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G.Galimberti, Ed.  
Cisco  
R.Kunze, Ed.  
Deutsche Telekom  
Kam Lam, Ed.  
Alcatel-Lucent  
D. Hiremagalur, Ed.  
Juniper  
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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 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 black links in a standardized way. This facilitates interworking in case of using optical interfaces from different vendors at the end of the link.

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.

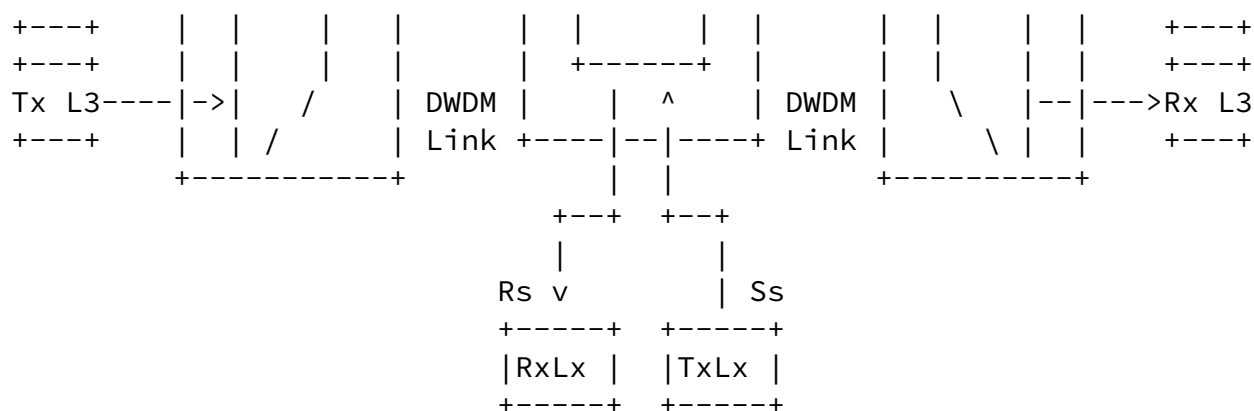
Although [RFC 3591](#) [[RFC3591](#)] describes and defines the SNMP MIB of a number of key optical parameters, alarms and Performance Monitoring, a more complete description of optical parameters and processes can be found in the ITU-T Recommendations. [Appendix A](#) of this document provides an overview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





$S_s$  = reference point at the DWDM network element tributary output  
 $R_s$  = reference point at the DWDM network element tributary input  
 $L_x$  = 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).

#### [4.1.1.1](#). 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 range (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

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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 specifies 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 SESs.(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 Errored 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.

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

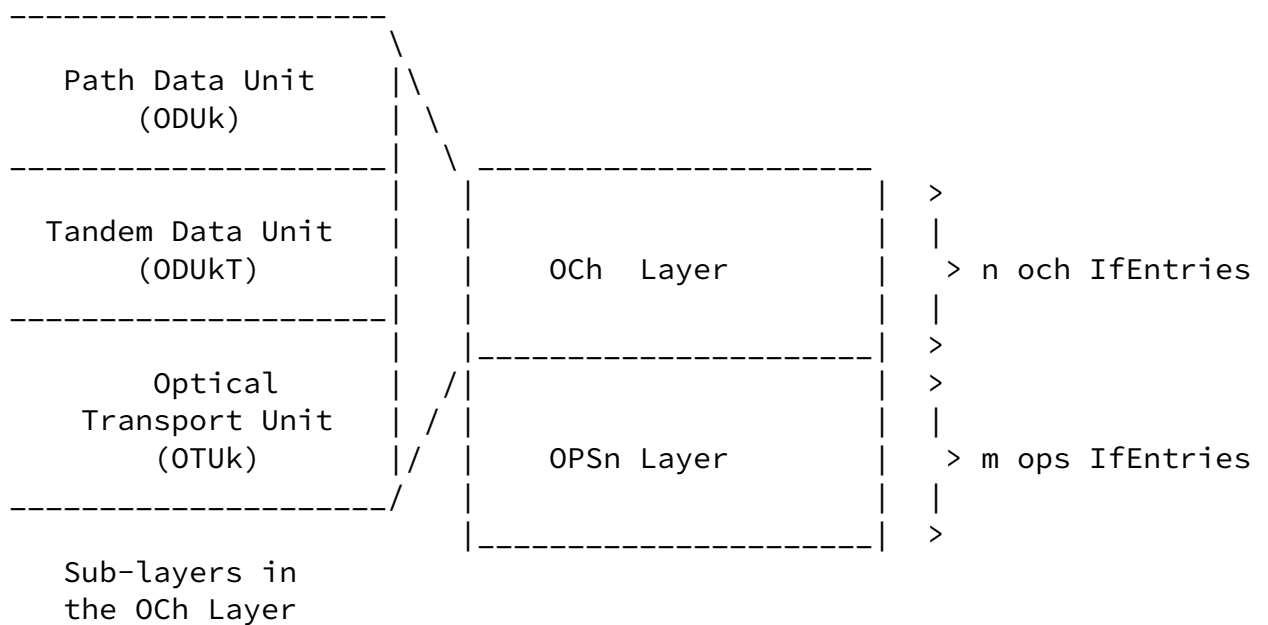


Figure 2: OTN Layers for OPS and OCh

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:
```

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

DESCRIPTION

"The MIB module to describe Black Link extension to [rfc3591](https://datatracker.ietf.org/doc/rfc3591).

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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
```

