

Network Working Group  
Internet-Draft  
Intended status: Standards Track  
Expires: September 15, 2011

E. Beili  
Actelis Networks  
M. Morgenstern  
ECI Telecom  
March 14, 2011

**Ethernet-based xDSL multi-pair bonding (G.Bond/Ethernet) MIB  
draft-ietf-adslmib-gbond-eth-mib-03.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 Ethernet-based multi-pair bonded xDSL interfaces, defined in ITU-T recommendation G.998.2.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on September 15, 2011.

Copyright Notice

Copyright (c) 2011 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as

described in the Simplified BSD License.

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">3</a>
<a href="#">2.</a>	The Internet-Standard Management Framework . . . . .	<a href="#">3</a>
<a href="#">3.</a>	The Broadband Forum Management Framework for xDSL Bonding . .	<a href="#">3</a>
<a href="#">4.</a>	Relation to other MIB modules . . . . .	<a href="#">3</a>
<a href="#">4.1.</a>	Relationship to Interfaces Group MIB module . . . . .	<a href="#">4</a>
<a href="#">4.2.</a>	Relationship to G.Bond MIB module . . . . .	<a href="#">4</a>
<a href="#">4.2.1.</a>	BACP-based Discovery . . . . .	<a href="#">4</a>
<a href="#">4.3.</a>	Relationship to EFM Copper MIB module . . . . .	<a href="#">6</a>
<a href="#">5.</a>	MIB Structure . . . . .	<a href="#">7</a>
<a href="#">5.1.</a>	Overview . . . . .	<a href="#">7</a>
<a href="#">5.2.</a>	Performance Monitoring . . . . .	<a href="#">7</a>
<a href="#">5.3.</a>	Mapping of Broadband Forum TR-159 Managed Objects . . . . .	<a href="#">7</a>
<a href="#">6.</a>	G.Bond/Ethernet MIB Definitions . . . . .	<a href="#">9</a>
<a href="#">7.</a>	Security Considerations . . . . .	<a href="#">47</a>
<a href="#">8.</a>	IANA Considerations . . . . .	<a href="#">48</a>
<a href="#">9.</a>	Acknowledgments . . . . .	<a href="#">48</a>
<a href="#">10.</a>	References . . . . .	<a href="#">48</a>
<a href="#">10.1.</a>	Normative References . . . . .	<a href="#">48</a>
<a href="#">10.2.</a>	Informative References . . . . .	<a href="#">49</a>



## **1. Introduction**

The Ethernet-based xDSL Multi-Pair Bonding, a.k.a. G.Bond/Ethernet, is specified in ITU-T G.998.2 recommendation [[G.998.2](#)], 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 an Ethernet traffic.

The MIB module, defined in this document, provides G.Bond/Ethernet specific objects for the management of G.998.2 bonded interfaces, extending the common bonding objects specified in GBOND-MIB [[I-D.ietf-adslmib-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", "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. Relation 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), G.Bond MIB (GBOND-MIB), and EFM Copper MIB (EFM-CU-MIB).



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

A G.Bond/Ethernet 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/Ethernet 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, [[G.994.1](#)] handshake-based discovery, initialization sequence etc.

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

##### **4.2.1. BACP-based Discovery**

All G.998 protocols share a G.handshake-based remote Bonding Channel Entity (BCE) discovery. The GBOND-MIB module provides an example of an automatic BCE connection to the corresponding GPS ports of a generic G.998 multi-port Central Office (CO) device, using the G.handshake-based discovery. Amendment 2 to the ITU-T G.998.2 specification [[G.998.2-Amd2](#)], provides an alternative optional Bonding Aggregation Control Protocol (BACP) for in-service discovery, aggregation and pair management.

The following pseudo-code gives the same example of the discovery and automatic BCE assignment for a multi-GBS G.Bond/Eth CO device, using BACP objects defined in this MIB module, IF-CAP-STACK-MIB and IF-MIB modules [Note that automatic BCE assignment is only shown here for the purposes of the example. Fixed BCE pre-assignment, manual assignment or auto-assignment using an alternative internal algorithm may be chosen by a particular implementation]:



```
// Go over all GBS ports in the CO device
FOREACH gbs[i] IN CO_device
{ // Perform discovery and auto-assignment on GBS ports
  // with room for more Channels
  IF ( gbs[i].NumBCEs < gbs[i].BondCapacity )
  { IF ( gbs[i].gBondEthOperCp == cpBACP )
    { // Using BACP

      // Get Eligible Group ID and Remote Group ID
      // from a connected BCE (during BACP
      // initialization each BCE is connected to its own GBS)
      gid = ifStackTable[gbs[i]].bce[0].gBondEthBceEligibleGroupID;
      rgid =
        ifStackTable[gbs[i]].bce[0].gBondEthBcePeerEligibleGroupID;

      // Go over all disconnected Channels, which can
      // potentially be connected to the GBS
      FOREACH bce[j] IN ifCapStackTable[gbs[i]] AND
        NOT IN ifStackTable[gbs[i]] // not connected
      { // Read the Remote Group ID for the selected BCE
        // and compare it with the Remote Group ID of the connected
        // BCE.
        r = bce[j].gBondEthBcePeerEligibleGroupID;
        IF ( r == rgid AND gbs[i].NumBCEs < gbs[i].BondCapacity)
        { // Remote RT_device connected via BCE[j] is a peer
          // for GBS[i] and there room for another BCE in the
          // GBS[i] aggregation group (max. Bonding capacity is
          // not reached yet).
          // Connect this BCE to the GBS (via ifStackTable,
          // ifInvStackTable being inverse of ifStackTable is
          // updated automatically, i.e., gbs[i] is auto-added
          // to ifInvStackTable[bce[j]])
          ADD bce[j] TO ifStackTable[gbs[i]];
          gbs[i].NumBCEs = gbs[i].NumBCEs + 1;
        }
      }
    }
  }
  // At this point we have discovered all local BCEs which
  // are physically connected to the same remote RT_device
  // and connected them to GBS[i]. Go to the next GBS.
  BREAK;
}
ELSE
{ // Use default G.HS discovery protocol
  ...
}
}
```





An SNMP Agent for a G.Bond device builds ifCapStackTable and its inverse ifInvCapStackTable on device initialization, according to the cross-connect capabilities of the device. When BACP is used, the gBondEthBceEligibleGroupID object identifying bonding eligibility MUST be automatically updated, whenever the ifCapStackTable/ifInvCapStackTable are changed.

#### **4.3. Relationship to EFM Copper MIB module**

EFM-CU-MIB [[RFC5066](#)] module defines objects for managing Ethernet in the First Mile Copper (EFMCu) interfaces 10PASS-TS and 2BASE-TL, defined in IEEE Std 802.3-2005 [[802.3](#)]. These interfaces are based on Single-pair High-speed Digital Subscriber Line (SHDSL) [[G.991.2](#)] and Very High speed Digital Subscriber Line (VDSL) [[G.993.1](#)] technology respectively, and can be optionally aggregated (bonded).

ITU-T G.998.2 specification extends the IEEE 802.3 Clause 61 bonding to work over any xDSL technology, providing the ability to bond individual channels as well as physical lines. It also allows the use of alternative HDLC encapsulation instead of the default 64/65-octet encapsulation and adds a new optional Bonding Aggregation Control Protocol (BACP) for in-service discovery, aggregation and pair management instead of the default G.handshake-based bonding protocol, which cannot be used in-service, while the link is up.

