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An SNMP MIB extension to [RFC3591](#) to manage optical interface parameters
of DWDM applications

[draft-galikunze-ccamp-g-698-2-snmp-mib-02](#)

Abstract

This memo defines a module of the Management Information Base (MIB) used by Simple Network Management Protocol (SNMP) in TCP/IP- based internets. In particular, it defines objects for managing Optical parameters associated with Dense Wavelength Division Multiplexing (DWDM) interfaces or characterized by the Optical Transport Network (OTN). This is an extension of the [RFC3591](#) to support the optical parameters mainly but not only described in recommendations like ITU-T G.698.2. [[ITU.G698.2](#)]

The MIB module defined in this memo can be used for Optical Parameters monitoring and/or configuration of the endpoints of Black Links.

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1. Introduction

This memo defines a portion of the Management Information Base (MIB) used by Simple Network Management Protocol (SNMP) in TCP/IP- based internets. In particular, it defines objects for managing Optical parameters associated with Wavelength Division Multiplexing (WDM) systems or characterized by the Optical Transport Network (OTN) in accordance with but not limited to the optical interface defined in G.698.2 [[ITU.G698.2](#)]

Black Link approach allows supporting an optical transmitter/receiver pair of one vendor to inject a DWDM channel and run it over an optical network composed of amplifiers, filters, add-drop multiplexers from a different vendor. From architectural point of view, the "Black Link" is a set of pre-configured/qualified network connections between the G.698.2 reference points S and R. The black links will be managed at the edges (i.e. the transmitters and receivers attached to the S and R reference points respectively) for the relevant parameters specified in G.698.2 [[ITU.G698.2](#)], G.798 [[ITU.G798](#)], G.874 [[ITU.G874](#)], and the performance parameters specified G.7710/Y.1701 [ITU-T G.7710] and G.874.1 [[ITU.G874.1](#)].

The G.698.2 [[ITU.G698.2](#)] provides optical parameter values for physical layer interfaces of Dense Wavelength Division Multiplexing (DWDM) systems primarily intended for metro applications which include optical amplifiers. Applications are defined in G.698.2 [[ITU.G698.2](#)] using optical interface parameters at the single-channel connection points between optical transmitters and the optical multiplexer, as well as between optical receivers and the optical demultiplexer in the DWDM system. This Recommendation uses a methodology which does not specify the details of the optical link, e.g. the maximum fibre length, explicitly. The Recommendation currently includes unidirectional DWDM applications at 2.5 and 10 Gbit/s (with 100 GHz and 50 GHz channel frequency spacing). Work is still underway for 40 and 100 Gbit/s interfaces. There is possibility for extensions to a lower channel frequency spacing.

This draft refers and supports also the
[draft-kunze-g-698-2-management-control-framework](#)

The building of an SNMP MIB describing the optical parameters defined in G.698.2 [[ITU.G698.2](#)] G.798 [[ITU.G798](#)], G.874 [[ITU.G874](#)], parameters specified G.7710/Y.1701 [ITU-T G.7710] allows the different vendors and operator to retrieve, provision and exchange information related to Optical blak links in a standardized way. This facilitates interworking in case of using optical interfaces from different vendors at the end of the link.

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The MIB, reporting the Optical parameters and their values, characterizes the features and the performances of the optical components and allow a reliable black link design in case of multivendor optical networks.

Although [RFC 3591](#) [[RFC3591](#)] describes and defines the SNMP MIB of a number of key optical parameters, alarms and Performance Monitoring, a more complete description of optical parameters and processes can be found in the ITU-T Recommendations. [Appendix A](#) of this document provides an overview about the extensive ITU-T documentation in this area. The same considerations can be applied to the [RFC 4054](#) [[RFC4054](#)]

2. 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](#)].

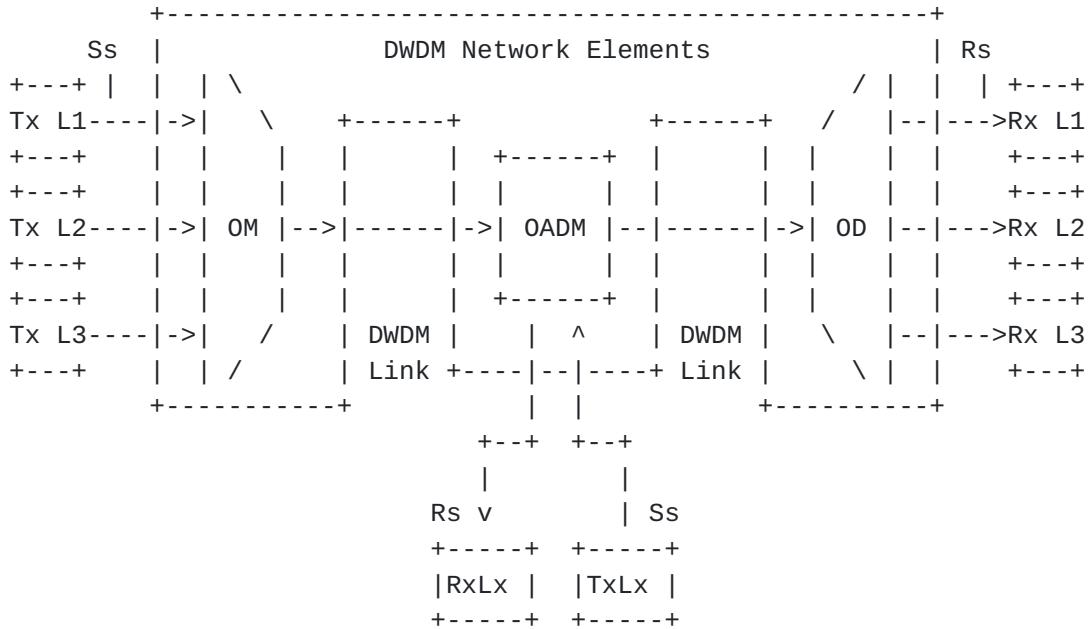
3. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)] In the description of OIDs the convention: Set (S) Get (G) and Trap (T) conventions will describe the action allowed by the parameter.

4. Overview

In this document, the term OTN (Optical Transport Network) system is used to describe devices that are compliant with the requirements specified in the ITU-T Recommendations G.872 [[ITU.G872](#)], G.709 [[ITU.G709](#)], G.798 [[ITU.G798](#)], G.874 [[ITU.G874](#)], and G.874.1 [[ITU.G874.1](#)] while refers to G.698.2 [[ITU.G698.2](#)] for the Black Link and DWDM parameter description.

Figure 1 shows a set of reference points, for the linear "black link" approach, for single-channel connection (Ss and Rs) between transmitters (Tx) and receivers (Rx). Here the DWDM network elements include an OM and an OD (which are used as a pair with the opposing element), one or more optical amplifiers and may also include one or more OADMs.



Ss = reference point at the DWDM network element tributary output

Rs = reference point at the DWDM network element tributary input

Lx = Lambda x

OM = Optical Mux

OD = Optical Demux

OADM = Optical Add Drop Mux

from Fig. 5.1/G.698.2

Figure 1: Linear Black Link

G.698.2 [[ITU.G698.2](#)] defines also Ring Black Link configurations [Fig. 5.2/G.698.2] and Bidirectional Black Link configurations [Fig. 5.3/G.698.2]

[4.1. Optical Parameters Description](#)

The black links are managed at the edges, i.e. at the transmitters (Tx) and receivers (Rx) attached to the S and R reference points respectively. The parameters that could be managed at the black link edges are specified in G.698.2 [[ITU.G698.2](#)] for the optical

interface, in G.798 [[ITU.G798](#)] for the equipment aspect, and in G.7710/Y.1701 [[ITU.G7710](#)] and G.874 [[ITU.G874](#)] for fault management and performance monitoring.

The definitions of the optical parameters are provided below to increase the readability of the document, where the definition is ended by (G) the parameter can be retrieve with a GET, when (S) it can be provisioned by a SET, (G,S) can be either GET and SET.

To support the management of these parameters, the SNMP MIB in [RFC 3591](#) [[RFC3591](#)] is extended with a new MIB module defined in [section 6](#) of this document. This new MIB module includes the definition of new configuration table of the OCh Layer for the parameters at Tx (S) and Rx (R).

[4.1.1. General](#)

The following general parameters from G.698.2 [[ITU.G698.2](#)] and G.694.1 [[ITU.G694.1](#)] provide general information at the optical interface reference points.

Minimum channel spacing:

This is the minimum nominal difference in frequency (in GHz) between two adjacent channels (G).

Bit rate/line coding of optical tributary signals:

Optical tributary signal class NRZ 2.5G (from nominally 622 Mbit/s to nominally 2.67 Gbit/s) or NRZ 10G nominally 2.4 Gbit/s to nominally 10.71 Gbit/s. (nominally 2.4 Gbit/s to nominally 10.71 Gbit/s). 40Gbit/s and 100Gbit/s are under study (G, S).

FEC Coding:

This parameter indicate what Forward Error Correction (FEC) code is used at Ss and Rs (G, S) (not mentioned in G.698). EDITOR NOTE: Need to check whether this parameter is to be put in "vendor specific" parameter or can be a standard parameter as defined in G.698.2. Is this the various adaptations (FEC encoding types) specified in G.798 clauses 12.3.1.1 (with FEC), 12.3.1.2 (without FEC), and 12.3.1.5 (vendor-specific FEC) .

Maximum bit error ratio (BER):

This parameter indicate the maximum Bit error rate can be supported by the application at the Receiver. In case of FEC applications it is intended after the FEC correction (G) .

Fiber type:

Fiber type as per fibre types are chosen from those defined in ITU-T Recs G.652, G.653, G.654 and G.655 (G,S) .

Wavelength Range (see G.694.1): [[ITU.G694.1](#)]

This parameter indicate minimum and maximum wavelength spectrum (G) in a definite wavelength Band (L, C and S).

Wavelength Value (see G.694.1 Table 1):

This parameter indicates the wavelength value that Ss and Rs will be set to work (in THz) se in particular [Section 6/G.694.1](#) (G, S).

Vendor Transceiver Class:

Other than specifying all the Transceiver parameter, it might be convenient for the vendors to summarize a set of parameters in a single proprietary parameter: the class of transceiver. The Transceiver classification will be based on the Vendor Name and the main TX and RX parameters (i.e. Trunk Mode, Framing, Bit rate, Trunk Type, Channel Band, Channel Grid, Modulation Format, Channel Modulation Format, FEC Coding, Electrical Signal Framing at Tx, Minimum maximum Chromatic Disperion (CD) at Rx, Maximum Polarization Mode Dispersion (PMD) at Rx, Maximum differential group delay at Rx, Loopbacks, TDC, Pre-FEC BER, Q-factor, Q-margin,etc.). If this parameter is used, the MIB parameters specifying the Transceiver characteristics may not be significant and the vendor will be responsible to specify the Class contents and values. The Vendor can publish the parameters of its Classes or declare to be compatible with published Classes.(G) Optional for compliance. (not mentioned in G.698)

Single-channel application codes (see G.698.2):

This parameter indicates the transceiver application code at Ss and Rs as defined in [[ITU.G698.2](#)] Chapter 5.4 - this parameter can be called Optical Interface Identifier OII as per [[draft-martinelli-wson-interface-class](#)] (G).

PARAMETERS	Get/Set	Reference
Minimum channel spacing	G	G.698.2 S.7.1.1
Bit rate/line coding of opt. trib. signals	G,S	G.698.2 S.7.1.2
FEC Coding	G,S	G.975
Maximum bit error ratio (BER)	G	G.698.2 S.7.1.3
Fiber type	G,S	G.698.2 S.7.1.4
Wavelength Range	G	G.694.1 S.6
Wavelength Value	G,S	G.694.1 S.6
Vendor Transceiver Class	G	N.A.
Single-channel application codes	G	G.698.2 S.5.3

Table 1: General parameters

4.1.2. Parameters at Ss

The following parameters for the interface at point S are defined in G.698.2 [[ITU.G698.2](#)].

Maximum and minimum mean channel output power:

The mean launched power at Ss is the average power (in dBm) of a pseudo-random data sequence coupled into the DWDM link. It is defined as the rrange (Max and Min) of the parameter (G, S)

Minimum and maximum central frequency:

The central frequency is the nominal single-channel frequency (in THz) on which the digital coded information of the particular optical channel is modulated by use of the NRZ line code. The central frequencies of all channels within an application lie on the frequency grid for the minimum channel spacing of the application given in ITU-T Rec. G.694.1. This parameter give the Maximum and minimum frequency interval the channel must be modulated (G)

Maximum spectral excursion:

This is the maximum acceptable difference between the nominal central frequency (in GHz) of the channel and the minus 15 dB points of the transmitter spectrum furthest from the nominal central frequency measured at point Ss. (G)

Maximum transmitter (residual) dispersion OSNR penalty (B.3/G.959.1) [[ITU.G959.1](#)]

Defines a reference receiver that this penalty is measured with. Lowest OSNR at Ss with worst case (residual) dispersion minus the Lowest OSNR at Ss with no dispersion. Lowest OSNR at Ss with no

dispersion (G)

Minimum side mode suppression ratio, Minimum channel extinction ratio, Eye mask:

Although are defined in G.698.2 are not supported by this draft (G).

Current Laser Output power:

This parameter report the current Transceiver Output power, it can be either a setting and measured value (G, S) NEED TO DISCUSS ON THIS.

PARAMETERS	Get/Set	Reference
MAX and min mean channel output power	G,S	G.698.2 S.7.2.1
Min and MAX central frequency	G	G.698.2 S.7.2.2
MAX spectral excursion	G	G.698.2 S.7.2.3
MAX transmitter (residual) disper.	G	G.698.2 S.7.2.7
OSNR penalty		
MAX side mode suppression ratio, min	G	G.698.2 S.7.2.6
channel extinction ratio, Eye mask		
Current Laser Output power	G,S	N.A.

Table 2: parameters at Ss

[4.1.3. Optical path from point Ss to Rs](#)

The following parameters for the optical path from point S and R are defined in G.698.2 [[ITU.G698.2](#)].