---

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```
"  
    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
```

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```
    " Severity of the notification.
    "
    SYNTAX INTEGER {
        optIfCritical(1),
        optIfMajor(2),
        optIfMinor(3),
        optIfInfo(4)
    }
--
-- Alarm for the OCh and OTUk layer
--
OptIfOTNNOChAlarms ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        " This is the possible alarms from the OCh and OTUk layer."
    SYNTAX INTEGER {
        -- OTN Loss of signal alarm
        optIf0tnLosAlarm(1),
        -- OTN Loss of Frame alarm
        optIf0tnLofAlarm(2),
        -- OTN Loss of Multi Frame alarm
        optIf0tnLomAlarm(3),
        -- OTN Server Signal Failure alarm
        optIf0tn0tuSsfAlarm(4),
        -- OTN OTU Backward Defect Indicator alarm
        optIf0tn0tuBdiAlarm(5),
        -- OTN OTU Trail Trace Identifier Mismatch alarm
        optIf0tn0tuTimAlarm(6),
        -- OTN OTU Degraded alarm,
        optIf0tn0tuDegAlarm(7),
        -- OTN OTU Fec Excessive Errors alarm
        optIf0tn0tuFecExcessiveErrsAlarm(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 }
optIfOTNPMGroup          OBJECT IDENTIFIER ::= { optIfExtMibModule 3 }
optIfOTNAlarm            OBJECT IDENTIFIER ::= { optIfExtMibModule 4 }
```

-- OPS - Optical Physical Section

```
optIfOPSmConfigTable OBJECT-TYPE
    SYNTAX SEQUENCE OF OptIfOPSmConfigEntry
    MAX-ACCESS not-accessible
```

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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 {
        optIfOChMimumumChannelSpacing      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
    }

```

```

optIfOChMimumumChannelSpacing OBJECT-TYPE
    SYNTAX      OptIfChannelSpacing
    MAX-ACCESS  read-only

```

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```

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."  
::= { optIf0ChConfigExtEntry 2 }

optIf0ChBitRateLineCoding 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)  
"  
::= { optIf0ChConfigExtEntry 3 }

optIf0ChFEC 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  
"  
::= { optIf0ChConfigExtEntry 4 }

optIf0ChSinkMaximumBERMantissa 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.
    "

```

```

::= { optIf0ChConfigExtEntry 5 }

```

```

optIf0ChSinkMaximumBERExponent 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.
    "

```

```

::= { optIf0ChConfigExtEntry 6 }

```

```

optIf0ChMinWavelengthn 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* optIf0ChMimumumChannelSpacing
      (converted to nm) Eg - optIf0ChMimumumChannelSpacing in nm
      'Wavelength (nm ) = 1471nm + n* 20nm
      (20nm is the spacing for CWDM)'.
    "

```

```

::= { optIf0ChConfigExtEntry 7 }

```

```

optIf0ChMaxWavelengthn 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* optIf0ChMimumumChannelSpacing
      (in nm) Eg - optIf0ChMimumumChannelSpacing in nm
    "

```

```
        'Wavelength (nm ) = 1471nm + n* 20nm
        (20nm is the spacing for CWDM)'.
    "
 ::= { optIf0ChConfigExtEntry  8 }
```

optIf0ChWavelengthn 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* optIf0ChMimumumChannelSpacing
    (in nm) Eg - optIf0ChMimumumChannelSpacing in nm
    Wavelength (nm ) = 1471nm + n* 20nm
    (20nm is the spacing for CWDM)
    "
```

```
 ::= { optIf0ChConfigExtEntry  9 }
```

optIf0ChVendorTransceiverClass 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)
    "
```

```
 ::= { optIf0ChConfigExtEntry  10 }
```

optIf0ChOpticalInterfaceApplicationCodeType OBJECT-TYPE

SYNTAX INTEGER {

g698dot1(1),

g698dot2(2),

g959dot1(3)

```
    }  
MAX-ACCESS  read-write
```

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```
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  
    "
```

```
::= { optIf0ChConfigExtEntry  11 }
```

```
optIf0ChOpticalInterfaceApplicationCode  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  
    "
```

```
::= { optIf0ChConfigExtEntry  12 }
```

```
optIf0ChLaserAdminState  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  
    "
```

```
::= { optIf0ChConfigExtEntry  13 }
```

```
optIf0ChLaserOperationalState  OBJECT-TYPE
```

```
SYNTAX  INTEGER {  
                disabled(0),  
                enabled(1)  
            }
```

```

    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "
        The Operational Status of Laser : 0 - disabled
                                           1 - enabled
    "
 ::= { optIf0ChConfigExtEntry 14 }

```

```

optIf0ChAdminState 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.
    "
 ::= { optIf0ChConfigExtEntry 15 }

```

```

optIf0ChOperationalState 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
    "

```

