider a DS3 device with 4 high
            speed links carrying router traffic, a feed for
            voice, a feed for video, and a synchronous channel
            for a non-routed protocol.  We might describe the
            allocation of channels, in the dsx3FracTable, as
            follows:
            dsx3FracIfIndex.2. 1 = 3  dsx3FracIfIndex.2.15 = 4
            dsx3FracIfIndex.2. 2 = 3  dsx3FracIfIndex.2.16 = 6
            dsx3FracIfIndex.2. 3 = 3  dsx3FracIfIndex.2.17 = 6
            dsx3FracIfIndex.2. 4 = 3  dsx3FracIfIndex.2.18 = 6
            dsx3FracIfIndex.2. 5 = 3  dsx3FracIfIndex.2.19 = 6
            dsx3FracIfIndex.2. 6 = 3  dsx3FracIfIndex.2.20 = 6
            dsx3FracIfIndex.2. 7 = 4  dsx3FracIfIndex.2.21 = 6
            dsx3FracIfIndex.2. 8 = 4  dsx3FracIfIndex.2.22 = 6
            dsx3FracIfIndex.2. 9 = 4  dsx3FracIfIndex.2.23 = 6
            dsx3FracIfIndex.2.10 = 4  dsx3FracIfIndex.2.24 = 6
            dsx3FracIfIndex.2.11 = 4  dsx3FracIfIndex.2.25 = 6
            dsx3FracIfIndex.2.12 = 5  dsx3FracIfIndex.2.26 = 6
            dsx3FracIfIndex.2.13 = 5  dsx3FracIfIndex.2.27 = 6
            dsx3FracIfIndex.2.14 = 5  dsx3FracIfIndex.2.28 = 6
            For dsx3M23, dsx3 SYNTRAN, dsx3CbitParity, and
            dsx3ClearChannel  there are 28 legal channels,
            numbered 1 through 28.

            For e3Framed there are 16 legal channels, numbered
            1 through 16.  The channels (1..16) correspond
            directly to the equivalently numbered time-slots."
     ::= { ds3 13 }
```

```
    dsx3FracEntry OBJECT-TYPE
         SYNTAX  Dsx3FracEntry
         MAX-ACCESS  not-accessible
         STATUS  deprecated
         DESCRIPTION
                        "An entry in the DS3 Fractional table."
         INDEX   { dsx3FracIndex, dsx3FracNumber }
         ::= { dsx3FracTable 1 }

    Dsx3FracEntry ::=
         SEQUENCE {
             dsx3FracIndex      INTEGER,
             dsx3FracNumber     INTEGER,
             dsx3FracIfIndex    INTEGER
         }

    dsx3FracIndex OBJECT-TYPE
        SYNTAX  INTEGER (1..'7fffffff'h)
        MAX-ACCESS  read-only -- read-only since originally an
                                    -- SMIv1 index
        STATUS  deprecated
        DESCRIPTION
                "The index value which uniquely identifies  the
                DS3  interface  to which this entry is applicable
                The interface identified by a  particular value
                of  this  index is the same interface as
                identified by the same value  an  dsx3LineIndex
                object instance."
        ::= { dsx3FracEntry 1 }

    dsx3FracNumber OBJECT-TYPE
        SYNTAX  INTEGER (1..31)
        MAX-ACCESS  read-only  -- read-only since originally an
                                    -- SMIv1 index
        STATUS  deprecated
        DESCRIPTION
                "The channel number for this entry."
        ::= { dsx3FracEntry 2 }

    dsx3FracIfIndex OBJECT-TYPE
       SYNTAX  INTEGER (0..'7fffffff'h)
       MAX-ACCESS  read-write
       STATUS  deprecated
       DESCRIPTION
                "An index value that uniquely identifies an
                interface.  The interface identified by a
                particular value of this index is the same
                interface as  identified by the same value an
```

```
             ifIndex object instance. If no interface is
             currently using a channel, the value should be
             zero.  If a single interface occupies more  than
             one  time slot,  that ifIndex value will be found
             in multiple time slots."
    ::= { dsx3FracEntry 3 }


  -- DS3 TRAPS

   ds3Traps OBJECT IDENTIFIER ::= { ds3 15 }

   dsx3LineStatusChange NOTIFICATION-TYPE
       OBJECTS { dsx3LineStatus,
                 dsx3LineStatusLastChange }
       STATUS  current
       DESCRIPTION
               "A dsx3LineStatusChange trap is sent when the
               value of an instance of dsx3LineStatus changes. It
               can be utilized by an NMS to trigger polls.  When
               the line status change results in a lower level
               line status change (i.e., ds1), then no traps for
               the lower level are sent."
        ::= { ds3Traps 0 1 }