Maximum and minimum (residual) chromatic dispersion:

These parameters define the maximum and minimum value of the optical path "end to end chromatic dispersion" (in ps/nm) that the system shall be able to tolerate. (G)

Minimum optical return loss at Ss:

These parameter defines minimum optical return loss (in dB) of the cable plant at the source reference point (Ss), including any connectors (G)

Maximum discrete reflectance between Ss and Rs:

Optical reflectance is defined to be the ratio of the reflected optical power present at a point, to the optical power incident to that point. Control of reflections is discussed extensively in ITU-T Rec. G.957 (G)

Maximum differential group delay:

Differential group delay (DGD) is the time difference between the fractions of a pulse that are transmitted in the two principal states of polarization of an optical signal. For distances greater than several kilometres, and assuming random (strong) polarization mode coupling, DGD in a fibre can be statistically modelled as having a Maxwellian distribution. (G)

Maximum polarization dependent loss:

The polarization dependent loss (PDL) is the difference (in dB) between the maximum and minimum values of the channel insertion loss (or gain) of the black link from point SS to RS due to a variation of the state of polarization (SOP) over all SOPs. (G)

Maximum inter-channel crosstalk:

Inter-channel crosstalk is defined as the ratio of total power in all of the disturbing channels to that in the wanted channel, where the wanted and disturbing channels are at different wavelengths. The parameter specify the isolation of a link conforming to the "black link" approach such that under the worst-case operating conditions the inter-channel crosstalk at any reference point RS is less than the maximum inter-channel crosstalk value (G)

Maximum interferometric crosstalk:

This parameter places a requirement on the isolation of a link conforming to the "black link" approach such that under the worst case operating conditions the interferometric crosstalk at any reference point RS is less than the maximum interferometric crosstalk value. (G)

Maximum optical path OSNR penalty:

The optical path OSNR penalty is defined as the difference between the Lowest OSNR at Rs and Lowest OSNR at Ss that meets the BER requirement (G)

Maximum ripple:

Although is defined in G.698.2, this parameter is not supported by this draft.

PARAMETERS	Get/Set	Reference
MAX and min (residual) chromatic dispersion	G	G.698.2 S.7.3.2
Min optical return loss at Ss	G	G.698.2 S.7.3.3
MAX discrete reflectance between Ss and Rs	G	G.698.2 S.7.3.4
MAX differential group delay	G	G.698.2 S.7.3.5
MAX polarization dependent loss	G	G.698.2 S.7.3.6
MAX inter-channel crosstalk	G	G.698.2 S.7.3.7
MAX interferometric crosstalk	G	G.698.2 S.7.3.8
MAX optical path OSNR penalty	G	G.698.2 S.7.3.9
MAX ripple	G	G.698.2 S.7.3.1

Table 3: parameters between Ss and Rs

4.1.4. Interface at point Rs

The following parameters for the interface at point R are defined in G.698.2.

4.1.4.1. Mandatory parameters

Maximum and minimum mean input power:

The maximum and minimum values of the average received power (in dBm) at point Rs. (G)

Minimum optical signal-to-noise ratio (OSNR):

The minimum optical signal-to-noise ratio (OSNR) is the minimum value of the ratio of the signal power in the wanted channel to the highest noise power density in the range of the central frequency plus and minus the maximum spectral excursion (G)

Receiver OSNR tolerance:

The receiver OSNR tolerance is defined as the minimum value of OSNR at point Rs that can be tolerated while maintaining the maximum BER of the application. (G)

Maximum reflectance at receiver:

Although is defined in G.698.2, this parameter is not supported by this draft (G).

PARAMETERS	Get/Set	Reference
MAX and min mean input power	G	G.698.2 S.7.4.1
Min optical signal-to-noise ratio (OSNR)	G	G.698.2 S.7.4.2
Receiver OSNR tolerance	G	G.698.2 S.7.4.3
MAX reflectance at receiver	G	G.698.2 S.7.4.4

Table 4: mandatory parameters

4.1.4.2. Optional parameters

Current Chromatic Dispersion (CD):

Residual Chromatic Dispersion measuread at Rx Transceiver port (G).

Current Optical Signal to Noise Ratio (OSNR):

Current Optical Signal to Noise Ratio (OSNR) estimated at Rx Transceiver port (G).

Current Quality factor (Q):

"Q" factor estimated at Rx Transceiver port (G).

PARAMETERS	Get/Set	Reference
Current Chromatic Dispersion (CD)	G	N.A.
Current Opt. Signal to Noise Ratio (OSNR)	G	N.A.
Current Quality factor (Q)	G	N.A.

Table 5: optional parameters

4.1.5. Alarms and Threshold definition

This section describes the Alarms and the Thresholds at Ss and Rs points according to ITU-T Recommendations G.798 [[ITU.G798](#)], G.874 [[ITU.G874](#)], and G.874.1 [[ITU.G874.1](#)].

OTN alarms defined in [RFC3591](#):

Threshold Crossing Alert (TCA Alarm)

LOW-TXPOWER

HIGH-TXPOWER

LOW-RXPOWER

HIGH-RXPOWER

Loss of Signal (LOS)

Loss of Frame (LOF)

Server Signal Failure-P (SSF-P)

Loss of Multiframe (LOM)

OTN Thresholds (for TCA) defined in [RFC3591](#)

LOW-TXPOWER

HIGH-TXPOWER

LOW-RXPOWER

HIGH-RXPOWER

As the above parameters/alarms are already defined in [RFC3591](#), they are out of scope of this document and the [RFC3591](#) will continue to be the only reference for them

The list below reports the new Alarms and Thresholds not managed in [RFC3591](#)

4.1.6. Performance Monitoring (PM) description

This section describes the Performance Monitoring parameters and their thresholds at Ss and Rs points (Near -End and Far-End) according to ITU-T Recommendations G.826 [[ITU.G826](#)], G.8201 [[ITU.G8201](#)], G.709 [[ITU.G709](#)], G.798 [[ITU.G798](#)], G.874 [[ITU.G874](#)], and G.874.1 [[ITU.G874.1](#)].

BIP8 :

Number of BIP8's occurred in an observation period (G). BIP-8 consists of a parity byte calculated bit-wise across a large number of bytes in a transmission transport frame. BIP-8 bits are set such that the overall data stream, including the BIP-8 byte, has even parity.

Errored Second (es) :

It is a one-second period in which there is one or more errored blocks or during which a defect (e.g. Loss of Signal (LOS)) is detected. The number of errored seconds is summed over 15-minute and 24-hour intervals. (G)

Severely Errored Seconds (ses) :

It is a one-second period in which the errored block ratio exceeds a threshold or during which a defect is detected. See ITU-T Recommendation G.8201 Table 7-1 for details. The number of severely errored seconds is summed over 15-minute and 24-hour intervals.(G)

Unavailable Seconds (uas) :

It is a one-second period in the unavailable time. A period of unavailable time begins at the onset of ten consecutive SES events. These ten seconds are considered to be part of unavailable time. A new period of available time begins at the onset of ten consecutive non-SES events. These ten seconds are considered to be part of available time. (G)

Background Block Errors (bbe) :

An errored block not occurring as part of an SES(G)

Error Seconds Ratio (esr) :

The ratio of ES in available time to total seconds in available time during a fixed measurement interval(G)

Severely Errored Seconds Ratio (sesr) :

The ratio of SES in available time to total seconds in available time during a fixed measurement interval(G)

Background Block Errored Seconds Ratio (bber) :

The ratio of Background Block Errors (BBE) to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during SESSs.(G)

FEC corrected Bit Error (FECcorrErr):

The number of bits corrected by the FEC are counted over one second (G)

FEC un-corrected Bit Error :

The number of bits un-corrected by the FEC are counted over one second (G)

Pre-FEC Bit Error :

The number of Errorred bits at receiving side before the FEC function counted over one second (G)

OTN Valid Intervals :

The number of contiguous 15 minute intervals for which valid OTN performance monitoring data is available for the particular interface (G)

FEC Valid Intervals :

The number of contiguous 15 minute intervals for which valid FEC PM data is available for the particular interface.(G)

4.1.7. Generic Parameter description

This section describes the Generic Parameters at Ss and Rs points according to ITU-T Recommendations G.872 [[ITU.G872](#)], G.709 [[ITU.G709](#)], G.798 [[ITU.G798](#)], G.874 [[ITU.G874](#)], and G.874.1 [[ITU.G874.1](#)].

Interface Admin Status :

The Administrative Status of an Interface: Up/Down - In Service/Out of Service (can be Automatic in Service) (G/S)

Interface Operational Status :

The Operational Status of an Interface: Up/Down - In Service/Out of Service (G)

4.2. Use of ifTable

This section specifies how the MIB II interfaces group, as defined in [RFC 2863](#) [[RFC2863](#)], is used for the link ends of a black link. Only the ifGeneralInformationGroup will be supported for the ifTable and the ifStackTable to maintain the relationship between the OCh and OPS layers. The OCh and OPS layers are managed in the ifTable using IfEntries that correlate to the layers depicted in Figure 1.

For example, a device with TX and/or RX will have an Optical Physical Section (OPS) layer, and an Optical Channel (OCh) layer. There is a one to n relationship between the OPS and OCh layers.

EDITOR NOTE: Reason for changing from OChr to OCh: Work on revised G.872 in the SG15 December 2011 meeting agreed to remove OChr from the architecture and to update G.709 to account for this architectural change. The meeting also agreed to consent the revised text of G.872 and G.709 at the September 2012 SG15 meeting.

Figure 2 In the following figures, opticalChannel and opticalPhysicalSection are abbreviated as och and ops respectively.

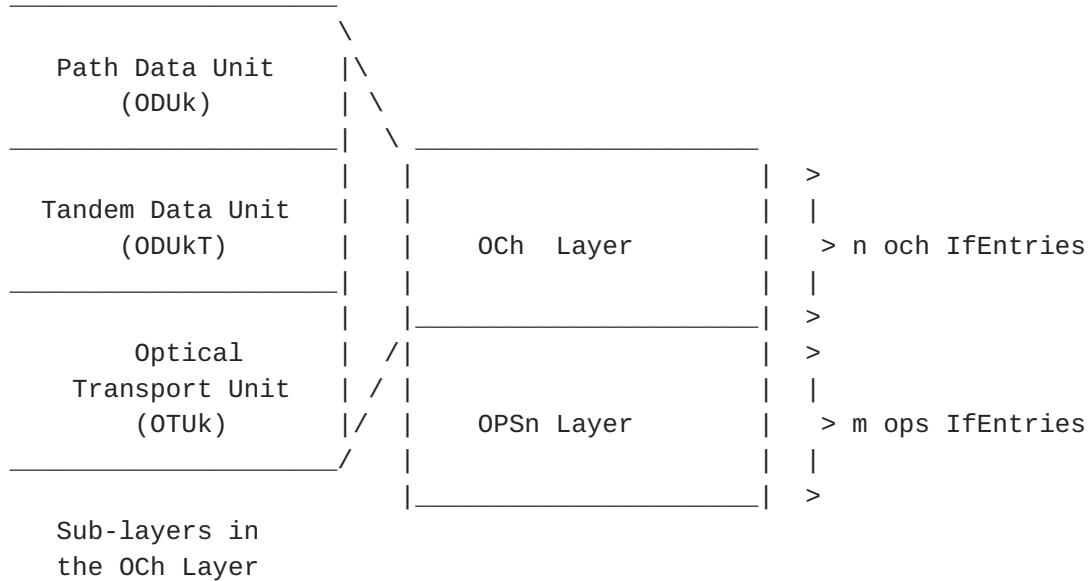


Figure 2: OTN Layers for OPS and OCh

Each opticalChannel IfEntry is mapped to one of the m opticalPhysicalSection IfEntries, where m is greater than or equal to 1. Conversely, each opticalTransPhysicalSection port entry is mapped to one of the n opticalChannel IfEntries, where n is greater than or equal to 1.

The design of the Optical Interface MIB provides the option to model an interface either as a single bidirectional object containing both sink and source functions or as a pair of unidirectional objects, one containing sink functions and the other containing source functions.

If the sink and source for a given protocol layer are to be modelled as separate objects, then there need to be two ifTable entries, one that corresponds to the sink and one that corresponds to the source, where the directionality information is provided in the configuration tables for that layer via the associated Directionality objects. The agent is expected to maintain consistent directionality values between ifStackTable layers (e.g., a sink must not be stacked in a 1:1 manner on top of a source, or vice-versa), and all protocol layers that are represented by a given ifTable entry are expected to have the same directionality.

When separate ifTable entries are used for the source and sink functions of a given physical interface, association between the two uni-directional ifTable entries (one for the source function and the other for the sink functions) should be provided. It is recommended that identical ifName values are used for the two ifTable entries to indicate such association. An implementation shall explicitly state what mechanism is used to indicate the association, if ifName is not used.

4.2.1. Use of ifTable for OPS Layer

Only the ifGeneralInformationGroup needs to be supported.

ifTable Object	Use for OTN OPS Layer
----------------	-----------------------

ifIndex	The interface index.
ifDescr	Optical Transport Network (OTN) Optical Physical Section (OPS)
ifType	opticalPhysicalSection (xxx)
 <<<Editor Note: Need new IANA registration value for xxx. >>>	
ifSpeed	Actual bandwidth of the interface in bits per second. If the bandwidth of the interface is greater than the maximum value of 4,294,967,295, then the maximum value is reported and ifHighSpeed must be used to report the interface's speed.
ifPhysAddress	An octet string with zero length. (There is no specific address associated with the interface.)
ifAdminStatus	The desired administrative state of the interface. Supports read-only access.
ifOperStatus	The operational state of the interface. The value lowerLayerDown(7) is not used, since there is no lower layer interface. This object is set to notPresent(6) if a component is missing, otherwise it is set to down(2) if either of the objects optIfOPSNCurrentStatus indicates that any defect is present.

ifLastChange	The value of sysUpTime at the last change in ifOperStatus.
ifName	Enterprise-specific convention (e.g., TL-1 AID) to identify the physical or data entity associated with this interface or an OCTET STRING of zero length. The enterprise-specific convention is intended to provide the means to reference one or more enterprise-specific tables.
ifLinkUpDownTrapEnable	Default value is enabled(1). Supports read-only access.
ifHighSpeed	Actual bandwidth of the interface in Mega-bits per second. A value of n represents a range of 'n-0.5' to 'n+0.499999'.
ifConnectorPresent	Set to true(1).
ifAlias	The (non-volatile) alias name for this interface as assigned by the network manager.