```

"
 ::= { optIf0ChConfigExtEntry 15 }

-- Parameters at 0Ch Src (Ss)
-- OptIf0ChSrcConfigEntry

optIf0ChSrcConfigTable OBJECT-TYPE
    SYNTAX SEQUENCE OF OptIf0ChSrcConfigEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A configuration table of 0Ch Src (Ss) parameters."
    ::= { optIf0ChSrcSinkGroup 2 }

```

```

optIf0ChSrcConfigEntry OBJECT-TYPE
    SYNTAX OptIf0ChSrcConfigEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        " A conceptual row that contains the Src (Ss) configuration
          parameters for a given interface."
    INDEX { ifIndex }
    ::= { optIf0ChSrcConfigTable 1 }

```

```

OptIf0ChSrcConfigEntry ::=
    SEQUENCE {
        optIf0ChMinimumMeanChannelOutputPower Integer32,
        optIf0ChMaximumMeanChannelOutputPower Integer32,
        optIf0ChMinimumCentralFrequencyyn Unsigned32,
        optIf0ChMaximumCentralFrequencyyn Unsigned32,
        optIf0ChMaximumSpectralExcursion Unsigned32,
        optIf0ChMaximumTxDispersionOSNRPenalty Integer32
    }

```

```

optIf0ChMinimumMeanChannelOutputPower 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.

"

::= { optIf0ChSrcConfigEntry 1}

optIf0ChMaximumMeanChannelOutputPower 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.

"

::= { optIf0ChSrcConfigEntry 2}

optIf0ChMinimumCentralFrequencyn OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

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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 [\[RFC6205\]](#)

$\text{Freq} = 193.1 \text{ THz} + n * \text{optIf0ChMimumChannelSpacing} \text{ (Thz)}$

"

::= { optIf0ChSrcConfigEntry 3}

optIf0ChMaximumCentralFrequencyn 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*optIf0ChMimumChannelSpacing (in Thz)
    "
 ::= { optIf0ChSrcConfigEntry 4}

optIf0ChMaximumSpectralExcursion 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.
        "
    ::= { optIf0ChSrcConfigEntry 5}

optIf0ChMaximumTxDispersionOSNRPenalty 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

```

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```

    Lowest OSNR at Ss with no dispersion. Lowest OSNR at Ss with no
    dispersion
    "
 ::= { optIf0ChSrcConfigEntry 6}

-- Optical Path from Point Src (Ss) to Sink (Rs)
-- Alternatively this can be optIf0ChSsRsTable

optIf0ChSrcSinkConfigTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OptIf0ChSrcSinkConfigEntry
    MAX-ACCESS  not-accessible

```



```

STATUS    current
DESCRIPTION
    "A table of paramters for the optical path from Src to Sink
    (Ss to Rs)."
```

::= {	optIf0ChSrcSinkGroup	3	}
-------	----------------------	---	---

```

optIf0ChSrcSinkConfigEntry OBJECT-TYPE
    SYNTAX      OptIf0ChSrcSinkConfigEntry
    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 }
```

::= {	optIf0ChSrcSinkConfigTable	1	}
-------	----------------------------	---	---

```

OptIf0ChSrcSinkConfigEntry ::=
    SEQUENCE {
        optIf0ChSrcSinkMinimumChromaticDispersion      Integer32,
        optIf0ChSrcSinkMaximumChromaticDispersion      Integer32,
        optIf0ChSrcSinkMinimumSrcOpticalReturnLoss      Integer32,
        optIf0ChSrcSinkMaximumDiscreteReflectanceSrcToSink Integer32,
        optIf0ChSrcSinkMaximumDifferentialGroupDelay    Integer32,
        optIf0ChSrcSinkMaximumPolarizationDependentLoss Integer32,
        optIf0ChSrcSinkMaximumInterChannelCrosstalk     Integer32,
        optIf0ChSrcSinkMaximumInterFerometricCrosstalk  Integer32,
        optIf0ChSrcSinkMaximumOpticalPathOSNRPenalty    Integer32
    }
```

```

optIf0ChSrcSinkMinimumChromaticDispersion 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."
    ::= { optIf0ChSrcSinkConfigEntry 1}
```

```

optIf0ChSrcSinkMaximumChromaticDispersion 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."
    ::= { optIf0ChSrcSinkConfigEntry  2 }

```

```

optIf0ChSrcSinkMinimumSrcOpticalReturnLoss    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."
    ::= { optIf0ChSrcSinkConfigEntry  3 }

```

```

optIf0ChSrcSinkMaximumDiscreteReflectanceSrcToSink    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 pre.sent at a point, to the optical power incident
            to that point. Control of reflections is discussed extensively in
            ITU-T Rec. G.957."
    ::= { optIf0ChSrcSinkConfigEntry  4}

