

**xDSL multi-pair bonding using Time-Division Inverse Multiplexing  
(G.Bond/TDIM) MIB  
draft-ietf-adslmib-gbond-tdim-mib-07.txt**

Abstract

This document defines Management Information Base (MIB) module for use with network management protocols in TCP/IP based internets. This document proposes an extension to the GBOND-MIB module with a set of objects for managing multi-pair bonded xDSL interfaces using Time-Division Inverse Multiplexing (TDIM), defined in ITU-T recommendation G.998.3.

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## **1. Introduction**

The Multi-pair bonding using time-division inverse multiplexing (TDIM), a.k.a. G.Bond/TDIM, is specified in ITU-T G.998.3 recommendation [[G.998.3](#)], which defines a method for bonding (or aggregating) of multiple xDSL lines (or individual bearer channels in multiple xDSL lines) into a single bi-directional logical link, carrying a mix of various traffic streams, e.g. Ethernet, Asynchronous Transfer Mode (ATM), Time-Division Multiplexing (TDM).

The MIB module, defined in this document, provides G.Bond/TDIM-specific objects for the management of G.998.3 bonded interfaces, extending the common bonding objects specified in GBOND-MIB [[I-D.ietf-ads1mib-gbond-mib](#)] module.

## **2. The Internet-Standard Management Framework**

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

## **3. The Broadband Forum Management Framework for xDSL Bonding**

This document makes use of the Broadband Forum technical report Management Framework for xDSL Bonding [[TR-159](#)], defining a management model and a hierarchy of management objects for the bonded xDSL interfaces.

## **4. Relationship to other MIB modules**

This section outlines the relationship of the MIB modules defined in this document with other MIB modules described in the relevant RFCs. Specifically, the following MIB modules are discussed: Interfaces Group MIB (IF-MIB) and G.Bond MIB (GBOND-MIB).



#### **4.1. Relationship to Interfaces Group MIB module**

A G.Bond/TDIM port is a private case of a Bonded multi-pair xDSL interface and as such is managed using generic interface management objects defined in the IF-MIB [[RFC2863](#)]. In particular an interface index (ifIndex) is used to index instances of G.Bond/TDIM ports, as well as xDSL lines/channels, in a managed system.

#### **4.2. Relationship to G.Bond MIB module**

GBOND-MIB [[I-D.ietf-adslmib-gbond-mib](#)] module defines management objects common for all Bonded multi-pair xDSL interfaces. In particular it describes the bonding management, bonded port and channel configuration, initialization sequence etc.

Both GBOND-MIB and GBOND-TDIM-MIB modules are REQUIRED to manage a G.Bond/TDIM port.

### **5. MIB Structure**

#### **5.1. Overview**

All management objects defined in the GBOND-TDIM-MIB module are contained in a single group gBondTdimPort. This group is further split into 6 sub-groups, structured as recommended by [RFC 4181](#) [[RFC4181](#)]:

- o gBondTdimPortNotifications - containing notifications (TDIM Service Down/Up).
- o gBondTdimPortConfTable - containing objects for configuration of a G.Bond/TDIM port.
- o gBondTdimPortCapTable - containing objects reflecting capability of a G.Bond/TDIM port.
- o gBondTdimPortStatTable - containing objects providing overall status information of a G.Bond/TDIM port, complementing the generic status information from the ifTable of IF-MIB and gBondPortStatFltStatus of GBOND-MIB.
- o gBondTdimSvcTable - containing objects for configuration and status of the services in a G.Bond/TDIM port.
- o gBondTdimPM - containing objects for an OPTIONAL Historical Performance Monitoring (PM) of a G.Bond/TDIM port.



## **5.2. Link Protection Configuration**

G.Bond/TDIM specification allows an optional Forward Error Correction (FEC) and Interleaver block, which, if supported and enabled, provides a degree of protection against micro-interruptions, alien noise, and even individual Bonding Channel Entity (BCE) failures, a.k.a. cut-line protection.

Management objects in the gBondTdimPortConfTable can be used to configure and query the FEC and Interleaver function of the G.Bond/TDIM port.

## **5.3. Service Configuration**

Unlike the other two xDSL Multi-Pair Bonding schemes (G.Bond/ATM and G.Bond/Ethernet), which send the information required for reassembly of the fragmented data along with the data, G.Bond/TDIM is a synchronous scheme, requiring both ends to know the data distribution tables before any actual data transfer can happen.

Management objects in the gBondTdimPortConfTable (gBondTdimPortConfAdminServices), gBondTdimSvcTable and gBondTdimOperSvcTable can be used to configure and query the configuration of services transported via the G.Bond/TDIM link. The services may be configured independently of the link state (i.e. in- and out-of-service), as G.998.3 communicates changes in the service configuration via specific Bonding Communication Channel (BCC) messages, switching both ends of the link to the new configuration synchronously.

There can be up to 60 active services defined on a G.Bond/TDIM link. This MIB module provides an ability to define up to 255 services via the gBondTdimSvcTable, with each row representing a possible service, and then set the actual service configuration using the gBondTdimPortConfAdminServices object (a byte-vector of service indices), listing the active services in the order of their position in the G.Bond/TDIM frame. This design allows one to easily modify service drop priority, which directly corresponds to the service position.

The actual list of services is provided via the read-only gBondTdimOperSvcTable, where each entry's index corresponds to the service position, starting from index 1 for the first entry, 2 for the second entry etc., providing an easy service navigation for a management application using GET-NEXT (instead of counting bytes in the gBondTdimPortConfAdminServices object).

The service configuration can only be changed on a Bonding





Transmission Unit at the Central Office (BTU-C).

When configuring the services, please bear in mind that the sum of all the services' bandwidth SHOULD be less or equal to the target data rate of the bonded link. Note that G.Bond/TDIM links are symmetrical, i.e. their upstream data rate equals to the downstream data rate.

#### **5.3.1. Management of TDM Services and service drop priority during bandwidth degradation**

G.Bond/TDIM protocol provides an ability to map TDM services into the TDIM bonded link directly, without any additional overhead. It addresses only structure-agnostic TDM transport, disregarding any structure that may be imposed on these streams, in particular the structure imposed by the standard TDM framing [\[G.704\]](#).

During bandwidth degradation services with a lower priority are impaired or dropped first. Synchronous services (fractional DS1/E1, clear channel E1/T1, T3/E3, clock) positioned in the beginning of the G.Bond/TDIM frame, have higher priority than asynchronous services (Ethernet, ATM, GFP encapsulated), positioned farther away. Within the services of the same type, those with lower position (index) have higher priority.

#### **5.3.2. Service Notifications**

This MIB module provides specific Up/Down notifications (gBondTdimSvcUp/gBondTdimSvcDown) for each of the configured services. During bandwidth degradation a number of services may be suspended (dropped) simultaneously, according to their drop priority (position in the service list). Please note that it is possible for a higher priority service to be dropped before a lower priority one. For example, suppose there are two services configured on a 2 Mbps G.Bond/TDIM link: a T1 service (gBondTdimSvcType with a value of ds1, with a bandwidth requirement of 1.5 Mbps) and an Ethernet service with a size of 0.5 Mbps. When the actual link bandwidth is reduced to 1.4 Mbps, the T1 service with a gBondTdimOperSvcPosition value of 1 would be dropped, while the Ethernet service with a gBondTdimPerSvcPosition value of 2 would remain up.

Notifications SHOULD be rate-limited (throttled) such that there is an implementation-specific gap between the generation of consecutive notifications of the same event. This mechanism prevents notification flooding in case gBondTdimServiceOperState oscillates between Up and Down states. When notifications are rate-limited, they are dropped and not queued for sending at a future time. This is intended to be a general rate-limiting statement for notifications



that otherwise have no explicit rate-limiting assertions in this document.

#### **5.4. Performance Monitoring**

The OPTIONAL performance monitoring counters, thresholds and history buckets (interval-counters), similar to those defined in [[TR-159](#)] are implemented using the textual conventions defined in the HC-PerfHist-TC-MIB [[RFC3705](#)]. The HC-PerfHist-TC-MIB defines 64-bit versions of the textual conventions found in PerfHist-TC-MIB [[RFC3593](#)].

The agent SHOULD align the beginning of each interval to a fifteen minute boundary of a wall clock. Likewise, the beginning of each one day intervals SHOULD be aligned with the start of a day.

Counters are not reset when a G.Bond TDIM port is reinitialized, but rather only when the agent is reset or reinitialized.

Note that the accumulation of certain performance events for a monitored entity is inhibited (counting stops) during periods of service unavailability on that entity. The DESCRIPTION clause of performance monitoring counters in this MIB module specifies which of the counters are inhibited during periods of service unavailability.

#### **5.5. Mapping of Broadband Forum TR-159 and ITU-T G.998.3 Managed Objects**

This section contains the mapping between relevant managed objects (attributes) defined in [[TR-159](#)] and managed objects defined in this document. Note that all management objects defined in [[G.998.3](#)] have corresponding objects in [[TR-159](#)].



