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**Ethernet-based xDSL multi-pair bonding (G.Bond/Ethernet) MIB
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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.

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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", "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, 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 remote Bonding Channel Entity (BCE) discovery, using the [[G.994.1](#)] handshake (G.hs). The GBOND-MIB module provides an example of an automatic BCE connection to the corresponding Generic Bonding Sublayer (GBS) ports of a generic G.998 multi-port Central Office (CO) device, using the G.hs-based BCE 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 gBondEthBceConfEligibleGroupID 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.hs-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

Note also that while EFM-CU-MIB relies on ifMauMediaAvailable object from MAU-MIB [[RFC4836](#)] for the additional bonded xDSL-specific operational states, GBOND-MIB provides these indication via gBondPortStatOperStatus object, complementing the ifOperStatus object from IF-MIB.

Finally, EFM-CU-MIB does not include historical Performance

Monitoring (PM), while GBOND-MIB/GBOND-MIB-ETH/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.

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		gBondEthPortCapBacpSupported
+-----+-----+		+-----+-----+
aEthTcAdminType		gBondEthPortConfTcAdminType
+-----+-----+		+-----+-----+
aEthTcOperType		gBondEthPortStatTcOperType
+-----+-----+		+-----+-----+
aEthTcTypesSupported		gBondEthPortCapTcTypesSupported
+-----+-----+		+-----+-----+
aEthRxErrors		gBondEthPortStatRxErrors
+-----+-----+		+-----+-----+
aEthRxSmallFragments		gBondEthPortStatRxSmallFragments
+-----+-----+		+-----+-----+
aEthRxLargeFragments		gBondEthPortStatRxLargeFragments
+-----+-----+		+-----+-----+
aEthRxBadFragments		gBondEthPortStatRxBadFragments
+-----+-----+		+-----+-----+
aEthRxLostFragments		gBondEthPortStatRxLostFragments
+-----+-----+		+-----+-----+
aEthRxLostStarts		gBondEthPortStatRxLostStarts
+-----+-----+		+-----+-----+
aEthRxLostEnds		gBondEthPortStatRxLostEnds
+-----+-----+		+-----+-----+
aEthRxOverflows		gBondEthPortStatRxOverflows
+-----+-----+		+-----+-----+
oBondEth - BACP Package		
(Optional)		
+-----+-----+		+-----+-----+
aEthAdminCP		gBondEthPortConfAdminCp
+-----+-----+		+-----+-----+
aEthOperCP		gBondEthPortStatOperCp
+-----+-----+		+-----+-----+
oChannel - BACP package		
(Optional)		
+-----+-----+		+-----+-----+
aChannelEligibleGroupID		gBondEthBceConfEligibleGroupID
+-----+-----+		+-----+-----+
aChannelEligibleStreamID		gBondEthBceConfPeerEligibleGroupI
		D
+-----+-----+		+-----+-----+
oChannel - PM package		
(Optional)		
+-----+-----+		+-----+-----+

+-----+-----+		+-----+
aChannelPtmTcRxCodingViolatio	gBondEthBceStatTcInCodingErrors	
ns		
+-----+-----+		+-----+
aChannelPtmTcRxCrcErrors	gBondEthBceStatTcInCrcErrors	
+-----+-----+		+-----+

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 gBondEthPortPm* 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 gBondEthPortPm* 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/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

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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
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
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

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

REVISION "201202130000Z" -- Feb 13, 2012

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 {
        gBondEthPortConfTcAdminType      GBondEthPtmTcType,
        gBondEthPortConfAdminCp          GBondEthCpType
    }

gBondEthPortConfTcAdminType 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 gBondEthPortCapTcTypesSupported) SHALL be rejected (with the error inconsistentValue).

Changing gBondEthPortConfTcAdminType is a traffic disruptive operation and as such SHALL be done when the link (GBS) is administratively 'down', as indicated by the ifAdminStatus object in IF-MIB.

Attempts to change this object SHALL be rejected (with the error inconsistentValue) if the link is Up or Initializing.

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

REFERENCE

"[[TR-159](#)] 5.5.3.4; IF-MIB, ifAdminStatus"
::= { gBondEthPortConfEntry 1 }

gBondEthPortConfAdminCp 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 gBondEthPortCapBacpSupported is false) SHALL be rejected (with the error inconsistentValue).