```

```

optIf0ChSrcSinkMaximumDifferentialGroupDelay    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."

::= { optIf0ChSrcSinkConfigEntry 5}

optIf0ChSrcSinkMaximumPolarizationDependentLoss 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."

::= { optIf0ChSrcSinkConfigEntry 6}

optIf0ChSrcSinkMaximumInterChannelCrosstalk 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."

::= { optIf0ChSrcSinkConfigEntry 7}

optIf0ChSrcSinkMaximumInterFerometricCrosstalk 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

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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.."

::= { optIf0ChSrcSinkConfigEntry 8 }

optIf0ChSrcSinkMaximumOpticalPathOSNRPenalty 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."

::= { optIf0ChSrcSinkConfigEntry 9 }

-- Parameters at Sink (Rs)

-- optIf0ChSinkConfigTable

optIf0ChSinkConfigTable OBJECT-TYPE

SYNTAX SEQUENCE OF OptIf0ChSinkConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of 0Ch Sink (Rs) configuration parameters."

::= { optIf0ChSrcSinkGroup 4 }

optIf0ChSinkConfigEntry OBJECT-TYPE

SYNTAX OptIf0ChSinkConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A conceptual row that contains the Sink (Rs) configuration parameters for a given interface."

INDEX { ifIndex }

::= { optIf0ChSinkConfigTable 1 }

OptIf0ChSinkConfigEntry ::=

SEQUENCE {

optIf0ChSinkMinimumMeanIntputPower	Integer32,
optIf0ChSinkMaximumMeanIntputPower	Integer32,
optIf0ChSinkMinimumOSNR	Integer32,
optIf0ChSinkOSNRTolerance	Integer32

}

optIf0ChSinkMinimumMeanIntputPower OBJECT-TYPE  
SYNTAX Integer32

---

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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))."  
::= { optIf0ChSinkConfigEntry 1}

optIf0ChSinkMaximumMeanIntputPower 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))."  
::= { optIf0ChSinkConfigEntry 2}

optIf0ChSinkMinimumOSNR 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."  
::= { optIf0ChSinkConfigEntry 3}

optIf0ChSinkOSNRTolerance 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)."  
::= { optIf0ChSinkConfigEntry 4 }

-- Performance Monitoring

-- The OptIf0ChSinkCurrentExtEntry table is an extension to the

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-- optIf0ChSinkCurrentExtEntry  
-- following optional parameters for current status  
-- OptIf0ChSinkCurrentExtEntry

optIf0ChSinkCurrentExtTable OBJECT-TYPE  
SYNTAX SEQUENCE OF OptIf0ChSinkCurrentExtEntry  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"A table of OCh sink extension to the performance monitoring  
information for the current 15-minute interval."  
::= { optIf0TNPMGroup 1 }

optIf0ChSinkCurrentExtEntry OBJECT-TYPE  
SYNTAX OptIf0ChSinkCurrentExtEntry  
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 { optIf0ChSinkCurrentEntry }  
::= { optIf0ChSinkCurrentExtTable 1 }

```

OptIf0ChSinkCurrentExtEntry ::=
    SEQUENCE {
        optIf0ChSinkCurrentChromaticDispersion      Integer32,
        optIf0ChSinkCurrentOSNR                      Integer32,
        optIf0ChSinkCurrentQ                          Integer32
    }

optIf0ChSinkCurrentChromaticDispersion OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "ps/nm"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " Residual Chromatic Dispersion measured at Rx Transceiver port."
    ::= { optIf0ChSinkCurrentExtEntry 1}

optIf0ChSinkCurrentOSNR OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "0.1 db"
    MAX-ACCESS  read-only
    STATUS      current

```

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#### DESCRIPTION

```

    " Current Optical Signal to Noise Ratio (OSNR) estimated at Rx
      Transceiver port ."
    ::= { optIf0ChSinkCurrentExtEntry 2}

```

optIf0ChSinkCurrentQ OBJECT-TYPE

```

    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " 'Q' factor estimated at Rx Transceiver port."
    ::= { optIf0ChSinkCurrentExtEntry 3}

```

```

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

```

optIf0TNPMConfigTable OBJECT-TYPE

```

    SYNTAX      SEQUENCE OF OptIf0TNPMConfigEntry
    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,
            optIfOTNPMConfigTCMLLevel }
    ::= { optIfOTNPMConfigTable 1 }

```

```

OptIfOTNPMConfigEntry ::=
    SEQUENCE {
        optIfOTNPMConfigType           OptIfDataType,
        optIfOTNPMConfigLayer          OptIfOTNLayer,
        optIfOTNPMConfigTCMLLevel      Unsigned32,
        optIfOTNPM15MinBip8Threshold  Unsigned32,
        optIfOTNPM15MinESsThreshold   Unsigned32,
        optIfOTNPM15MinSESSThreshold  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.
    "
    ::= { optIf0TNPMConfigEntry 4 }

optIf0TNPM15MinESsThreshold 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.
        "
    ::= { optIf0TNPMConfigEntry 5 }

optIf0TNPM15MinSESsThreshold 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.
        "
    ::= { optIf0TNPMConfigEntry 6 }

optIf0TNPM15MinUASsThreshold 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
--
optIfOTNPMCurrentTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OptIfOTNPMCurrentEntry
    MAX-ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A table for the Performance monitoring Current Table.
        "
    ::= {optIfOTNPMGroup 3}

optIfOTNPMCurrentEntry OBJECT-TYPE
    SYNTAX      OptIfOTNPMCurrentEntry
    MAX-ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A conceptual entry in the Near end or Far End performance
        monitoring Current table for the type 'optIfOTNPMCurrentLayer'
        layer.
        "
    INDEX { ifIndex, optIfOTNPMCurrentType ,
            optIfOTNPMCurrentLayer, optIfOTNPMCurrentTCMLevel }
    ::= { optIfOTNPMCurrentTable 1 }

OptIfOTNPMCurrentEntry ::=
    SEQUENCE {
        optIfOTNPMCurrentType          OptIfDataType,
        optIfOTNPMCurrentLayer          OptIfOTNLayer,

```

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```

    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

```

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```

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.