EFM-CU-MIB can be used to manage all aspects of the EFMCu physical interfaces (PHYS), including a complete (within the scope of the 802.3 standard) management of the SHDSL/VDSL lines. GBOND-MIB and GBOND-ETH-MIB modules on the other hand, provide management objects only for the bonding part, leaving the management of the individual xDSL interfaces (lines/channels) to the respective xDSL-LINE-MIB modules.

Therefore an IEEE 802.3 2BASE-TL/10PASS-TS interface can be managed by either combination of the following MIB modules:

IF-MIB + IF-CAP-STACK-MIB + EtherLike-MIB + MAU-MIB + EFM-CU-MIB

IF-MIB + IF-CAP-STACK-MIB + GBOND-MIB + GBOND-ETH-MIB + HDLSL2-SHDSL-LINE-MIB/VDSL-LINE-MIB

Finally, EFM-CU-MIB does not include historical Performance Monitoring (PM), while GBOND-MIB/GBOND-ETH-MIB/xDSL-LINE-MIB combination provides full PM functionality for a bonded link and individual xDSL lines.



## **[5.](#) MIB Structure**

### **[5.1.](#) Overview**

The main management objects defined in the GBOND-ETH-MIB module are split into 2 groups, structured as recommended by [RFC 4181](#) [[RFC4181](#)]:

- o gBondEthPort - containing objects for configuration, capabilities, status and PM of G.Bond/Eth ports. Note that the rest of the objects for the Generic Bonded Sub-layer (GBS) port configuration, capabilities, status, notifications and PM, is located in the GBOND-MIB module.
- o gBondEthBce - containing objects representing OPTIONAL status information and BACP configuration for each Bonding Channel Entity (BCE). Note that the rest of the objects for the BCE configuration, capabilities, status and notifications, is located in relevant xDSL line MIB modules as well as in the GBOND-MIB module.

### **[5.2.](#) 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 GBS is reinitialized, but rather only when the agent is reset or reinitialized (or under specific request outside the scope of this MIB module).

### **[5.3.](#) Mapping of Broadband Forum TR-159 Managed Objects**

This section contains the mapping between relevant managed objects (attributes) defined in [[TR-159](#)] and managed objects defined in this document.



+-----+-----+	+-----+-----+	+-----+-----+
TR-159 Managed Object	Corresponding SNMP Object	
+-----+-----+	+-----+-----+	+-----+-----+
oBondEth - Basic Package		
(Mandatory)		
+-----+-----+	+-----+-----+	+-----+-----+
aEthBACPSupported	gBondEthBacpSupported	
+-----+-----+	+-----+-----+	+-----+-----+
aEthTcAdminType	gBondEthTcAdminType	
+-----+-----+	+-----+-----+	+-----+-----+
aEthTcOperType	gBondEthTcOperType	
+-----+-----+	+-----+-----+	+-----+-----+
aEthTcTypesSupported	gBondEthTcTypesSupported	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxErrors	gBondEthRxErrors	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxSmallFragments	gBondEthRxSmallFragments	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxLargeFragments	gBondEthRxLargeFragments	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxBadFragments	gBondEthRxBadFragments	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxLostFragments	gBondEthRxLostFragments	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxLostStarts	gBondEthRxLostStarts	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxLostEnds	gBondEthRxLostEnds	
+-----+-----+	+-----+-----+	+-----+-----+
aEthRxOverflows	gBondEthRxOverflows	
+-----+-----+	+-----+-----+	+-----+-----+
oBondEth - BACP Package		
(Optional)		
+-----+-----+	+-----+-----+	+-----+-----+
aEthAdminCP	gBondEthAdminCp	
+-----+-----+	+-----+-----+	+-----+-----+
aEthOperCP	gBondEthOperCp	
+-----+-----+	+-----+-----+	+-----+-----+
oChannel - BACP package		
(Optional)		
+-----+-----+	+-----+-----+	+-----+-----+
aChannelEligibleGroupID	gBondEthBceEligibleGroupID	
+-----+-----+	+-----+-----+	+-----+-----+
aChannelEligibleStreamID	gBondEthBcePeerEligibleGroupID	
+-----+-----+	+-----+-----+	+-----+-----+
oChannel - PM package (Optional)		
+-----+-----+	+-----+-----+	+-----+-----+
aChannelPtmTcRxCodingViolations	gBondEthBceTcInCodingErrors	
+-----+-----+	+-----+-----+	+-----+-----+



+-----+-----+	
aChannelPtmTcRxCrcErrors	gBondEthBceTcInCrcErrors
+-----+-----+	

Table 1: Mapping of TR-159 Managed Objects

## 6. G.Bond/Ethernet MIB Definitions

GBOND-ETH-MIB DEFINITIONS ::= BEGIN

### IMPORTS

```

MODULE-IDENTITY,
OBJECT-TYPE,
Counter32,
mib-2,
Unsigned32
    FROM SNMPv2-SMI          -- [RFC2578]
TEXTUAL-CONVENTION,
TruthValue,
PhysAddress
    FROM SNMPv2-TC          -- [RFC2579]
MODULE-COMPLIANCE,
OBJECT-GROUP
    FROM SNMPv2-CONF        -- [RFC2580]
ifIndex
    FROM IF-MIB             -- [RFC2863]
HCPperfCurrentCount,
HCPperfValidIntervals,
HCPperfInvalidIntervals,
HCPperfTimeElapsed
    FROM HC-PerfHist-TC-MIB -- [RFC3705]
;
```

### gBondEthMIB MODULE-IDENTITY

LAST-UPDATED "201103140000Z" -- Mar 14, 2011

ORGANIZATION "IETF ADSL MIB Working Group"

#### CONTACT-INFO

"WG charter:

<http://www.ietf.org/html.charters/adslmib-charter.html>

#### Mailing Lists:

General Discussion: [adslmib@ietf.org](mailto:adslmib@ietf.org)

To Subscribe: [adslmib-request@ietf.org](mailto:adslmib-request@ietf.org)

In Body: subscribe your\_email\_address

Chair: Menachem Dodge

Postal: ECI Telecom, Ltd.

30 Hasivim St.,





Petach-Tikva 4951169  
Israel

Phone: +972-3-926-8421

E-Mail: menachem.dodge@ecitele.com

Editor: Edward Beili

Postal: Actelis Networks, Inc.

25 Bazel St., P.O.B. 10173

Petach-Tikva 49103

Israel

Phone: +972-3-924-3491

E-Mail: edward.beili@actelis.com

Editor: Moti Morgenstern

Postal: ECI Telecom

30 Hasivim St.

Petach-Tikva 4951169

Israel

Phone: +972-3-926-6258

E-Mail: moti.morgenstern@ecitele.com"

#### DESCRIPTION

"The objects in this MIB module are used to manage the Ethernet-based multi-pair bonded xDSL Interfaces, defined in ITU-T recommendation G.998.2 (G.Bond/Ethernet).

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.998.2] refers to:

ITU-T Recommendation G.998.2: 'Ethernet-based multi-pair bonding', January 2005.

[G.998.2-Amd2] refers to:

ITU-T G.998.2 Amendment 2, December 2007

[802.3] refers to:

IEEE Std 802.3-2005: 'IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements -  
Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications', December 2005.

[TR-159] refers to:



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

Naming Conventions:

BACP - Bonding Aggregation Control Protocol  
BCE - Bonding Channel Entity  
CO - Central Office  
CPE - Customer Premises Equipment  
GBS - Generic Bonding Sublayer  
HDLC - High-level Data Link Control  
PTM-TC - Packet Transfer Mode Transmission Convergence  
(sub-layer)  
SNR - Signal to Noise Ratio  
TC - Transmission Convergence (sub-layer)  
UAS - Unavailable Seconds

Copyright (C) The IETF Trust (2011).