+-----+-----+		
TR-159 Managed Object	Corresponding SNMP Object	
+-----+-----+		
oBondTDIM - Basic Package		
(Mandatory)		
+-----+-----+		
aCRC4Errors	gBondTdimPortStatCrc4Errors	
+-----+-----+		
aCRC6Errors	gBondTdimPortStatCrc6Errors	
+-----+-----+		
aCRC8Errors	gBondTdimPortStatCrc8Errors	
+-----+-----+		
aFECSupported	gBondTdimPortCapFecSupported	
+-----+-----+		
oBondTDIM - FEC Package		
(Optional)		
+-----+-----+		
aFECAdminState	gBondTdimPortConfFecAdminState	
+-----+-----+		
aFECOperState	gBondTdimPortStatFecOperState	
+-----+-----+		
aFECWordSize	gBondTdimPortConfFecWordSize	
+-----+-----+		
aFECRedundancySize	gBondTdimPortConfFecRedundancySize	
+-----+-----+		
aFECInterleaverType	gBondTdimPortConfFecInterleaverType	
+-----+-----+		
aFECInterleaverDepth	gBondTdimPortConfFecInterleaverDepth	
+-----+-----+		
aFECMaxWordSize	gBondTdimPortCapFecMaxWordSize	
+-----+-----+		
aFECMaxRedundancySize	gBondTdimPortCapFecMaxRedundancySize	
+-----+-----+		
aFECInterleaverTypesSuppo	gBondTdimPortCapFecInterleaverTypeSup	
rted	ported	
+-----+-----+		
aFECMaxInterleaverDepth	gBondTdimPortCapFecMaxInterleaverDept	
	h	
+-----+-----+		
oTDIMService - Basic		
Package (Mandatory)		
+-----+-----+		
aServiceID	gBondTdimOperSvcPosition	
+-----+-----+		
aServiceIfIdx	gBondTdimSvcIfIdx	
+-----+-----+		
aServiceType	gBondTdimSvcType	
+-----+-----+		



aServiceSize	gBondTdimSvcSize	
aServiceOperState	gBondTdimOperSvcState	
aServiceUpDownEnable	gBondTdimPortConfSvcUpDownEnable	
nServiceUp	gBondTdimSvcUp	
nServiceDown	gBondTdimSvcDown	

Table 1: Mapping of TR-159 Managed Objects

Note that some of the mapping between the objects defined in TR-159 and the ones defined in this MIB module is not one-to-one, for example, while TR-159 PM attributes aGroupPerf\* map to the corresponding gBondPortPm\* objects of the GBOND-MIB module, there are no dedicated PM attributes for the gBondTdimPortPm\* and gBondTdimSvcPm\* objects introduced in this MIB module. However, since their definition is identical to the definition of gBondPortPm\* objects of the GBOND-MIB module, we can map gBondTdimPortPm\* and gBondTdimSvcPm\* to the relevant aGroupPerf\* attributes of TR-159 and use the term 'partial mapping' to denote the fact that this mapping is not one-to-one.

## 6. G.Bond/TDIM MIB Definitions

GBOND-TDIM-MIB DEFINITIONS ::= BEGIN

```

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    NOTIFICATION-TYPE,
    mib-2,
    Unsigned32,
    Counter32
    FROM SNMPv2-SMI          -- [RFC2578]
    TEXTUAL-CONVENTION,
    RowStatus,
    TruthValue
    FROM SNMPv2-TC          -- [RFC2579]
    MODULE-COMPLIANCE,
    OBJECT-GROUP,
    NOTIFICATION-GROUP
    FROM SNMPv2-CONF        -- [RFC2580]
    ifIndex,
    InterfaceIndex

```





```
FROM IF-MIB -- [RFC2863]  
HCPerfCurrentCount,  
HCPerfIntervalCount,  
HCPerfValidIntervals,  
HCPerfInvalidIntervals,  
HCPerfTimeElapsed  
FROM HC-PerfHist-TC-MIB -- [RFC3705]  
;
```

---

#### gBondTdimMIB MODULE-IDENTITY

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ORGANIZATION "IETF ADSL MIB Working Group"

#### CONTACT-INFO

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#### DESCRIPTION

"The objects in this MIB module are used to manage the multi-pair bonded xDSL Interfaces using time-division inverse multiplexing (TDIM), defined in ITU-T recommendation G.998.3 (G.Bond/TDIM).

This MIB module MUST be used in conjunction with GBOND-MIB module, common to all G.Bond technologies.

The following references are used throughout this MIB module:



[G.998.3] refers to:

ITU-T Recommendation G.998.3: 'Multi-pair bonding using time-division inverse multiplexing', January 2005.

[TR-159] refers to:

Broadband Forum Technical Report: 'Management Framework for xDSL Bonding', December 2008.

#### Naming Conventions:

BCE - Bonding Channel Entity  
BTU - Bonding Transmission Unit  
BTU-C - Bonding Transmission Unit, CO side  
BTU-R - Bonding Transmission Unit, Remote Terminal (CPE) side  
CO - Central Office  
CPE - Customer Premises Equipment  
GBS - Generic Bonding Sublayer  
GBS-C - Generic Bonded Sub-layer, CO side  
GBS-R - Generic Bonded Sub-layer, Remote Terminal (CPE) side  
SNR - Signal to Noise Ratio

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This version of this MIB module is part of RFC YYYY;  
see the RFC itself for full legal notices."

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DESCRIPTION "Initial version, published as RFC YYYY."

-- EdNote: Replace YYYY with the actual RFC number &  
-- remove this note

::= { mib-2 ZZZ }

-- EdNote: Replace ZZZ with a real OID once it is  
-- allocated & remove this note.

-- Sections of the module

-- Structured as recommended by [\[RFC4181\]](#), [Appendix D](#)

gBondTdimObjects OBJECT IDENTIFIER ::= { gBondTdimMIB 1 }

gBondTdimConformance OBJECT IDENTIFIER ::= { gBondTdimMIB 2 }

-- Groups in the module

gBondTdimPort OBJECT IDENTIFIER ::= { gBondTdimObjects 1 }

-- Textual Conventions



GBondTdimSvcIndex ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"A unique value, greater than zero, for each Service defined in the managed G.Bond/TDIM port.

It is RECOMMENDED that values are assigned contiguously starting from 1. The value for each Service MUST remain constant at least from one re-initialization of the local management subsystem to the next re-initialization."

SYNTAX Unsigned32 (1..255)

GBondTdimSvcIndexList ::= TEXTUAL-CONVENTION

DISPLAY-HINT "1d:"

STATUS current

DESCRIPTION

"This textual convention represents a continuous ordered list of all the services defined for the managed G.Bond/TDIM port.

The value of this object is a concatenation of zero or more (up to 60) octets, where each octet contains an 8-bit GBondTdimSvcIndex value, identifying a particular service.

An octet's position reflects the associated service position and its priority in the G.Bond/TDIM frame, with 1st octet being the 1st service of highest priority.

A zero-length octet string is object-specific and MUST therefore be defined as part of the description of any object that uses this syntax. Examples of the usage of a zero-length value might include situations where an object using this textual convention is irrelevant for a specific G.Bond/TDIM port type or that no services have been defined for this port."

SYNTAX OCTET STRING (SIZE(0..60))

GBondTdimSvcOrderIndex ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"A unique value, greater than zero, for each Service defined in the managed G.Bond/TDIM port, showing its relative position inside the G.Bond/TDIM frame."

SYNTAX Unsigned32 (1..60)

-- Port Notifications Group

gBondTdimPortNotifications OBJECT IDENTIFIER

::= { gBondTdimPort 0 }

gBondTdimSvcUp NOTIFICATION-TYPE



```
OBJECTS {
  -- ifIndex is not needed here since we are under specific GBS
  gBondTdimOperSvcPosition,
  gBondTdimSvcIfIdx,
  gBondTdimOperSvcState
}
STATUS      current
DESCRIPTION
  "This notification indicates that a service indicated by the
  gBondTdimOperSvcPosition (mapped to a particular interface
  indicated by the gBondTdimSvcIfIdx) in a particular
  G.Bond/TDIM port' is passing traffic.

  This notification is generated (unless disabled or dropped by
  the rate limiting mechanism), when the gBondTdimOperSvcState
  object has left the Down state, while the G.Bond/TDIM port
  state (ifOperStatus of IF-MIB) is Up.

  Generation of this notification is controlled by the
  gBondTdimPortConfSvcUpDownEnable object.

  This object maps to the TR-159 notification nServiceUp."
REFERENCE
  "[TR-159] 5.5.5.7"
::= { gBondTdimPortNotifications 1 }
```

#### gBondTdimSvcDown NOTIFICATION-TYPE

```
OBJECTS {
  -- ifIndex is not needed here since we are under specific GBS
  gBondTdimOperSvcPosition,
  gBondTdimSvcIfIdx,
  gBondTdimOperSvcState
}
STATUS      current
DESCRIPTION
  "This notification indicates that a service indicated by the
  gBondTdimOperSvcPosition (mapped to a particular interface
  indicated by the gBondTdimSvcIfIdx) in a particular
  G.Bond/TDIM port has stopped passing the traffic.

  This notification is generated (unless disabled or dropped by
  the rate limiting mechanism), when the gBondTdimOperSvcState
  object has entered the Down state, while the G.Bond/TDIM port
  state (ifOperStatus of IF-MIB) is Up.

  Generation of this notification is controlled by the
  gBondTdimPortConfSvcUpDownEnable object.
```





This object maps to the TR-159 notification nServiceDown."

## REFERENCE

"[[TR-159](#)] 5.5.5.8"

::= { gBondTdimPortNotifications 2 }

-- G.Bond/TDIM Port group

gBondTdimPortConfTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimPortConfEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"Table for Configuration of G.Bond/TDIM ports. Entries in this table MUST be maintained in a persistent manner"

::= { gBondTdimPort 1 }

gBondTdimPortConfEntry OBJECT-TYPE

SYNTAX GBondTdimPortConfEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry in the G.Bond/TDIM Port Configuration table. Each entry represents an G.Bond/TDIM port indexed by the ifIndex. Additional configuration parameters are available via the gBondPortConfEntry of GBOND-MIB. Note that an G.Bond/TDIM port runs on top of a single or multiple BCE port(s), which are also indexed by ifIndex."

INDEX { ifIndex }

::= { gBondTdimPortConfTable 1 }

GBondTdimPortConfEntry ::=

SEQUENCE {

gBondTdimPortConfFecAdminState TruthValue,  
gBondTdimPortConfFecWordSize Unsigned32,  
gBondTdimPortConfFecRedundancySize Unsigned32,  
gBondTdimPortConfFecInterleaverType INTEGER,  
gBondTdimPortConfFecInterleaverDepth Unsigned32,  
gBondTdimPortConfAdminServices GBondTdimSvcIndexList,  
gBondTdimPortConfSvcUpDownEnable TruthValue

}

gBondTdimPortConfFecAdminState OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

## DESCRIPTION

"A desired state of the OPTIONAL Forward Error Correction (FEC) function of the G.Bond/TDIM port."



A value of 'false' indicates that the FEC function SHALL be disabled. A value of 'true' indicates that the FEC SHALL be enabled, if supported by the G.Bond/TDIM port, as indicated by the gBondTdimPortCapFecSupported object.

The gBondTdimPortStatFecOperState object indicates current operational state of the FEC function.

