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Technical Specification

Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Network Management



Reference

DTS/BRAN-0020005

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Broadband Radio Access Networks (BRAN).

The present document gives guidelines for network management of HIPERLAN Type 2 (HIPERLAN/2) devices and defines a HIPERLAN/2 SNMP MIB.

Introduction

The present document is organized in the following way:

- Clause 4 describes some general preconditions for the MIB definition;
- Clause 5 describes the H/2 SNMP MIB;
- Annexes A, B, C, and D contain the MIB definitions (ASN.1).

TR 101 683 [1] contains an overall description of the HIPERLAN/2 system. The Physical (PHY) layer is described in [2], the Data Link Control (DLC) layer is described in [3], the Radio Link Control (RLC) sublayer is described in [4], and the Convergence (CL) layers for Ethernet and ATM UNI are described in [5], [6], [7], and [8].

1 Scope

The purpose of the present document is to provide a common view of HIPERLAN Type 2 (H/2) devices from different vendors for basic network monitoring and network control. This is achieved by defining a H/2 SNMP MIB to optionally be included in H/2 devices. For network monitoring basic performance and fault monitoring is covered. A basic set of configuration parameters is defined for network control.

Systems management like device setup, software upgrade and also the manager side for network management is out of the scope of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ETSI TR 101 683: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; System Overview".
- [2] ETSI TS 101 475: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Physical (PHY) Layer".
- [3] ETSI TS 101 761-1: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Data Link Control (DLC) Layer; Part 1: Basic Data Transport Functions".
- [4] ETSI TS 101 761-2: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Data Link Control (DLC) Layer; Part 2: Radio Link Control (RLC) sublayer".
- [5] ETSI TS 101 493-1: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Packet based Convergence Layer; Part 1: Common Part".
- [6] ETSI TS 101 493-2: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Packet based Convergence Layer; Part 2: Ethernet Service Specific Convergence Sublayer (SSCS)".
- [7] ETSI TS 101 763-1: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Cell based Convergence Layer; Part 1: Common Part".
- [8] ETSI TS 101 763-2: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Cell based Convergence Layer; Part 2: UNI Service Specific Convergence Sublayer (SSCS)".
- [9] ETSI TR 101 764: "Broadband Radio Access Networks (BRAN); Definition of the BRAN domain".
- [10] IETF RFC 2571 (April 1999): "An Architecture for Describing SNMP Management Frameworks", Wijnen, B., Harrington, D. and R. Presuhn.
- [11] IETF STD 16 RFC 1155 (May 1990): "Structure and Identification of Management Information for TCP/IP-based Internets, Rose, M. and K. McCloghrie".
- [12] IETF STD 16 RFC 1212 (March 1991): "Concise MIB Definitions", Rose, M. and K. McCloghrie.

- [13] IETF RFC 1215 (March 1991): "A Convention for Defining Traps for use with the SNMP", Rose, M.
- [14] IETF STD 58 RFC 2578 (April 1999): "Structure of Management Information Version 2 (SMIv2)", McCloghrie, K., Perkins, D. and J. Schoenwaelder.
- [15] IETF STD 58 RFC 2579 (April 1999): "Textual Conventions for SMIv2", McCloghrie, K., Perkins, D. and J. Schoenwaelder.
- [16] IETF STD 58 RFC 2580 (April 1999): "Conformance Statements for SMIv2", McCloghrie, K., Perkins, D. and J. Schoenwaelder.
- [17] IETF STD 15 RFC 1157 (May 1990): "Simple Network Management Protocol", Case, J., Fedor, M., Schoffstall, M. and J. Davin.
- [18] IETF RFC 1901 (January 1996): "Introduction to Community-based SNMPv2", Case, J., McCloghrie, K., Rose, M. and S. Waldbusser.
- [19] IETF RFC 1906 (January 1996): "Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)", Case, J., McCloghrie, K., Rose, M. and S. Waldbusser.
- [20] IETF RFC 2572 (April 1999): "Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)", Case, J., Harrington D., Presuhn R. and B. Wijnen.
- [21] IETF RFC 2574 (April 1999): "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", Blumenthal, U. and B. Wijnen.
- [22] IETF RFC 1905 (January 1996): "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", Case, J., McCloghrie, K., Rose, M. and S. Waldbusser.
- [23] IETF RFC 2573 (April 1999): "SNMPv3 Applications", Levi, D., Meyer, P. and B. Stewart.
- [24] IETF RFC 2575 (April 1999): "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", Wijnen, B., Presuhn, R. and K. McCloghrie.
- [25] IETF RFC 1213 (March 1991): "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", McCloghrie, K. and M. Rose.
- [26] IETF RFC 2233 (November 1997): "The Interfaces Group MIB using SMIv2", McCloghrie, K. and F. Kastenholz.

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AP	Access Point
ASN.1	Abstract Syntax Notation One
CL	Convergence Layer
H/2	HIPERLAN Type 2
MIB	Management Information Base
MT	Mobile Terminal
OID	Object Identifier
PC	Personal Computer
SMI	Structure of Management Information
SNMP	Simple Network Management Protocol
TS	Technical Specification

4 H/2 Network Management

This clause gives the preconditions for clause 5 where the H/2 MIB, the SNMP framework etc. are described.

The purpose of defining a MIB and related principles is to provide a common view to the human network manager of H/2 devices from different vendors. Basic performance and fault monitoring is covered for network monitoring. A basic set of configuration parameters is defined for network control.

Systems management like device setup and software upgrade and also the manager side for network management are considered to be vendor specific and are not described in the present document. Vendor specific additions to the H/2 MIB can be placed in vendor specific MIBs.

It is assumed that each H/2 device with SNMP support besides the H/2 MIB contains at least parts of the Internet standard MIB, MIB-II.

4.1 Basic Principles

- SNMP network management requires an IP core network. SNMP often implies a corporate (business) environment.
- Centralized mode (see [3]) is covered. In the future direct mode (see [3]) may be covered.
- The H/2 SNMP MIB is defined in the present document for the AP. In the future it may be adapted to any managed H/2 device by excluding or adding groups and single objects.
- SMIV2 (Structure of Management Information) is used for the definition of the H/2 MIB. An easy transformation to SMIV1 (and SNMPv1) is provided for so a SNMPv1 manager can be used. For more information on SMI see 5.1.
- SNMPv3 is recommended for security reasons, but SNMPv3 is not mandatory. For more information on security see 5.1 and 5.2.