4.2.2. Use of ifTable for OCh Layer

Use of ifTable for OCh Layer See [RFC 3591 \[RFC3591\] section 2.4](#)

4.2.3. Use of ifStackTable

Use of the ifStackTable and ifInvStackTable to associate the opticalPhysicalSection and opticalChannel interface entries is best illustrated by the example shown in Figure 3. The example assumes an ops interface with ifIndex i that carries two multiplexed och interfaces with ifIndex values of j and k, respectively. The example shows that j and k are stacked above (i.e., multiplexed into) i. Furthermore, it shows that there is no layer lower than i and no layer higher than j and/or k.

Figure 3

HigherLayer	LowerLayer
0	j
0	k
j	i
k	i
i	0

Figure 3: Use of ifStackTable for an OTN port

For the inverse stack table, it provides the same information as the interface stack table, with the order of the Higher and Lower layer interfaces reversed.

[5. Structure of the MIB Module](#)

EDITOR NOTE:text will be provided based on the MIB module in [Section 6](#)

[6. Object Definitions](#)

EDITOR NOTE: Once the scope in [Section 1](#) and the parameters in [Section 4](#) are finalized, a MIB module will be defined. It could be an extension to the OPT-IF-MIB module of [RFC 3591](#). >>>


```
OPT-IF-EXT-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY,  
    OBJECT-TYPE,  
    Gauge32,  
    Integer32,  
    Unsigned32,  
    transmission,  
    NOTIFICATION-TYPE  
        FROM SNMPv2-SMI  
    TEXTUAL-CONVENTION,  
    RowPointer,  
    RowStatus,  
    TruthValue,  
    DateAndTime,  
    Counter64,  
    DisplayString  
        FROM SNMPv2-TC  
    SnmpAdminString  
        FROM SNMP-FRAMEWORK-MIB  
    MODULE-COMPLIANCE, OBJECT-GROUP  
        FROM SNMPv2-CONF  
    ifIndex  
        FROM IF-MIB  
    optIfMibModule,  
    optIfOChConfigEntry,  
    optIfOChSinkCurrentEntry,  
    OptIfDirectionality  
    FROM OPT-IF-MIB;
```

```
-- This is the MIB module for the optical parameters associated with  
-- the black link end points.
```

```
optIfExtMibModule MODULE-IDENTITY  
LAST-UPDATED "201204250000Z"  
ORGANIZATION "IETF OPSAWG/CCAMP Working Group"  
CONTACT-INFO  
"WG charter:  
http://www.ietf.org/html.charters/
```

Mailing Lists:

Editor: Gabrielle Galimberti
Email: ggalimbe@cisco.com"

DESCRIPTION

"The MIB module to describe Black Link extension to [rfc3591](#).

Copyright (C) The Internet Society (2012). This version
of this MIB module is part of ; see the RFC
itself for full legal notices."

REVISION "201204250000Z"

DESCRIPTION

"Draft version 1.0"
::={ optIfMibModule 3 }

OptIfChannelSpacing ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Channel spacing

- 1 - 100 Ghz
- 2 - 50GHz
- 3 - 25GHz
- 4 - 12.5GHz
- 5 - 6.25Ghz

"

SYNTAX INTEGER {
 spacing100Ghz(1),
 spacing50Ghz(2),
 spacing25Ghz(3),
 spacing12point5Ghz(4),
 spacing6point25Ghz(5)
}

OptIfBitRateLineCoding ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Optical tributary signal class

- 1 - NRZ 2.5G (from nominally 622 Mbit/s to nominal 2.67 Gbit/s)
- 2 - NRZ 10G nominally 2.4 Gbit/s to nominally 10.71 Gbit/s.
- 3 - 40Gbits/s
- 4 - 100Gbits/s
- 5 - 400Gbits/s

40Gbits/s and above are under study. "

SYNTAX INTEGER {
 rate2point5G(1),
 rate10G(2),
 rate40G(3),
 rate100G(4),


```
rate400G(5)
}

OptIfFiberTypeRecommendation ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        " Fiber Types - ITU-T Recs G.652, G.653, G.654 and G.655
          One for recommendation and one for category.
          G.652 A, B, C, D
          G.653 A, B
          G.654 A, B, C
          G.655 C, D, E
          G.656
          G.657 A, B
        "
SYNTAX INTEGER {
    g652(1),
    g653(2),
    g654(3),
    g655(4),
    g656(5),
    g657(6)
}

OptIfFiberTypeCategory ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        " Fiber Types - ITU-T Recs G.652, G.653, G.654 and G.655
          G.652 A, B, C, D
          G.653 A, B
          G.654 A, B, C
          G.655 C, D, E
          G.656
          G.657 A, B
          Categories - A, B, C, D and E
        "
SYNTAX INTEGER {
    categoryA(1),
    categoryB(2),
    categoryC(3),
    categoryD(4),
    categoryE(5)
}

OptIfGridTypes ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        " The types of Grid as defined by ITU-T
```



```

"
SYNTAX INTEGER {
    gridReserved(0),
    gridITUDWDM(1),
    gridITUCWDM(2),
    gridITUFlex(4)
}

OptIfDataType      ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"
This parameter indicates the parameters for the table are for
the Near End or Far End data.
1 - Near End
2 - Far End
"
SYNTAX INTEGER {
    nearEnd(1),
    farEnd(2)
}

OptIfOTNLayer     ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"
This parameter indicates the parameters for the table are for OTUK,
ODUK, TCM performance data.
1 - OTUK
2 - ODUK
3 - TCM
The ODUK layer and TCM sublayer PM is not related to the black
link PM management, but since this could be a common PM model for
the ODUK layer and TCM sublayers, they are included here so it may
be used for simple scenarios where only lower order ODUK or higher
order ODUK is present. For scenarios where both lower order ODUK
and higher order ODUK are present, further extension to the MIB
model is required, in particular for the indexing for these layers.
"
SYNTAX INTEGER {
    optIfOTUkLayer(1),
    optIfODUkLayer(2),
    optIfTCMSubLayer(3)
}

optIfOTNAlarmSeverity ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION

```



```

    " Severity of the notification.
    "
SYNTAX INTEGER {
    optIfCritical(1),
    optIfMajor(2),
    optIfMinor(3),
    optIfInfo(4)
}

-- Alarm for the OCh and OTUk layer
--

OptIfOTNOChAlarms ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
    " This is the possible alarms from the OCh and OTUk layer."
SYNTAX INTEGER {
    -- OTN Loss of signal alarm
    optIfOtnLosAlarm(1),
    -- OTN Loss of Frame alarm
    optIfOtnLofAlarm(2),
    -- OTN Loss of Multi Frame alarm
    optIfOtnLomAlarm(3),
    -- OTN Server Signal Failure alarm
    optIfOtnOtuSsfAlarm(4),
    -- OTN OTU Backward Defect Indicator alarm
    optIfOtnOtuBdiAlarm(5),
    -- OTN OTU Trail Trace Identifier Mismatch alarm
    optIfOtnOtuTimAlarm(6),
    -- OTN OTU Degraded alarm,
    optIfOtnOtuDegAlarm(7),
    -- OTN OTU Fec Excessive Errors alarm
    optIfOptIfOtnOtuFecExcessiveErrsAlarm(8),
    -- OTN OTU BBE Thresholdalarm
    optIf15MinThreshBBETCA(9),
    -- OTN OTU ES Thresholdalarm
    optIf15MinThreshESTCA(10),
    -- OTN OTU SES Threshold alarm
    optIf15MinThreshSESTCA(11),
    -- OTN OTU UAS Threshold alarm
    optIf15MinThreshUASTCA(12),
    -- OTN OTU Bip8 Threshold alarm
    optIf15MinThreshBip8TCA(13),
    -- OTN FEC uncorrectedwords TCA
    optIf15MinThreshFECUnCorrectedWordsTCA(14),
    -- OTN Pre FEC BER TCA
    optIf15MinThreshPreFECBERTCA(15)
}

```



```

OptIfOTNODukTcmAlarms ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
    " This is the alarms from the ODUk and TCM layer."
  SYNTAX INTEGER {
    -- OTN ODU/TCM Open Connection Indicator
    optIfOTNodukTcmOciAlarm(1),
    -- OTN ODU/TCM LCK
    optIfOTNodukTcmLckAlarm(2),
    -- OTN ODU/TCM Backward Defect Indicator
    optIfOTNodukTcmBdiAlarm(3),
    -- OTN ODU/TCM Trail Trace Identifier Mismatch
    optIfOTNodukTcmTimAlarm(4),
    -- OTN ODU/TCM Degraded
    optIfOTNodukTcmDegAlarm(5),
    -- OTN ODU/TCM LTC - Loss of Tandem connection
    optIfOTNodukTcmLtcAlarm(6),
    -- OTN ODU/TCM CSF - Client Signal Failure
    optIfOTNodukTcmCsfAlarm(7),
    -- OTN ODU/TCM Server Signal Failure
    optIfOTNodukTcmSsfAlarm(8),
    -- OTN OTU BBE Threshold
    optIfOTNodukTcm15MinThreshBBETCA(9),
    -- OTN OTU ES Threshold
    optIfOTNodukTcm15MinThreshESTCA(10),
    -- OTN OTU SES Threshold
    optIfOTNodukTcm15MinThreshSESTCA(11),
    -- OTN OTU UAS Threshold
    optIfOTNodukTcm15MinThreshUASTCA(12)
  }

-- Addition to the RFC 3591 objects
optIfOTNNotifications OBJECT IDENTIFIER ::= { optIfExtMibModule 0 }
optIfOPSMEntry OBJECT IDENTIFIER ::= { optIfExtMibModule 1 }
optIfOChSrcSinkGroup OBJECT IDENTIFIER ::= { optIfExtMibModule 2 }
optIfOTNPGroup OBJECT IDENTIFIER ::= { optIfExtMibModule 3 }
optIfOTNALarm OBJECT IDENTIFIER ::= { optIfExtMibModule 4 }

-- OPS - Optical Physical Section
optIfOPSMConfigTable OBJECT-TYPE
  SYNTAX SEQUENCE OF OptIfOPSMConfigEntry
  MAX-ACCESS not-accessible

```



```
STATUS current
DESCRIPTION
    "A table of OPS General config parameters."
 ::= { optIfObjects 10 }

optIfOPSMConfigEntry OBJECT-TYPE
    SYNTAX      OptIfOPSMConfigEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        "An conceptual row of OPS General config parameters."
INDEX  { ifIndex }
 ::= { optIfOPSMConfigTable 1 }

OptIfOPSMConfigEntry ::= 
SEQUENCE {
    optIfOPSMDirectionality      OptIfDirectionality,
    optIfOPSMFiberTypeRecommendation  OptIfFiberTypeRecommendation,
    optIfOPSMFiberTypeCategory      OptIfFiberTypeCategory
}

optIfOPSMDirectionality OBJECT-TYPE
    SYNTAX      OptIfDirectionality
    MAX-ACCESS  read-only
    STATUS     current
    DESCRIPTION
        "Indicates the directionality of the entity."
 ::= { optIfOPSMConfigEntry 1 }

optIfOPSMFiberTypeRecommendation OBJECT-TYPE
    SYNTAX      OptIfFiberTypeRecommendation
    MAX-ACCESS  read-only
    STATUS     current
    DESCRIPTION
        "Fiber type as per fibre types are chosen from those defined in
         ITU-T Recs G.652, G.653, G.654, G.655, G.656 and G.657."
 ::= { optIfOPSMConfigEntry 2 }

optIfOPSMFiberTypeCategory OBJECT-TYPE
    SYNTAX      OptIfFiberTypeCategory
    MAX-ACCESS  read-only
    STATUS     current
    DESCRIPTION
        "Fiber type as per fibre types are chosen from those defined in
         ITU-T Recs G.652, G.653, and G.655.
         The categories are A, B, C, D and E."
 ::= { optIfOPSMConfigEntry 3 }
```


-- OCh config table
-- modified the OCh Table group
-- General parameters for the Black Link Ss-Rs will be added to
-- the OchConfigTable

```
optIfOChConfigExtTable OBJECT-TYPE
  SYNTAX  SEQUENCE OF OptIfOChConfigExtEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    "A table of OCh General config extension parameters"
 ::= { optIfOChSrcSinkGroup 1 }
```

```
optIfOChConfigExtEntry OBJECT-TYPE
  SYNTAX      OptIfOChConfigExtEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    " A conceptual row that contains OCh configuration extension
     information of an interface. "
AUGMENTS { optIfOChConfigEntry }
 ::= { optIfOChConfigExtTable 1 }
```

```
OptIfOChConfigExtEntry ::=
SEQUENCE {
  optIfOChMminimumChannelSpacing          OptIfChannelSpacing,
  optIfOChGridType                      OptIfGridTypes,
  optIfOChBitRateLineCoding              OptIfBitRateLineCoding,
  optIfOChFEC                           Unsigned32,
  optIfOChSinkMaximumBERMantissa       Unsigned32,
  optIfOChSinkMaximumBERExponent        Unsigned32,
  optIfOChMinWavelengthn               Unsigned32,
  optIfOChMaxWavelengthn               Unsigned32,
  optIfOChWavelengthn                  Unsigned32,
  optIfOChVendorTransceiverClass       DisplayString,
  optIfOChOpticalInterfaceApplicationCodeType INTEGER,
  optIfOChOpticalInterfaceApplicationCode DisplayString,
  optIfOChLaserAdminState               INTEGER,
  optIfOChLaserOperationalState         INTEGER,
  optIfOChAdminState                   INTEGER,
  optIfOChOperationalState             INTEGER
}
```

```
optIfOChMminimumChannelSpacing  OBJECT-TYPE
  SYNTAX      OptIfChannelSpacing
  MAX-ACCESS  read-only
```



```

STATUS      current
DESCRIPTION
" A minimum nominal difference between two adjacent channels."
 ::= { optIfOChConfigExtEntry 1 }

optIfOChGridType  OBJECT-TYPE
SYNTAX      OptIfGridTypes
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
" The grid type for this interface."
 ::= { optIfOChConfigExtEntry 2 }

optIfOChBitRateLineCoding  OBJECT-TYPE
SYNTAX  OptIfBitRateLineCoding
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
" Optical tributary signal class
    NRZ 2.5G (from nominally 622 Mbit/s to nominally 2.67 Gbit/s)
    NRZ 10G (nominally 2.4 Gbit/s to nominally 10.71 Gbit/s)
"
 ::= { optIfOChConfigExtEntry 3 }

optIfOChFEC  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-write
STATUS  current
DESCRIPTION
" This parameter indicates what Forward Error Correction (FEC) code
is used at Source and Sink.
    GFEC (from G709) and the I.x EFEC's
    (G.975 - Table I.1 super FEC).
    1 - No FEC
    2 - GFEC
    3 - I.2 EFEC
    4 - I.3 EFEC
    5 - I.4 EFEC
    6 - I.5 EFEC
    7 - I.6 EFEC
    8 - I.7 EFEC
    9 - I.8 EFEC
    10 - I.9 EFEC
    99 - Vendor Specific
"
 ::= { optIfOChConfigExtEntry 4 }

optIfOChSinkMaximumBERMantissa  OBJECT-TYPE