For the GBS-R ports, the value of this object cannot be changed directly. This value may be changed as a result of writing operation on the gBondTdimPortCapFecSupported object of a remote GBS-C.

Modifications of this object MUST be performed when the link is Down.

Attempts to change this object MUST be rejected, if the link is Up or Initializing or if it is an GBS-R.

This object maps to TR-159/G.998.3 attribute aFECAdminState."

#### REFERENCE

"[[TR-159](#)] 5.5.4.5; [[G.998.3](#)] [Appendix II](#), B-X"  
::= { gBondTdimPortConfEntry 1 }

#### gBondTdimPortConfFecWordSize OBJECT-TYPE

SYNTAX Unsigned32(0|20..255)

UNITS "octets"

MAX-ACCESS read-write

STATUS current

#### DESCRIPTION

"A FEC code word size in octets for the G.Bond/TDIM ports supporting FEC function.

This object is read-write for the GBS-C ports and read-only for the GBS-R.

A value of zero SHALL be returned if the FEC is disabled (via gBondTdimPortConfFecAdminState) or not supported.

Changing of the FEC code word size MUST be performed when the FEC enabled link is Down. Attempts to change this object MUST be rejected, if the link is Up or Initializing or the FEC function is disabled/not supported.

This object maps to TR-159/G.998.3 attribute aFECWordSize."

#### REFERENCE

"[[TR-159](#)] 5.5.4.7; [[G.998.3](#)] [Appendix II](#), B-XI"  
::= { gBondTdimPortConfEntry 2 }

#### gBondTdimPortConfFecRedundancySize OBJECT-TYPE



SYNTAX        Unsigned32(0|2|4|8|16|20)

UNITS         "octets"

MAX-ACCESS   read-write

STATUS        current

DESCRIPTION

"A FEC redundancy word size in octets for the G.Bond/TDIM ports supporting FEC function.

This object is read-write for the GBS-C ports and read-only for the GBS-R.

A value of zero SHALL be returned if the FEC is disabled (via gBondTdimPortConfFecAdminState) or not supported.

Changing of the FEC redundancy word size MUST be performed when the FEC enabled link is Down. Attempts to change this object MUST be rejected, if the link is Up or Initializing or the FEC function is disabled/not supported.

This object maps to TR-159/G.998.3 attribute aFECRedundancySize."

REFERENCE

"[[TR-159](#)] 5.5.4.8; [[G.998.3](#)] [Appendix II](#), B-XII"  
::= { gBondTdimPortConfEntry 3 }

gBondTdimPortConfFecInterleaverType    OBJECT-TYPE

SYNTAX        INTEGER {

    none(0),

    block(1),

    convolution(2)

}

MAX-ACCESS   read-write

STATUS        current

DESCRIPTION

"An Interleaver type for the G.Bond/TDIM ports supporting FEC function.

This object is read-write for the GBS-C ports and read-only for the GBS-R.

A value of none(0) SHALL be returned if the FEC is disabled (via gBondTdimPortConfFecAdminState) or not supported.

Changing of the Interleaver type MUST be performed when the FEC enabled link is Down. Attempts to change this object MUST be rejected, if the link is Up or Initializing or the FEC function is disabled/not supported.



This object maps to TR-159/G.998.3 attribute  
aFECInterleaverType."

## REFERENCE

"[[TR-159](#)] 5.5.4.9; [[G.998.3](#)] [Appendix II](#), B-XIII"  
::= { gBondTdimPortConfEntry 4 }

## gBondTdimPortConfFecInterleaverDepth OBJECT-TYPE

SYNTAX Unsigned32(0|1|2|3|4|6|8|12|16|24|32|48|96)

MAX-ACCESS read-write

STATUS current

## DESCRIPTION

"An Interleaver Depth for the G.Bond/TDIM ports supporting  
FEC function.

This object is read-write for the GBS-C ports and read-only  
for the GBS-R.

A value of zero SHALL be returned if the FEC is disabled  
(via gBondTdimPortConfFecAdminState) or not supported.

Changing of the Interleaver Depth MUST be performed when the  
FEC enabled link is Down. Attempts to change this object MUST  
be rejected, if the link is Up or Initializing or the FEC  
function is disabled/not supported.

This object maps to TR-159/G.998.3 attribute  
aFECInterleaverDepth."

## REFERENCE

"[[TR-159](#)] 5.5.4.10; [[G.998.3](#)] [Appendix II](#), B-XIV"  
::= { gBondTdimPortConfEntry 5 }

## gBondTdimPortConfAdminServices OBJECT-TYPE

SYNTAX GBondTdimSvcIndexList

MAX-ACCESS read-write

STATUS current

## DESCRIPTION

"Desired list of services for a G.Bond/TDIM port. This object is  
a list of pointers to entries in the gBondTdimSvcTable.

The value of this object is a continuous ordered list of up to  
60 indices (gBondTdimSvcIdx) of the active services carried  
via the G.Bond/TDIM link.

This object is writable and readable for the GBS-C ports.  
It is irrelevant for the GBS-R ports - a zero-length octet  
string SHALL be returned on an attempt to read this object and  
an attempt to change this object MUST be rejected in this case.





Note that the current operational service list is available via the gBondTdimOperSvcTable object.

This object for a GBS-C port MAY be modified independently of the link's state, i.e. in- and out-of-service. Attempts to set this object to a list with a member value that is not the value of the index for an active entry in the corresponding gBondTdimSvcTable table MUST be rejected."

## REFERENCE

"[[G.998.3](#)] 10.2.3, 13.3.4.6-13.3.4.11"  
::= { gBondTdimPortConfEntry 6 }

## gBondTdimPortConfSvcUpDownEnable OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

## DESCRIPTION

"Indicates whether gBondTdimSvcUp and gBondTdimSvcDown notifications should be generated for this interface.

Value of true(1) indicates that the notifications are enabled.  
Value of false(2) indicates that the notifications are disabled.

This object maps to the TR-159 attribute  
aServiceUpDownEnable."

## REFERENCE

"[[TR-159](#)] 5.5.5.6"  
::= { gBondTdimPortConfEntry 7 }

## gBondTdimPortCapTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimPortCapEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"Table for Capabilities of G.Bond/TDIM ports. Entries in this table MUST be maintained in a persistent manner."

::= { gBondTdimPort 2 }

## gBondTdimPortCapEntry OBJECT-TYPE

SYNTAX GBondTdimPortCapEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry in the G.Bond/TDIM port Capability table.  
Each entry represents an G.Bond/TDIM port indexed by the ifIndex. Additional capabilities are available via the



gBondPortCapabilityEntry of GBOND-MIB.

Note that a G.Bond/TDIM port runs on top of a single or multiple BCE port(s), which are also indexed by ifIndex."

INDEX { ifIndex }

::= { gBondTdimPortCapTable 1 }

GBondTdimPortCapEntry ::=

```
SEQUENCE {
    gBondTdimPortCapFecSupported          TruthValue,
    gBondTdimPortCapFecMaxWordSize        Unsigned32,
    gBondTdimPortCapFecMaxRedundancySize   Unsigned32,
    gBondTdimPortCapFecInterleaverTypeSupported INTEGER,
    gBondTdimPortCapFecMaxInterleaverDepth Unsigned32
}
```

gBondTdimPortCapFecSupported OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"FEC and Interleaver Capability of the G.Bond/TDIM port.

This object has a value of true(1) when the port supports the FEC and Interleaver function.

A value of false(2) is returned when the port does not support the FEC and Interleaver function.

This object maps to the TR-159/G.998.3 attribute aFECSupported."

REFERENCE

"[[TR-159](#)] 5.5.4.4; [[G.998.3](#)] [Appendix II](#), B-VI"

::= { gBondTdimPortCapEntry 1 }

gBondTdimPortCapFecMaxWordSize OBJECT-TYPE

SYNTAX Unsigned32(0|20..255)

UNITS "octets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A Maximum supported FEC code word size in octets for the G.Bond/TDIM ports with FEC function.

A value of zero SHALL be returned if the FEC is not supported.

This object maps to TR-159 attribute aFECWordSize"

REFERENCE

"[[TR-159](#)] 5.5.4.11; [[G.998.3](#)] [Appendix II](#), B-XI"

::= { gBondTdimPortCapEntry 2 }



**gBondTdimPortCapFecMaxRedundancySize** OBJECT-TYPE

SYNTAX Unsigned32(0|2|4|8|16|20)

UNITS "octets"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A Maximum supported FEC redundancy word size in octets for the G.Bond/TDIM ports with FEC function.

A value of zero SHALL be returned if the FEC is not supported.

This object maps to TR-159 attribute  
aFECMaxRedundancySize."

## REFERENCE

"[[TR-159](#)] 5.5.4.12; [[G.998.3](#)] [Appendix II](#), B-XII"

::= { gBondTdimPortCapEntry 3 }

**gBondTdimPortCapFecInterleaverTypeSupported** OBJECT-TYPE

SYNTAX INTEGER {

none(0),

block(1),

convolution(2),

blockConvolution(3)

}

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Supported Interleaver types for the G.Bond/TDIM ports with FEC function.

Possible values are:

- none - the port does not support interleaving
- block - the port supports Block Interleaver
- convolution - the port supports Convolution Interleaver
- blockConvolution - the port supports both Block and Convolution Interleaver

This object maps to TR-159 attribute  
aFECInterleaverTypesSupported."

## REFERENCE

"[[TR-159](#)] 5.5.4.13; [[G.998.3](#)] [Appendix II](#), B-XIII"

::= { gBondTdimPortCapEntry 4 }

**gBondTdimPortCapFecMaxInterleaverDepth** OBJECT-TYPE

SYNTAX Unsigned32(0|1|2|3|4|6|8|12|16|24|32|48|96)

MAX-ACCESS read-only

STATUS current

## DESCRIPTION



"A Maximum Interleaver Depth for the G.Bond/TDIM ports with FEC function.

A value of zero SHALL be returned if the Interleaver is not supported.