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

REVISION "201103140000Z" -- Mar 14, 2011

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](#)

gBondEthObjects OBJECT IDENTIFIER ::= { gBondEthMIB 1 }

gBondEthConformance OBJECT IDENTIFIER ::= { gBondEthMIB 2 }

-- Groups in the module

gBondEthPort OBJECT IDENTIFIER ::= { gBondEthObjects 1 }

gBondEthBce OBJECT IDENTIFIER ::= { gBondEthObjects 2 }

-----  
-- Textual Conventions  
-----



GBondEthPtmTcType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This textual convention represents possible PTM-TC types in G.bond/Eth ports. The following values are defined:

- tc6465 - 64/65-octet encapsulation, as defined in [\[802.3\]](#) Clause 61.3.3
- tcHDLC - HDLC encapsulation, as defined in [\[G.998.2\]](#) Annex B"

SYNTAX INTEGER {

tc6465(1),  
tcHDLC(2)

}

GBondEthCpType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This textual convention represents possible Control Protocol types in G.bond/Eth ports. The following values are defined:

- unknown - the Control Protocol cannot be determined.
- cpHS - G.hs-based discovery and aggregation, as specified in [\[G.998.2\]](#)
- cpBACP - Bonding Aggregation Control Protocol (BACP) - a frame-based discovery, aggregation and link management protocol, as specified in [\[G.998.2-Amd2\]](#) Annex C."

SYNTAX INTEGER {

unknown(0),  
cpHS(1),  
cpBACP(2)

}

-----  
-- GBS Notifications group  
-----

-- empty --

-----  
-- GBS group  
-----

gBondEthPortConfTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortConfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Table for Configuration of G.Bond/Eth GBS ports. Entries in



this table MUST be maintained in a persistent manner"  
::= { gBondEthPort 1 }

gBondEthPortConfEntry OBJECT-TYPE

SYNTAX GBondEthPortConfEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the G.Bond/Eth Port Configuration table.

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

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

INDEX { ifIndex }

::= { gBondEthPortConfTable 1 }

GBondEthPortConfEntry ::=

SEQUENCE {

gBondEthTcAdminType GBondEthPtmTcType,

gBondEthAdminCp GBondEthCpType

}

gBondEthTcAdminType OBJECT-TYPE

SYNTAX GBondEthPtmTcType

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Administrative (desired) PTM-TC encapsulation type of G.Bond/Eth port (GBS).

Possible values are:

tc6465(1) - 64/65-octet encapsulation

tcHDLC(2) - HDLC encapsulation

Attempts to set a port to a non-supported PTM-TC encapsulation type (see gBondEthTcTypesSupported) SHALL be rejected.

Changing gBondEthTcAdminType is a traffic disruptive operation and as such SHALL be done when the link is Down. Attempts to change this object SHALL be rejected if the link is Up or Initializing.

This object MUST be maintained in a persistent manner.

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

REFERENCE

"[[TR-159](#)] 5.5.3.4"

::= { gBondEthPortConfEntry 1 }

gBondEthAdminCp OBJECT-TYPE





SYNTAX       GBondEthCpType

MAX-ACCESS   read-write

STATUS       current

DESCRIPTION

"Administrative (desired) bonding control protocol of G.Bond/Eth port (GBS). Possible values are:

    cpHS(1)    - use G.hs-based protocol (default)

    cpBACP(2)  - use frame-based BACP

Note G.hs-based protocol support is mandatory, according to [\[G.998.2\]](#). Attempts to set a port to a non-supported bonding control protocol (e.g. BACP if the value of gBondEthBacpSupported is false) SHALL be rejected.

Changing gBondEthAdminCp is a traffic disruptive operation and as such SHALL be done when the link is Down.

Attempts to change this object SHALL be rejected if the link is Up or Initializing.

This object MUST be maintained in a persistent manner.

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

REFERENCE

"[\[TR-159\]](#) 5.5.3.2"

DEFVAL { 1 }

::= { gBondEthPortConfEntry 2 }

gBondEthPortCapabilityTable OBJECT-TYPE

SYNTAX       SEQUENCE OF GBondEthPortCapabilityEntry

MAX-ACCESS   not-accessible

STATUS       current

DESCRIPTION

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

::= { gBondEthPort 2 }

gBondEthPortCapabilityEntry OBJECT-TYPE

SYNTAX       GBondEthPortCapabilityEntry

MAX-ACCESS   not-accessible

STATUS       current

DESCRIPTION

"An entry in the G.Bond/Eth Port Capability table.

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

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

INDEX { ifIndex }

::= { gBondEthPortCapabilityTable 1 }



GBondEthPortCapabilityEntry ::=

```
SEQUENCE {  
    gBondEthTcTypesSupported      BITS,  
    gBondEthBacpSupported        TruthValue  
}
```

gBondEthTcTypesSupported OBJECT-TYPE

```
SYNTAX      BITS {  
    tc6465(0),  
    tcHDLC(1)  
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"PTM-TC Encapsulation types supported by the G.Bond/Eth port.  
This is a bitmap of possible encapsulation types. The various  
bit positions are:

- tc6465 - GBS is capable of 64/65-octet encapsulation
- tcHDLC - GBS is capable of HDLC encapsulation

A desired encapsulation is determined by  
gBondEthTcAdminType, while gBondEthTcOperType reflects the  
current operating mode.

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

REFERENCE

"[[TR-159](#)] 5.5.3.6"

::= { gBondEthPortCapabilityEntry 1 }

gBondEthBacpSupported OBJECT-TYPE

```
SYNTAX      TruthValue
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether Bonding Aggregation Control Protocol  
(BACP) - frame-based discovery, aggregation and link management  
protocol specified in [[G.998.2-Amd2](#)] is supported by the  
G.Bond/Ethernet port.

A value of true(1) indicates that the BACP is supported.

A value of false(2) indicates that the BACP is unsupported.

The BACP functionality, if supported, can be enabled or  
disabled via gBondEthAdminCP, while gBondEthOperCP  
reflects the current BACP operating mode.

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

REFERENCE



"[[TR-159](#)] 5.5.3.1, [[G.998.2-Amd2](#)] Annex C"  
 ::= { gBondEthPortCapabilityEntry 2 }

#### gBondEthPortStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortStatusEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"This table provides overall status information of G.Bond ports, complementing the generic status information from the ifTable of IF-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."

::= { gBondEthPort 3 }

#### gBondEthPortStatusEntry OBJECT-TYPE

SYNTAX GBondEthPortStatusEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"An entry in the G.Bond/Eth Port Status table.  
 Each entry represents a G.Bond/Eth port indexed by the ifIndex.

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

INDEX { ifIndex }

::= { gBondEthPortStatusTable 1 }

#### GBondEthPortStatusEntry ::=

SEQUENCE {

gBondEthTcOperType	GBondEthPtmTcType,
gBondEthOperCp	GBondEthCpType,
gBondEthRxErrors	Counter32,
gBondEthRxSmallFragments	Counter32,
gBondEthRxLargeFragments	Counter32,
gBondEthRxBadFragments	Counter32,
gBondEthRxLostFragments	Counter32,
gBondEthRxLostStarts	Counter32,
gBondEthRxLostEnds	Counter32,
gBondEthRxOverflows	Counter32

}

#### gBondEthTcOperType OBJECT-TYPE

SYNTAX GBondEthPtmTcType

MAX-ACCESS read-only



STATUS current

DESCRIPTION

"Current operational encapsulation type of the G.Bond/Eth port.