Changing gBondEthPortConfAdminCp is a traffic disruptive operation and as such SHALL be done when the link (GBS) is administratively 'down', as indicated by the ifAdminStatus object in IF-MIB.

Attempts to change this object SHALL be rejected (with the error inconsistentValue) if the link is Up or Initializing.

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

REFERENCE

"[[TR-159](#)] 5.5.3.2; IF-MIB, ifAdminStatus"
DEFVAL { cpHS }
::= { gBondEthPortConfEntry 2 }

gBondEthPortCapTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortCapEntry

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 }

gBondEthPortCapEntry OBJECT-TYPE

SYNTAX GBondEthPortCapEntry

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 }

::= { gBondEthPortCapTable 1 }

GBondEthPortCapEntry ::=

SEQUENCE {

gBondEthPortCapTcTypesSupported BITS,
gBondEthPortCapBacpSupported TruthValue

}

gBondEthPortCapTcTypesSupported 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
gBondEthPortConfTcAdminType, while gBondEthPortStatTcOperType
reflects the current operating mode.

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

REFERENCE

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

::= { gBondEthPortCapEntry 1 }

gBondEthPortCapBacpSupported 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"

::= { gBondEthPortCapEntry 2 }

gBondEthPortStatTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortStatEntry

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 }

gBondEthPortStatEntry OBJECT-TYPE

SYNTAX GBondEthPortStatEntry

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 }

::= { gBondEthPortStatTable 1 }

GBondEthPortStatEntry ::=

```
SEQUENCE {
    gBondEthPortStatTcOperType      GBondEthPtmTcType,
    gBondEthPortStatOperCp          GBondEthCpType,
    gBondEthPortStatRxErrors        Counter32,
    gBondEthPortStatRxSmallFragments Counter32,
    gBondEthPortStatRxLargeFragments Counter32,
    gBondEthPortStatRxBadFragments  Counter32,
    gBondEthPortStatRxLostFragments Counter32,
    gBondEthPortStatRxLostStarts    Counter32,
    gBondEthPortStatRxLostEnds      Counter32,
    gBondEthPortStatRxOverflows     Counter32
}
```

gBondEthPortStatTcOperType 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

tcHDLC(2) - GBS uses HDLC encapsulation

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

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

REFERENCE

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

::= { gBondEthPortStatEntry 1 }

gBondEthPortStatOperCp 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 gBondEthPortConfAdminCp variable.

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

REFERENCE

"[[TR-159](#)] 5.5.3.3"
::= { gBondEthPortStatEntry 2 }

gBondEthPortStatRxErrors OBJECT-TYPE

SYNTAX Counter32
UNITS "fragments"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A number of Ethernet frame fragments that have been received by the bonding function and discarded due to various errors.

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 aEthRxErrors."

REFERENCE

"[[TR-159](#)] 5.5.3.7"
::= { gBondEthPortStatEntry 3 }

gBondEthPortStatRxSmallFragments OBJECT-TYPE

SYNTAX Counter32
UNITS "fragments"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A number of fragments smaller than minFragmentSize (64 Bytes), that have been received by the bonding function 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"
::= { gBondEthPortStatEntry 4 }

gBondEthPortStatRxLargeFragments OBJECT-TYPE

SYNTAX Counter32
UNITS "fragments"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A number of fragments larger than maxFragmentSize (512 Bytes), which have been received by the bonding function 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 aEthRxBadFragments."

REFERENCE

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

::= { gBondEthPortStatEntry 5 }

gBondEthPortStatRxBadFragments OBJECT-TYPE

SYNTAX Counter32
UNITS "fragments"
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 and discarded by the bonding function (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"

::= { gBondEthPortStatEntry 6 }

gBondEthPortStatRxLostFragments OBJECT-TYPE

SYNTAX Counter32
UNITS "fragments"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A number of gaps in the sequence of fragments, which have been received by the bonding function (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 aEthRxLostFragments."