This object maps to TR-159 attribute aFECMaxInterleaverDepth."  
REFERENCE

"[[TR-159](#)] 5.5.4.14; [[G.998.3](#)] [Appendix II](#), B-XIV"  
::= { gBondTdimPortCapEntry 5 }

#### gBondTdimPortStatTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimPortStatEntry  
MAX-ACCESS not-accessible  
STATUS current

#### DESCRIPTION

"This table provides overall status information of G.Bond TDIM ports, complementing the generic status information from the ifTable of IF-MIB and gBondFltStatus of GBOND-MIB. Additional status information about connected BCEs is available from the relevant line MIBs.

This table contains live data from the equipment. As such, it is NOT persistent."

::= { gBondTdimPort 3 }

#### gBondTdimPortStatEntry OBJECT-TYPE

SYNTAX GBondTdimPortStatEntry  
MAX-ACCESS not-accessible  
STATUS current

#### DESCRIPTION

"An entry in the G.Bond/TDIM port Status table.

Each entry represents a G.Bond/TDIM port indexed by the ifIndex.

Note that an G.Bond GBS port runs on top of a single or multiple BCE port(s), which are also indexed by ifIndex."

INDEX { ifIndex }

::= { gBondTdimPortStatTable 1 }

#### GBondTdimPortStatEntry ::=

```
SEQUENCE {
    gBondTdimPortStatFecOperState      TruthValue,
    gBondTdimPortStatFltStatus          BITS,
    gBondTdimPortStatCrc4Errors         Counter32,
    gBondTdimPortStatCrc6Errors         Counter32,
    gBondTdimPortStatCrc8Errors         Counter32
}
```





**gBondTdimPortStatFecOperState OBJECT-TYPE**

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only value, indicating current operational state of the OPTIONAL Forward Error Correction (FEC) function for the G.998.3 port.

A value of 'false' indicates that the FEC function is disabled. A value of 'true' indicates that the FEC function is enabled (and supported).

This object maps to TR-159 attribute aFECOperState."

**REFERENCE**

"[[TR-159](#)] 5.5.4.6"

::= { gBondTdimPortStatEntry 1 }

**gBondTdimPortStatFltStatus OBJECT-TYPE**

SYNTAX BITS {

serviceDown(0),

wrongConfig(1)

}

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"G.Bond/TDIM port Fault Status. This is a bitmap of possible conditions. The various bit positions are:

- |             |  |
|-------------|--|
| serviceDown | - at least one of the services defined for this aggregation group is down (due to low rate). |
| wrongConfig | - at least one BCE at the remote GBS-R is already connected to another GBS.                  |

This object is intended to supplement ifOperStatus object in IF-MIB and gBondFltStatus in GBOND-MIB."

**REFERENCE**

"G.998.3 [Section 6.3](#);

IF-MIB, ifOperStatus; GBOND-MIB, gBondFltStatus"

::= { gBondTdimPortStatEntry 2 }

**gBondTdimPortStatCrc4Errors OBJECT-TYPE**

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"The total number of CRC-4 errors (frame header error) on all pairs in the G.Bond/TDIM port. Simultaneous errors on M lines SHOULD be counted M times.



Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime, defined in IF-MIB.

This object maps to TR-159/G.998.3 attribute aCRC4Errors."

## REFERENCE

"[[TR-159](#)] 5.5.4.1; [[G.998.3](#)] [Appendix II](#), B-VII"  
::= { gBondTdimPortStatEntry 3 }

## gBondTdimPortStatCrc6Errors OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The total number of CRC-6 errors (super-frame error) on all pairs in the G.Bond/TDIM port. Simultaneous errors on M lines SHOULD be counted 1 time.

Discontinuities in the value of this counter can occur at re-initialization of the local management subsystem, and at other times as indicated by the value of ifCounterDiscontinuityTime, defined in IF-MIB.

This object maps to TR-159/G.998.3 attribute aCRC6Errors."

## REFERENCE

"[[TR-159](#)] 5.5.4.2; [[G.998.3](#)] [Appendix II](#), B-VIII"  
::= { gBondTdimPortStatEntry 4 }

## gBondTdimPortStatCrc8Errors OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The total number of CRC-8 errors (event/message error) on all pairs in the G.Bond/TDIM port. Simultaneous errors on M lines SHOULD be counted M times.

Discontinuities in the value of this counter can occur at re-initialization of the local management subsystem, and at other times as indicated by the value of ifCounterDiscontinuityTime, defined in IF-MIB.

This object maps to TR-159/G.998.3 attribute aCRC8Errors."

## REFERENCE

"[[TR-159](#)] 5.5.4.3; [[G.998.3](#)] [Appendix II](#), B-IX"  
::= { gBondTdimPortStatEntry 5 }



**gBondTdimOperSvcTable OBJECT-TYPE**

SYNTAX SEQUENCE OF GBondTdimOperSvcEntry

MAX-ACCESS not-accessible

STATUS current

**DESCRIPTION**

"Table of the operational Services configured on a G.Bond/TDIM port. This table reflects current actual service configuration, set by the gBondTdimPortConfAdminServices object. The number of entries (services) in this table is therefore can vary between 0, when no services are configured, and 60, for the maximum number of services.

This table contains live data from the equipment. As such, it is NOT persistent."

::= { gBondTdimPort 4 }

**gBondTdimOperSvcEntry OBJECT-TYPE**

SYNTAX GBondTdimOperSvcEntry

MAX-ACCESS not-accessible

STATUS current

**DESCRIPTION**

"An entry in the G.Bond/TDIM Port Operational Service table, containing the index of an active Service entry in the gBondTdimSvcTable. The entry is indexed by ifIndex, indicating corresponding G.Bond/TDIM port, and by gBondTdimOperSvcPosition (1..60), indicating the corresponding service position in the G.Bond/TDIM frame."

INDEX { ifIndex, gBondTdimOperSvcPosition }

::= { gBondTdimOperSvcTable 1 }

**GBondTdimOperSvcEntry ::=**

SEQUENCE {

gBondTdimOperSvcPosition GBondTdimSvcOrderIndex,

gBondTdimOperSvcIdx GBondTdimSvcIndex,

gBondTdimOperSvcState INTEGER

}

**gBondTdimOperSvcPosition OBJECT-TYPE**

SYNTAX GBondTdimSvcOrderIndex

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"G.Bond/TDIM operational Service position - a unique index, indicating relative placement of the associated service pointed by gBondTdimOperSvcIdx, within the G.Bond/TDIM frame.

There can be up to 60 services defined over TDIM bonded facility. Services with lower indices have higher priority in case of bandwidth degradation.



The value of gBondTdimOperSvcPosition for the first gBondTdimOperSvcEntry is always 1, incrementing sequentially for each consecutive entry, i.e. 2 for the second entry, 3 for the third etc.

This objects maps to TR-159/G.998.3 attribute aServiceID."

## REFERENCE

"[[TR-159](#)] 5.5.5.1; [[G.998.3](#)] [Appendix II](#), C-I"  
::= { gBondTdimOperSvcEntry 1 }

## gBondTdimOperSvcIdx OBJECT-TYPE

SYNTAX GBondTdimSvcIndex

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"G.Bond/TDIM operational Service index - a read-only pointer to an existing entry in the gBondTdimSvcTable (value of gBondTdimSvcIdx), describing a particular service."

::= { gBondTdimOperSvcEntry 2 }

## gBondTdimOperSvcState OBJECT-TYPE

SYNTAX INTEGER {

up(1),

down(2)

}

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"G.Bond/TDIM Service Operational State.

Possible values are:

- up - Service is up passing traffic.
- down - Service is down, due to a variety of reasons, e.g. G.Bond/TDIM port is down, current link bandwidth is too low to support a particular service, etc.

This objects maps to TR-159 attribute aServiceOperState."

## REFERENCE

"[[TR-159](#)] 5.5.5.5"  
::= { gBondTdimOperSvcEntry 3 }

## gBondTdimSvcTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimSvcEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION





"Table of possible Services for a G.Bond/TDIM ports.  
Entries in this table MUST be maintained in a persistent  
manner"

::= { gBondTdimPort 5 }

gBondTdimSvcEntry OBJECT-TYPE

SYNTAX GBondTdimSvcEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the G.Bond/TDIM Port Service table, containing  
the management information applicable to a particular Service,  
indexed by the gBondTdimSvcIdx, on a G.Bond/TDIM port,  
indexed by the ifIndex."

INDEX { ifIndex, gBondTdimSvcIdx }

::= { gBondTdimSvcTable 1 }

GBondTdimSvcEntry ::=

SEQUENCE {

gBondTdimSvcIdx GBondTdimSvcIndex,

gBondTdimSvcIfIdx InterfaceIndex,

gBondTdimSvcType INTEGER,

gBondTdimSvcSize Unsigned32,

gBondTdimSvcRowStatus RowStatus

}

gBondTdimSvcIdx OBJECT-TYPE

SYNTAX GBondTdimSvcIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"G.Bond/TDIM Service index - a unique index associated with  
a particular service entry."

::= { gBondTdimSvcEntry 1 }

gBondTdimSvcIfIdx OBJECT-TYPE

SYNTAX InterfaceIndex

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This is a unique index within the ifTable. It represents  
the interface index of a service to be transmitted over the  
G.Bond/TDIM service instance.

This objects maps to TR-159 attribute aServiceIfIndex."

REFERENCE

"[[TR-159](#)] 5.5.5.2"

::= { gBondTdimSvcEntry 2 }



## gBondTdimSvcType OBJECT-TYPE

SYNTAX INTEGER {

ds1(0),  
e1(1),  
nxds0(2),  
nxe0(3),  
ds3(4),  
e3(5),  
clock(6),  
ethernet(7),  
atm(8),  
gfpNoFCS(9),  
gfp(10)

}

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"G.Bond/TDIM Service Type.

Possible values are:

ds1	- Clear Channel DS1 (synchronous)
e1	- Clear Channel E1 (synchronous)
nxds0	- Fractional DS1 (synchronous)
nxe0	- Fractional E1 (synchronous)
ds3	- DS3 (synchronous)
e3	- E3 (synchronous)
clock	- Clock transfer (synchronous)
ethernet	- Ethernet (asynchronous)
atm	- ATM (asynchronous)
gfpNoFCS	- GFP encapsulated without FCS (asynchronous)
gfp	- GFP encapsulated with FCS (asynchronous)

For the GBS-R ports, the value of this object cannot be changed directly. This value may be changed as a result of writing operation on the gBondTdimSvcType object of a remote GBS-C.