   -- conformance information

   ds3Conformance OBJECT IDENTIFIER ::= { ds3 14 }
   ds3Groups      OBJECT IDENTIFIER ::= { ds3Conformance 1 }
   ds3Compliances OBJECT IDENTIFIER ::= { ds3Conformance 2 }


   -- compliance statements

   ds3Compliance MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for DS3/E3 interfaces."
       MODULE  -- this module
           MANDATORY-GROUPS { ds3NearEndConfigGroup,
                              ds3NearEndStatisticsGroup }

           GROUP       ds3FarEndGroup
           DESCRIPTION
               "Implementation of this group is optional for all
               systems that attach to a DS3 Interface.  However,
               only C-bit Parity and SYNTRAN DS3 applications
               have the capability (option) of providing this
               information."
           GROUP       ds3NearEndOptionalTrapGroup
```

```
            DESCRIPTION
                "Implementation of this group is optional for all
                systems that attach to a DS3 Interface.  If it is
                implemented then ds3NearEndOptionalConfigGroup
                should also be implemented."
            GROUP       ds3NearEndOptionalConfigGroup
            DESCRIPTION
                "Implementation of this group is optional for all
                systems that attach to a DS3 interface."

            OBJECT      dsx3LineType
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for the line type is not required."

            OBJECT      dsx3LineCoding
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for the line coding is not
                required."

            OBJECT      dsx3SendCode
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for the send code is not required."

            OBJECT      dsx3LoopbackConfig
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for loopbacks is not required."

            OBJECT      dsx3TransmitClockSource
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for the transmit clock source is not
                required."

            OBJECT      dsx3LineLength
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for the line length is not
                required."

            OBJECT      dsx3Channelization
            MIN-ACCESS  read-only
            DESCRIPTION
                "Write access for the channelization is not
                required."
```

```
        ::= { ds3Compliances 1 }

   -- units of conformance

   ds3NearEndConfigGroup  OBJECT-GROUP
       OBJECTS { dsx3LineIndex,
                 dsx3TimeElapsed,
                 dsx3ValidIntervals,
                 dsx3LineType,
                 dsx3LineCoding,
                 dsx3SendCode,
                 dsx3CircuitIdentifier,
                 dsx3LoopbackConfig,
                 dsx3LineStatus,
                 dsx3TransmitClockSource,
                 dsx3InvalidIntervals,
                 dsx3LineLength,
                 dsx3LoopbackStatus,
                 dsx3Channelization,
                 dsx3Ds1ForRemoteLoop}
       STATUS  current
       DESCRIPTION
               "A collection of objects providing configuration
               information applicable to all DS3/E3 interfaces."
       ::= { ds3Groups 1 }

   ds3NearEndStatisticsGroup OBJECT-GROUP
       OBJECTS { dsx3CurrentIndex,
                 dsx3CurrentPESs,
                 dsx3CurrentPSESs,
                 dsx3CurrentSEFSs,
                 dsx3CurrentUASs,
                 dsx3CurrentLCVs,
                 dsx3CurrentPCVs,
                 dsx3CurrentLESs,
                 dsx3CurrentCCVs,
                 dsx3CurrentCESs,
                 dsx3CurrentCSESs,
                 dsx3IntervalIndex,
                 dsx3IntervalNumber,
                 dsx3IntervalPESs,
                 dsx3IntervalPSESs,
                 dsx3IntervalSEFSs,
                 dsx3IntervalUASs,
                 dsx3IntervalLCVs,
                 dsx3IntervalPCVs,
                 dsx3IntervalLESs,
                 dsx3IntervalCCVs,
```

```
                     dsx3IntervalCESs,
                     dsx3IntervalCSESs,
                     dsx3IntervalValidData,
                     dsx3TotalIndex,
                     dsx3TotalPESs,
                     dsx3TotalPSESs,
                     dsx3TotalSEFSs,
                     dsx3TotalUASs,
                     dsx3TotalLCVs,
                     dsx3TotalPCVs,
                     dsx3TotalLESs,
                     dsx3TotalCCVs,
                     dsx3TotalCESs,
                     dsx3TotalCSESs }
         STATUS  current
         DESCRIPTION
                 "A collection of objects providing statistics
                 information applicable to all DS3/E3 interfaces."
         ::= { ds3Groups 2 }