```



```

SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  " This parameter indicate the maximum Bit(mantissa) error rate
  can be supported by the application at the Receiver. In case
  of FEC applications it is intended after the FEC correction.
"
 ::= { optIfOChConfigExtEntry 5 }

optIfOChSinkMaximumBERExponent OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    " This parameter indicate the maximum Bit(exponent) error rate
    can be supported by the application at the Receiver. In case
    of FEC applications it is intended after the FEC correction.
"
 ::= { optIfOChConfigExtEntry 6 }

optIfOChMinWavelengthn OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
    This parameter indicate minimum wavelength spectrum - n, in a
    definite wavelength Band (L, C and S) as represented in
    [RFC6205] by the formula
    Wavelength (nm) = 1471nm + n* optIfOChMiminumChannelSpacing
    (converted to nm) Eg - optIfOChMiminumChannelSpacing in nm
    'Wavelength (nm) = 1471nm + n* 20nm
    (20nm is the spacing for CWDM)'.
"
 ::= { optIfOChConfigExtEntry 7 }

optIfOChMaxWavelengthn OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
    This parameter indicate maximum wavelength - n spectrum in a
    definite wavelength Band (L, C and S) as represented in
    [RFC6205] by the formula
    Wavelength (nm) = 1471nm + n* optIfOChMiminumChannelSpacing
    (in nm) Eg - optIfOChMiminumChannelSpacing in nm

```



```

'Wavelength (nm) = 1471nm + n* 20nm
(20nm is the spacing for CWDM)'.

"
::= { optIfOChConfigExtEntry 8 }

optIfOChWavelengthn OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This parameter indicates the wavelength value in Hertz
Specified in Table 1 of G.694.1 e.g. 195.8875 as represented
in [RFC6205] by the formula
Wavelength (nm) = 1471nm + n* optIfOChMiminumChannelSpacing
(in nm) Eg - optIfOChMiminumChannelSpacing in nm
Wavelength (nm) = 1471nm + n* 20nm
(20nm is the spacing for CWDM)
"
::= { optIfOChConfigExtEntry 9 }

optIfOChVendorTransceiverClass OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS current
DESCRIPTION
" As defined in G.698
Vendors can summarize a set of parameters in a
single proprietary parameter: the Class of transceiver. The
Transceiver classification will be based on the Vendor Name
and the main TX and RX parameters (i.e. Trunk Mode, Framing,
Bit rate, Trunk Type etc).
If this parameter is used, the MIB parameters
specifying the Transceiver characteristics may not be
significant and the vendor will be responsible to specify the
Class contents and values. The Vendor can publish the
parameters of its Classes or declare to be compatible with
published Classes.(G) Optional for compliance. (not
mentioned in G.698)
"
::= { optIfOChConfigExtEntry 10 }

optIfOChOpticalInterfaceApplicationCodeType OBJECT-TYPE
SYNTAX INTEGER {
    g698dot1(1),
    g698dot2(2),
    g959dot1(3)
}
MAX-ACCESS read-write

```



```

STATUS current
DESCRIPTION

    " This parameter indicates the type fo transceiver application
    code at Ss and Rs as defined in
    [ITU.G698.1]/[ITU.G698.2]/ITU.G959.1] Chapter 5.3
    "
::= { optIfOChConfigExtEntry 11 }

optIfOChOpticalInterfaceApplicationCode OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    " This parameter indicates the transceiver application code
    at Ss and Rs as defined in [ITU.G698.2] Chapter 5.3
    "
::= { optIfOChConfigExtEntry 12 }

optIfOChLaserAdminState OBJECT-TYPE
SYNTAX INTEGER {
    disable(0),
    enable(1),
    autoInService(2)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "
        The configured State of the laser: 0 - disable
        1 - enable
        2 - Automatic - Inservice
    "
::= { optIfOChConfigExtEntry 13 }

optIfOChLaserOperationalState OBJECT-TYPE
SYNTAX INTEGER {
    disabled(0),
    enabled(1)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "
        The Operational Status of Laser : 0 - disabled
                                    1 - enabled
    "
::= { optIfOChConfigExtEntry 14 }

```



```

optIfOChAdminState OBJECT-TYPE
  SYNTAX  INTEGER {
    disable(0),
    enable(1),
    autoInService(2)
  }
  MAX-ACCESS  read-write
  STATUS  current
  DESCRIPTION
  "
    The Administrative Status of an Interface:
    0 - Out of Service
    1 - In Service
    2 - Automatic in Service.
  "
  ::= { optIfOChConfigExtEntry 15 }

optIfOChOperationalState OBJECT-TYPE
  SYNTAX  INTEGER {
    disabled(0),
    enabled(1),
    fault(2),
    degraded(3)
  }
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
  "
    The Operational Status of an Interface:
    0 - disabled
    1 - enabled
    2 - fault
  "
  ::= { optIfOChConfigExtEntry 15 }

-- Parameters at OCh Src (Ss)
-- OptIfOChSrcConfigEntry

optIfOChSrcConfigTable OBJECT-TYPE
  SYNTAX  SEQUENCE OF OptIfOChSrcConfigEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
  "A configuration table of OCh Src (Ss) parameters."
  ::= { optIfOChSrcSinkGroup 2 }

```



```

optIfOChSrcConfigEntry OBJECT-TYPE
    SYNTAX      OptIfOChSrcConfigEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        " A conceptual row that contains the Src (Ss) configuration
         parameters for a given interface."
    INDEX  { ifIndex }
    ::= { optIfOChSrcConfigTable 1 }

OptIfOChSrcConfigEntry ::=

SEQUENCE {
    optIfOChMinimumMeanChannelOutputPower          Integer32,
    optIfOChMaximumMeanChannelOutputPower          Integer32,
    optIfOChMinimumCentralFrequencyn              Unsigned32,
    optIfOChMaximumCentralFrequencyn              Unsigned32,
    optIfOChMaximumSpectralExcursion             Unsigned32,
    optIfOChMaximumTxDispersionOSNRPenalty       Integer32
}

optIfOChMinimumMeanChannelOutputPower  OBJECT-TYPE
    SYNTAX  Integer32
    UNITS   "0.1 dbm"
    MAX-ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "
        The minimum mean launched power at Ss is the average power (in dBm)
        of a pseudo-random data sequence coupled into the DWDM link.
        "
    ::= { optIfOChSrcConfigEntry  1}

optIfOChMaximumMeanChannelOutputPower  OBJECT-TYPE
    SYNTAX  Integer32
    UNITS   "0.1 dbm"
    MAX-ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "
        The maximum mean launched power at Ss is the average power (in dBm)
        of a pseudo-random data sequence coupled into the DWDM link.
        "
    ::= { optIfOChSrcConfigEntry  2}

optIfOChMinimumCentralFrequencyn  OBJECT-TYPE
    SYNTAX  Unsigned32
    MAX-ACCESS  read-only
    STATUS  current

```



```

DESCRIPTION
"
The minimum central frequency-n is the nominal single-channel
frequency (in THz) on which the digital coded information of
the particular optical channel is modulated by use of the NRZ
line code. Eg as described in [RFC6205]
Freq = 193.1 THz + n*optIfOChMiminumChannelSpacing (Thz)
"
 ::= { optIfOChSrcConfigEntry 3}

optIfOChMaximumCentralFrequencyn OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The maximum central frequency - n is the nominal single-channel
frequency (in THz) on which the digital coded information of
the particular optical channel is modulated by use of the NRZ
line code. Eg as described in [RFC6205]
Freq = 193.1 THz + n*optIfOChMiminumChannelSpacing (in Thz)
"
 ::= { optIfOChSrcConfigEntry 4}

optIfOChMaximumSpectralExcursion OBJECT-TYPE
SYNTAX Unsigned32
UNITS "0.1 GHz"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
This is the maximum acceptable difference between the nominal
central frequency (in GHz) of the channel and the minus 15 dB
points of the transmitter spectrum furthest from the nominal
central frequency measured at point Ss.
"
 ::= { optIfOChSrcConfigEntry 5}

optIfOChMaximumTxDispersion0SNRPenalty OBJECT-TYPE
SYNTAX Integer32
UNITS "0.1 dB"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
Defines a reference receiver that this penalty is measured with.
Lowest OSNR at Ss with worst case (residual) dispersion minus the

```



```

    Lowest OSNR at Ss with no dispersion. Lowest OSNR at Ss with no
    dispersion
"
 ::= { optIfOChSrcConfigEntry 6}

-- Optical Path from Point Src (Ss) to Sink (Rs)
-- Alternatively this can be optIfOChSsRsTable

optIfOChSrcSinkConfigTable OBJECT-TYPE
SYNTAX  SEQUENCE OF OptIfOChSrcSinkConfigEntry
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION
"A table of paramters for the optical path from Src to Sink
(Ss to Rs)."
 ::= { optIfOChSrcSinkGroup 3 }

optIfOChSrcSinkConfigEntry OBJECT-TYPE
SYNTAX      OptIfOChSrcSinkConfigEntry
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION
"A conceptual row that contains the optical path Src-Sink (Ss-Rs)
configuration parameters for a given interface."
INDEX  { ifIndex }
 ::= { optIfOChSrcSinkConfigTable 1 }

OptIfOChSrcSinkConfigEntry :=
SEQUENCE {
    optIfOChSrcSinkMinimumChromaticDispersion      Integer32,
    optIfOChSrcSinkMaximumChromaticDispersion      Integer32,
    optIfOChSrcSinkMinimumSrcOpticalReturnLoss     Integer32,
    optIfOChSrcSinkMaximumDiscreteReflectanceSrcToSink Integer32,
    optIfOChSrcSinkMaximumDifferentialGroupDelay  Integer32,
    optIfOChSrcSinkMaximumPolarizationDependentLoss Integer32,
    optIfOChSrcSinkMaximumInterChannelCrosstalk   Integer32,
    optIfOChSrcSinkMaximumInterFerometricCrosstalk Integer32,
    optIfOChSrcSinkMaximumOpticalPathOSNRPenalty   Integer32
}

optIfOChSrcSinkMinimumChromaticDispersion OBJECT-TYPE
SYNTAX  Integer32
UNITS   "ps/nm"
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
These parameters define the minimum value of the

```



```

optical path 'end to end chromatic dispersion' (in ps/nm) that the
system shall be able to tolerate."
 ::= { optIfOChSrcSinkConfigEntry 1}

optIfOChSrcSinkMaximumChromaticDispersion OBJECT-TYPE
SYNTAX Integer32
UNITS "ps/nm"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
These parameters define the maximum value of the
optical path 'end to end chromatic dispersion' (in ps/nm) that the
system shall be able to tolerate."
 ::= { optIfOChSrcSinkConfigEntry 2 }

optIfOChSrcSinkMinimumSrcOpticalReturnLoss OBJECT-TYPE
SYNTAX Integer32
UNITS ".1 db"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
These parameter defines minimum optical return loss (in dB) of the
cable plant at the source reference point (Src/Ss), including any
connectors."
 ::= { optIfOChSrcSinkConfigEntry 3 }

optIfOChSrcSinkMaximumDiscreteReflectanceSrcToSink OBJECT-TYPE
SYNTAX Integer32
UNITS ".1 db"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
Optical reflectance is defined to be the ratio of the reflected
optical power present at a point, to the optical power incident
to that point. Control of reflections is discussed extensively in
ITU-T Rec. G.957."
 ::= { optIfOChSrcSinkConfigEntry 4}

optIfOChSrcSinkMaximumDifferentialGroupDelay OBJECT-TYPE
SYNTAX Integer32
UNITS "ps"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"

```


Differential group delay (DGD) is the time difference between the fractions of a pulse that are transmitted in the two principal states of polarization of an optical signal. For distances greater than several kilometres, and assuming random (strong) polarization mode coupling, DGD in a fibre can be statistically modelled as having a Maxwellian distribution."

```
::= { optIfOChSrcSinkConfigEntry 5}
```

```
optIfOChSrcSinkMaximumPolarizationDependentLoss OBJECT-TYPE
SYNTAX Integer32
UNITS "0.1 db"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The polarization dependent loss (PDL) is the difference (in dB)
between the maximum and minimum values of the channel insertion
loss (or gain) of the black link from point SS to RS due to a
variation of the state of polarization (SOP) over all SOPs."
::= { optIfOChSrcSinkConfigEntry 6}
```

```
optIfOChSrcSinkMaximumInterChannelCrosstalk OBJECT-TYPE
SYNTAX Integer32
UNITS "0.1 db"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
Inter-channel crosstalk is defined as the ratio of total power in
all of the disturbing channels to that in the wanted channel,
where the wanted and disturbing channels are at different
wavelengths. The parameter specify the isolation of a link
conforming to the 'black link' approach such that under the
worst-case operating conditions the inter-channel crosstalk at
any reference point RS is less than the maximum inter-channel
crosstalk value."
::= { optIfOChSrcSinkConfigEntry 7}
```

```
optIfOChSrcSinkMaximumInterFerometricCrosstalk OBJECT-TYPE
SYNTAX Integer32
UNITS "0.1 db"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
This parameter places a requirement on the isolation of a link
```