4.2 Management of MT

In a corporate network the MTs (PCs) are normally not monitored via SNMP because of the large number of devices. In a H/2 environment the mobility of the MTs adds extra complexity.

The AP's view of the associated MTs is included in the H/2 MIB located in the AP. This can be the start for trouble shooting MT related problems.

4.3 Mapping of the H/2 Radio Interface on the Interface Table of MIB-II (informative)

The interface table (ifTable) of the standard Internet MIB MIB-II provides information for understanding of how the network interfaces of a device are performing. All types of managed network devices support the interface table of MIB-II. An AP normally supports interface entries for the core network interface and the H/2 radio interface. Characteristics of the H/2 radio interface are mapped on an interface entry of the interface table of MIB-II. This makes the H/2 device look like any network device to the network manager.

Different methods can be used when mapping the H/2 radio interface on the ifTable of MIB-II. The mapping can be done according to RFC 1213 [25] or via an extended ifTable as described in RFC 2233 [26]. If the extended ifTable is used it is possible to define interface entries for supported CLs besides the H/2 interface entry. The order of the interfaces can be defined e.g. indicating that a CL interface is on top of the H/2 interface.

Table 1 proposes a mapping for an AP according to RFC 1213 [25]. Some comments:

- The layer described in ifTable is DLC. Upper layer is CL. The interface to and from the upper layer is DLC-U-SAP, see DLC [3]. Lower layer is PHY [2].

- Packet in RFC 1213 [25] means here a UDCH, UMCH, or UBCH message (see [3]).
- From ifSpeed, ifInOctets, and ifOutOctets it should be possible to calculate the utilization of the H/2 interface. Just counting the data octets does not tell the utilization because of the link adaptation. Example: In a cell, there is a single MT near the AP constantly using a data rate of 5Mbit/s. The MT is moved to the cell border still using a data rate of 5 Mbit/s. The utilization of the H/2 interface of the AP is now perhaps 5 times larger than before. This is the reason why ifInOctets and ifOutOctets in Table 1 are provided as normalized octets. A normalized octet represents a constant portion of the MAC frame, see clause 4.4.

NOTE: ifInOctets and ifOutOctets is not showing the data traffic through the AP. The traffic can be estimated from other attributes e.g. ifInUcastPkts and ifOutUcastPkts (see Table 1).

Table 1: Mapping of a H/2 Interface Entry

Object	Syntax / Access	Description (RFC 1213 [25])	H/2 Implementation
ifDescr	DisplayString read-only	Information about the interface including the name of the manufacturer, the product name and the version of the hardware interface.	According to description.
ifType	INTEGER read-only	The type of interface, distinguished according to the physical/link protocol(s) immediately "below" the network layer in the protocol stack.	"hiperlan2(183)" or "other(1)"
ifMtu	INTEGER read-only	The size of the largest datagram, which can be sent/received on the interface, specified in octets.	Not very relevant but in order not to fool a smart management application set equal to smallest MTU size of supported CLs e.g. 1 518 in case of Ethernet.
ifSpeed	Gauge read-only	An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth.	A fix max bit rate supported by the AP. ifSpeed should be set so it is not exceeded but not too high either so the real speed always is far from ifSpeed. See also clause 4.4.
ifPhysAddress	PhysAddress read-only	The interface's address at the protocol layer immediately "below" the network layer in the protocol stack. For interfaces which do not have such an address (e.g., a serial line), this object should contain an octet string of zero length.	According to description.
ifAdminStatus	INTEGER read-write	The desired state of the interface. The testing state indicates that no operational packets can be passed	According to description.
ifOperStatus	INTEGER read-only	The current operational state of the interface. The testing(3) state indicates that no operational packets can be passed	According to description.
ifLastChange	TimeTicks read-only	The value of sysUpTime (time since start) at the time the interface entered its current operational state.	According to description.
ifInOctets	Counter read-only	The total number of octets received on the interface (i.e. from media), including framing characters.	Provided as "normalized octets" showing how occupied the medium is. See "Definition of Normalized Octet" below.
ifOutOctets	Counter read-only	The total number of octets transmitted out of the interface (i.e. to media), including framing characters.	Provided as "normalized octets" showing how occupied the medium is. See clause 4.4.
ifInUcastPkts	Counter read-only	The number of subnetwork-unicast packets delivered to a higher-layer protocol	Number of DLC-SDUs containing unicast information delivered from DLC to CL over DLC-U-SAP. Multicast as n times unicast is counted as unicast. I.e. the number of received UDCH messages DLC is handing over to CL.
ifOutUcastPkts	Counter read-only	The total number of packets that higher-level protocols requested be transmitted to a subnetwork-unicast address, including those that were discarded or not sent.	Number of DLC-SDUs containing unicast information delivered from CL to DLC over DLC-U-SAP. Multicast as n times unicast is counted as unicast. I.e. the number of UDCH messages DLC is requested to transmit.
ifInNUcastPkts	Counter read-only	The number of non-unicast (i.e., subnetwork-broadcast or subnetwork-multicast) packets delivered to a higher-layer protocol.	0. UMCH or UBCH is only for downlink.
ifOutNUcastPkts	Counter read-only	The total number of packets that higher-level protocols requested be transmitted to a non-unicast (i.e., a subnetwork-	Number of DLC-SDUs containing multicast or broadcast information delivered from CL to DLC over DLC-U-SAP. In case of

Object	Syntax / Access	Description (RFC 1213 [25])	H/2 Implementation
		broadcast or subnetwork-multicast) address, including those that were discarded or not sent.	repetition mode [3] the UBCH message is only counted once. I.e. the number of UMCH and UBCH messages DLC is requested to transmit.
ifInDiscards	Counter read-only	The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.	According to description. Discards in CL are counted too when relevant.
ifOutDiscards	Counter read-only	The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.	According to description. Discards in CL are counted too when relevant.
ifInErrors	Counter read-only	The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.	Number of discarded uplink UDCH messages. Could not be correctly received from the MT in spite of retries (bit errors or any other error but not resource problems).
ifOutErrors	Counter read-only	The number of outbound packets that could not be transmitted because of errors	Number of discarded UDCH, UMCH, and UBCH messages. Could not be correctly transmitted by the AP in spite of retries (bit errors or any other error but not resource problems).
ifInUnknownProtos	Counter read-only	The number of packets received via the interface which were discarded because of an unknown or unsupported protocol	0
ifOutQLen	Gauge read-only	The length of the output packet queue (in packets).	Not supported.
ifSpecific	OBJECT IDENTIFIER read-only	A reference to MIB definitions specific to the particular media being used to realize the interface.	{0 0}. Not useful.