"

::= { optIf0TNPMCurrentEntry 6 }

optIf0TNPMCurrentBip8 OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

Number of Bip8's in this period.

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"

::= { 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 }

optIf0TNPMCurrentSESS 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.  
"

::= { optIfOTNPMCurrentEntry 10 }

optIfOTNPMCurrentBBEs 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, optIfOTNPMIntervalTCMLLevel, optIfOTNPMIntervalNumber }

```
::= { optIfOTNPMIntervalTable 1 }
```

OptIfOTNPMIntervalEntry ::=

SEQUENCE {

optIfOTNPMIntervalType	OptIfDataType,
optIfOTNPMIntervalLayer	OptIfOTNLayer,
optIfOTNPMIntervalTCMLLevel	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.
"
::= { optIf0TNPMIntervalEntry 4}

optIf0TNPMIntervalSuspectedFlag OBJECT-TYPE
    SYNTAX TruthValue
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "
        If true, the data in this entry may be unreliable.
        "
    ::= { optIf0TNPMIntervalEntry 5}

optIf0TNPMIntervalBip8 OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "
        Number of Bip8's in this period.
        "
    ::= { optIf0TNPMIntervalEntry 6}

optIf0TNPMIntervalESSs 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.
        "
    ::= { optIf0TNPMIntervalEntry 7}

optIf0TNPMIntervalSESSs 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.
        "
    ::= { optIf0TNPMIntervalEntry 8}

```

---

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optIf0TNPMIntervalUASs 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.

"

::= { optIf0TNPMIntervalEntry 9}

optIf0TNPMIntervalBBEs OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

An errored block not occurring as part of an SES.

"

::= { optIf0TNPMIntervalEntry 10}

optIf0TNPMIntervalESR 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.

"

::= { optIf0TNPMIntervalEntry 11}

optIf0TNPMIntervalSESR 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.
"
 ::= { optIf0TNPMIntervalEntry 12}

```

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```

optIf0TNPMIntervalBBER 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.
        "
    ::= { optIf0TNPMIntervalEntry 13}

```

```

optIf0TNPMIntervalTimeStamp OBJECT-TYPE
    SYNTAX DateAndTime
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "
            The time stamp of this interval.
        "
    ::= { optIf0TNPMIntervalEntry 14}

```

--

-- PM Current Day Entry

--

```

optIf0TNPMCurrentDayTable OBJECT-TYPE
    SYNTAX SEQUENCE OF OptIf0TNPMCurrentDayEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        " A Performance monitoring Current Day Table.
        "
    ::= { optIf0TNPMGroup 5 }

```

```

optIf0TNPMCurrentDayEntry OBJECT-TYPE
    SYNTAX OptIf0TNPMCurrentDayEntry

```

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 ::=

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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.
"
 ::= { optIf0TNPMCurrentDayEntry 5}

```

```

optIf0TNPMCurrentDayESs 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.
        "
    ::= { optIf0TNPMCurrentDayEntry 6}

```

```

optIf0TNPMCurrentDaySESSs OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        " The number of seconds which have a severe error.

```

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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.

```

"
 ::= { optIf0TNPMCurrentDayEntry 7}

```

```

optIf0TNPMCurrentDayUASSs OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        " It is the number of unavailable seconds in the currennt 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.

"

::= { optIf0TNPMCurrentDayEntry 8}

optIf0TNPMCurrentDayBBEs OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

An errored block not occurring as part of an SES.

"

::= { optIf0TNPMCurrentDayEntry 9}

optIf0TNPMCurrentDayESR 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.

"

::= { optIf0TNPMCurrentDayEntry 10}

optIf0TNPMCurrentDaySESR 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.

"

::= { optIf0TNPMCurrentDayEntry 11}

optIf0TNPMCurrentDayBBER 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.
    "
 ::= { optIf0TNPMCurrentDayEntry 12}

optIf0TNPMCurrentDayElapsedTime OBJECT-TYPE
    SYNTAX  Unsigned32
    UNITS    "seconds"
    MAX-ACCESS read-only
    STATUS   current
    DESCRIPTION
        "
            The elapsed time for this day.
        "
    ::= { optIf0TNPMCurrentDayEntry 13}

--
-- PM Prev Day Entry
--
optIf0TNMPMPrevDayTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OptIf0TNMPMPrevDayEntry
    MAX-ACCESS not-accessible
    STATUS   current
    DESCRIPTION
        "A Performance monitoring Previous Day Table.
        "
    ::= { optIf0TNPMGroup 6 }

optIf0TNMPMPrevDayEntry OBJECT-TYPE
    SYNTAX      OptIf0TNMPMPrevDayEntry
    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

```

```

"
INDEX { ifIndex, optIfOTNPMPrevDayType      ,
        optIfOTNPMPrevDayLayer, optIfOTNPMPrevDayTCMLevel }
 ::= { optIfOTNPMPrevDayTable 1 }