conforming to the 'black link' approach such that under the worst case operating conditions the interferometric crosstalk at any reference point RS is less than the maximum interferometric crosstalk value.."

```
 ::= { optIfOChSrcSinkConfigEntry 8}

optIfOChSrcSinkMaximumOpticalPathOSNRPenalty OBJECT-TYPE
SYNTAX Integer32
UNITS "0.1 db"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The optical path OSNR penalty is defined as the difference between the Lowest OSNR at Rs and Lowest OSNR at Ss that meets the BER requirement."
 ::= { optIfOChSrcSinkConfigEntry 9}

-- Parameters at Sink (Rs)
-- optIfOChSinkConfigTable
optIfOChSinkConfigTable OBJECT-TYPE
SEQUENCE OF OptIfOChSinkConfigEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table of OCh Sink (Rs) configuration parameters."
 ::= { optIfOChSrcSinkGroup 4 }

optIfOChSinkConfigEntry OBJECT-TYPE
SYNTAX OptIfOChSinkConfigEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A conceptual row that contains the Sink (Rs) configuration parameters for a given interface."
INDEX { ifIndex }
 ::= { optIfOChSinkConfigTable 1 }

OptIfOChSinkConfigEntry ::=
SEQUENCE {
    optIfOChSinkMinimumMeanInputPower           Integer32,
    optIfOChSinkMaximumMeanInputPower           Integer32,
    optIfOChSinkMinimumOSNR                    Integer32,
    optIfOChSinkOSNRTolerance                 Integer32
}

optIfOChSinkMinimumMeanInputPower OBJECT-TYPE
SYNTAX Integer32
```



```

UNITS      "0.1 dBm"
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
  " The minimum values of the average received power (in dBm
   at point the Sink (Rs)."
 ::= { optIfOChSinkConfigEntry  1}

optIfOChSinkMaximumMeanInputPower OBJECT-TYPE
  SYNTAX  Integer32
  UNITS      "0.1 dBm"
  MAX-ACCESS read-only
  STATUS    current
  DESCRIPTION
    " The maximum values of the average received power (in dBm)
     at point the Sink (Rs)."
 ::= { optIfOChSinkConfigEntry  2}

optIfOChSinkMinimumOSNR OBJECT-TYPE
  SYNTAX  Integer32
  UNITS      "0.1 dB"
  MAX-ACCESS read-only
  STATUS    current
  DESCRIPTION
    " The minimum optical signal-to-noise ratio (OSNR) is the minimum
     value of the ratio of the signal power in the wanted channel to
     the highest noise power density in the range of the central
     frequency plus and minus the maximum spectral excursion."
 ::= { optIfOChSinkConfigEntry  3}

optIfOChSinkOSNRTolerance OBJECT-TYPE
  SYNTAX  Integer32
  UNITS      "0.1 dB"
  MAX-ACCESS read-only
  STATUS    current
  DESCRIPTION
    " The receiver OSNR tolerance is defined as the minimum value of
     OSNR at point Sink (Rs) that can be tolerated while maintaining
     the maximum BER of the application. Sink (Rs)."
 ::= { optIfOChSinkConfigEntry  4}

-- Performance Monitoring

-- The OptIfOChSinkCurrentExtEntry table is an extension to the

```



```
-- optIfOChSinkCurrentExtEntry
-- following optional parameters for current status
-- OptIfOChSinkCurrentExtEntry

optIfOChSinkCurrentExtTable OBJECT-TYPE
  SYNTAX  SEQUENCE OF OptIfOChSinkCurrentExtEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    "A table of OCh sink extension to the performance monitoring
     information for the current 15-minute interval."
 ::= { optIfOTNPMGroup 1 }
```

```
optIfOChSinkCurrentExtEntry OBJECT-TYPE
  SYNTAX  OptIfOChSinkCurrentExtEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    "A conceptual row that contains OCh sink performance
     monitoring information for an interface for the current
     15-minute interval."
 AUGMENTS { optIfOChSinkCurrentEntry }
 ::= { optIfOChSinkCurrentExtTable 1 }
```

```
OptIfOChSinkCurrentExtEntry ::=
  SEQUENCE {
    optIfOChSinkCurrentChromaticDispersion      Integer32,
    optIfOChSinkCurrentOSNR                      Integer32,
    optIfOChSinkCurrentQ                         Integer32
  }
```

```
optIfOChSinkCurrentChromaticDispersion OBJECT-TYPE
  SYNTAX  Integer32
  UNITS   "ps/nm"
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    " Residual Chromatic Dispersion measured at Rx Transceiver port."
 ::= { optIfOChSinkCurrentExtEntry 1}
```

```
optIfOChSinkCurrentOSNR OBJECT-TYPE
  SYNTAX  Integer32
  UNITS   "0.1 db"
  MAX-ACCESS  read-only
  STATUS  current
```



```

DESCRIPTION
  " Current Optical Signal to Noise Ratio (OSNR) estimated at Rx
  Transceiver port ."
 ::= { optIfOChSinkCurrentExtEntry 2}

optIfOChSinkCurrentQ  OBJECT-TYPE
  SYNTAX  Integer32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    " 'Q' factor estimated at Rx Transceiver port."
 ::= { optIfOChSinkCurrentExtEntry 3}

-- Performance Monitoring
-- OTN  PM Config Table
--

optIfOTNPMConfigTable  OBJECT-TYPE
  SYNTAX  SEQUENCE OF OptIfOTNPMConfigEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    " A table of performance monitoring configuration for the type
     'optIfOTNPMConfigLayer' layer."
 ::= { optIfOTNPMGroup 2 }

optIfOTNPMConfigEntry  OBJECT-TYPE
  SYNTAX      OptIfOTNPMConfigEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    " A conceptual entry in the performance monitoring configuration
     for the type
     'optIfOTNPMConfigLayer' layer.
    "
  INDEX  { ifIndex, optIfOTNPMConfigType, optIfOTNPMConfigLayer,
  optIfOTNPMConfigTCMLevel  }
 ::= { optIfOTNPMConfigTable 1 }

OptIfOTNPMConfigEntry ::=
  SEQUENCE {
    optIfOTNPMConfigType          OptIfDataType,
    optIfOTNPMConfigLayer         OptIfOTNLayer,
    optIfOTNPMConfigTCMLevel      Unsigned32,
    optIfOTNPM15MinBip8Threshold  Unsigned32,
    optIfOTNPM15MinESsThreshold   Unsigned32,
    optIfOTNPM15MinSESSsThreshold Unsigned32,
    optIfOTNPM15MinUASsThreshold  Unsigned32,
    optIfOTNPM15MinBBEsThreshold Unsigned32
  }

```



```

}

optIfOTNPMConfigType      OBJECT-TYPE
  SYNTAX  OptIfDataType
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
      This parameter indicates the parameters for the table are for the
      Near End or Far End performance data.
      1 - Near End
      2 - Far End
    "
  ::= { optIfOTNPMConfigEntry  1}

optIfOTNPMConfigLayer      OBJECT-TYPE
  SYNTAX  OptIfOTNLayer
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
      This parameter indicates the parameters for the table are for OTUK,
      ODUK, TCMn performance data.
      1 - OTUK
      2 - ODUK
      3 - TCM
      The ODUK/TCM Layer PM is not related to the black link PM
      management, but since this is a common PM model for the ODU/TCM
      layer, we may include it here.
    "
  ::= { optIfOTNPMConfigEntry  2}

optIfOTNPMConfigTCMLevel   OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
      This parameter indicates the TCM level (1-6)
      if the PM is of the type TCM. This will be 0 for OTUK/ODUK.
    "
  ::= { optIfOTNPMConfigEntry  3}

optIfOTNPM15MinBip8Threshold  OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION

```



```

"
The number of Bip8 encountered by the interface within any
given 15 minutes performance data collection period, which causes
the SNMP agent to send optIf15MinThreshBip8TCA. One notification
will be sent per interval per interface. A value of `0' will
disable the notification.
"
 ::= { optIfOTNPMConfigEntry 4 }

optIfOTNPM15MinESsThreshold OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The number of ES encountered by the interface within any
given 15 minutes performance data collection period, which causes
the SNMP agent to send optIf15MinThreshEsTCA. One notification
will be sent per interval per interface if the threshold is
exceeded. A value of `0' will disable the notification.
"
 ::= { optIfOTNPMConfigEntry 5 }

optIfOTNPM15MinSESSsThreshold OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The number of SES encountered by the interface within any
given 15 minutes performance data collection period, which causes
the SNMP agent to send optIf15MinThreshSESTCA. One notification
will be sent per interval per interface if the threshold is
exceeded. A value of `0' will disable the notification.
"
 ::= { optIfOTNPMConfigEntry 6 }

optIfOTNPM15MinUASsThreshold OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The number of UAS encountered by the interface within any
given 15 minutes performance data collection period, which causes
the SNMP agent to send optIf15MinThreshUASTCA. One notification
will be sent per interval per interface if the threshold is

```



```

        exceeded. A value of `0' will disable the notification.
    "
 ::= { optIfOTNPMConfigEntry 7 }

optIfOTNPM15MinBBEsThreshold OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
    "
        The number of UAS encountered by the interface within any
        given 15 minutes performance data collection period, which causes
        the SNMP agent to send optIf15MinThreshBBETCA. One notification
        will be sent per interval per interface if the threshold is
        exceeded. A value of `0' will disable the notification.
    "
 ::= { optIfOTNPMConfigEntry 8 }

-- 
-- PM Current Entry at either the OTU/ODUK/TCM
--

optIfOTNPMPCurrentTable OBJECT-TYPE
    SYNTAX SEQUENCE OF OptIfOTNPMPCurrentEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
    "
        A table for the Performance monitoring Current Table.
    "
 ::= {optIfOTNPMGroup 3}

optIfOTNPMPCurrentEntry OBJECT-TYPE
    SYNTAX      OptIfOTNPMPCurrentEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
    "
        A conceptual entry in the Near end or Far End performance
        monitoring Current table for the type 'optIfOTNPMPCurrentLayer'
        layer.
    "
 INDEX { ifIndex, optIfOTNPMPCurrentType ,
          optIfOTNPMPCurrentLayer, optIfOTNPMPCurrentTCMLevel }
 ::= { optIfOTNPMPCurrentTable 1 }

OptIfOTNPMPCurrentEntry ::=
    SEQUENCE {
        optIfOTNPMPCurrentType                  OptIfDataType,
        optIfOTNPMPCurrentLayer                OptIfOTNLayer,
```



```

        optIfOTNPMCurrentTCMLevel          Unsigned32,
        optIfOTNPMCurrentSuspectedFlag    TruthValue,
        optIfOTNPMCurrentInterval         Unsigned32,
        optIfOTNPMCurrentValidIntervals   Unsigned32,
        optIfOTNPMCurrentBip8             Unsigned32,
        optIfOTNPMCurrentESS              Unsigned32,
        optIfOTNPMCurrentSESS             Unsigned32,
        optIfOTNPMCurrentUASs             Unsigned32,
        optIfOTNPMCurrentBBEs             Unsigned32,
        optIfOTNPMCurrentESR              Unsigned32,
        optIfOTNPMCurrentSESR             Unsigned32,
        optIfOTNPMCurrentBBER             Unsigned32,
        optIfOTNPMCurrentElapsedTime     Unsigned32
    }

optIfOTNPMCurrentType           OBJECT-TYPE
SYNTAX  OptIfDataType
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for the
Near End or Far End performance data.
1 - Near End
2 - Far End
"
::= { optIfOTNPMCurrentEntry  1}

optIfOTNPMCurrentLayer          OBJECT-TYPE
SYNTAX  OptIfOTNLayer
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for
OTUK, ODUK, TCMn performance data.
1 - OTUK (OCh which is used for the black link)
2 - ODUK
3 - TCM
The ODUK/TCM Layer PM is not related to the black link PM
management, but since this is a common PM model for the ODU/TCM
layer, we may include it here.
"
::= { optIfOTNPMCurrentEntry  2}

optIfOTNPMCurrentTCMLevel      OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only

```



```

STATUS current
DESCRIPTION
"
  This parameter indicates the TCM level (1-6)
  if the PM is of the type TCM. This will be 0 for OTUK/ODUK.
"
::= { optIfOTNPMCurrentEntry 3}

```

```

optIfOTNPMCurrentSuspectedFlag  OBJECT-TYPE
SYNTAX  TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
  If true, the data in this entry may be unreliable.
"
::= { optIfOTNPMCurrentEntry 4}

```

```

optIfOTNPMCurrentInterval OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"
  This parameter indicates the measurement interval
  for calculation of the ratios.
"
::= { optIfOTNPMCurrentEntry 5}

```

```

optIfOTNPMCurrentValidIntervals OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"
  The number of contiguous 15 minute intervals for which valid
  PM data is available for the particular interface.
"
::= { optIfOTNPMCurrentEntry 6}

```

```

optIfOTNPMCurrentBip8   OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
  Number of Bip8's in this period.

```



```

"
 ::= { optIf0TNPMCurrentEntry 7 }

optIf0TNPMCurrentESs    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    This is the number of seconds in which one or more blocks are in
    error or during which a defect (e.g. Loss of Signal (LOS)) is
    detected.
  "
 ::= { optIf0TNPMCurrentEntry 8 }

optIf0TNPMCurrentSESSs   OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    The number of seconds which have a severe error.
    This is the number of seconds in which the errored block ratio
    exceeds the threshold or during which a defect (e.g. Loss of
    Signal (LOS)) is detected.
  "
 ::= { optIf0TNPMCurrentEntry 9 }

optIf0TNPMCurrentUASs    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    It is the number of unavailable seconds.
    A period of unavailable time begins at the onset of ten
    consecutive SES events. These ten seconds are considered to be
    part of unavailable time. A new period of available time begins
    at the onset of ten consecutive non-SES events. These ten
    seconds are considered to be part of available time.
  "
 ::= { optIf0TNPMCurrentEntry 10 }

optIf0TNPMCurrentBBEs    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    An errored block not occurring as part of an SES.