    ds3FarEndGroup  OBJECT-GROUP
         OBJECTS { dsx3FarEndLineIndex,
                     dsx3FarEndEquipCode,
                     dsx3FarEndLocationIDCode,
                     dsx3FarEndFrameIDCode,
                     dsx3FarEndUnitCode,
                     dsx3FarEndFacilityIDCode,
                     dsx3FarEndCurrentIndex,
                     dsx3FarEndTimeElapsed,
                     dsx3FarEndValidIntervals,
                     dsx3FarEndCurrentCESs,
                     dsx3FarEndCurrentCSESs,
                     dsx3FarEndCurrentCCVs,
                     dsx3FarEndCurrentUASs,
                     dsx3FarEndInvalidIntervals,
                     dsx3FarEndIntervalIndex,
                     dsx3FarEndIntervalNumber,
                     dsx3FarEndIntervalCESs,
                     dsx3FarEndIntervalCSESs,
                     dsx3FarEndIntervalCCVs,
                     dsx3FarEndIntervalUASs,
                     dsx3FarEndIntervalValidData,
                     dsx3FarEndTotalIndex,
                     dsx3FarEndTotalCESs,
                     dsx3FarEndTotalCSESs,
                     dsx3FarEndTotalCCVs,
                     dsx3FarEndTotalUASs }
         STATUS  current
```

```
      DESCRIPTION
              "A collection of objects providing remote
              configuration and statistics information
              applicable to C-bit Parity and SYNTRAN DS3
              interfaces."
      ::= { ds3Groups 3 }

  ds3DeprecatedGroup OBJECT-GROUP

      OBJECTS { dsx3IfIndex,
                dsx3FracIndex,
                dsx3FracNumber,
                dsx3FracIfIndex }
      STATUS  deprecated
      DESCRIPTION
              "A collection of obsolete objects that may be
              implemented for backwards compatibility."
      ::= { ds3Groups 4 }

  ds3NearEndOptionalConfigGroup OBJECT-GROUP
      OBJECTS { dsx3LineStatusLastChange,
                dsx3LineStatusChangeTrapEnable }

      STATUS    current
      DESCRIPTION
              "A collection of objects that may be implemented
              on DS3/E3 interfaces."
      ::= { ds3Groups 5 }

  ds3NearEndOptionalTrapGroup NOTIFICATION-GROUP
      NOTIFICATIONS { dsx3LineStatusChange }
      STATUS    current
      DESCRIPTION
              "A collection of notifications that may be
              implemented on DS3/E3 interfaces."
      ::= { ds3Groups 6 }

  END
```

4. **Appendix A** - **Use of dsx3IfIndex and dsx3LineIndex**

   This Appendix exists to document the previous use if dsx3IfIndex and
   dsx3LineIndex and to clarify the relationship of dsx3LineIndex as
   defined in RFC 1407 with the dsx3LineIndex as defined in this
   document.

   The following shows the old and new definitions and the relationship:

   [New Definition]: "This object should be made equal to ifIndex. The
   next paragraph describes its previous usage. Making the object equal
   to ifIndex allows proper use of ifStackTable.

   [Old Definition]: "this object is the identifier of a DS3/E3
   Interface on a managed device. If there is an ifEntry that is
   directly associated with this and only this DS3/E3 interface, it
   should have the same value as ifIndex. Otherwise, number the
   dsx3LineIndices with an unique identifier following the rules of
   choosing a number that is greater than ifNumber and numbering the
   inside interfaces (e.g., equipment side) with even numbers and
   outside interfaces (e.g, network side) with odd numbers."

   When the "Old Definition" was created, it was described this way to
   allow a manager to treat the value _as if_ it were an ifIndex, i.e.,
   the value would either be: 1) an ifIndex value or 2) a value that
   was guaranteed to be different from all valid ifIndex values.

   The new definition is a subset of that definition, i.e., the value is
   always an ifIndex value.

   The following is Section 3.1 from [RFC1407]:

   Different physical configurations for the support of SNMP with DS3/E3
   equipment exist. To accommodate these scenarios, two different
   indices for DS3/E3 interfaces are introduced in this MIB. These
   indices are dsx3IfIndex and dsx3LineIndex.

   External interface scenario: the SNMP Agent represents all managed
   DS3/E3 lines as external interfaces (for example, an Agent residing
   on the device supporting DS3/E3 interfaces directly):

For this scenario, all interfaces are assigned an integer value equal
to ifIndex, and the following applies:

    ifIndex=dsx3IfIndex=dsx3LineIndex for all interfaces.

The dsx3IfIndex column of the DS3/E3 Configuration table relates each
DS3/E3 interface to its corresponding interface (ifIndex) in the
Internet-standard MIB (MIB-II STD 17, [[RFC1213](#)]).

External&Internal interface scenario: the SNMP Agents resides on an
host external from the device supporting DS3/E3 interfaces (e.g., a
router). The Agent represents both the host and the DS3/E3 device.
The index dsx3LineIndex is used to not only represent the DS3/E3
interfaces external from the host/DS3/E3-device combination, but also
the DS3/E3 interfaces connecting the host and the DS3/E3 device. The
index dsx3IfIndex is always equal to ifIndex.

Example:

A shelf full of CSUs connected to a Router. An SNMP Agent residing
on the router proxies for itself and the CSU. The router has also an
Ethernet interface:

```
        +-----+
  |       |     |
  |       |     |                 +---------------------+
  |E      |     |   44.736 MBPS   |  ds3 M13    Line#A  | ds3 C-bit Parity
  |t      |  R  |---------------+ - - - - - -  - - -  - +------>
  |h      |     |               |                      |
  |e      |  O  |   44.736 MBPS  |   ds3 M13    Line#B | ds3 C-bit Parity
  |r      |     |--------------+ - - - - - - - - - - - +------>
  |n      |  U  |               |                      |
  |e      |     |   44.736 MBPS  |   ds3 M13    Line#C | ds3 C-bit Parity
  |t      |  T  |--------------+ - - - -- -- - - - - - +------>
  |       |     |               |                      |
  |-----|  E  |   44.736 MBPS  |   ds3 M13    Line#D | ds3 C-bit Parity
  |       |     |--------------+ -   - - - -- - - - - - +------>
  |       |  R  |               |_____|
  |       |     |
  |     +-----+
```

The assignment of the index values could for example be:

```
    ifIndex (= dsx3IfIndex)                        dsx3LineIndex

         1                    NA                   NA (Ethernet)
         2       Line#A   Router Side         6
         2       Line#A   Network Side        7
         3       Line#B   Router Side         8
         3       Line#B   Network Side        9
         4       Line#C   Router Side        10
         4       Line#C   Network Side       11
         5       Line#D   Router Side        12
         5       Line#D   Network Side       13
```

For this example, ifNumber is equal to 5. Note the following
description of dsx3LineIndex: the dsx3LineIndex identifies a DS3/E3
Interface on a managed device. If there is an ifEntry that is
directly associated with this and only this DS3/E3 interface, it
should have the same value as ifIndex. Otherwise, number the
dsx3LineIndices with an unique identifier following the rules of
choosing a number greater than ifNumber and numbering inside
interfaces (e.g., equipment side) with even numbers and outside
interfaces (e.g., network side) with odd numbers.

If the CSU shelf is managed by itself by a local SNMP Agent, the
situation would be:

```
    ifIndex (= dsx3IfIndex)                        dsx3LineIndex

         1       Line#A    Network Side            1
         2       Line#A    RouterSide              2
         3       Line#B    Network Side            3
         4       Line#B    RouterSide              4
         5       Line#C    Network Side            5
         6       Line#C    Router Side             6
         7       Line#D    Network Side            7
         8       Line#D    Router Side             8
```

[5](#). [Appendix B](#) - The delay approach to Unavialable Seconds.

This procedure is illustrated below for a DS3 C-Bit parity
application. Similar rules would apply for other interfaces covered
by this MIB. The procedure guarantees that the statistical counters
are correctly updated at all times, although they lag real time by 10
seconds. At the end of each 15 minutes interval the current interval
counts are transferred to the most recent interval entry and each
interval is shifted up by one position, with the oldest being
discarded if necessary in order to make room. The current interval

counts then start over from zero. Note, however, that the signal
state calculation does not start afresh at each interval boundary;
rather, signal state information is retained across interval
boundaries.