```

```

OptIfOTNPMPrevDayEntry ::=
  SEQUENCE {
    optIfOTNPMPrevDayType      OptIfDataType,
    optIfOTNPMPrevDayLayer     OptIfOTNLayer,
    optIfOTNPMPrevDayTCMLevel  Unsigned32,
    optIfOTNPMPrevDaySuspectedFlag TruthValue,
    optIfOTNPMPrevDayBip8      Unsigned32,
    optIfOTNPMPrevDayESs       Unsigned32,
    optIfOTNPMPrevDaySEs       Unsigned32,
    optIfOTNPMPrevDayUASs      Unsigned32,
    optIfOTNPMPrevDayBBEs      Unsigned32,
    optIfOTNPMPrevDayESR       Unsigned32,
    optIfOTNPMPrevDaySESR      Unsigned32,
    optIfOTNPMPrevDayBBER      Unsigned32,
    optIfOTNPMPrevDayTimeStamp DateAndTime
  }

```

```

optIfOTNPMPrevDayType      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
    "
  ::= { optIfOTNPMPrevDayEntry 1}

```

```

optIfOTNPMPrevDayLayer     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."

::= { optIf0TNPMPrevDayEntry 2}

optIf0TNPMPrevDayTCMLevel 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.

"

::= { optIf0TNPMPrevDayEntry 3}

optIf0TNPMPrevDaySuspectedFlag OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

If true, the data in this entry may be unreliable.

"

::= { optIf0TNPMPrevDayEntry 4}

optIf0TNPMPrevDayBip8 OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

Number of Bip8's occurred in an observation period.

"

::= { optIf0TNPMPrevDayEntry 5}

optIf0TNPMPrevDayESs 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.

"

::= { optIf0TNPMMPrevDayEntry 6}

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optIf0TNPMMPrevDaySESS 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.

"

::= { optIf0TNPMMPrevDayEntry 7}

optIf0TNPMMPrevDayUASS 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.

"

::= { optIf0TNPMMPrevDayEntry 8}

optIf0TNPMMPrevDayBBEs OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

An errored block not occurring as part of an SES.

"

::= { optIf0TNPMMPrevDayEntry 9}

optIf0TNPMMPrevDayESR 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.
    "
 ::= { optIf0TNPMPPrevDayEntry 10}

```

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```

optIf0TNPMPPrevDaySESR  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.
        "
    ::= { optIf0TNPMPPrevDayEntry 11}

```

```

optIf0TNPMPPrevDayBBER  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.
        "
    ::= { optIf0TNPMPPrevDayEntry 12}

```

```

optIf0TNPMPPrevDayTimeStamp  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

```

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---

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```

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

"

::= { optIf0TNPMFECConfigEntry 1 }

optIf0TNPMFECValidIntervals 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.

"

::= {optIf0TNPMFECConfigEntry 2}

optIf0TNPM15MinFECUncorrectedWordsThreshold OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

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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.

"

::= {optIf0TNPMFECConfigEntry 3}

optIf0TNPM15MinPreFECBERThresholdMantissa 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.
"
 ::= {optIf0TNPMFECConfigEntry 4}

optIf0TNPM15MinPreFECBERThresholdExponent 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.
        "
    ::= {optIf0TNPMFECConfigEntry 5}

--
-- FEC PM Table
--
optIf0TNPMFECCurrentTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OptIf0TNPMFECCurrentEntry
    MAX-ACCESS  not-accessible

```

```

    STATUS  current
    DESCRIPTION
        "A Performance monitoring FEC Current Table.
        "
    ::= { optIf0TNPMGroup 8 }

optIf0TNPMFECCurrentEntry OBJECT-TYPE
    SYNTAX  OptIf0TNPMFECCurrentEntry
    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
        "

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```

---

```

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        If true, the data in this entry may be unreliable.
    "
    ::= { optIfOTNPMFECCurrentEntry 2}

```

```

optIf0TNPMCurrentFECCorrectedErr    OBJECT-TYPE
    SYNTAX Counter64
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "
            The number of bits corrected by the FEC are counted in the
            interval.
        "
    ::= { optIf0TNPMFECCurrentEntry 3}

optIf0TNPMCurrentFECUncorrectedWords    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.
        "
    ::= { optIf0TNPMFECCurrentEntry 4}

optIf0TNPMCurrentFECBERMantissa    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.
        "
    ::= { optIf0TNPMFECCurrentEntry 5}

optIf0TNPMCurrentFECBERExponent    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).
        "
    ::= { optIf0TNPMFECCurrentEntry 6}

```