4.4 Definition of Normalized Octet (informative)

A normalized octet is a logical concept intended to represent a constant portion of the MAC frame. Normalized octets are used when implementing support for ifInOctets and ifOutOctets (see Table 1) in the H/2 device. A definition of a normalized octet needs the definition of a normalized bit. The time interval of a normalized bit is constant while the time interval of a data bit is variable depending on the link adaptation. The normalization means that the number of normalized bits per OFDM symbol is calculated so that when the MAC frame is full ifSpeed is reached. A simplified example is shown below:

Example: A vendor has estimated the maximum data rate under best conditions (ifSpeed) to 25 Mbit/s for an AP of a certain type. The time interval of an OFDM symbol is 4 μ s. This corresponds to $0,25 \times 10^6$ OFDM symbols/s. The normalized number of bits per OFDM symbol (n) can now be calculated:

$$n \times 0,25 \times 10^6 = 25 \times 10^6 \Rightarrow n = 100 \text{ normalized bits per OFDM symbol.}$$

One way to implement the support for e.g. ifOutOctets is to count the number of downlink OFDM symbols in each MAC frame, multiply with n/8, and add to ifOutOctets.

4.5 Agent Implementation

The implementation of the H/2 MIB and the H/2 mapping on the interface table of MIB-II are done via "best effort" in a vendor device. Any deviations for an agent implementation shall be documented in an agent capability specification (RFC 2580 [16]).

NOTE: The implementation of the H/2 MIB shall be done so the MIB attributes reflect the real values the attributes represent. An example of a bad implementation is a counter that is not stepped frequently not following the real value it represents. The update of the attributes should be done at least once a second.

5 H/2 SNMP MIB

5.1 The SNMP Network Management Framework

Managed objects are accessed via a virtual information store, called Management Information Base (MIB). Objects in the MIB are defined according to a SMI (Structure of Management Information) definition.

The SNMP Management Framework is defined in a set of RFCs. Framework components are:

- 1) An overall architecture (RFC 2571 [10]).
- 2) The SMI, i.e. mechanisms for describing and naming management objects and events. The first version, SMIV1, is described in STD 16, RFC 1155 [11], STD 16, RFC 1212 [12] and RFC 1215 [13]. The second version, called SMIV2, is described in STD 58, RFC 2578 [14], STD 58, RFC 2579 [15] and STD 58, RFC 2580 [16].
- 3) Message protocols for transferring management information. The first version, SNMPv1, is described in STD 15 [17], RFC 1157 [16]. The second version, SNMPv2c (not an Internet standards track protocol) is described in RFC 1901 [18] and RFC 1906 [19]. The third version, SNMPv3, is described in RFC 1906 [19], RFC 2572 [20] and RFC 2574 [21].
- 4) Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats are described in STD 15 [17], RFC 1157 [16]. A second set of protocol operations and associated PDU formats are described in RFC 1905 [22].
- 5) Fundamental applications (RFC 2573 [23]) and the view-based access control mechanism (RFC 2575 [24]).

The present document specifies a MIB module that is compliant to SMIV2. A MIB conforming to SMIV1 can be produced through appropriate translations. The translated MIB shall be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. This is not considered to change the semantics of the MIB.

5.2 Security Considerations

The H/2 MIB contains some read-only objects and some read-write objects. Unauthorized access to readable objects can be considered to be rather harmless. Unauthorized access to writable objects can be harmful, e.g. disturbing the operations of a H/2 device.

SNMPv1 provides an insecure environment. SNMPv3 adds security features. Implementators should consider using the User-based Security Model RFC 2574 [21] and the View-based Access Control Model RFC 2575 [24] of SNMPv3. The user should configure the system such way, that only authorized users have access to various parts of the MIB.

In case the SNMP framework only provides an insecure environment the implementators should consider to implement at least the H/2 security attributes with "MAX-ACCESS read-only" instead of "read-write", see annex B.

5.3 Overview

5.3.1 AP System

Figure 1 shows an AP connected to an ATM network and to an Ethernet network. The AP contains two H/2 transceivers. Each transceiver is handling the radio traffic within its cell. The transceivers have different characteristics (configuration and behaviour) concerning H/2.

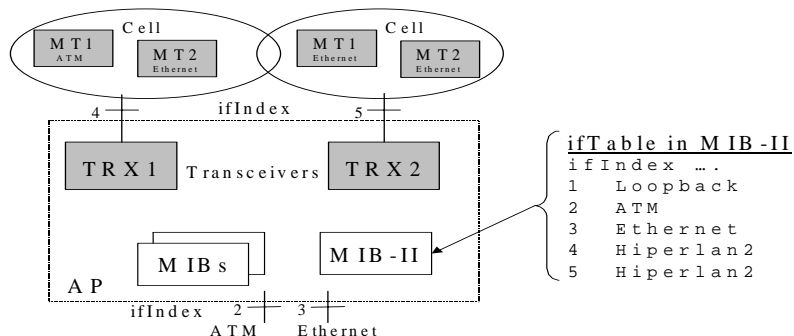


Figure 1: H/2 AP

The AP contains a number of MIBs, the set of these MIBs is vendor specific. It is however assumed that at least parts of MIB-II (the standard Internet MIB) is supported by the AP. The interface table of MIB-II contains one entry for each physical network interface of the AP including the H/2 radio interface(s). The interface table of MIB-II for this AP will look similar to the table shown in figure 1.

5.3.2 Overview of H/2 MIB (informative)

The H/2 MIB defined in the present document is intended to be placed in an AP. In the future the H/2 MIB can be placed in any H/2 device, i.e. any SNMP managed device with at least one H/2 interface. By excluding some groups and objects and by adding other groups and objects, the H/2 MIB can be adapted to any H/2 device type. The rest of this clause assumes that the device is an AP.

H/2 attributes common to the whole AP are located in a **H/2 System** group.

Besides the System group and the convergence layer group, the MIB is indexed to allow for one SNMP agent to support all transceivers in the AP. Index is ifIndex of the interface table of MIB-II.

Addresses: AP ID, NET ID, and NOP ID can be configured (set) via SNMP.