Attempts to change this object MUST be rejected for the GBS-R ports.

This object maps to TR-159/G.998.3 attribute aServiceType."

## REFERENCE

"[[TR-159](#)] 5.5.5.3; [[G.998.3](#)] [Appendix II](#), C-II"

::= { gBondTdimSvcEntry 3 }

## gBondTdimSvcSize OBJECT-TYPE

SYNTAX Unsigned32(0|20..255)

UNITS "octets"



MAX-ACCESS read-create  
STATUS current  
DESCRIPTION

"Service size in octets per bonding sub-block for a specific service identified by gBondTdimSvcIdx.

For TDM (synchronous) services with variable size  
e.g. fractional DS1/E1 - this object represents the number of DS0/E0 channels.

For asynchronous services (Ethernet, ATM, GFPnoFCS or GFP) -  
this object represents max. number of octets.

For non-fractional TDM services, i.e. DS1, E1, DS3, E3 and  
Clock, the value of this object MUST be 0.

A GET operation returns current value.

A SET operation, allowed on GBS-C ports, changes the service  
size to the indicated value. If the service type is a fixed  
rate synchronous service (gBondTdimSvcType is nxds0, nxe0,  
ds1, e1, ds3, e3 or clock), the operation MUST be rejected.

This object maps to TR-159/G.998.3 attribute aServiceSize."

REFERENCE

"[[TR-159](#)] 5.5.5.4; [[G.998.3](#)] [Appendix II](#), C-III"  
::= { gBondTdimSvcEntry 4 }

gBondTdimSvcRowStatus OBJECT-TYPE

SYNTAX RowStatus  
MAX-ACCESS read-create  
STATUS current

DESCRIPTION

"This object controls the creation, modification, or deletion  
of the associated entry in the gBondTdimSvcTable per the  
semantics of RowStatus.

If an 'active' entry is referenced via gBondTdimOperSvcIdx  
or gBondTdimPortConfAdminServices instance or indexes a  
gBondTdimSvcPm\*Entry, the entry MUST remain  
'active'.

An 'active' entry SHALL NOT be modified. In order to modify an  
existing entry, it MUST be taken out of service (by setting  
this object to 'notInService'), modified, and set 'active'  
again."

::= { gBondTdimSvcEntry 5 }

-----  
-- Performance Monitoring group



```

-----

gBondTdimPM    OBJECT IDENTIFIER ::= { gBondTdimPort 6 }

gBondTdimPortPmCurTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF GBondTdimPortPmCurEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains current Performance Monitoring information
        for a G.Bond/TDIM port. This table contains live data from the
        equipment and as such is NOT persistent."
    ::= { gBondTdimPM 1 }

gBondTdimPortPmCurEntry OBJECT-TYPE
    SYNTAX      GBondTdimPortPmCurEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the G.Bond/TDIM Port PM table.
        Each entry represents a G.Bond/TDIM port indexed by the
        ifIndex."
    INDEX { ifIndex }
    ::= { gBondTdimPortPmCurTable 1 }

GBondTdimPortPmCurEntry ::=
    SEQUENCE {
        gBondTdimPortPmCur15MinValidIntervals    HCPperfValidIntervals,
        gBondTdimPortPmCur15MinInvalidIntervals  HCPperfInvalidIntervals,
        gBondTdimPortPmCur15MinTimeElapsed       HCPperfTimeElapsed,
        gBondTdimPortPmCur15MinCrc4s             HCPperfCurrentCount,
        gBondTdimPortPmCur15MinCrc6s             HCPperfCurrentCount,
        gBondTdimPortPmCur15MinCrc8s             HCPperfCurrentCount,
        gBondTdimPortPmCur1DayValidIntervals     Unsigned32,
        gBondTdimPortPmCur1DayInvalidIntervals   Unsigned32,
        gBondTdimPortPmCur1DayTimeElapsed        HCPperfTimeElapsed,
        gBondTdimPortPmCur1DayCrc4s              HCPperfCurrentCount,
        gBondTdimPortPmCur1DayCrc6s              HCPperfCurrentCount,
        gBondTdimPortPmCur1DayCrc8s              HCPperfCurrentCount
    }

gBondTdimPortPmCur15MinValidIntervals OBJECT-TYPE
    SYNTAX      HCPperfValidIntervals
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A read-only number of 15-minute intervals for which the
        performance data was collected. The value of this object will

```





be 96 or the maximum number of 15-minute history intervals collected by the implementation unless the measurement was (re-)started recently, in which case the value will be the number of complete 15 minutes intervals for which there are at least some data.

In certain cases it is possible that some intervals are unavailable. In this case, this object reports the maximum interval number for which data is available.

This object partially maps to the TR-159 attribute `aGroupPerf15MinInvalidIntervals`."

REFERENCE

"[[TR-159](#)] 5.5.1.32"  
::= { gBondTdimPortPmCurEntry 1 }

`gBondTdimPortPmCur15MinInvalidIntervals` OBJECT-TYPE

SYNTAX HCPerfInvalidIntervals

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only number of 15-minute intervals for which the performance data was not always available. The value will typically be zero except in cases where the data for some intervals are not available.

This object partially maps to the TR-159 attribute `aGroupPerf15MinInvalidIntervals`."

REFERENCE

"[[TR-159](#)] 5.5.1.33"  
::= { gBondTdimPortPmCurEntry 2 }

`gBondTdimPortPmCur15MinTimeElapsed` OBJECT-TYPE

SYNTAX HCPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of seconds that have elapsed since the beginning of the current 15-minute performance interval.

This object partially maps to the TR-159 attribute `aGroupPerfCurr15MinTimeElapsed`."

REFERENCE

"[[TR-159](#)] 5.5.1.34"  
::= { gBondTdimPortPmCurEntry 3 }

`gBondTdimPortPmCur15MinCrc4s` OBJECT-TYPE

SYNTAX HCPerfCurrentCount



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of CRC-4 errors (frame header errors) on all active pairs in the G.Bond/TDIM port during the current 15-minute performance interval.

Simultaneous errors on M lines SHOULD be counted M times.

Note that the total number of CRC-4 errors is indicated by the gBondTdimPortStatCrc4Errors object.

This object is inhibited during Severely Errored Seconds (SES) or Unavailable Seconds (UAS)."

REFERENCE

"[[TR-159](#)] 5.5.4.1"

::= { gBondTdimPortPmCurEntry 4}

gBondTdimPortPmCur15MinCrc6s OBJECT-TYPE

SYNTAX HCPperfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of CRC-6 errors (super-frame errors) on all active pairs in the G.Bond/TDIM port during the current 15-minute performance interval.

Simultaneous errors on M lines SHOULD be counted 1 time.

Note that the total number of CRC-6 errors is indicated by the gBondTdimPortStatCrc6Errors object.

This object is inhibited during Unavailable Seconds (UAS)."

REFERENCE

"[[TR-159](#)] 5.5.4.2"

::= { gBondTdimPortPmCurEntry 5}

gBondTdimPortPmCur15MinCrc8s OBJECT-TYPE

SYNTAX HCPperfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of CRC-8 errors (event/message errors) on all active pairs in the G.Bond/TDIM port during the current 15-minute performance interval.

Simultaneous errors on M lines SHOULD be counted M times.

Note that the total number of CRC-8 errors is indicated by the gBondTdimPortStatCrc8Errors object.



This object is inhibited during Unavailable Seconds (UAS)."

## REFERENCE

"[[TR-159](#)] 5.5.4.3"  
::= { gBondTdimPortPmCurEntry 6 }

## gBondTdimPortPmCur1DayValidIntervals OBJECT-TYPE

SYNTAX Unsigned32 (0..7)

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only number of 1-day intervals for which data was collected. The value of this object will be 7 or the maximum number of 1-day history intervals collected by the implementation unless the measurement was (re-)started recently, in which case the value will be the number of complete 1-day intervals for which there are at least some data. In certain cases it is possible that some intervals are unavailable. In this case, this object reports the maximum interval number for which data is available."

## REFERENCE

"[[TR-159](#)] 5.5.1.45"  
::= { gBondTdimPortPmCurEntry 7 }

## gBondTdimPortPmCur1DayInvalidIntervals OBJECT-TYPE

SYNTAX Unsigned32 (0..7)

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only number of 1-day intervals for which data was not always available. The value will typically be zero except in cases where the data for some intervals are not available."

## REFERENCE

"[[TR-159](#)] 5.5.1.46"  
::= { gBondTdimPortPmCurEntry 8 }

## gBondTdimPortPmCur1DayTimeElapsed OBJECT-TYPE

SYNTAX HCPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of seconds that have elapsed since the beginning of the current 1-day performance interval."

## REFERENCE

"[[TR-159](#)] 5.5.1.47"  
::= { gBondTdimPortPmCurEntry 9 }

## gBondTdimPortPmCur1DayCrc4s OBJECT-TYPE



SYNTAX        HCPperfCurrentCount

MAX-ACCESS   read-only

STATUS        current

DESCRIPTION

"A read-only count of CRC-4 errors on the G.Bond/TDIM port in the current 1-day performance interval.

This object is inhibited during Severely Errored Seconds (SES) and Unavailable Seconds (UAS)."

::= { gBondTdimPortPmCurEntry 10 }

gBondTdimPortPmCur1DayCrc6s   OBJECT-TYPE

SYNTAX        HCPperfCurrentCount

MAX-ACCESS   read-only

STATUS        current

DESCRIPTION

"A read-only count of CRC-6 errors on the G.Bond/TDIM port in the current 1-day performance interval.

This object is inhibited during Unavailable Seconds (UAS)."

::= { gBondTdimPortPmCurEntry 11 }

gBondTdimPortPmCur1DayCrc8s   OBJECT-TYPE

SYNTAX        HCPperfCurrentCount

MAX-ACCESS   read-only

STATUS        current

DESCRIPTION

"A read-only count of CRC-8 on the G.Bond/TDIM port in the current 1-day performance interval.

This object is inhibited during Unavailable Seconds (UAS)."