Possible values are:

- tc6465(1) - GBS uses 64/65-octet encapsulation
- tcHDL(2) - GBS uses HDLC encapsulation

The operational PTM-TC encapsulation type can be configured via gBondEthTcAdminType.

This objects maps to the TR-159 attribute aEthTcOperType."

REFERENCE

"[[TR-159](#)] 5.5.3.5"

::= { gBondEthPortStatusEntry 1 }

gBondEthOperCp OBJECT-TYPE

SYNTAX GBondEthCpType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Current operational bonding discovery and aggregation control protocol of the G.Bond/Eth port.

Possible values are:

- unknown(0) - the protocol cannot be determined, e.g. when the GBS is down
- cpHS(1) - GBS uses G.hs-based protocol
- cpBACP(2) - GBS uses frame-based BACP

The operational discovery and aggregation control protocol can be configured via gBondEthAdminCp variable.

This objects maps to the TR-159 attribute aEthOperCP."

REFERENCE

"[[TR-159](#)] 5.5.3.3"

::= { gBondEthPortStatusEntry 2 }

gBondEthRxErros OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of fragments that have been received across the gamma interface and discarded.

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 the TR-159 attribute aEthRxEErrors."

REFERENCE

"[[TR-159](#)] 5.5.3.7"

::= { gBondEthPortStatusEntry 3 }

gBondEthRxSmallFragments OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of fragments smaller than minFragmentSize (64 Bytes), that have been received across the gamma interface and discarded.

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 the TR-159 attribute aEthRxSmallFragments."

REFERENCE

"[[TR-159](#)] 5.5.3.8"

::= { gBondEthPortStatusEntry 4 }

gBondEthRxLargeFragments OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of fragments larger than maxFragmentSize (512 Bytes), which have been received across the gamma interface and discarded.

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 the TR-159 attribute aEthRxLargeFragments."

REFERENCE

"[[TR-159](#)] 5.5.3.9"

::= { gBondEthPortStatusEntry 5 }

gBondEthRxBadFragments OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only



STATUS current

DESCRIPTION

"A number of fragments which do not fit into the sequence expected by the frame assembly function, that have been received across the gamma interface and discarded (the frame buffer is flushed to the next valid frame start).

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 the TR-159 attribute aEthRxBadFragments."

REFERENCE

"[[TR-159](#)] 5.5.3.10"

::= { gBondEthPortStatusEntry 6 }

gBondEthRxBadFragments OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of gaps in the sequence of fragments, which have been received across the gamma interface (the frame buffer is flushed to the next valid frame start, when fragment/fragments expected by the frame assembly function is/are not received).

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 the TR-159 attribute aEthRxBadFragments."

REFERENCE

"[[TR-159](#)] 5.5.3.11"

::= { gBondEthPortStatusEntry 7 }

gBondEthRxBadStarts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of missing StartOfPacket indicators expected by the frame assembly function.

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 the TR-159 attribute aEthRxLostStarts."

REFERENCE

"[[TR-159](#)] 5.5.3.12"

::= { gBondEthPortStatusEntry 8 }

gBondEthRxLostEnds OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of missing EndOfPacket indicators expected by the frame assembly function.

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 the TR-159 attribute aEthRxLostEnds."

REFERENCE

"[[TR-159](#)] 5.5.3.13"

::= { gBondEthPortStatusEntry 9 }

gBondEthRxOverflows OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of fragments, received across the gamma interface and discarded, which would have caused the frame assembly buffer to overflow.

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 the TR-159 attribute aEthRxOverflows."

REFERENCE

"[[TR-159](#)] 5.5.3.14"

::= { gBondEthPortStatusEntry 10 }

-----  
-- GBS Performance Monitoring group  
-----



gBondEthPM OBJECT IDENTIFIER ::= { gBondEthPort 4 }

gBondEthPortPerfCurrTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortPerfCurrEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains current Performance Monitoring information for a G.Bond/Eth port. This table contains live data from the equipment and as such is NOT persistent."

::= { gBondEthPM 1 }

gBondEthPortPerfCurrEntry OBJECT-TYPE

SYNTAX GBondEthPortPerfCurrEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the G.Bond/Eth Port PM table.  
Each entry represents a G.Bond/Eth port indexed by the ifIndex."

INDEX { ifIndex }

::= { gBondEthPortPerfCurrTable 1 }

GBondEthPortPerfCurrEntry ::=

SEQUENCE {

gBondEthPortPerf15MinValidIntervals	HCPperfValidIntervals,
gBondEthPortPerf15MinInvalidIntervals	HCPperfInvalidIntervals,
gBondEthPortPerfCurr15MinTimeElapsed	HCPperfTimeElapsed,
gBondEthPortPerfCurr15MinRxErrors	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxSmallFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxLargeFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxBadFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxLostFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxLostStarts	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxLostEnds	HCPperfCurrentCount,
gBondEthPortPerfCurr15MinRxOverflows	HCPperfCurrentCount,
gBondEthPortPerf1DayValidIntervals	Unsigned32,
gBondEthPortPerf1DayInvalidIntervals	Unsigned32,
gBondEthPortPerfCurr1DayTimeElapsed	HCPperfTimeElapsed,
gBondEthPortPerfCurr1DayRxErrors	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxSmallFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxLargeFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxBadFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxLostFragments	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxLostStarts	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxLostEnds	HCPperfCurrentCount,
gBondEthPortPerfCurr1DayRxOverflows	HCPperfCurrentCount

}





**gBondEthPortPerf15MinValidIntervals OBJECT-TYPE**

SYNTAX HCPerfValidIntervals

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"

::= { gBondEthPortPerfCurrEntry 1 }

**gBondEthPortPerf15MinInvalidIntervals 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"

::= { gBondEthPortPerfCurrEntry 2 }

**gBondEthPortPerfCurr15MinTimeElapsed OBJECT-TYPE**

SYNTAX HCPerfTimeElapsed

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"

::= { gBondEthPortPerfCurrEntry 3 }

## gBondEthPortPerfCurr15MinRxErrors OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of errored fragments received and discarded by a G.Bond/Eth port, during the current 15-minute performance interval.

Note that the total number of errored fragments is indicated by the gBondEthRxErrors object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.7"

::= { gBondEthPortPerfCurrEntry 4}

## gBondEthPortPerfCurr15MinRxSmallFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of fragments smaller than minFragmentSize (64 Bytes), that have been received and discarded by a G.Bond/Eth port, during the current 15-minute performance interval.

Note that the total number of small fragments is indicated by the gBondEthRxSmallFragments object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.8"

::= { gBondEthPortPerfCurrEntry 5}

## gBondEthPortPerfCurr15MinRxLargeFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of fragments larger than maxFragmentSize (512 Bytes), that have been received and discarded by a G.Bond/Eth port, during the current 15-minute performance interval.



Note that the total number of large fragments is indicated by the gBondEthRxLargeFragments object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.9"

::= { gBondEthPortPerfCurrEntry 6}

gBondEthPortPerfCurr15MinRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of fragments which do not fit into the sequence expected by the frame assembly function, that have been received and discarded by a G.Bond/Eth port, during the current 15-minute performance interval.

Note that the total number of small fragments is indicated by the gBondEthRxBadFragments object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.10"

::= { gBondEthPortPerfCurrEntry 7}

gBondEthPortPerfCurr15MinRxLostFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of gaps in the sequence of fragments, expected by the frame assembly function of a G.Bond/Eth port, during the current 15-minute performance interval.