Reset of H/2 Device: it is possible to reset (restart) the whole H/2 device by setting h2SysReset. The AP and the H/2 interfaces handled by the AP are restarted. Restart can be used after a reconfiguration. How the configuration of a device is done is vendor specific but in order to have a consistent set of configuration parameter values following way of working can be used:

- the user sets the parameters one by one using SNMP, but the new parameter values are not yet in use;
- the device is restarted;
- the new parameter values are now used.

Security: encryption and authentication can be setup via SNMP. Default setup is encryption but no authentication.

There are interval values for unicast and common key refresh. The values can be changed if the default values are not acceptable.

The H/2 device supplies a list of supported encryption and authentication algorithms. There is also a list of used encryption and authentication algorithms. This list gives the preferred order of algorithms at association time. The used lists can be modified.

The CL group is a placeholder for the CL MIBs describing the CLs supported by the device.

A table is showing **handovers** from each neighbour cell. The table is built up from information at handover time. The table depicts how the MTs are moving to this cell from the neighbour cells.

Utilization. Number of currently associated MTs give hints on the usage of each H/2 interface. The peak number of associated MTs is kept and can be reset to the current number of associated MTs. The total number of associations is counted.

How the MAC frame is utilized is described by "%downlink usage" and "%uplink usage". These attributes indicate if all radio capacity is used or not.

The **MT table** describes and identifies all associated MTs. The latest RSS0 and RSS1 measurements of the MT are available (see [2]). The measurement values can be useful when troubleshooting.

Notifications (events) are sent (configurable) in case of a H/2 security violation (denied authentication), association failure, not normal disassociation, or failed handover. Information from the latest event of each type is also kept in MIB attributes.

Time attributes i.e. attributes with SYNTAX TimeTicks, see annex B, are given as number of time ticks (0,01s) since system start.

For more information on the MIB contents see annex B.

5.3.3 Relationships to other MIBs

5.3.3.1 Common Definitions

All common H/2 definitions are specified in the module ETSI-H2-REG. This module contains mainly OIDs (Object Identifiers) to be used by the other H/2 modules. The other H/2 modules import used definitions from the definition module.

The H/2 MIBs are located within the HIPERLAN/2 area of the BRAN domain [9].

5.3.3.2 Relationship to the CL MIBs

The CL MIBs are placed in the CL group of the H/2 MIB.

5.3.3.3 Relationship to the "Interfaces" Group

Each H/2 radio interface shall be described by one entry in the interface table of MIB-II. The interface shall be described on DLC level i.e. independent of used CLs. See clause 4.3 for an example of an implementation.

5.3.4 Definitions to Import into a SNMP Manager (informative)

As an example, before managing a set of H/2 devices with an Ethernet interface following definitions should be imported into the SNMP manager:

- 1) ETSI-H2-REG containing common H/2 definitions;
- 2) ETSI-H2-MIB defining the H/2 main MIB;
- 3) ETSI-H2ETHCL-MIB defining the H/2 Ethernet CL MIB;
- 4) Any standard MIBs supported by the device and not yet imported into the SNMP manager;
- 5) Any vendor specific MIBs supported by the H/2 device.

5.4 Definitions

The definitions can be found in annexes A, B, C, and D.

Annex A (normative): ETSI-H2-REG. Common Definitions Module

```

-- *****
-- * ETSI BRAN HIPERLAN Type 2 (H2)
-- * Management Information Base (MIB): COMMON DEFINITIONS
-- *****

-- This module shall be updated when a new convergence layer (CL) is to
-- be defined.

ETSI-H2-REG DEFINITIONS ::= BEGIN

IMPORTS
  MODULE-IDENTITY, OBJECT-IDENTITY FROM SNMPv2-SMI
  TEXTUAL-CONVENTION          FROM SNMPv2-TC;

-- *****
-- * Module Identity
-- *****

etsih2RegModule MODULE-IDENTITY
  LAST-UPDATED "0006280900Z" -- June 28, 2000
  ORGANIZATION "ETSI BRAN Project"
  CONTACT-INFO
    "ETSI BRAN Project
     F-06921 Sophia Antipolis Cedex
     France
     E-Mail: secretariat@etsi.fr"
  DESCRIPTION
    "The registration module for management of HIPERLAN Type 2 (H2)
     devices."
  REVISION "0006280900Z" -- June 28, 2000
  DESCRIPTION
    "Initial version. Prepared for Ethernet CL
     and ATM UNI CL."
  ::= { etsih2Modules 1}

-- *****
-- * Basic Definitions
-- *****

-- Textual conventions

H2ClType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT "d"
  STATUS current
  DESCRIPTION
    "Indicates type of H2 Convergence Layer.
     To be updated when a new CL is added."
  SYNTAX INTEGER {
    atm(0),
    ethernet('20'H)
  }

H2ProfileType ::= TEXTUAL-CONVENTION
  DISPLAY-HINT "d"
  STATUS current
  DESCRIPTION
    "Indicates type of H2 Profile.
     To be updated when a new profile is added."
  SYNTAX INTEGER {
    business(1) - Profile for Business Environments
  }

-- The BRAN domain within ETSI common domain.
-- itu-t(0).identified-organization(4).etsi(0).branDomain(4)
branDomainId OBJECT IDENTIFIER ::= { 0 4 0 4 }

-- The HIPERLAN Type 2 area within the BRAN domain
etsiHiperlan2Id OBJECT IDENTIFIER ::= { branDomainId hiperlan2 (2) }

etsih2Regs OBJECT-IDENTITY

```

```

STATUS    current
DESCRIPTION
  "Sub-tree for registrations."
 ::= { etsiHiperlan2Id 1 }

etsih2Modules OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "Sub-tree for module registrations."
 ::= { etsih2Regs 1 }

etsih2Mib OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "Sub-tree for object and event definitions."
 ::= { etsiHiperlan2Id 2 }

etsih2MibModuleRoot OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "Root of H2 MIB Module."
 ::= { etsih2Modules 2 }

-- *****
-- * Convergence Layer MIBs
-- *****
-- New CL MIBs can be defined by using Ethernet and ATM below as templates.

etsih2ClObjs OBJECT IDENTIFIER ::= { etsih2Mib 2 2 } -- convergence layers

etsih2ClMibs OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "The root of the subtree assigned to the Convergence
  Layer MIBs."
 ::= { etsih2ClObjs 2 }

-- Ethernet CL MIB

etsih2EthClMib OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "The root of the subtree assigned to the Ethernet Convergence
  Layer MIB."
 ::= { etsih2ClMibs 1 }

etsih2EthClMibModuleRoot OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "H2 Ethernet Convergence Layer MIB Module."
 ::= { etsih2Modules 3 }

-- ATM UNI CL MIB

etsih2AtmClMib OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "The root of the subtree assigned to the ATM Convergence
  Layer MIB."
 ::= { etsih2ClMibs 2 }

etsih2AtmClMibModuleRoot OBJECT-IDENTITY
STATUS    current
DESCRIPTION
  "H2 ATM Convergence Layer MIB Module."
 ::= { etsih2Modules 4 }

END