```

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

```

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optIf0TNPMFECIntervalType            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  
    "  
 ::= { optIf0TNPMFECIntervalEntry 1 }

optIf0TNPMFECIntervalNumber    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.  
    "  
 ::= { optIf0TNPMFECIntervalEntry 2 }

optIf0TNPMFECIntervalSuspectedFlag    OBJECT-TYPE  
SYNTAX    TruthValue  
MAX-ACCESS    read-only  
STATUS    current  
DESCRIPTION  
    "  
        If true, the data in this entry may be unreliable.  
    "  
 ::= { optIf0TNPMFECIntervalEntry 3 }

optIf0TNPMIntervalFECCorrectedErr    OBJECT-TYPE  
SYNTAX    Counter64  
MAX-ACCESS    read-only  
STATUS    current

DESCRIPTION

"

The number of bits corrected by the FEC are counted in the interval.

"

::= { optIf0TNPMFECIntervalEntry 4}

optIf0TNPMIntervalFECUncorrectedWords OBJECT-TYPE

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SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

The number of words un-corrected words by the FEC are counted over the interval.

"

::= { optIf0TNPMFECIntervalEntry 5}

optIf0TNPMIntervalMinFECBERMantissa OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

The minimum 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.

"

::= { optIf0TNPMFECIntervalEntry 6}

optIf0TNPMIntervalMinFECBERExponent OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

The minimum 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.

"

::= { optIf0TNPMFECIntervalEntry 7}

optIf0TNPMIntervalMaxFECBERMantissa OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

The maximum 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.

"

::= { optIf0TNPMFECIntervalEntry 8}

optIf0TNPMIntervalMaxFECBERExponent OBJECT-TYPE

SYNTAX Unsigned32

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MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

The maximum 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.

"

::= { optIf0TNPMFECIntervalEntry 9}

optIf0TNPMIntervalAvgFECBERMantissa 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.

"

::= { optIf0TNPMFECIntervalEntry 10}

optIf0TNPMIntervalAvgFECBERExponent 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

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#### 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,



```

    optIf0TNPMFECCurrentDaySuspectedFlag    TruthValue,
    optIf0TNPMCurrentDayFECCorrectedErr      Counter64,
    optIf0TNPMCurrentDayFECUncorrectedWords  Counter64,
    optIf0TNPMCurrentDayMinFECBERMantissa    Unsigned32,
    optIf0TNPMCurrentDayMinFECBERExponent    Unsigned32,
    optIf0TNPMCurrentDayMaxFECBERMantissa    Unsigned32,
    optIf0TNPMCurrentDayMaxFECBERExponent    Unsigned32,
    optIf0TNPMCurrentDayAvgFECBERMantissa    Unsigned32,
    optIf0TNPMCurrentDayAvgFECBERExponent    Unsigned32,
    optIf0TNPMFECCurrentDayElapsedTime       Unsigned32
}

```

optIf0TNPMFECCurrentDayType                      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

"

::= { optIf0TNPMFECCurrentDayEntry 1 }

optIf0TNPMFECCurrentDaySuspectedFlag      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 minimum 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 minimum 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.  
"

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.
    "
    ::= { optIfOTNPMFECCurrentDayEntry 10}

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

--
-- FEC PM Prev day Table
--
optIfOTNPMFECPrevDayTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF OptIfOTNPMFECPrevDayEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A Performance monitoring FEC previous day table.
        "
    ::= { optIfOTNPMGroup 11 }

optIfOTNPMFECPrevDayEntry OBJECT-TYPE
    SYNTAX      OptIfOTNPMFECPrevDayEntry
    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, optIfOTNPMFECPrevDayType }
    ::= { optIfOTNPMFECPrevDayTable 1 }

OptIfOTNPMFECPrevDayEntry ::=
    SEQUENCE {
        optIfOTNPMFECPrevDayType          OptIfDataType,
        optIfOTNPMFECPrevDaySuspectedFlag TruthValue,
        optIfOTNPMPrevDayFECCorrectedErr  Counter64,
        optIfOTNPMPrevDayFECUncorrectedWords Counter64,
        optIfOTNPMPrevDayMinFECBERMantissa Unsigned32,
        optIfOTNPMPrevDayMinFECBERExponent Unsigned32,
        optIfOTNPMPrevDayMaxFECBERMantissa Unsigned32,
        optIfOTNPMPrevDayMaxFECBERExponent Unsigned32,
        optIfOTNPMPrevDayAvgFECBERMantissa Unsigned32,

```

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```
        optIf0TNMPPrevDayAvgFECBERExponent    Unsigned32,
        optIf0TNPMFECPrevDayTimeStamp          DateAndTime
    }

optIf0TNPMFECPrevDayType          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
        "
    ::= { optIf0TNPMFECPrevDayEntry 1}

optIf0TNPMFECPrevDaySuspectedFlag  OBJECT-TYPE
    SYNTAX  TruthValue
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "
            If true, the data in this entry may be unreliable.
        "
    ::= { optIf0TNPMFECPrevDayEntry 2}

optIf0TNMPPrevDayFECCorrectedErr  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.
        "
    ::= { optIf0TNPMFECPrevDayEntry 3}

optIf0TNMPPrevDayFECUncorrectedWords  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.