Note that the total number of the lost fragments is indicated by the gBondEthRxLostFragments object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.11"

::= { gBondEthPortPerfCurrEntry 8}

gBondEthPortPerfCurr15MinRxLostStarts OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION



"A read-only count of missing StartOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the current 15-minute performance interval.

Note that the total number of missing StartOfPacket indicators is indicated by the gBondEthRxLostStarts object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.12"

::= { gBondEthPortPerfCurrEntry 9}

gBondEthPortPerfCurr15MinRxLostEnds OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of missing EndOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the current 15-minute performance interval.

Note that the total number of missing EndOfPacket indicators is indicated by the gBondEthRxLostEnds object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.13"

::= { gBondEthPortPerfCurrEntry 10}

gBondEthPortPerfCurr15MinRxOverflows OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments that have been received and discarded by a G.Bond/Eth port, which would have caused the frame assembly buffer to overflow, during the current 15-minute performance interval.

Note that the total number of fragments which would have caused the frame assembly buffer to overflow is indicated by the gBondEthRxOverflows object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.14"

::= { gBondEthPortPerfCurrEntry 11}





**gBondEthPortPerf1DayValidIntervals 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"

::= { gBondEthPortPerfCurrEntry 12 }

**gBondEthPortPerf1DayInvalidIntervals 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"

::= { gBondEthPortPerfCurrEntry 13 }

**gBondEthPortPerfCurr1DayTimeElapsed OBJECT-TYPE**

SYNTAX HPerfTimeElapsed

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"

::= { gBondEthPortPerfCurrEntry 14 }

**gBondEthPortPerfCurr1DayRxErrors OBJECT-TYPE**

SYNTAX HPerfCurrentCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of errored fragments received and discarded by a G.Bond/Eth port, during the current 1-day performance"



interval.

Note that the total number of errored fragments is indicated by the gBondEthRxErrors object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.7"

::= { gBondEthPortPerfCurrEntry 15 }

gBondEthPortPerfCurr1DayRxSmallFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments smaller than minFragmentSize (64 Bytes), that have been received and discarded by a G.Bond/Eth port, during the current 1-day performance interval.

Note that the total number of small fragments is indicated by the gBondEthRxSmallFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.8"

::= { gBondEthPortPerfCurrEntry 16 }

gBondEthPortPerfCurr1DayRxLargeFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments larger than maxFragmentSize (512 Bytes), that have been received and discarded by a G.Bond/Eth port, during the current 1-day performance interval.

Note that the total number of large fragments is indicated by the gBondEthRxLargeFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.9"

::= { gBondEthPortPerfCurrEntry 17 }

gBondEthPortPerfCurr1DayRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current



## DESCRIPTION

"A read-only count of fragments which do not fit into the sequence expected by the frame assembly function, that have been received and discarded by a G.Bond/Eth port, during the current 1-day performance interval.

Note that the total number of small fragments is indicated by the gBondEthRxBadFragments object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.10"

::= { gBondEthPortPerfCurrEntry 18}

## gBondEthPortPerfCurr1DayRxLostFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of gaps in the sequence of fragments, expected by the frame assembly function of a G.Bond/Eth port, during the current 1-day performance interval.

Note that the total number of the lost fragments is indicated by the gBondEthRxLostFragments object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.11"

::= { gBondEthPortPerfCurrEntry 19}

## gBondEthPortPerfCurr1DayRxLostStarts OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A read-only count of missing StartOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the current 1-day performance interval.

Note that the total number of missing StartOfPacket indicators is indicated by the gBondEthRxLostStarts object.

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

## REFERENCE

"[[TR-159](#)] 5.5.3.12"

::= { gBondEthPortPerfCurrEntry 20}



**gBondEthPortPerfCurr1DayRxLostEnds OBJECT-TYPE**

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of missing EndOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the current 1-day performance interval.

Note that the total number of missing EndOfPacket indicators is indicated by the gBondEthRxLostEnds object.

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

**REFERENCE**

"[[TR-159](#)] 5.5.3.13"

::= { gBondEthPortPerfCurrEntry 21}

**gBondEthPortPerfCurr1DayRxOverflows OBJECT-TYPE**

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of fragments that have been received and discarded by a G.Bond/Eth port, which would have caused the frame assembly buffer to overflow, during the current 1-day performance interval.

Note that the total number of fragments which would have caused the frame assembly buffer to overflow is indicated by the gBondEthRxOverflows object.

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

**REFERENCE**

"[[TR-159](#)] 5.5.3.14"

::= { gBondEthPortPerfCurrEntry 22}

-- Port PM history: 15-min buckets

**gBondEthPortPerf15MinTable OBJECT-TYPE**

SYNTAX SEQUENCE OF GBondEthPortPerf15MinEntry

MAX-ACCESS not-accessible

STATUS current

**DESCRIPTION**

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

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

::= { gBondEthPM 2 }





## gBondEthPortPerf15MinEntry OBJECT-TYPE

SYNTAX GBondEthPortPerf15MinEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry in the G.Bond/Eth Port historical 15-minute PM table. Each entry represents performance monitoring data for a G.Bond/Eth port, indexed by ifIndex, collected during a particular 15-minute interval, indexed by gBondEthPortPerf15MinIntervalIndex."

INDEX { ifIndex, gBondEthPortPerf15MinIntervalIndex }  
 ::= { gBondEthPortPerf15MinTable 1 }

## GBondEthPortPerf15MinEntry ::=

## SEQUENCE {

gBondEthPortPerf15MinIntervalIndex	Unsigned32,
gBondEthPortPerf15MinIntervalMoniTime	HCPperfTimeElapsed,
gBondEthPortPerf15MinIntervalRxErrors	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxSmallFragments	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxLargeFragments	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxBadFragments	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxLostFragments	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxLostStarts	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxLostEnds	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalRxOverflows	HCPperfCurrentCount,
gBondEthPortPerf15MinIntervalValid	TruthValue

}

## gBondEthPortPerf15MinIntervalIndex 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"

::= { gBondEthPortPerf15MinEntry 1 }

## gBondEthPortPerf15MinIntervalMoniTime OBJECT-TYPE

SYNTAX HCPperfTimeElapsed

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."

::= { gBondEthPortPerf15MinEntry 2 }

gBondEthPortPerf15MinIntervalRxErrors OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of errored fragments received and discarded by a G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of errored fragments is indicated by the gBondEthRxErrors object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.7"

::= { gBondEthPortPerf15MinEntry 3 }

gBondEthPortPerf15MinIntervalRxSmallFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments smaller than minFragmentSize (64 Bytes), that have been received and discarded by a G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of small fragments is indicated by the gBondEthRxSmallFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.8"

::= { gBondEthPortPerf15MinEntry 4 }

gBondEthPortPerf15MinIntervalRxLargeFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments larger than maxFragmentSize (512 Bytes), that have been received and discarded by a



G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of large fragments is indicated by the gBondEthRxBadFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.9"

::= { gBondEthPortPerf15MinEntry 5}

gBondEthPortPerf15MinIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments which do not fit into the sequence expected by the frame assembly function, that have been received and discarded by a G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of small fragments is indicated by the gBondEthRxBadFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.10"

::= { gBondEthPortPerf15MinEntry 6}

gBondEthPortPerf15MinIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of gaps in the sequence of fragments, expected by the frame assembly function of a G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of the lost fragments is indicated by the gBondEthRxBadFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.11"

::= { gBondEthPortPerf15MinEntry 7}

gBondEthPortPerf15MinIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount



MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of missing StartOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of missing StartOfPacket indicators is indicated by the gBondEthRxLostStarts object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.12"

::= { gBondEthPortPerf15MinEntry 8}

gBondEthPortPerf15MinIntervalRxLostEnds OBJECT-TYPE

SYNTAX HCPperfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of missing EndOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the 15-minute performance history interval.