::= { gBondTdimPortPmCurEntry 12 }

-- Port PM history: 15-min buckets

gBondTdimPortPm15MinTable   OBJECT-TYPE

SYNTAX        SEQUENCE OF GBondTdimPortPm15MinEntry

MAX-ACCESS   not-accessible

STATUS        current

DESCRIPTION

"This table contains historical 15-minute buckets of Performance Monitoring information for a G.Bond/TDIM port (a row for each 15-minute interval, up to 96 intervals).

Entries in this table MUST be maintained in a persistent manner."

::= { gBondTdimPM 2 }

gBondTdimPortPm15MinEntry   OBJECT-TYPE

SYNTAX        GBondTdimPortPm15MinEntry





MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"An entry in the G.Bond/TDIM Port historical 15-minute PM table.  
Each entry represents performance monitoring data for a G.Bond  
TDIM port, indexed by ifIndex, collected during a particular  
15-minute interval, indexed by  
gBondTdimPortPm15MinIntervalIndex."  
INDEX { ifIndex, gBondTdimPortPm15MinIntervalIndex }  
::= { gBondTdimPortPm15MinTable 1 }

gBondTdimPortPm15MinEntry ::=

SEQUENCE {  
    gBondTdimPortPm15MinIntervalIndex Unsigned32,  
    gBondTdimPortPm15MinIntervalMoniTime HCPperfTimeElapsed,  
    gBondTdimPortPm15MinIntervalCrc4s HCPperfIntervalCount,  
    gBondTdimPortPm15MinIntervalCrc6s HCPperfIntervalCount,  
    gBondTdimPortPm15MinIntervalCrc8s HCPperfIntervalCount,  
    gBondTdimPortPm15MinIntervalValid TruthValue  
}

gBondTdimPortPm15MinIntervalIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..96)  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"Performance Data Interval number. 1 is the most recent previous  
interval; interval 96 is 24 hours ago.  
Intervals 2..96 are OPTIONAL.  
  
This object partially maps to the TR-159 attribute  
aGroupPerf15MinIntervalNumber."  
REFERENCE  
"[[TR-159](#)] 5.5.1.57"  
::= { gBondTdimPortPm15MinEntry 1 }

gBondTdimPortPm15MinIntervalMoniTime OBJECT-TYPE

SYNTAX HCPperfTimeElapsed  
UNITS "seconds"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"A read-only count of seconds over which the performance data  
was actually monitored. This value will be the same as the  
interval duration (900 seconds), except in a situation where  
performance data could not be collected for any reason."  
::= { gBondTdimPortPm15MinEntry 2 }



**gBondTdimPortPm15MinIntervalCrc4s OBJECT-TYPE**

SYNTAX HCPerfIntervalCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of CRC-4 errors on the G.Bond/TDIM port during the 15-minute performance history interval.

This object is inhibited during Severely Errored Seconds (SES) and Unavailable Seconds (UAS)."

::= { gBondTdimPortPm15MinEntry 3 }

**gBondTdimPortPm15MinIntervalCrc6s OBJECT-TYPE**

SYNTAX HCPerfIntervalCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of CRC-6 errors on the G.Bond/TDIM port during the 15-minute performance history interval.

This object is inhibited during Unavailable Seconds (UAS)."

::= { gBondTdimPortPm15MinEntry 4 }

**gBondTdimPortPm15MinIntervalCrc8s OBJECT-TYPE**

SYNTAX HCPerfIntervalCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of CRC-8 errors on the G.Bond/TDIM port during the current 15-minute performance interval.

This object is inhibited during Unavailable Seconds (UAS)."

::= { gBondTdimPortPm15MinEntry 5 }

**gBondTdimPortPm15MinIntervalValid OBJECT-TYPE**

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only object indicating whether or not this history bucket contains valid data. Valid bucket is reported as true(1) and invalid bucket as false(2).

If this history bucket is invalid the BTU-C MUST NOT produce notifications based upon the value of the counters in this bucket.

Note that an implementation may decide not to store invalid history buckets in its data base. In such case this object is not required as only valid history buckets are available while



invalid history buckets are simply not in the data base.

This object partially maps to the TR-159 attribute  
aGroupPerf15MinIntervalValid."

#### REFERENCE

"[[TR-159](#)] 5.5.1.58"

::= { gBondTdimPortPm15MinEntry 6 }

-- Port PM history: 1-day buckets

#### gBondTdimPortPm1DayTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimPortPm1DayEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"This table contains historical 1-day buckets of Performance Monitoring information for a G.Bond/TDIM port (a row for each 1-day interval, up to 7 intervals).

Entries in this table MUST be maintained in a persistent manner."

::= { gBondTdimPM 3 }

#### gBondTdimPortPm1DayEntry OBJECT-TYPE

SYNTAX GBondTdimPortPm1DayEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"An entry in the G.Bond/TDIM port historical 1-day PM table.

Each entry represents performance monitoring data for such port, indexed by ifIndex, collected during a particular 1-day interval, indexed by gBondTdimPortPm1DayIntervalIndex."

INDEX { ifIndex, gBondTdimPortPm1DayIntervalIndex }

::= { gBondTdimPortPm1DayTable 1 }

#### GBondTdimPortPm1DayEntry ::=

#### SEQUENCE {

gBondTdimPortPm1DayIntervalIndex	Unsigned32,
gBondTdimPortPm1DayIntervalMoniTime	HCPperfTimeElapsed,
gBondTdimPortPm1DayIntervalCrc4s	HCPperfIntervalCount,
gBondTdimPortPm1DayIntervalCrc6s	HCPperfIntervalCount,
gBondTdimPortPm1DayIntervalCrc8s	HCPperfIntervalCount,
gBondTdimPortPm1DayIntervalValid	TruthValue

}

#### gBondTdimPortPm1DayIntervalIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..7)

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION



"Performance Data Interval number. 1 is the most recent previous interval; interval 7 is 7 days ago.  
Intervals 2..7 are OPTIONAL.

This object partially maps to the TR-159 attribute  
aGroupPerf1DayIntervalNumber."

## REFERENCE

"[[TR-159](#)] 5.5.1.62"  
::= { gBondTdimPortPm1DayEntry 1 }

## gBondTdimPortPm1DayIntervalMoniTime OBJECT-TYPE

SYNTAX HCPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of seconds over which the performance data was actually monitored. This value will be the same as the interval duration (86400 seconds), except in a situation where performance data could not be collected for any reason.

This object partially maps to the TR-159 attribute  
aGroupPerf1DayIntervalMoniSecs."

## REFERENCE

"[[TR-159](#)] 5.5.1.64"  
::= { gBondTdimPortPm1DayEntry 2 }

## gBondTdimPortPm1DayIntervalCrc4s OBJECT-TYPE

SYNTAX HCPerfIntervalCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of CRC-4 errors on the G.Bond/TDIM port during the 1-day performance history interval.

This object is inhibited during Severely Errored Seconds (SES) and Unavailable Seconds (UAS)."

::= { gBondTdimPortPm1DayEntry 3 }

## gBondTdimPortPm1DayIntervalCrc6s OBJECT-TYPE

SYNTAX HCPerfIntervalCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of CRC-6 errors on the G.Bond/TDIM port during the 1-day performance history interval.

This object is inhibited during Unavailable Seconds (UAS)."





```
::= { gBondTdimPortPm1DayEntry 4 }
```

gBondTdimPortPm1DayIntervalCrc8s OBJECT-TYPE

SYNTAX HCPerfIntervalCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of CRC-6 errors on the G.Bond/TDIM port during the current 1-day performance interval.

This object is inhibited during Unavailable Seconds (UAS)."

```
::= { gBondTdimPortPm1DayEntry 5 }
```

gBondTdimPortPm1DayIntervalValid OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only object indicating whether or not this history bucket contains valid data. Valid bucket is reported as true(1) and invalid bucket as false(2).

If this history bucket is invalid the BTU-C MUST NOT produce notifications based upon the value of the counters in this bucket.

Note that an implementation may decide not to store invalid history buckets in its data base. In such case this object is not required as only valid history buckets are available while invalid history buckets are simply not in the data base.

This object partially maps to the TR-159 attribute aGroupPerf1DayIntervalValid."

REFERENCE

"[[TR-159](#)] 5.5.1.63"

```
::= { gBondTdimPortPm1DayEntry 6 }
```

-- Services PM

gBondTdimSvcPmCurTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimSvcPmCurEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains current Performance Monitoring information for the services of a G.Bond/TDIM port.

This table contains live data from the equipment and as such is NOT persistent."

```
::= { gBondTdimPM 4 }
```



**gBondTdimSvcPmCurEntry OBJECT-TYPE**

SYNTAX       GBondTdimSvcPmCurEntry

MAX-ACCESS   not-accessible

STATUS       current

**DESCRIPTION**

"An entry in the G.Bond/TDIM Services PM table.  
Each entry represents a service, indexed by the  
gBondTdimSvcIdx, in a G.Bond/TDIM port, indexed by the  
ifIndex."

INDEX { ifIndex, gBondTdimSvcIdx }

::= { gBondTdimSvcPmCurTable 1 }

**GBondTdimSvcPmCurEntry ::=**

SEQUENCE {

gBondTdimSvcPmCur15MinValidIntervals	HCPperfValidIntervals,
gBondTdimSvcPmCur15MinInvalidIntervals	HCPperfInvalidIntervals,
gBondTdimSvcPmCur15MinTimeElapsed	HCPperfTimeElapsed,
gBondTdimSvcPmCur15MinDowns	HCPperfCurrentCount,
gBondTdimSvcPmCur1DayValidIntervals	Unsigned32,
gBondTdimSvcPmCur1DayInvalidIntervals	Unsigned32,
gBondTdimSvcPmCur1DayTimeElapsed	HCPperfTimeElapsed,
gBondTdimSvcPmCur1DayDowns	HCPperfCurrentCount

}

**gBondTdimSvcPmCur15MinValidIntervals OBJECT-TYPE**

SYNTAX       HCPperfValidIntervals

MAX-ACCESS   read-only

STATUS       current

**DESCRIPTION**

"A read-only number of 15-minute intervals for which the  
performance data was collected. The value of this object will  
be 96 or the maximum number of 15-minute history intervals  
collected by the implementation unless the measurement was  
(re-)started recently, in which case the value will be the  
number of complete 15 minutes intervals for which there are at  
least some data.