```

Annex B (normative):

ETSI-H2-MIB. HIPERLAN Type 2 MIB Module

```

-- *****
-- * ETSI BRAN HIPERLAN Type 2 (H2)
-- * Management Information Base (MIB)
-- *****

-- This MIB describes a H2 device with one or more transceivers (H2 radio
-- interfaces). For an Access Point (AP) one radio interface corresponds
-- to a cell.

-- The REFERENCE clauses within the OBJECT-TYPE constructs refer to
-- HIPERLAN Type 2 technical specifications (TS):
-- PHY TS: TS 101 475 Physical (PHY) Layer
-- DLC TS: TS 101 761-1 DLC Layer Part 1, Basic Data Transport Function
-- RLC TS: TS 101 761-2 DLC Layer Part 2, RLC Sublayer

ETSI-H2-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE,
    NOTIFICATION-TYPE, TimeTicks,
    Integer32, Counter32, Gauge32    FROM SNMPv2-SMI
    TEXTUAL-CONVENTION, DisplayString FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP,
    NOTIFICATION-GROUP                FROM SNMPv2-CONF
    ifIndex                            FROM RFC1213-MIB
    etsih2Mib, etsih2MibModuleRoot,
    H2ClType, H2ProfileType,
    etsih2ClObjs                       FROM ETSI-H2-REG;

-- *****
-- * Module Identity
-- *****

etsih2MibModule MODULE-IDENTITY
    LAST-UPDATED "0006290900Z" -- June 29, 2000
    ORGANIZATION "ETSI BRAN Project"
    CONTACT-INFO
        "ETSI BRAN Project
        F-06921 Sophia Antipolis Cedex
        France
        E-Mail: secretariat@etsi.fr"
    DESCRIPTION
        "The MIB module for management of
        HIPERLAN Type 2 (H2) devices."
    REVISION "0006290900Z" -- June 29, 2000
    DESCRIPTION
        "Initial version."
    ::= { etsih2MibModuleRoot 1 }

-- *****
-- * Major Structure
-- *****

-- Conformance area, containing groups and compliance specifications
etsih2Confs OBJECT IDENTIFIER ::= { etsih2Mib 1}
etsih2Groups OBJECT IDENTIFIER ::= { etsih2Confs 1}
etsih2Compl OBJECT IDENTIFIER ::= { etsih2Confs 2}

-- Subtree for objects, and for each functional area
etsih2Objs OBJECT IDENTIFIER ::= { etsih2Mib 2}
-- Objects common for the whole H2 device
    etsih2SysObjs OBJECT IDENTIFIER ::= { etsih2Objs 1}
-- etsih2ClObjs OBJECT IDENTIFIER ::= { etsih2Objs 2} -- convergence layers
-- Objects per H2 radio interface i.e. per cell
    etsih2RifObjs OBJECT IDENTIFIER ::= { etsih2Objs 3} -- cell
    etsih2MtObjs OBJECT IDENTIFIER ::= { etsih2Objs 4} -- mobile terminals
    etsih2DlcObjs OBJECT IDENTIFIER ::= { etsih2Objs 5} -- DLC layer
    etsih2PhyObjs OBJECT IDENTIFIER ::= { etsih2Objs 6} -- physical layer

-- Sub-tree for events

```



```

etsih2Events OBJECT IDENTIFIER ::= { etsih2Mib 3}
etsih2EventsV2 OBJECT IDENTIFIER ::= { etsih2Events 1}

-- Textual conventions

EncryptionAlgorithm ::= TEXTUAL-CONVENTION
  DISPLAY-HINT "d"
  STATUS current
  DESCRIPTION
    "Indicates type of H2 encryption algorithm."
  SYNTAX INTEGER {
    noEncryption(1),
    des(2),
    tripleDes(3)
  }

AuthenticationAlgorithm ::= TEXTUAL-CONVENTION
  DISPLAY-HINT "d"
  STATUS current
  DESCRIPTION
    "Indicates type of H2 authentication algorithm."
  SYNTAX INTEGER {
    noAuthentication(1),
    presharedKey(2),
    rsaSignature512(3),
    rsaSignature768(4),
    rsaSignature1024(5)
  }

-- *****
-- * System (H2 Device)
-- *****
-- Objects common for the whole H2 system (H2 device)

h2SysReset OBJECT-TYPE
  SYNTAX INTEGER { on(1), off(2) }
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "Setting this attribute to ON means reset of the H2 system
    including all H2 radio interfaces.
    NOTE: Changing parameters in this MIB (attributes with
    MAX-ACCESS read-write) may not be effective until the system
    is reset i.e.:
    1) Do all parameter settings
    2) Reset the system."
  ::= { etsih2SysObjs 1 }

-- H2 System Addresses

h2SysNetId OBJECT-TYPE
  SYNTAX INTEGER(0..1023)
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "H2 network identifier (NET ID). Shall be the same for all APs
    that belong to the same network of a certain operator for a
    given geographic area. APs with the same NET ID shall support the
    same convergence layers.
    Values of NET ID:
    0: Reserved for future use.
    1-959: For common use. Before selecting a NET ID in this range,
    it should be assured that the chosen NET ID is unique in the
    coverage area of a network.
    960-1023: Reserved for public systems."
  REFERENCE
    "DLC and RLC TS: NET ID"
  ::= { etsih2SysObjs 2 }

h2SysGlobalNopId OBJECT-TYPE
  SYNTAX DisplayString (SIZE(0..31))
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "Globally unique part of H2 network operator identifier
    (NOP ID). NOP ID contains a global and a local part.
    NOP ID can be either a valid NOP ID or not used. Before

```

association an MT compares the NOP ID sent by the AP with a list of NOP IDs stored in the MT. The MT should associate to a group within its list.
Default value is a zero length string meaning that the global NOP ID is not used."