```
+---------------------------------------------------------------------+
|                READ COUNTERS & STATUS INFO FROM HARDWARE            |
|                                                                     |
|BPV EXZ LOS     PCV CCV AIS SEF OOF LOF         FEBE  RAI            |
+---------------------------------------------------------------------+
   |   |   |       |   |   |   |   |   |             |    |
   |   |   |       |   |   |   |   |   |             |    |
   V   V   V       V   V   V   V   V   V             V    V
+---------------------------------------------------------------------+
| ACCUM ONE-SEC STATS, CHK ERR THRESHOLDS, & UPDT SIGNAL STATE       |
|                                                                     |
|<------------- NEAR END ---------------->| |<---- FAR END ----->|
|                                                                     |
|LCV LES PCV CCV PES CES PSES CSES SEFS A/U CCV CES CSES SEFS A/U|
+---------------------------------------------------------------------+
   |   |   |   |   |   |    |    |    |    |   |    |    |    |   |
   |   |   |   |   |   |    |    |    |    |   |    |    |    |   |
   V   V   V   V   V   V    V    V    V    |   V    V    V    V   |
+-------------------------------------+ | +----------------+ |
|            ONE-SEC DELAY            | | | ONE-SEC DELAY  | |
|             (1 OF 10)               | | |   (1 OF 10)    | |
+-------------------------------------+ | +----------------+ |
   |   |   |   |   |   |    |    |    |    |   |    |    |    |   |
   /   /   /   /   /   /    /    /    /    /   /    /    /    /   /
   |   |   |   |   |   |    |    |    |    |   |    |    |    |   |
   V   V   V   V   V   V    V    V    V    |   V    V    V    V   |
+-------------------------------------+ | +----------------+ |
|            ONE-SEC DELAY            | | | ONE-SEC DELAY  | |
|            (10 OF 10)               | | |  (10 OF 10)    | |
+-------------------------------------+ | +----------------+ |
   |   |   |   |   |   |    |    |    |    |   |    |    |    |   |
   |   |   |   |   |   |    |    |    |    |   |    |    |    |   |
   V   V   V   V   V   V    V    V    V    V   V    V    V    V   V
+---------------------------------------------------------------------+
|                    UPDATE STATISTICS COUNTERS                      |
|                                                                     |
|<------------- NEAR END ---------------->| |<---- FAR END ----->|
|                                                                     |
|LCV LES PCV CCV PES CES PSES CSES SEFS UAS CCV CES CSES SEFS UAS|
+---------------------------------------------------------------------+
```

Note that if such a procedure is adopted there is no current interval
data for the first ten seconds after a system comes up.

noSuchInstance must be returned if a management station attempts to
access the current interval counters during this time.

It is an implementation-specific matter whether an agent assumes that
the initial state of the interface is available or unavailable.

[6](#). Acknowledgments

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[8](#). Security Considerations

   There are a number of management objects defined in this MIB module
   with a MAX-ACCESS clause of read-write. 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. The
   specific the objects and their sensitivities/vulnerabilities are as
   follows.

   Setting the following objects to incorrect values may result in
   traffic interruptions:

      dsx3LineType
      dsx3LineCoding
      dsx3SendCode
      dsx3LoopbackConfig
      dsx3TransmitClockSource
      dsx3LineLength
      dsx3Channelization
      dsx3Ds1ForRemoteLoop

   In the case of dsx3LineType, for example, both ends of a DS3/E3 must
   have the same value in order for traffic to flow. In the case of
   dsx3SendCode and dsx3LoopbackConfig, for another example, traffic may
   stop transmitting when particular loopbacks are applied.

   Setting the following objects to an incorrect value will result in
   the remote end receiving an incorrect Path Identification message,
   which may result in a connectivity inconsistency:

      dsx3FarEndEquipCode
      dsx3FarEndLocationIDCode
      dsx3FarEndFrameIDCode
      dsx3FarEndUnitCode
      dsx3FarEndFacilityIDCode

   Setting the following object to an incorrect value will not harm the
   traffic, but it may cause a circuit to be mis-identified and thereby
   create difficulties for service personnel when attempting to
   troubleshoot a problem:

      dsx3CircuitIdentifier

   Setting the following object can cause an increase in the number of
   traps received by the network management station:

      dsx3LineStatusChangeTrapEnable

   The readable objects in this MIB module (i.e., the objects with a
   MAX-ACCESS other than not-accessible) may be considered sensitive in
   some environments since, collectively, they provide extensive
   information about the performance of interfaces in DS3/E3 equipment
   or networks and can reveal some aspects of their configuration. In
   such environments it is important to control even GET and NOTIFY
   access to these objects and possibly to encrypt the values of these
   objects when sending them over the network via SNMP.

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

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

   Further, deployment of SNMP versions prior to SNMPv3 is NOT
   RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to
   enable cryptographic security. It is then a customer/operator
   responsibility to ensure that the SNMP entity giving access to an
   instance of this MIB module is properly configured to give access to
   the objects only to those principals (users) that have legitimate
   rights to indeed GET or SET (change/create/delete) them.

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