```



```

"
 ::= { optIfOTNPMCurrentEntry 11 }

optIfOTNPMCurrentESR    OBJECT-TYPE
SYNTAX  Unsigned32
UNITS   ".001"
MAX-ACCESS  read-only
STATUS   current
DESCRIPTION
"
The ratio of ES in available time to total seconds in available
time during a fixed measurement interval.
"
 ::= { optIfOTNPMCurrentEntry 12 }

optIfOTNPMCurrentSESR   OBJECT-TYPE
SYNTAX  Unsigned32
UNITS   ".001"
MAX-ACCESS  read-only
STATUS   current
DESCRIPTION
"
The ratio of SES in available time to total seconds in available
time during a fixed measurement interval.
"
 ::= { optIfOTNPMCurrentEntry 13 }

optIfOTNPMCurrentBBER  OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       ".001"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"
The ratio of BER in available time to total seconds in available
time during a fixed measurement interval.
"
 ::= { optIfOTNPMCurrentEntry 14 }

optIfOTNPMCurrentElapsedTime OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"
The elapsed time for this 15 minute interval.
"
```



```

"
 ::= { optIfOTNPMCurrentEntry 15 }

--
-- OTN PM Interval Table
-- Upto 96 15-minute intervals
--

optIfOTNPMIntervalTable OBJECT-TYPE
  SYNTAX  SEQUENCE OF OptIfOTNPMIntervalEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    "A Performance monitoring Interval Table.
  "
  ::= { optIfOTNPMGroup 4 }

optIfOTNPMIntervalEntry OBJECT-TYPE
  SYNTAX      OptIfOTNPMIntervalEntry
  MAX-ACCESS  not-accessible
  STATUS  current
  DESCRIPTION
    "A conceptual entry in the Near end or Far End performance
     monitoring Interval table for the type 'optIfOTNPMIntervalLayer'
     layer.
  "
  INDEX  { ifIndex, optIfOTNPMIntervalType, optIfOTNPMIntervalLayer,
            optIfOTNPMIntervalTCMLevel, optIfOTNPMIntervalNumber  }
  ::= { optIfOTNPMIntervalTable 1 }

OptIfOTNPMIntervalEntry ::=

SEQUENCE {
    optIfOTNPMIntervalType          OptIfDataType,
    optIfOTNPMIntervalLayer         OptIfOTNLayer,
    optIfOTNPMIntervalTCMLevel     Unsigned32,
    optIfOTNPMIntervalNumber        Unsigned32,
    optIfOTNPMIntervalSuspectedFlag TruthValue,
    optIfOTNPMIntervalBip8          Unsigned32,
    optIfOTNPMIntervalESs           Unsigned32,
    optIfOTNPMIntervalSESS          Unsigned32,
    optIfOTNPMIntervalUASs          Unsigned32,
    optIfOTNPMIntervalBBEs          Unsigned32,
    optIfOTNPMIntervalESR           Unsigned32,
    optIfOTNPMIntervalSESR          Unsigned32,
    optIfOTNPMIntervalBBER          Unsigned32,
    optIfOTNPMIntervalTimeStamp     DateAndTime
}
}

optIfOTNPMIntervalType      OBJECT-TYPE

```



```
SYNTAX OptIfDataType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
This parameter indicates the parameters for the table are for the
Near End or Far End performance data.
1 - Near End
2 - Far End
"
::= { optIfOTNPMIntervalEntry 1}

optIfOTNPMIntervalLayer OBJECT-TYPE
SYNTAX OptIfOTNLayer
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
This parameter indicates the parameters for the table are for
OTUK, ODUK, TCMn performance data.
1 - OTUK
2 - ODUK
3 - TCM
The ODUK/TCM Layer PM is not related to the black link PM
management, but since this is a common PM model for the ODU/TCM
layer, we may include it here."
::= { optIfOTNPMIntervalEntry 2}

optIfOTNPMIntervalTCMLevel OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
This parameter indicates the TCM level (1-6)
if the PM is of the type TCM. This will be 0 for OTUK/ODUK.
"
::= { optIfOTNPMIntervalEntry 3}

optIfOTNPMIntervalNumber OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
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.  
"  
 ::= { optIfOTNPMIntervalEntry 4}  
  
optIfOTNPMIntervalSuspectedFlag    OBJECT-TYPE  
  SYNTAX  TruthValue  
  MAX-ACCESS read-only  
  STATUS   current  
  DESCRIPTION  
  "  
    If true, the data in this entry may be unreliable.  
"  
 ::= { optIfOTNPMIntervalEntry 5}  
  
optIfOTNPMIntervalBip8    OBJECT-TYPE  
  SYNTAX Unsigned32  
  MAX-ACCESS read-only  
  STATUS   current  
  DESCRIPTION  
  "  
    Number of Bip8's in this period.  
"  
 ::= { optIfOTNPMIntervalEntry 6}  
  
optIfOTNPMIntervalESS    OBJECT-TYPE  
  SYNTAX Unsigned32  
  MAX-ACCESS read-only  
  STATUS   current  
  DESCRIPTION  
  "  
    It is a one-second period which has one or more errored blocks  
    or during which a defect (e.g. Loss of Signal (LOS)) is detected.  
"  
 ::= { optIfOTNPMIntervalEntry 7}  
  
optIfOTNPMIntervalSESS    OBJECT-TYPE  
  SYNTAX Unsigned32  
  MAX-ACCESS read-only  
  STATUS   current  
  DESCRIPTION  
  " The number of seconds which have a severe error.  
    It is a one-second period in which the errored block ratio  
    exceeds the threshold or during which a defect (e.g. Loss of  
    Signal(LOS) is detected.  
"  
 ::= { optIfOTNPMIntervalEntry 8}
```



```
optIfOTNPMIntervalUAs OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    " It is the number of unavailable seconds in this 15 minute
     interval.
    A period of unavailable time begins at the onset of ten
    consecutive SES events. These ten seconds are considered to be
    part of unavailable time. A new period of available time begins
    at the onset of ten consecutive non-SES events. These ten
    seconds are considered to be part of available time.
  "
  ::= { optIfOTNPMIntervalEntry 9}

optIfOTNPMIntervalBBs OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
  An errored block not occurring as part of an SES.
  "
  ::= { optIfOTNPMIntervalEntry 10}

optIfOTNPMIntervalESR OBJECT-TYPE
  SYNTAX Unsigned32
  UNITS ".001"
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
  The ratio of ES in available time to total seconds in available
  time during a fixed measurement interval.
  "
  ::= { optIfOTNPMIntervalEntry 11}

optIfOTNPMIntervalSESR OBJECT-TYPE
  SYNTAX Unsigned32
  UNITS ".001"
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
  The ratio of SES in available time to total seconds in available
  time during a fixed measurement interval.
  "
  ::= { optIfOTNPMIntervalEntry 12}
```



```

optIfOTNPMIntervalBBER OBJECT-TYPE
  SYNTAX Unsigned32
  UNITS ".001"
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    "
      The ratio of BBE in available time to total seconds in available
      time during a fixed measurement interval.
    "
  ::= { optIfOTNPMIntervalEntry 13}

optIfOTNPMIntervalTimeStamp OBJECT-TYPE
  SYNTAX DateAndTime
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    "
      The time stamp of this interval.
    "
  ::= { optIfOTNPMIntervalEntry 14}

--
-- PM Current Day Entry
--

optIfOTNPMCurrentDayTable OBJECT-TYPE
  SYNTAX SEQUENCE OF OptIfOTNPMCurrentDayEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    " A Performance monitoring Current Day Table.
  "
  ::= { optIfOTNPMGroup 5 }

optIfOTNPMCurrentDayEntry OBJECT-TYPE
  SYNTAX      OptIfOTNPMCurrentDayEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "A conceptual entry in the Near end or Far End performance
     monitoring Current day table for the type
     'optIfOTNPMCurrentDayLayer' layer.
  "
  INDEX { ifIndex, optIfOTNPMCurrentDayType, optIfOTNPMCurrentDayLayer,
           optIfOTNPMCurrentDayTCMLevel }
  ::= { optIfOTNPMCurrentDayTable 1 }

OptIfOTNPMCurrentDayEntry ::=
```



```
SEQUENCE {
    optIfOTNPMCurrentDayType          OptIfDataType,
    optIfOTNPMCurrentDayLayer         OptIfOTNLayer,
    optIfOTNPMCurrentDayTCMLevel     Unsigned32,
    optIfOTNPMCurrentDaySuspectedFlag TruthValue,
    optIfOTNPMCurrentDayBip8          Unsigned32,
    optIfOTNPMCurrentDayESS           Unsigned32,
    optIfOTNPMCurrentDaySESS          Unsigned32,
    optIfOTNPMCurrentDayUASS          Unsigned32,
    optIfOTNPMCurrentDayBBEs          Unsigned32,
    optIfOTNPMCurrentDayESR           Unsigned32,
    optIfOTNPMCurrentDaySESR          Unsigned32,
    optIfOTNPMCurrentDayBBER          Unsigned32,
    optIfOTNPMCurrentDayElapsedTime   Unsigned32
}
```

```
optIfOTNPMCurrentDayType      OBJECT-TYPE
SYNTAX  OptIfDataType
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for
the Near End or Far End performance data.
1 - Near End
2 - Far End
"
::= { optIfOTNPMCurrentDayEntry  1}
```

```
optIfOTNPMCurrentDayLayer      OBJECT-TYPE
SYNTAX  OptIfOTNLayer
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for
OTUK, ODUK, TCMn performance data.
1 - OTUK
2 - ODUK
3 - TCM
The ODUK/TCM Layer PM is not related to the black link PM
management, but since this is a common PM model for the ODU/TCM
layer, we may include it here."
::= { optIfOTNPMCurrentDayEntry  2}
```

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



```
STATUS current
DESCRIPTION
"
  This parameter indicates the TCM level (1-6)
  if the PM is of the type TCM. This will be 0 for OTUK/ODUK.
"
::= { optIfOTNPMCurrentDayEntry 3}
```

```
optIfOTNPMCurrentDaySuspectedFlag  OBJECT-TYPE
SYNTAX  TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
  If true, the data in this entry may be unreliable.
"
::= { optIfOTNPMCurrentDayEntry 4}
```

```
optIfOTNPMCurrentDayBip8  OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
  Number of Bip8's in this period.
"
::= { optIfOTNPMCurrentDayEntry 5}
```

```
optIfOTNPMCurrentDayESS  OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
  The number of seconds which have an error.
  It is a one-second period which has one or more errored blocks
  or during which a defect(e.g., Loss of Signal (LOS)) is detected.
"
::= { optIfOTNPMCurrentDayEntry 6}
```

```
optIfOTNPMCurrentDaySESS  OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
  The number of seconds which have a severe error.
```


A severely errored second, is a one-second period in which the errored block ratio exceeds the threshold or during which a defect (e.g. Loss of Signal (LOS)) is detected.

```

"
 ::= { optIfOTNPMCurrentDayEntry 7}

optIfOTNPMCurrentDayUASs    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    " It is the number of unavailable seconds in the cunrrent day.
     A period of unavailable time begins at the onset of ten
     consecutive SES events. These ten seconds are considered to be
     part of unavailable time. A new period of available time begins
     at the onset of ten consecutive non-SES events. These ten
     seconds are considered to be part of available time.
"
 ::= { optIfOTNPMCurrentDayEntry 8}

optIfOTNPMCurrentDayBBEs   OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
"
  An errored block not occurring as part of an SES.
"
 ::= { optIfOTNPMCurrentDayEntry 9}

optIfOTNPMCurrentDayESR    OBJECT-TYPE
  SYNTAX  Unsigned32
  UNITS   ".001"
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
"
  The ratio of ES in available time to total seconds in available
  time during a fixed measurement interval.
"
 ::= { optIfOTNPMCurrentDayEntry 10}

optIfOTNPMCurrentDaySESR   OBJECT-TYPE
  SYNTAX  Unsigned32
  UNITS   ".001"
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
```



```

"
The ratio of SES in available time to total seconds in available
time during a fixed measurement interval.
"
::= { optIfOTNPMCurrentDayEntry 11}

optIfOTNPMCurrentDayBBER OBJECT-TYPE
SYNTAX Unsigned32
UNITS ".001"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The ratio of BBE in available time to total seconds in available
time during a fixed measurement interval.
"
::= { optIfOTNPMCurrentDayEntry 12}

optIfOTNPMCurrentDayElapsedTime OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The elapsed time for this day.
"
::= { optIfOTNPMCurrentDayEntry 13}

-- 
-- PM Prev Day Entry
-- 

optIfOTNPMPrevDayTable OBJECT-TYPE
SYNTAX SEQUENCE OF OptIfOTNPMPrevDayEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A Performance monitoring Previous Day Table.
"
::= { optIfOTNPMGroup 6 }

optIfOTNPMPrevDayEntry OBJECT-TYPE
SYNTAX OptIfOTNPMPrevDayEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A conceptual entry in the Near end or Far End performance
monitoring previous day table for the type

```



```

'optIfOTNPMPPrevDayLayer' layer.
"
INDEX { ifIndex, optIfOTNPMPPrevDayType      ,
        optIfOTNPMPPrevDayLayer, optIfOTNPMPPrevDayTCMLevel  }
 ::= { optIfOTNPMPPrevDayTable 1 }

OptIfOTNPMPPrevDayEntry ::=

SEQUENCE {
    optIfOTNPMPPrevDayType          OptIfDataType,
    optIfOTNPMPPrevDayLayer         OptIfOTNLayer,
    optIfOTNPMPPrevDayTCMLevel     Unsigned32,
    optIfOTNPMPPrevDaySuspectedFlag TruthValue,
    optIfOTNPMPPrevDayBip8          Unsigned32,
    optIfOTNPMPPrevDayESS           Unsigned32,
    optIfOTNPMPPrevDaySESS          Unsigned32,
    optIfOTNPMPPrevDayUAS           Unsigned32,
    optIfOTNPMPPrevDayBBEs          Unsigned32,
    optIfOTNPMPPrevDayESR           Unsigned32,
    optIfOTNPMPPrevDaySESR          Unsigned32,
    optIfOTNPMPPrevDayBBER          Unsigned32,
    optIfOTNPMPPrevDayTimeStamp     DateAndTime
}

optIfOTNPMPPrevDayType      OBJECT-TYPE
SYNTAX  OptIfDataType
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for the
Near End or Far End performance data.
1 - Near End
2 - Far End
"
 ::= { optIfOTNPMPPrevDayEntry  1}

optIfOTNPMPPrevDayLayer    OBJECT-TYPE
SYNTAX  OptIfOTNLayer
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for
OTUK, ODUK, TCMn performance data.
1 - OTUK
2 - ODUK
3 - TCM
The ODUk/TCM Layer PM is not related to the black link PM

```



```

management, but since this is a common PM model for the ODU/TCM
layer, we may include it here."
 ::= { optIfOTNPMPrevDayEntry  2}

optIfOTNPMPrevDayTCMLevel    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    This parameter indicates the TCM level (1-6)
    if the PM is of the type TCM.
  "
 ::= { optIfOTNPMPrevDayEntry  3}

optIfOTNPMPrevDaySuspectedFlag    OBJECT-TYPE
  SYNTAX  TruthValue
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    If true, the data in this entry may be unreliable.
  "
 ::= { optIfOTNPMPrevDayEntry  4}

optIfOTNPMPrevDayBip8    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    Number of Bip8's occurred in an observation period.
  "
 ::= { optIfOTNPMPrevDayEntry  5}

optIfOTNPMPrevDayESs    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS read-only
  STATUS   current
  DESCRIPTION
  "
    The number of seconds which have an error.
    It is a one-second period which has one or more errored block
    or during which a defect (e.g. Loss of Signal (LOS)) is detected.
  "
 ::= { optIfOTNPMPrevDayEntry  6}