Note that the total number of missing EndOfPacket indicators is indicated by the gBondEthRxLostEnds object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.13"

::= { gBondEthPortPerf15MinEntry 9}

gBondEthPortPerf15MinIntervalRxOverflows OBJECT-TYPE

SYNTAX HCPperfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments that have been received and discarded by a G.Bond/Eth port, which would have caused the frame assembly buffer to overflow, during the 15-minute performance history interval.

Note that the total number of fragments which would have caused the frame assembly buffer to overflow is indicated by the gBondEthRxOverflows object.

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

REFERENCE





```
"[TR-159] 5.5.3.14"  
::= { gBondEthPortPerf15MinEntry 10}
```

gBondEthPortPerf15MinIntervalValid 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 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"  
::= { gBondEthPortPerf15MinEntry 11 }
```

-- Port PM history: 1-day buckets

gBondEthPortPerf1DayTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortPerf1DayEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

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

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

```
::= { gBondEthPM 3 }
```

gBondEthPortPerf1DayEntry OBJECT-TYPE

SYNTAX GBondEthPortPerf1DayEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the G.Bond/Eth 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 gBondEthPortPerf1DayIntervalIndex."

```
INDEX { ifIndex, gBondEthPortPerf1DayIntervalIndex }
```



```
::= { gBondEthPortPerf1DayTable 1 }
```

```
GBondEthPortPerf1DayEntry ::=
```

```
SEQUENCE {
    gBondEthPortPerf1DayIntervalIndex      Unsigned32,
    gBondEthPortPerf1DayIntervalMoniTime   HCPerfTimeElapsed,
    gBondEthPortPerf1DayIntervalRxErrors   HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxSmallFragments HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxLargeFragments HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxBadFragments HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxLostFragments HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxLostStarts   HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxLostEnds     HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalRxOverflows    HCPerfCurrentCount,
    gBondEthPortPerf1DayIntervalValid         TruthValue
}
```

```
gBondEthPortPerf1DayIntervalIndex 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 24 hours ago. Intervals 2..7 are OPTIONAL.

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

```
REFERENCE
```

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

```
::= { gBondEthPortPerf1DayEntry 1 }
```

```
gBondEthPortPerf1DayIntervalMoniTime OBJECT-TYPE
```

```
SYNTAX      HCPerfTimeElapsed
```

```
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"

```
::= { gBondEthPortPerf1DayEntry 2 }
```



**gBondEthPortPerf1DayIntervalRxErrors OBJECT-TYPE**

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of errored fragments received and discarded by a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of errored fragments is indicated by the gBondEthRxErrors object.

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

**REFERENCE**

"[[TR-159](#)] 5.5.3.7"

::= { gBondEthPortPerf1DayEntry 3 }

**gBondEthPortPerf1DayIntervalRxSmallFragments OBJECT-TYPE**

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of fragments smaller than minFragmentSize (64 Bytes), that have been received and discarded by a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of small fragments is indicated by the gBondEthRxSmallFragments object.

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

**REFERENCE**

"[[TR-159](#)] 5.5.3.8"

::= { gBondEthPortPerf1DayEntry 4}

**gBondEthPortPerf1DayIntervalRxLargeFragments OBJECT-TYPE**

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"A read-only count of fragments larger than maxFragmentSize (512 Bytes), that have been received and discarded by a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of large fragments is indicated by the gBondEthRxLargeFragments object.

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

**REFERENCE**



"[[TR-159](#)] 5.5.3.9"

::= { gBondEthPortPerf1DayEntry 5}

gBondEthPortPerf1DayIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments which do not fit into the sequence expected by the frame assembly function, that have been received and discarded by a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of small fragments is indicated by the gBondEthRxBadFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.10"

::= { gBondEthPortPerf1DayEntry 6}

gBondEthPortPerf1DayIntervalRxLostFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of gaps in the sequence of fragments, expected by the frame assembly function of a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of the lost fragments is indicated by the gBondEthRxLostFragments object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.11"

::= { gBondEthPortPerf1DayEntry 7}

gBondEthPortPerf1DayIntervalRxLostStarts OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of missing StartOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of missing StartOfPacket indicators





is indicated by the gBondEthRxLostStarts object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.12"

::= { gBondEthPortPerf1DayEntry 8}

gBondEthPortPerf1DayIntervalRxLostEnds OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of missing EndOfPacket indicators expected by the frame assembly function of a G.Bond/Eth port, during the 1-day performance history interval.

Note that the total number of missing EndOfPacket indicators is indicated by the gBondEthRxLostEnds object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.13"

::= { gBondEthPortPerf1DayEntry 9}

gBondEthPortPerf1DayIntervalRxOverflows OBJECT-TYPE

SYNTAX HCPerfCurrentCount

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A read-only count of fragments that have been received and discarded by a G.Bond/Eth port, which would have caused the frame assembly buffer to overflow, during the 1-day performance history interval.

Note that the total number of fragments which would have caused the frame assembly buffer to overflow is indicated by the gBondEthRxOverflows object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.14"

::= { gBondEthPortPerf1DayEntry 10}

gBondEthPortPerf1DayIntervalValid 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 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"

```
::= { gBondEthPortPerf1DayEntry 11 }
```

```
-----  
-- BCE group  
-----
```

#### gBondEthBceConfTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthBceConfEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"Table for Configuration of G.Bond/Eth specific aspects for the Bonding Channel Entity (BCE) ports (modems/channels).

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

```
::= { gBondEthBce 1 }
```

#### gBondEthBceConfEntry OBJECT-TYPE

SYNTAX GBondEthBceConfEntry

MAX-ACCESS not-accessible

STATUS current

#### DESCRIPTION

"An entry in the G.Bond/Eth BCE Configuration table.

Each entry represents G.998.2-specific aspects of a BCE port indexed by the ifIndex. Note that a G.Bond/Eth BCE port can be stacked below a single GBS port, also indexed by ifIndex."

INDEX { ifIndex }

```
::= { gBondEthBceConfTable 1 }
```

#### GBondEthBceConfEntry ::=

SEQUENCE {

gBondEthBceEligibleGroupID PhysAddress,