REFERENCE

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

::= { gBondEthPortStatEntry 7 }

gBondEthPortStatRxLostStarts 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"

::= { gBondEthPortStatEntry 8 }

gBondEthPortStatRxLostEnds 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"

::= { gBondEthPortStatEntry 9 }

gBondEthPortStatRxOverflows OBJECT-TYPE

SYNTAX Counter32

UNITS "fragments"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A number of fragments, received and discarded by the bonding function, 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"

::= { gBondEthPortStatEntry 10 }

 -- GBS Performance Monitoring group

gBondEthPM OBJECT IDENTIFIER ::= { gBondEthPort 4 }

gBondEthPortPmCurTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortPmCurEntry

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 }

gBondEthPortPmCurEntry OBJECT-TYPE

SYNTAX GBondEthPortPmCurEntry

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 }

::= { gBondEthPortPmCurTable 1 }

GBondEthPortPmCurEntry ::=

SEQUENCE {

gBondEthPortPm15MinValidIntervals	HCPperfValidIntervals,
gBondEthPortPm15MinInvalidIntervals	HCPperfInvalidIntervals,
gBondEthPortPmCur15MinTimeElapsed	HCPperfTimeElapsed,

gBondEthPortPmCur15MinRxErrors	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxSmallFragments	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxLargeFragments	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxBadFragments	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxLostFragments	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxLostStarts	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxLostEnds	HCPperfCurrentCount,
gBondEthPortPmCur15MinRxOverflows	HCPperfCurrentCount,
gBondEthPortPm1DayValidIntervals	Unsigned32,
gBondEthPortPm1DayInvalidIntervals	Unsigned32,
gBondEthPortPmCur1DayTimeElapsed	HCPperfTimeElapsed,
gBondEthPortPmCur1DayRxErrors	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxSmallFragments	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxLargeFragments	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxBadFragments	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxLostFragments	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxLostStarts	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxLostEnds	HCPperfCurrentCount,
gBondEthPortPmCur1DayRxOverflows	HCPperfCurrentCount

}

gBondEthPortPm15MinValidIntervals 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"

::= { gBondEthPortPmCurEntry 1 }

gBondEthPortPm15MinInvalidIntervals 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"

::= { gBondEthPortPmCurEntry 2 }

gBondEthPortPmCur15MinTimeElapsed 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"

::= { gBondEthPortPmCurEntry 3 }

gBondEthPortPmCur15MinRxErrors OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxErrors object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 4 }

gBondEthPortPmCur15MinRxSmallFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxSmallFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 5}

gBondEthPortPmCur15MinRxLargeFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLargeFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 6}

gBondEthPortPmCur15MinRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxBadFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 7}

gBondEthPortPmCur15MinRxLostFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLostFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 8}

gBondEthPortPmCur15MinRxLostStarts 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 gBondEthPortStatRxLostStarts object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 9}

gBondEthPortPmCur15MinRxLostEnds 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 gBondEthPortStatRxLostEnds object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 10}

gBondEthPortPmCur15MinRxOverflows OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxOverflows object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 11}

gBondEthPortPm1DayValidIntervals OBJECT-TYPE

SYNTAX Unsigned32 (0..7)

UNITS "days"

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"

::= { gBondEthPortPmCurEntry 12 }

gBondEthPortPm1DayInvalidIntervals OBJECT-TYPE

SYNTAX Unsigned32 (0..7)

UNITS "days"

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"

::= { gBondEthPortPmCurEntry 13 }

gBondEthPortPmCur1DayTimeElapsed OBJECT-TYPE

SYNTAX HCPperfTimeElapsed

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"

::= { gBondEthPortPmCurEntry 14 }

gBondEthPortPmCur1DayRxErrors OBJECT-TYPE

SYNTAX HCPperfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxErrors object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 15 }

gBondEthPortPmCur1DayRxSmallFragments OBJECT-TYPE

SYNTAX HCPperfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxSmallFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 16}

gBondEthPortPmCur1DayRxLargeFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLargeFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 17}

gBondEthPortPmCur1DayRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxBadFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 18}

gBondEthPortPmCur1DayRxLostFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLostFragments object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 19}

gBondEthPortPmCur1DayRxLostStarts 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 gBondEthPortStatRxLostStarts object.

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

REFERENCE

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

::= { gBondEthPortPmCurEntry 20}

gBondEthPortPmCur1DayRxLostEnds 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 gBondEthPortStatRxLostEnds object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.13"
::= { gBondEthPortPmCurEntry 21}

gBondEthPortPmCur1DayRxOverflows OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxOverflows object.