In certain cases it is possible that some intervals are  
unavailable. In this case, this object reports the maximum  
interval number for which data is available.

This object partially maps to the TR-159 attribute  
aGroupPerf15MinValidIntervals."

**REFERENCE**"[[TR-159](#)] 5.5.1.32"

::= { gBondTdimSvcPmCurEntry 1 }

**gBondTdimSvcPmCur15MinInvalidIntervals OBJECT-TYPE**

SYNTAX       HCPperfInvalidIntervals



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only number of 15-minute intervals for which the performance data was not always available. The value will typically be zero except in cases where the data for some intervals are not available.

This object partially maps to the TR-159 attribute  
aGroupPerf15MinInvalidIntervals."

REFERENCE

"[[TR-159](#)] 5.5.1.33"

::= { gBondTdimSvcPmCurEntry 2 }

gBondTdimSvcPmCur15MinTimeElapsed OBJECT-TYPE

SYNTAX HCPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of seconds that have elapsed since the beginning of the current 15-minute performance interval.

This object partially maps to the TR-159 attribute  
aGroupPerfCurr15MinTimeElapsed."

REFERENCE

"[[TR-159](#)] 5.5.1.34"

::= { gBondTdimSvcPmCurEntry 3 }

gBondTdimSvcPmCur15MinDowns OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of seconds in the current 15-minute performance interval, during which a particular TDIM Service was 'down', as indicated by the gBondTdimOperSvcState object.

This object is inhibited during Unavailable Seconds (UAS)."  
::= { gBondTdimSvcPmCurEntry 4 }

gBondTdimSvcPmCur1DayValidIntervals OBJECT-TYPE

SYNTAX Unsigned32 (0..7)

UNITS "days"

MAX-ACCESS read-only

STATUS current



## DESCRIPTION

"A read-only number of 1-day performance history intervals for which the data was collected. The value of this object will be 7 or the maximum number of 1-day history intervals collected by the implementation unless the measurement was (re-)started recently, in which case the value will be the number of complete 1-day intervals for which there are at least some data. In certain cases it is possible that some intervals are unavailable. In this case, this object reports the maximum interval number for which data is available."

## REFERENCE

"[[TR-159](#)] 5.5.1.45"  
 ::= { gBondTdimSvcPmCurEntry 5 }

## gBondTdimSvcPmCur1DayInvalidIntervals OBJECT-TYPE

SYNTAX Unsigned32 (0..7)  
UNITS "days"  
MAX-ACCESS read-only  
STATUS current

## DESCRIPTION

"A read-only number of 1-day performance history intervals for which the performance data was not always available. The value will typically be zero except in cases where the data for some intervals are not available."

## REFERENCE

"[[TR-159](#)] 5.5.1.46"  
 ::= { gBondTdimSvcPmCurEntry 6 }

## gBondTdimSvcPmCur1DayTimeElapsed OBJECT-TYPE

SYNTAX HCPerfTimeElapsed  
UNITS "seconds"  
MAX-ACCESS read-only  
STATUS current

## DESCRIPTION

"A read-only count of seconds that have elapsed since the beginning of the current 1-day performance interval."

## REFERENCE

"[[TR-159](#)] 5.5.1.47"  
 ::= { gBondTdimSvcPmCurEntry 7 }

## gBondTdimSvcPmCur1DayDowns OBJECT-TYPE

SYNTAX HCPerfCurrentCount  
UNITS "seconds"  
MAX-ACCESS read-only  
STATUS current

## DESCRIPTION

"A read-only count of seconds in the current 1-day performance interval, during which a particular TDIM Service was





'down', as indicated by the gBondTdimOperSvcState object.

This object is inhibited during Unavailable Seconds (UAS)."  
 ::= { gBondTdimSvcPmCurEntry 8 }

-- Service PM history: 15-min buckets

gBondTdimSvcPm15MinTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimSvcPm15MinEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains historical 15-minute buckets of Performance Monitoring information for the Services of a G.Bond/TDIM port (a multi-dimensional row for each 15-minute interval, up to 96 intervals).

Entries in this table MUST be maintained in a persistent manner."  
 ::= { gBondTdimPM 5 }

gBondTdimSvcPm15MinEntry OBJECT-TYPE

SYNTAX GBondTdimSvcPm15MinEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the G.Bond/TDIM Services historical 15-minute PM table.

Each entry represents performance monitoring data for a particular Service, indexed by gBondTdimSvcIdx, in a G.Bond TDIM port, indexed by ifIndex, collected during a particular 15-minute interval, indexed by gBondTdimSvcPm15MinIntervalIndex."

INDEX { ifIndex, gBondTdimSvcIdx,  
 gBondTdimSvcPm15MinIntervalIndex }

::= { gBondTdimSvcPm15MinTable 1 }

GBondTdimSvcPm15MinEntry ::=

SEQUENCE {

gBondTdimSvcPm15MinIntervalIndex Unsigned32,

gBondTdimSvcPm15MinIntervalMoniTime HCPperfTimeElapsed,

gBondTdimSvcPm15MinIntervalDowns HCPperfIntervalCount,

gBondTdimSvcPm15MinIntervalValid TruthValue

}

gBondTdimSvcPm15MinIntervalIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..96)

MAX-ACCESS not-accessible

STATUS current



## DESCRIPTION

"Performance Data Interval number. 1 is the most recent previous interval; interval 96 is 24 hours ago.  
Intervals 2..96 are OPTIONAL.

This object partially maps to the TR-159 attribute  
aGroupPerf15MinIntervalNumber."

## REFERENCE

"[[TR-159](#)] 5.5.1.57"  
::= { gBondTdimSvcPm15MinEntry 1 }

## gBondTdimSvcPm15MinIntervalMoniTime OBJECT-TYPE

SYNTAX HCPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of seconds over which the performance data was actually monitored. This value will be the same as the interval duration (900 seconds), except in a situation where performance data could not be collected for any reason."

::= { gBondTdimSvcPm15MinEntry 2 }

## gBondTdimSvcPm15MinIntervalDowns OBJECT-TYPE

SYNTAX HCPerfIntervalCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of seconds in the 15-minute performance history interval, during which a particular TDIM Service was 'down', as indicated by the gBondTdimOperSvcState object.

This object is inhibited during Unavailable Seconds (UAS)."  
::= { gBondTdimSvcPm15MinEntry 3 }

## gBondTdimSvcPm15MinIntervalValid OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only object indicating whether or not this history bucket contains valid data. Valid bucket is reported as true(1) and invalid bucket as false(2).

If this history bucket is invalid the BTU-C MUST NOT produce notifications based upon the value of the counters in this bucket.

Note that an implementation may decide not to store invalid



history buckets in its data base. In such case this object is not required as only valid history buckets are available while invalid history buckets are simply not in the data base.

This object partially maps to the TR-159 attribute aGroupPerf15MinIntervalValid."

#### REFERENCE

"[[TR-159](#)] 5.5.1.58"  
 ::= { gBondTdimSvcPm15MinEntry 4 }

-- Service PM history: 1-day buckets

#### gBondTdimSvcPm1DayTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondTdimSvcPm1DayEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"This table contains historical 1-day buckets of Performance Monitoring information for the Services of a G.Bond/TDIM port (a multi-dimensional row for each 1-day interval, up to 7 intervals).

Entries in this table MUST be maintained in a persistent manner."

::= { gBondTdimPM 6 }

#### gBondTdimSvcPm1DayEntry OBJECT-TYPE

SYNTAX GBondTdimSvcPm1DayEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"An entry in the G.Bond/TDIM Service historical 1-day PM table. Each entry represents performance monitoring data for a particular Service, indexed by gBondTdimSvcIdx, defined in a G.Bond/TDIM port, indexed by ifIndex, collected during a particular 1-day interval, indexed by gBondTdimSvcPm1DayIntervalIndex."

INDEX { ifIndex, gBondTdimSvcIdx,  
 gBondTdimSvcPm1DayIntervalIndex }

::= { gBondTdimSvcPm1DayTable 1 }

#### GBondTdimSvcPm1DayEntry ::=

#### SEQUENCE {

gBondTdimSvcPm1DayIntervalIndex	Unsigned32,
gBondTdimSvcPm1DayIntervalMoniTime	HCPperfTimeElapsed,
gBondTdimSvcPm1DayIntervalDowns	HCPperfIntervalCount,
gBondTdimSvcPm1DayIntervalValid	TruthValue

}

#### gBondTdimSvcPm1DayIntervalIndex OBJECT-TYPE



SYNTAX        Unsigned32 (1..7)

MAX-ACCESS   not-accessible

STATUS        current

DESCRIPTION

"Performance Data Interval number. 1 is the most recent previous interval; interval 7 is 7 days ago. Intervals 2..7 are OPTIONAL.

This object partially maps to the TR-159 attribute aGroupPerf1DayIntervalNumber."

REFERENCE

"[[TR-159](#)] 5.5.1.62"

::= { gBondTdimSvcPm1DayEntry 1 }

gBondTdimSvcPm1DayIntervalMoniTime OBJECT-TYPE

SYNTAX        HCPperfTimeElapsed

UNITS         "seconds"

MAX-ACCESS   read-only

STATUS        current

DESCRIPTION

"A read-only count of seconds over which the performance data was actually monitored. This value will be the same as the interval duration (86400 seconds), except in a situation where performance data could not be collected for any reason.

This object partially maps to the TR-159 attribute aGroupPerf1DayIntervalMoniSecs."

REFERENCE

"[[TR-159](#)] 5.5.1.64"

::= { gBondTdimSvcPm1DayEntry 2 }

gBondTdimSvcPm1DayIntervalDowns OBJECT-TYPE

SYNTAX        HCPperfIntervalCount

UNITS         "seconds"

MAX-ACCESS   read-only

STATUS        current

DESCRIPTION

"A read-only count of seconds in the 1-day performance history interval, during which a particular TDIM Service was 'down', as indicated by the gBondTdimOperSvcState object.