```
    gBondEthBcePeerEligibleGroupID PhysAddress
}
```

gBondEthBceEligibleGroupID OBJECT-TYPE

SYNTAX PhysAddress (SIZE(0|6))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"BACP Eligible Group ID of a G.Bond/ETH BCE port.

A universally unique 6-octet long identifier, used by the OPTIONAL BACP, to determine bonding eligibility. When two BCEs have the same gBondEthBceEligibleGroupID on a system, they are eligible to be aggregated on that system. Typically, all BCEs on a BTU-R device would be assigned the same gBondEthBceEligibleGroupID, to assert that all of the BCEs should be in the same bonded group. BCEs with different gBondEthBceEligibleGroupID values MUST NOT be connected to the same GBS.

BCEs with the same gBondEthBceEligibleGroupID MAY be connected to different GBS ports.

This object MUST be instantiated during BACP initialization, when every BCE belongs to its own GBS. Attempts to change this object MUST be rejected if the BCE is aggregated with other BCEs, i.e. more than one BCE is connected to the same GBS, or if the BCE in question is not eligible to be bonded with other BCEs having the same value (e.g. the bonding is limited to a single Line Card and BCEs are located on the different Line Cards, or BCEs are the channels of the same line).

Note that bonding eligibility is reflected in the ifCapStackTable and its inverse ifInvCapStackTable, and as such any modification of gBondEthBceEligibleGroupID MUST be reflected in these tables.

A zero-length octet string SHALL be returned on an attempt to read this object on systems not supporting BACP (the value of gBondEthBacpSupported for the connected GBS is false).

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

REFERENCE

"[[TR-159](#)] 5.5.7.3"

::= { gBondEthBceConfEntry 1 }

gBondEthBcePeerEligibleGroupID OBJECT-TYPE

SYNTAX PhysAddress (SIZE(0|6))

MAX-ACCESS read-only

STATUS current



## DESCRIPTION

"BACP Eligible Group ID of a peer G.Bond/ETH BCE port, most recently received by the local BCE via Local info TLV BACPDU message from the peer BCE.

A universally unique 6-octet long identifier, used by the OPTIONAL BACP, to determine bonding eligibility.

BCEs with different gBondEthBcePeerEligibleGroupID values MUST NOT be connected to the same GBS.

BCEs with the same gBondEthBcePeerEligibleGroupID MAY be connected to different GBS ports.

A zero-length octet string SHALL be returned on an attempt to read this object on systems not supporting BACP (the value of gBondEthBacpSupported for the connected GBS is false) or when no BACPPDUs has been received from the peer BCE.

This object maps to the G.998.2-Amd2 attribute Remote Group ID."

## REFERENCE

"[[G.998.2-Amd2](#)] C.3.1.6"

::= { gBondEthBceConfEntry 2 }

## gBondEthBceStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthBceStatusEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"This table provides common status information of G.Bond/Eth BCE ports.

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

::= { gBondEthBce 2 }

## gBondEthBceStatusEntry OBJECT-TYPE

SYNTAX GBondEthBceStatusEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry in the G.Bond/Eth BCE Status table.

Each entry represents common aspects of a G.Bond/Eth BCE port indexed by the ifIndex. Note that a BCE port can be stacked below a single GBS port, also indexed by ifIndex, possibly together with other BCE ports."

INDEX { ifIndex }

::= { gBondEthBceStatusTable 1 }





```
GBondEthBceStatusEntry ::=
```

```
  SEQUENCE {
    gBondEthBceTcInCodingErrors      Counter32,
    gBondEthBceTcInCrcErrors         Counter32
  }
```

```
gBondEthBceTcInCodingErrors OBJECT-TYPE
```

```
  SYNTAX      Counter32
```

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

```
  STATUS      current
```

```
  DESCRIPTION
```

"A number of PTM-TC encapsulation errors. This counter is incremented for each encapsulation error detected by the PTM-TC receive function.

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 attribute aChannelPtmTcRxCodingViolations."

```
  REFERENCE
```

"[[TR-159](#)] 5.5.7.8"

```
 ::= { gBondEthBceStatusEntry 1 }
```

```
gBondEthBceTcInCrcErrors OBJECT-TYPE
```

```
  SYNTAX      Counter32
```

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

```
  STATUS      current
```

```
  DESCRIPTION
```

"A number of PTM-TC CRC errors. This counter is incremented for each CRC error detected by the PTM-TC receive function.

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 attribute aChannelPtmTcRxCrcErrors."

```
  REFERENCE
```

"[[TR-159](#)] 5.5.7.9"

```
 ::= { gBondEthBceStatusEntry 2 }
```

```
-----
-- Conformance Statements
-----
```



```
gBondEthGroups      OBJECT IDENTIFIER
 ::= { gBondEthConformance 1 }
```

```
gBondEthCompliances OBJECT IDENTIFIER
 ::= { gBondEthConformance 2 }
```

-- Object Groups

```
gBondEthBasicGroup OBJECT-GROUP
OBJECTS {
    gBondEthTcTypesSupported,
    gBondEthBacpSupported,
    gBondEthTcAdminType,
    gBondEthTcOperType,
    gBondEthRxErrors,
    gBondEthRxSmallFragments,
    gBondEthRxLargeFragments,
    gBondEthRxBadFragments,
    gBondEthRxLostFragments,
    gBondEthRxLostStarts,
    gBondEthRxLostEnds,
    gBondEthRxOverflows,
    gBondEthBceTcInCodingErrors,
    gBondEthBceTcInCrcErrors
}
STATUS      current
DESCRIPTION
    "A collection of objects representing management information
    for G.Bond/Eth GBS ports."
 ::= { gBondEthGroups 1 }
```

```
gBondEthBacpGroup OBJECT-GROUP
OBJECTS {
    gBondEthAdminCp,
    gBondEthOperCp,
    gBondEthBceEligibleGroupID,
    gBondEthBcePeerEligibleGroupID
}
STATUS      current
DESCRIPTION
    "A collection of objects representing management information
    for the OPTIONAL frame-based Bonding Aggregation Control
    Protocol (BACP) used by G.Bond/Eth GBS ports instead of the
    mandatory G.hs-based discovery and aggregation protocol."
 ::= { gBondEthGroups 2 }
```

```
gBondEthBceGroup OBJECT-GROUP
```



```
OBJECTS {
    gBondEthBceTcInCodingErrors,
    gBondEthBceTcInCrcErrors
}
STATUS          current
DESCRIPTION
    "A collection of objects representing OPTIONAL management
    information for G.Bond/Eth BCE ports."
::= { gBondEthGroups 3 }
```

#### gBondEthPerfCurrGroup OBJECT-GROUP

```
OBJECTS {
    gBondEthPortPerf15MinValidIntervals,
    gBondEthPortPerf15MinInvalidIntervals,
    gBondEthPortPerfCurr15MinTimeElapsed,
    gBondEthPortPerfCurr15MinRxErrors,
    gBondEthPortPerfCurr15MinRxSmallFragments,
    gBondEthPortPerfCurr15MinRxLargeFragments,
    gBondEthPortPerfCurr15MinRxBadFragments,
    gBondEthPortPerfCurr15MinRxLostFragments,
    gBondEthPortPerfCurr15MinRxLostStarts,
    gBondEthPortPerfCurr15MinRxLostEnds,
    gBondEthPortPerfCurr15MinRxOverflows,
    gBondEthPortPerf1DayValidIntervals,
    gBondEthPortPerf1DayInvalidIntervals,
    gBondEthPortPerfCurr1DayTimeElapsed,
    gBondEthPortPerfCurr1DayRxErrors,
    gBondEthPortPerfCurr1DayRxSmallFragments,
    gBondEthPortPerfCurr1DayRxLargeFragments,
    gBondEthPortPerfCurr1DayRxBadFragments,
    gBondEthPortPerfCurr1DayRxLostFragments,
    gBondEthPortPerfCurr1DayRxLostStarts,
    gBondEthPortPerfCurr1DayRxLostEnds,
    gBondEthPortPerfCurr1DayRxOverflows
}
STATUS          current
DESCRIPTION
    "A collection of objects supporting OPTIONAL current Performance
    Monitoring information for G.Bond/Eth ports."
::= { gBondEthGroups 4 }
```

#### gBondEthPerf15MinGroup OBJECT-GROUP

```
OBJECTS {
    gBondEthPortPerf15MinIntervalMoniTime,
    gBondEthPortPerf15MinIntervalRxErrors,
    gBondEthPortPerf15MinIntervalRxSmallFragments,
    gBondEthPortPerf15MinIntervalRxLargeFragments,
    gBondEthPortPerf15MinIntervalRxBadFragments,
```