```



```

optIf0TNPMPrevDaySESSS   OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    " The number of seconds which have a severe error.
     A severely errored second, is a one-second period in which the
     errored block ratio exceeds the threshold or during which a
     defect (e.g. Loss of Signal (LOS)) is detected.
    "
 ::= { optIf0TNPMPrevDayEntry  7}

optIf0TNPMPrevDayUASSS   OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    " It is the number of unavailable seconds in the previous day.
     A period of unavailable time begins at the onset of ten
     consecutive SES events. These ten seconds are considered to be
     part of unavailable time. A new period of available time begins
     at the onset of ten consecutive non-SES events. These ten
     seconds are considered to be part of available time.
    "
 ::= { optIf0TNPMPrevDayEntry  8}

optIf0TNPMPrevDayBBES   OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
     An errored block not occurring as part of an SES.
    "
 ::= { optIf0TNPMPrevDayEntry  9}

optIf0TNPMPrevDayESR    OBJECT-TYPE
  SYNTAX  Unsigned32
  UNITS   ".001"
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
     The ratio of ES in available time to total seconds in available
     time during a fixed measurement interval.
    "
 ::= { optIf0TNPMPrevDayEntry  10}

```



```

optIfOTNPMPrevDaySESR    OBJECT-TYPE
  SYNTAX  Unsigned32
  UNITS   ".001"
  MAX-ACCESS  read-only
  STATUS   current
  DESCRIPTION
  "
    The ratio of SES in available time to total seconds in available
    time during a fixed measurement interval.
  "
 ::= { optIfOTNPMPrevDayEntry  11}

optIfOTNPMPrevDayBBER    OBJECT-TYPE
  SYNTAX  Unsigned32
  UNITS   ".001"
  MAX-ACCESS  read-only
  STATUS   current
  DESCRIPTION
  "
    The ratio of BBE in available time to total seconds in available
    time during a fixed measurement interval.
  "
 ::= { optIfOTNPMPrevDayEntry  12}

optIfOTNPMPrevDayTimeStamp    OBJECT-TYPE
  SYNTAX  DateAndTime
  MAX-ACCESS  read-only
  STATUS   current
  DESCRIPTION
  "
    The time stamp for this day.
  "
 ::= { optIfOTNPMPrevDayEntry  13}

-- 
-- OTN FEC PM Config Table
-- 

optIfOTNPMFECConfigTable OBJECT-TYPE
  SYNTAX  SEQUENCE OF OptIfOTNPMFECConfigEntry
  MAX-ACCESS  not-accessible
  STATUS   current
  DESCRIPTION
  "A table of performance monitoring  FEC configuration. "
 ::= { optIfOTNPMGroup 7 }

optIfOTNPMFECConfigEntry OBJECT-TYPE
  SYNTAX      OptIfOTNPMFECConfigEntry
  MAX-ACCESS  not-accessible

```



```
STATUS current
DESCRIPTION
  " A conceptual entry in the performance monitoring FEC
  configuration layer."
INDEX { ifIndex, optIfOTNPMFECConfigType }
::= { optIfOTNPMFECConfigTable 1 }

OptIfOTNPMFECConfigEntry ::=

SEQUENCE {
    optIfOTNPMFECConfigType
                            OptIfDataType,
    optIfOTNPMFECValidIntervals
                            Unsigned32,
    optIfOTNPM15MinFECUnCorrectedWordsThreshold
                            Unsigned32,
    optIfOTNPM15MinPreFECBERThresholdMantissa
                            Unsigned32,
    optIfOTNPM15MinPreFECBERThresholdExponent
                            Unsigned32
}

optIfOTNPMFECConfigType      OBJECT-TYPE
SYNTAX  OptIfDataType
MAX-ACCESS read-only
STATUS  current
DESCRIPTION
"
This parameter indicates the parameters for the table are for the
Near End or Far End performance data.
1 - Near End
2 - Far End
"
::= { optIfOTNPMFECConfigEntry 1}

optIfOTNPMFECValidIntervals  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS read-only
STATUS  current
DESCRIPTION
"
The number of contiguous 15 minute intervals for which valid FEC
PM data is available for the particular interface.
"
::= {optIfOTNPMFECConfigEntry 2}

optIfOTNPM15MinFECUnCorrectedWordsThreshold  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS read-only
```



```

STATUS current
DESCRIPTION
"
The number of Uncorrected words encountered by the interface
within any given 15 minutes performance data collection period,
which causes the SNMP agent to send
optIf15MinThreshFECUnCorrectedWordsTCA.
One notification will be sent per interval per interface if the
thresholds is exceeded.. A value of `0' will disable
the notification.
"
 ::= {optIfOTNPMFECCConfigEntry 3}

optIfOTNPM15MinPreFECBERTThresholdMantissa OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The Pre FEC BER (mantissa) by the interface within any
given 15 minutes performance data collection period, which
causes the SNMP agent to send optIf15MinThreshPreFECBERTCA. One
notification will be sent per interval per interface. A value
of `0' will disable the notification.
"
 ::= {optIfOTNPMFECCConfigEntry 4}

optIfOTNPM15MinPreFECBERTThresholdExponent OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The Pre FEC BER (exponent) by the interface within any
given 15 minutes performance data collection period, which
causes the SNMP agent to send optIf15MinThreshPreFECBERTCA. One
notification will be sent per interval per interface. A value of
`0' will disable the notification.
"
 ::= {optIfOTNPMFECCConfigEntry 5}

--
-- FEC PM Table
--

optIfOTNPMFECCurrentTable OBJECT-TYPE
SYNTAX SEQUENCE OF OptIfOTNPMFECCurrentEntry
MAX-ACCESS not-accessible

```



```

STATUS current
DESCRIPTION
  "A Performance monitoring FEC Current Table.
  "
 ::= { optIfOTNPMGroup 8 }

optIfOTNPMFECCurrentEntry OBJECT-TYPE
  SYNTAX      OptIfOTNPMFECCurrentEntry
  MAX-ACCESS  not-accessible
  STATUS     current
  DESCRIPTION
    " A conceptual entry in the Near end or Far End performance
     monitoring FEC current table.
    "
  INDEX  { ifIndex, optIfOTNPMFECCurrentType}
  ::= { optIfOTNPMFECCurrentTable  1 }

OptIfOTNPMFECCurrentEntry ::=

SEQUENCE {
  optIfOTNPMFECCurrentType          OptIfDataType,
  optIfOTNPMFECCurrentSuspectedFlag TruthValue,
  optIfOTNPMCurrentFECCorrectedErr Counter64,
  optIfOTNPMCurrentFECUncorrectedWords Counter64,
  optIfOTNPMCurrentFECBERMantissa   Unsigned32,
  optIfOTNPMCurrentFECBERExponent   Unsigned32,
  optIfOTNPMCurrentFECElapsedTime   Unsigned32
}

optIfOTNPMFECCurrentType      OBJECT-TYPE
  SYNTAX  OptIfDataType
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
  "
    This parameter indicates the parameters for the table are for the
    Near End or Far End performance data.
    1 - Near End
    2 - Far End
  "
 ::= { optIfOTNPMFECCurrentEntry  1}

optIfOTNPMFECCurrentSuspectedFlag  OBJECT-TYPE
  SYNTAX  TruthValue
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
  "

```



```
If true, the data in this entry may be unreliable.  
"  
 ::= { optIfOTNPMFECCurrentEntry 2}  
  
optIfOTNPMCurrentFECCorrectedErr OBJECT-TYPE  
  SYNTAX Counter64  
  MAX-ACCESS read-only  
  STATUS current  
  DESCRIPTION  
    "  
      The number of bits corrected by the FEC are counted in the  
      interval.  
    "  
  ::= { optIfOTNPMFECCurrentEntry 3}  
  
optIfOTNPMCurrentFECUncorrectedWords OBJECT-TYPE  
  SYNTAX Counter64  
  MAX-ACCESS read-only  
  STATUS current  
  DESCRIPTION  
    "  
      The number of un-corrected words by the FEC are counted over the  
      interval.  
    "  
  ::= { optIfOTNPMFECCurrentEntry 4}  
  
optIfOTNPMCurrentFECBERMantissa OBJECT-TYPE  
  SYNTAX Unsigned32  
  MAX-ACCESS read-only  
  STATUS current  
  DESCRIPTION  
    "  
      The number of Errored bits at receiving side before the FEC  
      function counted over one second .. mantissa.  
    "  
  ::= { optIfOTNPMFECCurrentEntry 5}  
  
optIfOTNPMCurrentFECBERExponent OBJECT-TYPE  
  SYNTAX Unsigned32  
  MAX-ACCESS read-only  
  STATUS current  
  DESCRIPTION  
    "  
      The number of Errored bits at receiving side before the FEC  
      function counted over one second .. exponent (eg -1).  
    "  
  ::= { optIfOTNPMFECCurrentEntry 6}
```



```

optIfOTNPMCurrentFECElapsedTime      OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS      "seconds"
    MAX-ACCESS  read-only
    STATUS     current
    DESCRIPTION
        "Time elapsed for this 15 minute interval."
    ::= { optIfOTNPMFECEntry 7 }

-- 
-- FEC PM  Interval Table
--

optIfOTNPMFECIntervalTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OptIfOTNPMFECIntervalEntry
    MAX-ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A Performance monitoring FEC Interval Table.
        "
    ::= { optIfOTNPMGroup 9 }

optIfOTNPMFECIntervalEntry OBJECT-TYPE
    SYNTAX      OptIfOTNPMFECIntervalEntry
    MAX-ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        " A conceptual entry in the Near end or Far End performance
        monitoring FEC interval table.
        "
    INDEX { ifIndex, optIfOTNPMIntervalType, optIfOTNPMFECIntervalNumber }
    ::= { optIfOTNPMFECIntervalTable 1 }

OptIfOTNPMFECIntervalEntry ::=

SEQUENCE {
    optIfOTNPMFECIntervalType          OptIfDataType,
    optIfOTNPMFECIntervalNumber        Unsigned32,
    optIfOTNPMFECIntervalSuspectedFlag TruthValue,
    optIfOTNPMIntervalFECCorrectedErr Counter64,
    optIfOTNPMIntervalFECUncorrectedWords Counter64,
    optIfOTNPMIntervalMinFECBERMantissa Unsigned32,
    optIfOTNPMIntervalMinFECBERExponent Unsigned32,
    optIfOTNPMIntervalMaxFECBERMantissa Unsigned32,
    optIfOTNPMIntervalMaxFECBERExponent Unsigned32,
    optIfOTNPMIntervalAvgFECBERMantissa Unsigned32,
    optIfOTNPMIntervalAvgFECBERExponent Unsigned32,
    optIfOTNPMFECIntervalTimeStamp     DateAndTime
}

```



```

optIfOTNPMFECIntervalType      OBJECT-TYPE
  SYNTAX  OptIfDataType
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
      This parameter indicates the parameters for the table are for the
      Near End or Far End performance data.
      1 - Near End
      2 - Far End
    "
 ::= { optIfOTNPMFECIntervalEntry  1}

optIfOTNPMFECIntervalNumber    OBJECT-TYPE
  SYNTAX  Unsigned32
  MAX-ACCESS  read-only
  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.
    "
 ::= { optIfOTNPMFECIntervalEntry  2}

optIfOTNPMFECIntervalSuspectedFlag   OBJECT-TYPE
  SYNTAX  TruthValue
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
      If true, the data in this entry may be unreliable.
    "
 ::= { optIfOTNPMFECIntervalEntry  3}

optIfOTNPMIntervalFECCorrectedErr   OBJECT-TYPE
  SYNTAX  Counter64
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
    "
      The number of bits corrected by the FEC are counted in the
      interval.
    "
 ::= { optIfOTNPMFECIntervalEntry  4}

optIfOTNPMIntervalFECUncorrectedWords  OBJECT-TYPE

```



```
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The number of words un-corrected words by the FEC are counted over
the interval.
"
 ::= { optIfOTNPMFECIntervalEntry 5}

optIfOTNPMIntervalMinFECBERMantissa    OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The minimun bit error rate at receiving side before the FEC
function counted over one second .. mantissa. This is the minimum
Pre FEC BER in the current 24hour period.
"
 ::= { optIfOTNPMFECIntervalEntry 6}

optIfOTNPMIntervalMinFECBERExponent    OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The minimun bit error rate at receiving side before the FEC
function counted over one second .. exponent. This is the minimum
Pre FEC BER in the current 24hour period.
"
 ::= { optIfOTNPMFECIntervalEntry 7}

optIfOTNPMIntervalMaxFECBERMantissa    OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The maximun bit error rate at receiving side before the FEC
function counted over one second .. mantissa. This is the maximum
Pre FEC BER in the current 24hour period.
"
 ::= { optIfOTNPMFECIntervalEntry 8}

optIfOTNPMIntervalMaxFECBERExponent    OBJECT-TYPE
SYNTAX Unsigned32
```



```

MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
The maximun bit error rate at receiving side before the FEC
function counted over one second .. exponent. This is the maximum
Pre FEC BER in the current 24hour period.
"
 ::= { optIfOTNPMFECIntervalEntry  9}

optIfOTNPMIntervalAvgFECBERMantissa  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
The average bit error rate at receiving side before the FEC
function counted over one second .. mantissa. This is the average
Pre FEC BER in the current 24hour period.
"
 ::= { optIfOTNPMFECIntervalEntry  10}

optIfOTNPMIntervalAvgFECBERExponent  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
"
The average bit error rate at receiving side before the FEC
function counted over one second .. exponent. This is the average
Pre FEC BER in the current 24hour period.
"
 ::= { optIfOTNPMFECIntervalEntry  11}

optIfOTNPMFECIntervalTimeStamp  OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
" Time stamp of this interval."
 ::= { optIfOTNPMFECIntervalEntry 12 }

--
-- FEC PM Current Day day Table
--

optIfOTNPMFECCurrentDayTable  OBJECT-TYPE
SYNTAX  SEQUENCE OF OptIfOTNPMFECCurrentDayEntry
MAX-ACCESS  not-accessible
STATUS  current