REFERENCE

"RLC TS: NETW-OP-ID-GLOBAL"

::= { etsih2SysObjs 3 }

h2SysLocalNopId OBJECT-TYPE

SYNTAX DisplayString (SIZE(0..31))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Local part of H2 network operator identifier (NOP ID). NOP ID contains a global and a local part. NOP ID can be either a valid NOP ID or not used. Before association an MT compares the NOP ID sent by the AP with a list of NOP IDs stored in the MT. The MT should associate to a group within its list.
Default value is a zero length string meaning that the local NOP ID is not used."

REFERENCE

"RLC TS: NETW-OP-ID-LOCAL"

::= { etsih2SysObjs 4 }

h2SysNopUserGroup OBJECT-TYPE

SYNTAX INTEGER {
openUserGroup(0),
closedUserGroup(1)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates if the NOP ID (network operator identifier) defines a closed user group or not. Before association an MT compares the NOP ID sent by the AP with a list of NOP IDs stored in the MT. If it is an open group the MT may continue the association even if the NOP ID of the AP is missing in the MT list. If a closed group and the NOP ID is missing in the MT list, the MT may not continue the association.
Default value is 0 (open user group)."

REFERENCE

"RLC TS: C-U-G"

::= { etsih2SysObjs 5 }

-- H2 System Security: Key refresh

h2SysUnicastDesKeyRefresh OBJECT-TYPE

SYNTAX INTEGER(0..2880) -- Up to 48 hours

UNITS "Minutes"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Refresh interval (in minutes) for unicast DES encryption keys. 0 means no refresh.
Default value is 60 minutes."

REFERENCE

"RLC TS: RLC-UNICAST-KEY-REFRESH"

::= { etsih2SysObjs 6 }

h2SysCommonDesKeyRefresh OBJECT-TYPE

SYNTAX INTEGER(0..2880) -- Up to 48 hours

UNITS "Minutes"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Refresh interval (in minutes) for multicast and broadcast DES encryption keys. 0 means no refresh.
Default value is 60 minutes."

REFERENCE

"RLC TS: RLC-COMMON-KEY-REFRESH"

::= { etsih2SysObjs 7 }

h2SysUnicast3DesKeyRefresh OBJECT-TYPE

SYNTAX INTEGER(0..2880) -- Up to 48 hours

UNITS "Minutes"

```

MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "Refresh interval (in minutes) for unicast Triple DES
    encryption keys. 0 means no refresh.
    Default value is 0 (no refresh)."
```

REFERENCE

```

    "RLC TS: RLC-UNICAST-KEY-REFRESH"
 ::= { etsih2SysObjs 8 }
```

h2SysCommon3DesKeyRefresh OBJECT-TYPE

```

SYNTAX INTEGER(0..2880) -- Up to 48 hours
UNITS "Minutes"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "Refresh interval (in minutes) for multicast and broadcast
    Triple DES encryption keys. 0 means no refresh.
    Default value is 0 (no refresh)."
```

REFERENCE

```

    "RLC TS: RLC-COMMON-KEY-REFRESH"
 ::= { etsih2SysObjs 9 }
```

h2SysDhAge OBJECT-TYPE

```

SYNTAX INTEGER(0..48)
UNITS "Hours"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "Lifetime of Diffie-Hellman secret. Is also the maximum
    time of a security association. 0 means unlimited lifetime.
    Default value is 0 (unlimited lifetime)."
```

REFERENCE

```

    "RLC TS: Diffie-Hellman secret"
 ::= { etsih2SysObjs 10 }
```

-- H2 System Security: Supported encryption algorithms

h2SysSuppEncr OBJECT-TYPE

```

SYNTAX INTEGER {
    des(1),
    tripledesDes(2)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Supported encryption algorithms."
```

```

 ::= { etsih2SysObjs 11 }
```

-- H2 System Security: Used encryption algorithms

h2SysUsedEncrUni OBJECT-TYPE

```

SYNTAX INTEGER {
    tripledesDes(1),
    des(2),
    tripledes(3),
    tripledesDesNone(4),
    tripledesNone(5),
    desNone(6),
    none(7)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "Order of preferred encryption algorithms for unicast
    traffic. The first algorithm has the highest preference.
    Default value is tripledesDes (first TripleDES, second
    DES) if the device supports TripleDES, or otherwise DES
    only."
```

REFERENCE

```

    "RLC TS: RLC-LINK-CAPABILITY encryption proposals"
 ::= { etsih2SysObjs 12 }
```

h2SysUsedEncrMulti OBJECT-TYPE

```

SYNTAX INTEGER {
    tripledesDes(1),
    des(2),
    tripledes(3),
```

```

    tripledDesNone(4),
    tripledDesNone(5),
    desNone(6),
    none(7)
  }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
  "Order of preferred encryption algorithms for multicast
  traffic. The first algorithm has the highest preference.
  Default value is tripledDes (first TripleDES, second
  DES) if the device supports TripleDES, or otherwise DES
  only."
REFERENCE
  "RLC TS: RLC-GROUP-JOIN encryption proposals"
 ::= { etsih2SysObjs 13 }

```

```

h2SysUsedEncrBroad OBJECT-TYPE
  SYNTAX INTEGER {
    tripledDes(1),
    des(2),
    tripledDes(3),
    tripledDesNone(4),
    tripledDesNone(5),
    desNone(6),
    none(7)
  }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
  "Order of preferred encryption algorithm for broadcast
  traffic. The first algorithm has the highest preference.
  Default value is tripledDes (first TripleDES, second
  DES) if the device supports TripleDES, or otherwise DES
  only."
REFERENCE
  "RLC TS: RLC-BROADCAST-JOIN encryption proposals"
 ::= { etsih2SysObjs 14 }

```

-- H2 System Security: Supported authentication algorithms

```

h2SysSuppAuth OBJECT-TYPE
  SYNTAX INTEGER {
    sk(1), -- preshared key
    skRSA512(2),
    skRSA512RSA768(3),
    skRSA512RSA768RSA1024(4),
    skRSA768(5),
    skRSA768RSA1024(6),
    skRSA1024(7),
    skRSA512RSA1024(8)
  }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Supported authentication algorithms."
 ::= { etsih2SysObjs 15 }

```

-- H2 System Security: Used authentication algorithms

```

h2SysUsedAuth1 OBJECT-TYPE
  SYNTAX INTEGER {
    rsa1024(1),
    rsa768(2),
    rsa512(3),
    sk(4), -- preshared key
    noauthentication(5),
    endoflist(6)
  }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
  "The first preferred authentication algorithm of the
  supported algorithms. The preference is indicated
  by a list of max five algorithms. The first algorithm
  has the highest preference. Not used entries have the
  value endoflist."