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

REFERENCE

"[[TR-159](#)] 5.5.3.14"
::= { gBondEthPortPmCurEntry 22}

-- Port PM history: 15-min buckets

gBondEthPortPm15MinTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortPm15MinEntry

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 }

gBondEthPortPm15MinEntry OBJECT-TYPE

SYNTAX GBondEthPortPm15MinEntry

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 gBondEthPortPm15MinIntervalIndex."

INDEX { ifIndex, gBondEthPortPm15MinIntervalIndex }


```
::= { gBondEthPortPm15MinTable 1 }
```

```
GBondEthPortPm15MinEntry ::=
```

```
SEQUENCE {
    gBondEthPortPm15MinIntervalIndex      Unsigned32,
    gBondEthPortPm15MinIntervalMoniTime   HCPperfTimeElapsed,
    gBondEthPortPm15MinIntervalRxErrors   HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxSmallFragments HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxLargeFragments HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxBadFragments HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxLostFragments HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxLostStarts HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxLostEnds   HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalRxOverflows HCPperfCurrentCount,
    gBondEthPortPm15MinIntervalValid        TruthValue
}
```

```
gBondEthPortPm15MinIntervalIndex 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"

```
::= { gBondEthPortPm15MinEntry 1 }
```

```
gBondEthPortPm15MinIntervalMoniTime 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."

```
::= { gBondEthPortPm15MinEntry 2 }
```

```
gBondEthPortPm15MinIntervalRxErrors OBJECT-TYPE
```

```
SYNTAX      HCPperfCurrentCount
```

```
UNITS       "fragments"
```

```
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 gBondEthPortStatRxErrors object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 3}

gBondEthPortPm15MinIntervalRxSmallFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxSmallFragments object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 4}

gBondEthPortPm15MinIntervalRxLargeFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLargeFragments object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 5}

gBondEthPortPm15MinIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxBadFragments object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 6}

gBondEthPortPm15MinIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxBadFragments object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 7}

gBondEthPortPm15MinIntervalRxBadFragments 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 gBondEthPortStatRxLostStarts object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 8}

gBondEthPortPm15MinIntervalRxLostEnds 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 15-minute performance history interval.

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

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 9}

gBondEthPortPm15MinIntervalRxOverflows OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxOverflows object.

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

REFERENCE

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

::= { gBondEthPortPm15MinEntry 10}

gBondEthPortPm15MinIntervalValid 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"

::= { gBondEthPortPm15MinEntry 11 }

-- Port PM history: 1-day buckets

gBondEthPortPm1DayTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthPortPm1DayEntry

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 }

gBondEthPortPm1DayEntry OBJECT-TYPE

SYNTAX GBondEthPortPm1DayEntry

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 gBondEthPortPm1DayIntervalIndex."

INDEX { ifIndex, gBondEthPortPm1DayIntervalIndex }

::= { gBondEthPortPm1DayTable 1 }

GBondEthPortPm1DayEntry ::=

SEQUENCE {

gBondEthPortPm1DayIntervalIndex	Unsigned32,
gBondEthPortPm1DayIntervalMoniTime	HCPperfTimeElapsed,
gBondEthPortPm1DayIntervalRxErrors	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxSmallFragments	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxLargeFragments	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxBadFragments	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxLostFragments	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxLostStarts	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxLostEnds	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalRxOverflows	HCPperfCurrentCount,
gBondEthPortPm1DayIntervalValid	TruthValue

}

gBondEthPortPm1DayIntervalIndex 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"

::= { gBondEthPortPm1DayEntry 1 }

gBondEthPortPm1DayIntervalMoniTime 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"

::= { gBondEthPortPm1DayEntry 2 }

gBondEthPortPm1DayIntervalRxErrors OBJECT-TYPE

SYNTAX HCPperfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxErrors object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 3 }

gBondEthPortPm1DayIntervalRxSmallFragments OBJECT-TYPE

SYNTAX HCPperfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxSmallFragments object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 4 }

gBondEthPortPm1DayIntervalRxLargeFragments OBJECT-TYPE

SYNTAX HCPperfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLargeFragments object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 5}

gBondEthPortPm1DayIntervalRxBadFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxBadFragments object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 6}

gBondEthPortPm1DayIntervalRxLostFragments OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxLostFragments object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 7}

gBondEthPortPm1DayIntervalRxLostStarts 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 gBondEthPortStatRxLostStarts object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 8}

gBondEthPortPm1DayIntervalRxLostEnds 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 gBondEthPortStatRxLostEnds object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 9}

gBondEthPortPm1DayIntervalRxOverflows OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "fragments"

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 gBondEthPortStatRxOverflows object.

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

REFERENCE

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

::= { gBondEthPortPm1DayEntry 10}

gBondEthPortPm1DayIntervalValid 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"

::= { gBondEthPortPm1DayEntry 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 {  
    gBondEthBceConfEligibleGroupID      PhysAddress,  
    gBondEthBceConfPeerEligibleGroupID  PhysAddress  
}
```