"

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::= { optIfOTNPMFECPrevDayEntry 4}

optIfOTNPMPrevDayMinFECBERMantissa OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"

The maximum 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 minimum 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 maximum 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).

```

"
 ::= { optIf0TNPMFECPrevDayEntry 7}

optIf0TNMPPrevDayMaxFECBERExponent OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "
        The maximum 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.
        "

```

---

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```

 ::= { optIf0TNPMFECPrevDayEntry 8}

optIf0TNMPPrevDayAvgFECBERMantissa 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).
        "
 ::= { optIf0TNPMFECPrevDayEntry 9}

optIf0TNMPPrevDayAvgFECBERExponent 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.
        "
 ::= { optIf0TNPMFECPrevDayEntry 10}

optIf0TNPMFECPrevDayTimeStamp 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,
    optIfOTNAlarmTCMLLevel        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:

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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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## 11. Contributors

Arnold Mattheus  
Deutsche Telekom  
Darmstadt  
Germany  
email a.mattheus@telekom.de

Manuel Paul  
Deutsche Telekom  
Berlin  
Germany  
email Manuel.Paul@telekom.de

Frank Luennemann  
Deutsche Telekom  
Munster  
Germany  
email Frank.Luennemann@telekom.de

Scott Mansfield  
Ericsson Inc.  
email scott.mansfield@ericsson.com

Najam Saquib  
Cisco  
Ludwig-Erhard-Strasse 3  
ESCHBORN, HESSEN 65760  
GERMANY  
email nasaquib@cisco.com

Walid Wakim  
Cisco  
9501 Technology Blvd  
ROSEMONT, ILLINOIS 60018  
UNITED STATES

email wwakim@cisco.com

Ori Gerstel  
Cisco  
32 HaMelacha St., (HaSharon Bldg)  
SOUTH NETANYA, HAMERKAZ 42504  
ISRAEL  
email ogerstel@cisco.com

## [12.](#) References

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### [12.1.](#) Normative References

- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", [RFC 2863](#), June 2000.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.
- [RFC3591] Lam, H-K., Stewart, M., and A. Huynh, "Definitions of Managed Objects for the Optical Interface Type", [RFC 3591](#), September 2003.
- [RFC6205] Otani, T. and D. Li, "Generalized Labels for Lambda-Switch-Capable (LSC) Label Switching Routers", [RFC 6205](#), March 2011.

[ITU.G698.2]

International Telecommunications Union, "Amplified multichannel dense wavelength division multiplexing applications with single channel optical interfaces", ITU-T Recommendation G.698.2, November 2009.

[ITU.G709]

International Telecommunications Union, "Interface for the Optical Transport Network (OTN)", ITU-T Recommendation G.709, March 2003.

[ITU.G872]

International Telecommunications Union, "Architecture of optical transport networks", ITU-T Recommendation G.872, November 2001.

[ITU.G798]

International Telecommunications Union, "Characteristics of optical transport network hierarchy equipment functional blocks", ITU-T Recommendation G.798,

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---

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October 2010.

[ITU.G874]

International Telecommunications Union, "Management aspects of optical transport network elements", ITU-T Recommendation G.874, July 2010.

[ITU.G874.1]

International Telecommunications Union, "Optical transport network (OTN): Protocol-neutral management information model for the network element view", ITU-T Recommendation G.874.1, January 2002.

[ITU.G959.1]

International Telecommunications Union, "Optical transport network physical layer interfaces", ITU-T Recommendation G.959.1, November 2009.

[ITU.G826]

International Telecommunications Union, "End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections", ITU-



T Recommendation G.826, November 2009.

[ITU.G8201]

International Telecommunications Union, "Error performance parameters and objectives for multi-operator international paths within the Optical Transport Network (OTN)", ITU-T Recommendation G.8201, April 2011.

[ITU.G694.1]

International Telecommunications Union, "Spectral grids for WDM applications: DWDM frequency grid", ITU-T Recommendation G.694.1, June 2002.

[ITU.G7710]

International Telecommunications Union, "Common equipment management function requirements", ITU-T Recommendation G.7710, May 2008.

## 12.2. Informative References

[RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.

[RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", [RFC 2629](#), June 1999.

G.Galimberti, et al. Expires August 27, 2013

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---

Internet-Draft [draft-galikunze-ccamp-g-698-2-snmp-mib-02](#) February 2013

[RFC4181] Heard, C., "Guidelines for Authors and Reviewers of MIB Documents", [BCP 111](#), [RFC 4181](#), September 2005.

[I-D.kunze-g-698-2-management-control-framework]

Kunze, R., "A framework for Management and Control of optical interfaces supporting G.698.2", [draft-kunze-g-698-2-management-control-framework-00](#) (work in progress), July 2011.

[RFC4054] Strand, J. and A. Chiu, "Impairments and Other Constraints on Optical Layer Routing", [RFC 4054](#), May 2005.

## 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

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## Authors' Addresses

Gabriele Galimberti (editor)  
Cisco  
Via Philips,12  
20052 - Monza  
Italy

Phone: +390392091462  
Email: ggalimbe@cisco.com

Ruediger Kunze (editor)  
Deutsche Telekom  
Dddd, xx  
Berlin  
Germany

Phone: +49xxxxxxxxxx  
Email: RKunze@telekom.de

Hing-Kam Lam (editor)  
Alcatel-Lucent  
600-700 Mountain Avenue, Murray Hill  
New Jersey, 07974  
USA

Phone: +17323313476  
Email: kam.lam@alcatel-lucent.com

Dharini Hiremagalur (editor)  
Juniper  
1194 N Mathilda Avenue  
Sunnyvale - 94089 California  
USA

Phone: +1408  
Email: dharinih@juniper.net