```



```

DESCRIPTION
  " A Performance monitoring FEC current day table.
"
 ::= { optIfOTNPMGroup 10 }

optIfOTNPMFECCurrentDayEntry OBJECT-TYPE
  SYNTAX      OptIfOTNPMFECCurrentDayEntry
  MAX-ACCESS  not-accessible
  STATUS     current
  DESCRIPTION
    " A conceptual entry in the Near end or Far End performance
      monitoring FEC current day table.
"
 INDEX  { ifIndex, optIfOTNPMFECCurrentDayType }
 ::= { optIfOTNPMFECCurrentDayTable 1 }

OptIfOTNPMFECCurrentDayEntry :=
  SEQUENCE {
    optIfOTNPMFECCurrentDayType          OptIfType,
    optIfOTNPMFECCurrentDaySuspectedFlag TruthValue,
    optIfOTNPMCurrentDayFECCorrectedErr Counter64,
    optIfOTNPMCurrentDayFECUncorrectedWords Counter64,
    optIfOTNPMCurrentDayMinFECBERMantissa Unsigned32,
    optIfOTNPMCurrentDayMinFECBERExponent Unsigned32,
    optIfOTNPMCurrentDayMaxFECBERMantissa Unsigned32,
    optIfOTNPMCurrentDayMaxFECBERExponent Unsigned32,
    optIfOTNPMCurrentDayAvgFECBERMantissa Unsigned32,
    optIfOTNPMCurrentDayAvgFECBERExponent Unsigned32,
    optIfOTNPMFECCurrentDayElapsedTime   Unsigned32
  }

optIfOTNPMFECCurrentDayType      OBJECT-TYPE
  SYNTAX  OptIfDataType
  MAX-ACCESS  read-only
  STATUS  current
  DESCRIPTION
  "
    This parameter indicates the parameters for the table are for the
    Near End or Far End performance data.
    1 - Near End
    2 - Far End
  "
 ::= { optIfOTNPMFECCurrentDayEntry 1}

optIfOTNPMFECCurrentDaySuspectedFlag  OBJECT-TYPE
  SYNTAX  TruthValue
  MAX-ACCESS  read-only

```



```
STATUS current
DESCRIPTION
"
If true, the data in this entry may be unreliable.
"
 ::= { optIf0TNPMFECCurrentDayEntry 2}

optIf0TNPMCurrentDayFECCorrectedErr OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The number of bits corrected by the FEC are counted in the
interval.
"
 ::= { optIf0TNPMFECCurrentDayEntry 3}

optIf0TNPMCurrentDayFECUncorrectedWords OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The number of words un-corrected by the FEC are counted over the
Day.
"
 ::= { optIf0TNPMFECCurrentDayEntry 4}

optIf0TNPMCurrentDayMinFECBERMantissa OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The minimun bit error rate at receiving side before the FEC
function counted over one second .. mantissa. This is the minimum
PreFEC BER in the current 24hour period.
"
 ::= { optIf0TNPMFECCurrentDayEntry 5}

optIf0TNPMCurrentDayMinFECBERExponent OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"
The minimun bit error rate at receiving side before the FEC
```



```
        function counted over one second .. exponent. This is the minimum
        PreFEC BER in the current 24hour period.
    "
 ::= { optIf0TNPMFECCurrentDayEntry 6}

optIf0TNPMCurrentDayMaxFECBERMantissa    OBJECT-TYPE
    SYNTAX  Unsigned32
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        The maximun bit error rate at receiving side before the FEC
        function counted over one second .. mantissa. This is the maximum
        PreFEC BER in the current 24hour period.
    "
 ::= { optIf0TNPMFECCurrentDayEntry 7}

optIf0TNPMCurrentDayMaxFECBERExponent    OBJECT-TYPE
    SYNTAX  Unsigned32
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        The maximun bit error rate at receiving side before the FEC
        function counted over one second .. exponent. This is the maximum
        PreFEC BER in the current 24hour period..
    "
 ::= { optIf0TNPMFECCurrentDayEntry 8}

optIf0TNPMCurrentDayAvgFECBERMantissa    OBJECT-TYPE
    SYNTAX  Unsigned32
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        The average bit error rate at receiving side before the FEC
        function counted over one second .. mantissa. This is the average
        PreFEC BER in the current 24hour period. .
    "
 ::= { optIf0TNPMFECCurrentDayEntry 9}

optIf0TNPMCurrentDayAvgFECBERExponent    OBJECT-TYPE
    SYNTAX  Unsigned32
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        The average bit error rate at receiving side before the FEC
```



```

        function counted over one second .. exponent. This is the average
        PreFEC BER in the current 24hour period.
    "
 ::= { optIf0TNPMFECCurrentDayEntry 10}

optIf0TNPMFECCurrentDayElapsedTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS      "seconds"
    MAX-ACCESS  read-only
    STATUS     current
    DESCRIPTION
        " Time elapsed for current day."
 ::= { optIf0TNPMFECCurrentDayEntry 11}

--
-- FEC PM  Prev day Table
--

optIf0TNPMFECPrevDayTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OptIf0TNPMFECPrevDayEntry
    MAX-ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A Performance monitoring FEC previous day table.
    "
 ::= { optIf0TNPMGroup 11 }

optIf0TNPMFECPrevDayEntry OBJECT-TYPE
    SYNTAX      OptIf0TNPMFECPrevDayEntry
    MAX-ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        " A conceptual entry in the Near end or Far End performance
        monitoring FEC previous day table
    "
INDEX  { ifIndex, optIf0TNPMFECPrevDayType }
 ::= { optIf0TNPMFECPrevDayTable 1 }

OptIf0TNPMFECPrevDayEntry ::=
SEQUENCE {
    optIf0TNPMFECPrevDayType          OptIfDataType,
    optIf0TNPMFECPrevDaySuspectedFlag TruthValue,
    optIf0TNPMPrevDayFECCorrectedErr Counter64,
    optIf0TNPMPrevDayFECUncorrectedWords Counter64,
    optIf0TNPMPrevDayMinFECBERMantissa Unsigned32,
    optIf0TNPMPrevDayMinFECBERExponent Unsigned32,
    optIf0TNPMPrevDayMaxFECBERMantissa Unsigned32,
    optIf0TNPMPrevDayMaxFECBERExponent Unsigned32,
    optIf0TNPMPrevDayAvgFECBERMantissa Unsigned32,
}

```



```

        optIfOTNPMPPrevDayAvgFECBERExponent      Unsigned32,
        optIfOTNPMFECPrevDayTimeStamp            DateAndTime
    }

optIfOTNPMFECPrevDayType          OBJECT-TYPE
    SYNTAX  OptIfDataType
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        This parameter indicates the parameters for the table are for the
        Near End or Far End performance data.
        1 - Near End
        2 - Far End
    "
    ::= { optIfOTNPMFECPrevDayEntry  1}

optIfOTNPMFECPrevDaySuspectedFlag  OBJECT-TYPE
    SYNTAX  TruthValue
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        If true, the data in this entry may be unreliable.
    "
    ::= { optIfOTNPMFECPrevDayEntry  2}

optIfOTNPMPPrevDayFECCorrectedErr  OBJECT-TYPE
    SYNTAX  Counter64
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        The number of bits corrected by the FEC are counted in the
        previous day.
    "
    ::= { optIfOTNPMFECPrevDayEntry  3}

optIfOTNPMPPrevDayFECUncorrectedWords  OBJECT-TYPE
    SYNTAX  Counter64
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
    "
        The number of un-corrected words by the FEC are counted over the
        previous Day.
    "

```



```

 ::= { optIfOTNPMFECPrevDayEntry 4}

optIfOTNPMPrevDayMinFECBERMantissa    OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
    The maximun bit error rate at receiving side before the FEC
    function counted over one second .. mantissa. This is the maximum
    Pre FEC BER in the previous 24hour period.
  "
 ::= { optIfOTNPMFECPrevDayEntry 5}

optIfOTNPMPrevDayMinFECBERExponent    OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
    The minimun bit error rate at receiving side before the FEC
    function counted over one second .. exponent. This is the maximum
    Pre FEC BER in the previous 24hour period
  "
 ::= { optIfOTNPMFECPrevDayEntry 6}

optIfOTNPMPrevDayMaxFECBERMantissa    OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
    The maximun bit error rate at receiving side before the FEC
    function counted over one second .. mantissa. This is the maximum
    Pre FEC BER in the previous 24hour period (mantissa).
  "
 ::= { optIfOTNPMFECPrevDayEntry 7}

optIfOTNPMPrevDayMaxFECBERExponent    OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
  "
    The maximun bit error rate at receiving side before the FEC
    function counted over one second .. exponent (eg -3).
    This is the maximum Pre FEC BER in the previous 24hour period.
  "

```



```

 ::= { optIfOTNPMFECPrevDayEntry 8}

optIfOTNPMPrevDayAvgFECBERMantissa OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    "
      The average bit error rate at receiving side before the FEC
      function counted over one second .. mantissa. This is the average
      Pre FEC BER during the previous 24hour period (mantissa).
    "
 ::= { optIfOTNPMFECPrevDayEntry 9}

optIfOTNPMPrevDayAvgFECBERExponent OBJECT-TYPE
  SYNTAX Unsigned32
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    "
      The average bit error rate at receiving side before the FEC
      function counted over one second .. exponent (eg -3).
      This is the average Pre FEC BER during the previous 24hour period.
    "
 ::= { optIfOTNPMFECPrevDayEntry 10}

optIfOTNPMFECPrevDayTimeStamp OBJECT-TYPE
  SYNTAX DateAndTime
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    " Time stamp for the Prev day."
 ::= { optIfOTNPMFECPrevDayEntry 11}

-- 
-- OTN Alarm Table
-- 

optIfOTNALarmTable OBJECT-TYPE
  SYNTAX SEQUENCE OF OptIfOTNALarmEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    " A table of alarm entries."
 ::= { optIfOTNALarm 1 }

optIfOTNALarmEntry OBJECT-TYPE
  SYNTAX OptIfOTNALarmEntry
  MAX-ACCESS not-accessible

```



```

STATUS      current
DESCRIPTION
    " A conceptual entry in the alarm table."
INDEX { ifIndex }
 ::= { optIfOTNAlarmTable 1 }

OptIfOTNAlarmEntry ::= SEQUENCE {
    optIfOTNAlarmLocation          OptIfOTNType,
    optIfOTNAlarmDirection         OptIfDirectionality,
    optIfOTNAlarmLayer             OptIfOTNLayer,
    optIfOTNAlarmTCMLevel          Unsigned32,
    optIfOTNAlarmType              Unsigned32,
    optIfOTNAlarmSeverity          OptIfOTNAlarmSeverity,
    optIfOTNAlarmDate              DateAndTime,
    optIfOTNAlarmStatus            TruthValue
}

optIfOTNAlarmLocation OBJECT-TYPE
SYNTAX      OptIfOTNType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " An index that uniquely identifies an entry in the
     alarm table."
 ::= { optIfOTNAlarmEntry 1 }

optIfOTNAlarmDirection OBJECT-TYPE
SYNTAX      OptIfDirectionality
MAX-ACCESS  accessible-for-notify
STATUS      current
DESCRIPTION
    " The object identifies indicates if this entry was for
     for the Tx/Rx or both."
 ::= { optIfOTNAlarmEntry 2 }

optIfOTNAlarmLayer OBJECT-TYPE
SYNTAX      OptIfOTNLayer
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " This specifies which layer this alarm is for."
 ::= { optIfOTNAlarmEntry 3 }

optIfOTNAlarmTCMLevel   OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current

```



```

DESCRIPTION
" TCM level 1-6 of the alarm. It will be 0 if alarm layer is
OCh, OTUk or ODUk."
 ::= { optIfOTNAlarmEntry 4 }

optIfOTNAlarmType OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
" This specifies the type of alarm of the layer
'optIfOTNAlarmLayer' ."
 ::= { optIfOTNAlarmEntry 5 }

optIfOTNAlarmSeverity OBJECT-TYPE
SYNTAX      OptIfOTNAlarmSeverity
MAX-ACCESS  accessible-for-notify
STATUS      current
DESCRIPTION
" The object identifies the severity of the last alarm/alert
that most recently was set or cleared."
 ::= { optIfOTNAlarmEntry 6 }

optIfOTNAlarmDate OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This specifies the date and time when this alarm occurred."
 ::= { optIfOTNAlarmEntry 7 }

optIfOTNAlarmStatus OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
" This specifies the state of the alarm -- cleared(0) or set(1)."
 ::= { optIfOTNAlarmEntry 8 }

-- 
-- OTN Notifications
-- 

optIfOTNAlarmSet NOTIFICATION-TYPE
OBJECTS { optIfOTNAlarmLocation,
          optIfOTNAlarmDirection,
          optIfOTNAlarmLayer,
          optIfOTNAlarmTCMLevel,

```



```

        optIfOTNAlarmType,
        optIfOTNAlarmSeverity,
        optIfOTNAlarmDate }

STATUS current
DESCRIPTION
" Notification of a recently set OTN alarm of layer
and Type."
 ::= { optIfOTNNotifications 1 }

optIfOTNAlarmClear NOTIFICATION-TYPE
OBJECTS { optIfOTNAlarmLocation,
          optIfOTNAlarmDirection,
          optIfOTNAlarmLayer,
          optIfOTNAlarmTCMLevel,
          optIfOTNAlarmType,
          optIfOTNAlarmSeverity,
          optIfOTNAlarmDate }

STATUS current
DESCRIPTION
" Notification of a recently clear OTN alarm of layer
and Type."
 ::= { optIfOTNNotifications 2 }

END

```

[7.](#) Relationship to Other MIB Modules

[7.1.](#) Relationship to the [TEMPLATE TODO] MIB

[7.2.](#) MIB modules required for IMPORTS

[8.](#) Definitions

[TEMPLATE TODO]: put your valid MIB module here.
A list of tools that can help automate the process of
checking MIB definitions can be found at
<http://www.ops.ietf.org/mib-review-tools.html>

[9.](#) Security Considerations

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

environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

o

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP.

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.

10. IANA Considerations

Option #1:

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Descriptor	OBJECT IDENTIFIER value
sampleMIB	{ mib-2 XXX }

Option #2:

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

Note well: prior to official assignment by the IANA, an internet draft MUST use placeholders (such as "XXX" above) rather than actual numbers. See [RFC4181 Section 4.5](#) for an example of how this is done in an internet draft MIB module.

Option #3:

This memo includes no request to IANA.

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Appendix A. Change Log

This optional section should be removed before the internet draft is submitted to the IESG for publication as an RFC.

Note to RFC Editor: please remove this appendix before publication as an RFC.

Appendix B. Open Issues

Note to RFC Editor: please remove this appendix before publication as an RFC.

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