gBondEthBceConfEligibleGroupID 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 gBondEthBceConfEligibleGroupID 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 gBondEthBceConfEligibleGroupID, to assert that all of the BCEs should be in the same bonded group. BCEs with different gBondEthBceConfEligibleGroupID values MUST NOT be connected to the same GBS.

BCEs with the same gBondEthBceConfEligibleGroupID 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 (with the error inconsistentValue), 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 gBondEthBceConfEligibleGroupID 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 gBondEthPortCapBacpSupported for the connected GBS is false).

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

REFERENCE

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

::= { gBondEthBceConfEntry 1 }

gBondEthBceConfPeerEligibleGroupID 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 gBondEthBceConfPeerEligibleGroupID values MUST NOT be connected to the same GBS.

BCEs with the same gBondEthBceConfPeerEligibleGroupID 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 gBondEthPortCapBacpSupported 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 }

gBondEthBceStatTable OBJECT-TYPE

SYNTAX SEQUENCE OF GBondEthBceStatEntry

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 }

gBondEthBceStatEntry OBJECT-TYPE

SYNTAX GBondEthBceStatEntry

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 }  
 ::= { gBondEthBceStatTable 1 }
```

```
GBondEthBceStatEntry ::=   
  SEQUENCE {  
    gBondEthBceStatTcInCodingErrors      Counter32,  
    gBondEthBceStatTcInCrcErrors         Counter32  
  }
```

gBondEthBceStatTcInCodingErrors 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"

```
 ::= { gBondEthBceStatEntry 1 }
```

gBondEthBceStatTcInCrcErrors 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"