```

Default setup (no authentication) is:

```
1 noauthentication
2 endoflist
3 endoflist
4 endoflist
5 endoflist
```

If authentication, a setup is defined from a subset or all of the supported authentication algorithms with the strongest algorithm first. Example:

```
1 RSA1024 (the first preferred)
2 RSA768 (the second preferred)
3 RSA512 (...)
4 sk (preshared key)
5 endoflist."
```

REFERENCE

"RLC TS: RLC-LINK-CAPABILITY authentication proposals"

::= { etsih2SysObjs 16 }

h2SysUsedAuth2 OBJECT-TYPE

```
SYNTAX INTEGER {
    rsa1024(1),
    rsa768(2),
    rsa512(3),
    sk(4), -- preshared key
    noauthentication(5),
    endoflist(6)
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The second preferred authentication algorithm of the supported algorithms. The preference is indicated by a list of max five algorithms. The first algorithm has the highest preference. Not used entries have the value endoflist.

Default setup (no authentication) is:

```
1 noauthentication
2 endoflist
3 endoflist
4 endoflist
5 endoflist
```

If authentication, a setup is defined from a subset or all of the supported authentication algorithms with the strongest algorithm first. Example:

```
1 RSA1024 (the first preferred)
2 RSA768 (the second preferred)
3 RSA512 (...)
4 sk (preshared key)
5 endoflist."
```

REFERENCE

"RLC TS: RLC-LINK-CAPABILITY authentication proposals"

::= { etsih2SysObjs 17 }

h2SysUsedAuth3 OBJECT-TYPE

```
SYNTAX INTEGER {
    rsa1024(1),
    rsa768(2),
    rsa512(3),
    sk(4), -- preshared key
    noauthentication(5),
    endoflist(6)
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The third preferred authentication algorithm of the supported algorithms. The preference is indicated by a list of max five algorithms. The first algorithm has the highest preference. Not used entries have the value endoflist.

Default setup (no authentication) is:

```
1 noauthentication
2 endoflist
3 endoflist
```

```
4 endoflist
5 endoflist
```

If authentication, a setup is defined from a subset or all of the supported authentication algorithms with the strongest algorithm first. Example:

```
1 RSA1024 (the first preferred)
2 RSA768 (the second preferred)
3 RSA512 (...)
4 sk (preshared key)
5 endoflist."
```

REFERENCE

```
"RLC TS: RLC-LINK-CAPABILITY authentication proposals"
::= { etsih2SysObjs 18 }
```

h2SysUsedAuth4 OBJECT-TYPE

```
SYNTAX INTEGER {
    rsa1024(1),
    rsa768(2),
    rsa512(3),
    sk(4), -- preshared key
    noauthentication(5),
    endoflist(6)
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The fourth preferred authentication algorithm of the supported algorithms. The preference is indicated by a list of max five algorithms. The first algorithm has the highest preference. Not used entries have the value endoflist.

Default setup (no authentication) is:

```
1 noauthentication
2 endoflist
3 endoflist
4 endoflist
5 endoflist
```

If authentication, a setup is defined from a subset or all of the supported authentication algorithms with the strongest algorithm first. Example:

```
1 RSA1024 (the first preferred)
2 RSA768 (the second preferred)
3 RSA512 (...)
4 sk (preshared key)
5 endoflist."
```

REFERENCE

```
"RLC TS: RLC-LINK-CAPABILITY authentication proposals"
::= { etsih2SysObjs 19 }
```

h2SysUsedAuth5 OBJECT-TYPE

```
SYNTAX INTEGER {
    rsa1024(1),
    rsa768(2),
    rsa512(3),
    sk(4), -- preshared key
    noauthentication(5),
    endoflist(6)
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The fifth preferred authentication algorithm of the supported algorithms. The preference is indicated by a list of max five algorithms. The first algorithm has the highest preference. Not used entries have the value endoflist.

Default setup (no authentication) is:

```
1 noauthentication
2 endoflist
3 endoflist
4 endoflist
5 endoflist
```

If authentication, a setup is defined from a subset or all

```

of the supported authentication algorithms with the strongest
algorithm first. Example:
  1 RSA1024 (the first preferred)
  2 RSA768 (the second preferred)
  3 RSA512 (...)
  4 sk (preshared key)
  5 endoflist."
REFERENCE
  "RLC TS: RLC-LINK-CAPABILITY authentication proposals"
::= { etsih2SysObjs 20 }

-- H2 profile table describing supported profiles.

h2SysProfileTable OBJECT-TYPE
  SYNTAX SEQUENCE OF H2SysProfileEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "Table of supported H2 profiles."
  ::= { etsih2SysObjs 21 }

h2SysProfileEntry OBJECT-TYPE
  SYNTAX H2SysProfileEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "An entry in the profile table."
  INDEX {h2SysProfileIndex}
  ::= { h2SysProfileTable 1 }

H2SysProfileEntry ::= SEQUENCE {
  h2SysProfileIndex Integer32,
  h2SysProfileId H2ProfileType,
  h2SysProfileVersion INTEGER
}

h2SysProfileIndex OBJECT-TYPE
  SYNTAX Integer32
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "Auxiliary variable used to identify instances
    of the columnar objects in the profile table."
  ::= { h2SysProfileEntry 1 }

h2SysProfileId OBJECT-TYPE
  SYNTAX H2ProfileType
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    "Type of H2 profile."
  REFERENCE
    "RLC TS: PROFILE-ID"
  ::= { h2SysProfileEntry 2 }

h2SysProfileVersion OBJECT-TYPE
  SYNTAX INTEGER (0..31)
  MAX-ACCESS read-only
  STATUS current
  DESCRIPTION
    "Version of H2 profile."
  REFERENCE
    "RLC TS: PROFILE-VERSION"
  ::= { h2SysProfileEntry 3 }

-- *****
-- * Convergence Layer
-- *****

-- Convergence Layer (CL) table describing supported CLs.

h2ClTable OBJECT-TYPE
  SYNTAX SEQUENCE OF H2ClEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "Table of supported CLs."
  ::= { etsih2ClObjs 1 }