```

    gBondEthPortPerf15MinIntervalRxLostFragments,
    gBondEthPortPerf15MinIntervalRxLostStarts,
    gBondEthPortPerf15MinIntervalRxLostEnds,
    gBondEthPortPerf15MinIntervalRxOverflows,
    gBondEthPortPerf15MinIntervalValid
}
STATUS      current
DESCRIPTION
    "A collection of objects supporting OPTIONAL historical
    Performance Monitoring information for G.Bond/Eth ports, during
    previous 15-minute intervals ."
 ::= { gBondEthGroups 5 }

```

#### gBondEthPerf1DayGroup OBJECT-GROUP

```

OBJECTS {
    gBondEthPortPerf1DayIntervalMoniTime,
    gBondEthPortPerf1DayIntervalRxErrors,
    gBondEthPortPerf1DayIntervalRxSmallFragments,
    gBondEthPortPerf1DayIntervalRxLargeFragments,
    gBondEthPortPerf1DayIntervalRxBadFragments,
    gBondEthPortPerf1DayIntervalRxLostFragments,
    gBondEthPortPerf1DayIntervalRxLostStarts,
    gBondEthPortPerf1DayIntervalRxLostEnds,
    gBondEthPortPerf1DayIntervalRxOverflows,
    gBondEthPortPerf1DayIntervalValid
}
STATUS      current
DESCRIPTION
    "A collection of objects supporting OPTIONAL historical
    Performance Monitoring information for G.Bond/Eth ports, during
    previous 1-day intervals ."
 ::= { gBondEthGroups 6 }

```

```

-----
-- Compliance Statements
-----

```

#### gBondEthCompliance MODULE-COMPLIANCE

```

STATUS      current
DESCRIPTION
    "The compliance statement for G.Bond Ethernet 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 {
    gBondEthBasicGroup
}

GROUP      gBondEthBceGroup
DESCRIPTION
    "Support for this group is OPTIONAL"

GROUP      gBondEthBacpGroup
DESCRIPTION
    "Support for this group is OPTIONAL and only required for
    implementations supporting BACP."

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

GROUP      gBondEthPerf15MinGroup
DESCRIPTION
    "Support for this group is only required for implementations
    supporting historical Performance Monitoring."

GROUP      gBondEthPerf1DayGroup
DESCRIPTION
    "Support for this group is only required for implementations
    supporting 1-day historical Performance Monitoring."

OBJECT      gBondEthTcTypesSupported
SYNTAX      BITS {
    tc6465(0),
    tcHDL(1)
}
DESCRIPTION
    "Support for all TC types is not required. However at least
    one value SHALL be supported"

OBJECT      gBondEthBacpSupported
SYNTAX      TruthValue
DESCRIPTION
    "Support for BACP is OPTIONAL, therefore a value of false(2)
    SHALL be supported."

OBJECT      gBondEthTcAdminType
MIN-ACCESS  read-only
DESCRIPTION
    "Write access is not required (needed only for GBS"
```



supporting more than a single TC encapsulation type, i.e.  
tc6465 and tcHDLC."

OBJECT gBondEthAdminCp

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required (needed only for GBS  
supporting BACP in addition to mandatory G.hs-based bonding  
discovery and aggregation protocol."

::= { gBondEthCompliances 1 }

END

## **7. Security Considerations**

There is a number of managed objects defined in the GBOND-ETH-MIB module that have a MAX-ACCESS clause of read-write or read-create. Writing to these objects can have potentially disruptive effects on network operation, for example:

- o Changing of gBondEthPortConfTable configuration parameters (e.g. gBondEthTcAdminType) MAY lead to a complete service interruption, in case the specified PTM-TC encapsulation type is not supported by the remote end.
- o Changing of gBondEthBceConfTable configuration parameters (e.g. gBondEthBceEligibleGroupID) MAY lead to preventing a non-bonded BCE from being bonded in any bonding group or false advertisement of bonding eligibility (e.g. between BCEs residing on different line cards in an application which does not support cross-card bonding).

The user of the GBOND-ETH-MIB module must therefore be aware that support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

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

In such environments it is important to control also GET and NOTIFY access to these objects and possibly even to encrypt their values 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.

## **[8.](#) IANA Considerations**

An object identifier for gBondEthMIB 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**

### **[10.1.](#) Normative References**

- |                |   |
|----------------|---|
| [802.3]        | IEEE, "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications", IEEE Std 802.3-2005, December 2005. |
| [G.998.2]      | ITU-T, "Ethernet-based multi-pair bonding", ITU-T Recommendation G.998.2, January 2005, < <a href="http://www.itu.int/rec/T-REC-G.998.2/en">http://www.itu.int/rec/T-REC-G.998.2/en</a> >.  |
| [G.998.2-Amd2] | ITU-T, "Ethernet-based multi-pair bonding Amendment 2", ITU-T   |



Recommendation G.998.2/Amd.2,  
December 2007, <<http://www.itu.int/rec/T-REC-G.998.2-200712-I!Amd2/en>>.

- [I-D.ietf-adslmib-gbond-mib] Beili, E. and M. Morgenstern, "xDSL multi-pair bonding (G.Bond) MIB", [draft-ietf-adslmib-gbond-mib-06](#) (work in progress), March 2011.
- [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.
- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", [RFC 2863](#), June 2000.
- [RFC3705] Ray, B. and R. Abbi, "High Capacity Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals", [RFC 3705](#), February 2004.
- [TR-159] Beili, E. and M. Morgenstern, "Management Framework for xDSL Bonding", Broadband Forum technical report TR-159, December 2008.

## [10.2.](#) Informative References

- [ADSLMIB] IETF, "ADSL MIB (adslmib) Charter", <<http://www.ietf.org/html.charters/adslmib-charter.html>>.





- [G.991.2] ITU-T, "Single-pair High-speed Digital Subscriber Line (SHDSL) transceivers", ITU-T Recommendation G.991.2, December 2003, <<http://www.itu.int/rec/T-REC-G.991.2/en>>.
- [G.993.1] ITU-T, "Very High speed Digital Subscriber Line transceivers", ITU-T Recommendation G.993.1, June 2004, <<http://www.itu.int/rec/T-REC-G.993.1/en>>.
- [G.994.1] ITU-T, "Handshake procedures for digital subscriber line (DSL) transceivers", ITU-T Recommendation G.994.1, February 2007, <<http://www.itu.int/rec/T-REC-G.994.1/en>>.
- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.
- [RFC3593] Tesink, K., "Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals", [RFC 3593](#), September 2003.
- [RFC4181] Heard, C., "Guidelines for Authors and Reviewers of MIB Documents", [BCP 111](#), [RFC 4181](#), September 2005.
- [RFC5066] Beili, E., "Ethernet in the First Mile Copper (EFMCu) Interfaces MIB", [RFC 5066](#), November 2007.

## URIs

- [1] <<http://www.iana.org/>>



Authors' Addresses

Edward Beili  
Actelis Networks  
25 Bazel St.  
Petach-Tikva 49103  
Israel

Phone: +972-3-924-3491  
EMail: [edward.beili@actelis.com](mailto:edward.beili@actelis.com)

Moti Morgenstern  
ECI Telecom  
30 Hasivim St.  
Petach-Tikva 4951169  
Israel

Phone: +972-3-926-6258  
EMail: [moti.morgenstern@ecitele.com](mailto:moti.morgenstern@ecitele.com)