```
 ::= { gBondEthBceStatEntry 2 }
```



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

gBondEthGroups      OBJECT IDENTIFIER
    ::= { gBondEthConformance 1 }

gBondEthCompliances OBJECT IDENTIFIER
    ::= { gBondEthConformance 2 }

-- Object Groups

gBondEthBasicGroup OBJECT-GROUP
    OBJECTS {
        gBondEthPortCapTcTypesSupported,
        gBondEthPortCapBacpSupported,
        gBondEthPortConfTcAdminType,
        gBondEthPortStatTcOperType,
        gBondEthPortStatRxErrors,
        gBondEthPortStatRxSmallFragments,
        gBondEthPortStatRxLargeFragments,
        gBondEthPortStatRxBadFragments,
        gBondEthPortStatRxLostFragments,
        gBondEthPortStatRxLostStarts,
        gBondEthPortStatRxLostEnds,
        gBondEthPortStatRxOverflows,
        gBondEthBceStatTcInCodingErrors,
        gBondEthBceStatTcInCrcErrors
    }
    STATUS      current
    DESCRIPTION
        "A collection of objects representing management information
        for G.Bond/Eth GBS ports."
    ::= { gBondEthGroups 1 }

gBondEthBacpGroup OBJECT-GROUP
    OBJECTS {
        gBondEthPortConfAdminCp,
        gBondEthPortStatOperCp,
        gBondEthBceConfEligibleGroupID,
        gBondEthBceConfPeerEligibleGroupID
    }
    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 {
```

```
    gBondEthBceStatTcInCodingErrors,
```

```
    gBondEthBceStatTcInCrcErrors
```

```
  }
```

```
  STATUS      current
```

```
  DESCRIPTION
```

```
    "A collection of objects representing OPTIONAL management
    information for G.Bond/Eth BCE ports."
```

```
 ::= { gBondEthGroups 3 }
```

```
gBondEthPerfCurrGroup OBJECT-GROUP
```

```
  OBJECTS {
```

```
    gBondEthPortPm15MinValidIntervals,
```

```
    gBondEthPortPm15MinInvalidIntervals,
```

```
    gBondEthPortPmCur15MinTimeElapsed,
```

```
    gBondEthPortPmCur15MinRxErrors,
```

```
    gBondEthPortPmCur15MinRxSmallFragments,
```

```
    gBondEthPortPmCur15MinRxLargeFragments,
```

```
    gBondEthPortPmCur15MinRxBadFragments,
```

```
    gBondEthPortPmCur15MinRxLostFragments,
```

```
    gBondEthPortPmCur15MinRxLostStarts,
```

```
    gBondEthPortPmCur15MinRxLostEnds,
```

```
    gBondEthPortPmCur15MinRxOverflows,
```

```
    gBondEthPortPm1DayValidIntervals,
```

```
    gBondEthPortPm1DayInvalidIntervals,
```

```
    gBondEthPortPmCur1DayTimeElapsed,
```

```
    gBondEthPortPmCur1DayRxErrors,
```

```
    gBondEthPortPmCur1DayRxSmallFragments,
```

```
    gBondEthPortPmCur1DayRxLargeFragments,
```

```
    gBondEthPortPmCur1DayRxBadFragments,
```

```
    gBondEthPortPmCur1DayRxLostFragments,
```

```
    gBondEthPortPmCur1DayRxLostStarts,
```

```
    gBondEthPortPmCur1DayRxLostEnds,
```

```
    gBondEthPortPmCur1DayRxOverflows
```

```
  }
```

```
  STATUS      current
```

```
  DESCRIPTION
```

```
    "A collection of objects supporting OPTIONAL current Performance
    Monitoring information for G.Bond/Eth ports."
```

```
 ::= { gBondEthGroups 4 }
```

```
gBondEthPerf15MinGroup OBJECT-GROUP
```

```
  OBJECTS {
```

```
    gBondEthPortPm15MinIntervalMoniTime,
```



```
gBondEthPortPm15MinIntervalRxErrors,
gBondEthPortPm15MinIntervalRxSmallFragments,
gBondEthPortPm15MinIntervalRxLargeFragments,
gBondEthPortPm15MinIntervalRxBadFragments,
gBondEthPortPm15MinIntervalRxLostFragments,
gBondEthPortPm15MinIntervalRxLostStarts,
gBondEthPortPm15MinIntervalRxLostEnds,
gBondEthPortPm15MinIntervalRxOverflows,
gBondEthPortPm15MinIntervalValid
}
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 {
  gBondEthPortPm1DayIntervalMoniTime,
  gBondEthPortPm1DayIntervalRxErrors,
  gBondEthPortPm1DayIntervalRxSmallFragments,
  gBondEthPortPm1DayIntervalRxLargeFragments,
  gBondEthPortPm1DayIntervalRxBadFragments,
  gBondEthPortPm1DayIntervalRxLostFragments,
  gBondEthPortPm1DayIntervalRxLostStarts,
  gBondEthPortPm1DayIntervalRxLostEnds,
  gBondEthPortPm1DayIntervalRxOverflows,
  gBondEthPortPm1DayIntervalValid
}
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 gBondEthPortCapTcTypesSupported

SYNTAX BITS {

tc6465(0),
tcHDLC(1)

}

DESCRIPTION

"Support for all TC types is not required. However at least
one value SHALL be supported"

OBJECT gBondEthPortCapBacpSupported

SYNTAX TruthValue

DESCRIPTION

"Support for BACP is OPTIONAL, therefore a value of false(2)
SHALL be supported."

OBJECT gBondEthPortConfTcAdminType
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 tcHDLCL."

OBJECT gBondEthPortConfAdminCp
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 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 gBondEthPortConfTable configuration parameters (e.g. gBondEthPortConfTcAdminType) 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. gBondEthBceConfEligibleGroupID) 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).

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.

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 gBondEthPortStatTable - objects in this table (e.g. gBondEthPortStatTcOperType) provide status information for the G.Bond port, which may aid in deciphering of the G.Bond/ETH 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 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.

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