This object is inhibited during Unavailable Seconds (UAS)."

::= { gBondTdimSvcPm1DayEntry 3 }

gBondTdimSvcPm1DayIntervalValid OBJECT-TYPE

SYNTAX        TruthValue

MAX-ACCESS   read-only

STATUS        current





## DESCRIPTION

"A read-only object indicating whether or not this history bucket contains valid data. Valid bucket is reported as true(1) and invalid bucket as false(2).

If this history bucket is invalid the BTU-C MUST NOT produce notifications based upon the value of the counters in this bucket.

Note that an implementation may decide not to store invalid history buckets in its data base. In such case this object is not required as only valid history buckets are available while invalid history buckets are simply not in the data base.

This object partially maps to the TR-159 attribute  
aGroupPerf1DayIntervalValid."

## REFERENCE

"[[TR-159](#)] 5.5.1.63"

::= { gBondTdimSvcPm1DayEntry 4 }

--

-- Conformance Statements

--

gBondTdimGroups OBJECT IDENTIFIER

::= { gBondTdimConformance 1 }

gBondTdimCompliances OBJECT IDENTIFIER

::= { gBondTdimConformance 2 }

-- Object Groups

gBondTdimBasicGroup OBJECT-GROUP

OBJECTS {

gBondTdimPortConfAdminServices,  
gBondTdimPortStatCrc4Errors,  
gBondTdimPortStatCrc6Errors,  
gBondTdimPortStatCrc8Errors,  
gBondTdimPortCapFecSupported,  
gBondTdimOperSvcPosition,  
gBondTdimOperSvcIdx,  
gBondTdimOperSvcState,  
gBondTdimSvcIfIdx,  
gBondTdimSvcType,  
gBondTdimSvcSize,  
gBondTdimSvcRowStatus,  
gBondTdimPortStatFltStatus

}

STATUS current



## DESCRIPTION

"A collection of objects representing management information for G.Bond/TDIM ports."

::= { gBondTdimGroups 1 }

## gBondTdimFecGroup OBJECT-GROUP

## OBJECTS {

gBondTdimPortCapFecSupported,  
gBondTdimPortConfFecAdminState,  
gBondTdimPortStatFecOperState,  
gBondTdimPortConfFecWordSize,  
gBondTdimPortConfFecRedundancySize,  
gBondTdimPortConfFecInterleaverType,  
gBondTdimPortConfFecInterleaverDepth,  
gBondTdimPortCapFecMaxWordSize,  
gBondTdimPortCapFecMaxRedundancySize,  
gBondTdimPortCapFecInterleaverTypeSupported,  
gBondTdimPortCapFecMaxInterleaverDepth

}

STATUS current

## DESCRIPTION

"A collection of objects supporting OPTIONAL Forward Error Correction (FEC) and Interleaver function in G.Bond/TDIM ports."

::= { gBondTdimGroups 2 }

## gBondTdimAlarmConfGroup OBJECT-GROUP

## OBJECTS {

gBondTdimPortConfSvcUpDownEnable

}

STATUS current

## DESCRIPTION

"A collection of objects required for configuration of alarm thresholds and notifications in G.Bond/TDIM ports."

::= { gBondTdimGroups 3 }

## gBondTdimNotificationGroup NOTIFICATION-GROUP

## NOTIFICATIONS {

gBondTdimSvcUp,  
gBondTdimSvcDown

}

STATUS current

## DESCRIPTION

"This group supports notifications of significant conditions associated with G.Bond/TDIM ports."

::= { gBondTdimGroups 4 }

## gBondTdimPerfCurrGroup OBJECT-GROUP



```
OBJECTS {
    gBondTdimPortPmCur15MinValidIntervals,
    gBondTdimPortPmCur15MinInvalidIntervals,
    gBondTdimPortPmCur15MinTimeElapsed,
    gBondTdimPortPmCur15MinCrc4s,
    gBondTdimPortPmCur15MinCrc6s,
    gBondTdimPortPmCur15MinCrc8s,
    gBondTdimPortPmCur1DayValidIntervals,
    gBondTdimPortPmCur1DayInvalidIntervals,
    gBondTdimPortPmCur1DayTimeElapsed,
    gBondTdimPortPmCur1DayCrc4s,
    gBondTdimPortPmCur1DayCrc6s,
    gBondTdimPortPmCur1DayCrc8s,
    gBondTdimSvcPmCur15MinValidIntervals,
    gBondTdimSvcPmCur15MinInvalidIntervals,
    gBondTdimSvcPmCur15MinTimeElapsed,
    gBondTdimSvcPmCur15MinDowns,
    gBondTdimSvcPmCur1DayValidIntervals,
    gBondTdimSvcPmCur1DayInvalidIntervals,
    gBondTdimSvcPmCur1DayTimeElapsed,
    gBondTdimSvcPmCur1DayDowns
}
STATUS          current
DESCRIPTION
    "A collection of objects supporting OPTIONAL current Performance
    Monitoring information for G.Bond/TDIM ports."
::= { gBondTdimGroups 5 }
```

#### gBondTdimPerf15MinGroup OBJECT-GROUP

```
OBJECTS {
    gBondTdimPortPm15MinIntervalMoniTime,
    gBondTdimPortPm15MinIntervalCrc4s,
    gBondTdimPortPm15MinIntervalCrc6s,
    gBondTdimPortPm15MinIntervalCrc8s,
    gBondTdimPortPm15MinIntervalValid,
    gBondTdimSvcPm15MinIntervalMoniTime,
    gBondTdimSvcPm15MinIntervalDowns,
    gBondTdimSvcPm15MinIntervalValid
}
STATUS          current
DESCRIPTION
    "A collection of objects supporting OPTIONAL historical
    Performance Monitoring information for G.Bond/TDIM ports, during
    previous 15-minute intervals ."
::= { gBondTdimGroups 6 }
```

#### gBondTdimPerf1DayGroup OBJECT-GROUP

```
OBJECTS {
```



```

    gBondTdimPortPm1DayIntervalMoniTime,
    gBondTdimPortPm1DayIntervalCrc4s,
    gBondTdimPortPm1DayIntervalCrc6s,
    gBondTdimPortPm1DayIntervalCrc8s,
    gBondTdimPortPm1DayIntervalValid,
    gBondTdimSvcPm1DayIntervalMoniTime,
    gBondTdimSvcPm1DayIntervalDowns,
    gBondTdimSvcPm1DayIntervalValid
}
STATUS          current
DESCRIPTION
    "A collection of objects supporting OPTIONAL historical
    Performance Monitoring information for G.Bond/TDIM ports, during
    previous 1-day intervals ."
::= { gBondTdimGroups 7 }

-- Compliance Statements

gBondTdimCompliance MODULE-COMPLIANCE
STATUS          current
DESCRIPTION
    "The compliance statement for G.Bond/TDIM interfaces.
    Compliance with the following external compliance statements
    is REQUIRED:

    MIB Module          Compliance Statement
    -----
    IF-MIB              ifCompliance3
    GBOND-MIB           gBondCompliance"

MODULE -- this module
MANDATORY-GROUPS {
    gBondTdimBasicGroup,
    gBondTdimAlarmConfGroup,
    gBondTdimNotificationGroup
}

GROUP          gBondTdimFecGroup
DESCRIPTION
    "Support for this group is only required for implementations
    supporting G.Bond FEC and Interleaver function."

GROUP          gBondTdimPerfCurrGroup
DESCRIPTION
    "Support for this group is only required for implementations
    supporting Performance Monitoring."

GROUP          gBondTdimPerf15MinGroup

```





## DESCRIPTION

"Support for this group is only required for implementations supporting historical Performance Monitoring."

GROUP           gBondTdimPerf1DayGroup

## DESCRIPTION

"Support for this group is only required for implementations supporting historical Performance Monitoring."

::= { gBondTdimCompliances 1 }

END

## 7. Security Considerations

There is a number of managed 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 Changing of gBondTdimPortConfAdminServices object may lead to a potential service disruption, by changing a particular service' position (therefore changing its drop priority) or even removing the service from the link altogether.
- o Changing of gBondTdimSvcTable configuration parameters (e.g. gBondTdimSvcType or gBondTdimSvcSize) may lead to a potential service impairment, for example a TDM service would be dropped if there is not enough actual bandwidth on the bonded link to support this service.
- o Changing of gBondTdimPortConfTable configuration parameters (e.g. gBondTdimPortConfFecAdminState) may lead to anything from link quality and rate degradation to a complete link initialization failure.

Some of the readable objects in this MIB module (i.e., those with MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments since, collectively, they provide information about the performance of network interfaces and can reveal some aspects of their configuration.

In particular, since a bonded xDSL port can be comprised of multiple Unshielded Twisted Pair (UTP) voice grade copper, located in the same bundle with other pairs belonging to another operator/customer, it is theoretically possible to eavesdrop to a G.Bond transmission, simply



by "listening" to a cross-talk from the bonded pairs, especially if the operating parameters of the G.Bond link in question are known.

It is thus important to control even GET and/or NOTIFY access to these objects and possibly even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

- o gBondTdimPortStatFecOperState in gBondTdimPortStatTable indicate whether the FEC function is enabled, which may aid in deciphering of the G.Bond/TDIM transmissions.
- o gBondTdimOperSvcTable provide current operational service configuration, which may aid in deciphering of the G.Bond/TDIM transmissions.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPSec), 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.

Implementations MUST provide the security features described by the SNMPv3 framework (see [[RFC3410](#)]), including full support for authentication and privacy via the User-based Security Model (USM) [[RFC3414](#)] with the AES cipher algorithm [[RFC3826](#)]. Implementations MAY also provide support for the Transport Security Model (TSM) [[RFC5591](#)] in combination with a secure transport such as SSH [[RFC5592](#)] or TLS/DTLS [[RFC6353](#)].

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.

## **8. IANA Considerations**

An object identifier for gBondTdimMIB MODULE-IDENTITY SHALL be allocated by IANA [[1](#)] in the MIB-2 transmission sub-tree, before this document is published as an RFC.

## **9. Acknowledgments**

This document was produced by the [[ADSLMIB](#)] working group.



## **10. References**

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#### URIs

- [1]   <<http://www.iana.org/>>

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