```

```

h2ClEntry OBJECT-TYPE
    SYNTAX H2ClEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the CL table."
    INDEX {h2ClIndex}
    ::= { h2ClTable 1 }

H2ClEntry ::= SEQUENCE {
    h2ClIndex    Integer32,
    h2ClId      H2ClType
}

h2ClIndex OBJECT-TYPE
    SYNTAX Integer32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Auxiliary variable used to identify instances
        of the columnar objects in the CL table."
    ::= { h2ClEntry 1 }

h2ClId OBJECT-TYPE
    SYNTAX H2ClType
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Type of convergence layer."
    REFERENCE
        "RLC TS: CL-ID"
    ::= { h2ClEntry 2 }

-- *****
-- * Sub-tree for CL Specific MIBs
-- *****
-- Note: This is a placeholder (defined in ETSI-H2-REG) for
--       the supported CL MIBs defined in separate modules.

-- etsih2ClMibs OBJECT IDENTIFIER ::= { etsih2ClObjs 2 }

-- *****
-- * H2 Radio Interface (Cell)
-- *****
-- The radio interface (and the rest of this MIB) is indexed with ifIndex
-- of MIB-II. This allows one SNMP agent to support all transceivers in a
-- device.

h2RifNumber OBJECT-TYPE
    SYNTAX Integer32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of transceivers (H2 radio interfaces) of this H2
        device."
    ::= { etsih2RifObjs 1 }

h2RifTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2RifEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "H2 radio interface table."
    ::= { etsih2RifObjs 2 }

h2RifEntry OBJECT-TYPE
    SYNTAX H2RifEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the H2 radio interface table."
    INDEX {ifIndex}
    ::= { h2RifTable 1 }

H2RifEntry ::= SEQUENCE {
    h2RifUserInfo    DisplayString,
    h2RifApId        INTEGER,

```



```

    h2RifMcastType    INTEGER,
    h2RifMtAlivePeriod Integer32,
    h2RifMtAliveLimit INTEGER
  }

h2RifUserInfo OBJECT-TYPE
  SYNTAX DisplayString (SIZE(0..128))
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "Printable string to be used by the user to describe the
     transceiver (H2 radio interface). Contains information like
     location. Maximum string length is 128 octets."
  ::= { h2RifEntry 1 }

h2RifApId OBJECT-TYPE
  SYNTAX INTEGER(0..1023) -- 10 bits
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "Each AP is assigned an access point identifier (AP ID).
     The AP IDs within a H2 network shall be unique."
  REFERENCE
    "DLC TS: AP ID"
  ::= { h2RifEntry 2 }

h2RifMcastType OBJECT-TYPE
  SYNTAX INTEGER {
    unicast(1),
    multicast(2)
  }
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "Method used to handle multicast information to MTs.
     Either sent as unicast to each MT of the multicast group
     or as multicast only once. N times unicast is safer but is
     more costly in case of many group members.
     Default value is n times unicast."
  REFERENCE
    "RLC TS: Multicast"
  ::= { h2RifEntry 3 }

-- Association control

h2RifMtAlivePeriod OBJECT-TYPE
  SYNTAX Integer32
  UNITS "2ms"
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "Period in number of MAC frames (2ms) for the MT alive
     function. This function is used for checking that an MT and
     AP can communicate with each other and are still connected.
     Default value is 5000 (10 seconds)."
  REFERENCE
    "RLC TS: mt-alive-interval"
  ::= { h2RifEntry 4 }

h2RifMtAliveLimit OBJECT-TYPE
  SYNTAX INTEGER (1..4)
  MAX-ACCESS read-write
  STATUS current
  DESCRIPTION
    "The number of failed MT alive procedures (retransmissions
     included) before disassociation takes place. The number can be
     from one to four failures. Should be increased in an
     environment where there is a great risk of loosing MT alive
     messages.
     Default value is 2. If the MT alive period is 10 seconds this
     means 2*10 = 20 seconds before disassociation."
  REFERENCE
    "RLC TS: RLC_MT_ALIVE_REQUEST"
  ::= { h2RifEntry 5 }

-- The neighbour cell table describes handovers (HOs) from the
-- neighbour cells. The neighbour cell table is built up from the
-- knowledge of handovers to current cell.

```

```

h2RifNeighbTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2RifNeighbEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Neighbour cell table."
    ::= { etsih2RifObjs 3 }

h2RifNeighbEntry OBJECT-TYPE
    SYNTAX H2RifNeighbEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the neighbour cell table."
    INDEX {ifIndex, h2RifNeighbIndex}
    ::= { h2RifNeighbTable 1 }

H2RifNeighbEntry ::= SEQUENCE {
    h2RifNeighbIndex      Integer32,
    h2RifNeighbApId      INTEGER,
    h2RifHoFromNeighbCounter Counter32
}

h2RifNeighbIndex OBJECT-TYPE
    SYNTAX Integer32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Auxiliary variable used to identify instances
        of the columnar objects in the neighbour cell table."
    ::= { h2RifNeighbEntry 1 }

h2RifNeighbApId OBJECT-TYPE
    SYNTAX INTEGER(0..1023) -- 10 bits
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The AP ID of neighbour cell."
    ::= { h2RifNeighbEntry 2 }

h2RifHoFromNeighbCounter OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Number of successful handovers from the neighbour cell
        to current cell. Both radio and network handovers are
        counted."
    REFERENCE
        "RLC TS: RLC-HANDOVER-REQUEST"
    ::= { h2RifNeighbEntry 3 }

-- Association table

h2RifAssocTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2RifAssocEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Association table."
    ::= { etsih2RifObjs 4 }

h2RifAssocEntry OBJECT-TYPE
    SYNTAX H2RifAssocEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the association table."
    INDEX {ifIndex }
    ::= { h2RifAssocTable 1 }

H2RifAssocEntry ::= SEQUENCE {
    h2RifMtNumber      Integer32,
    h2RifAssocCounter Counter32,
    h2RifFailedAssocCounter Counter32,
    h2RifAuthCounter   Counter32,
    h2RifAuthViolCounter Counter32,

```

```

h2RifMtMaxNumber    Gauge32,
h2RifAssocFailTime  TimeTicks,
h2RifAssocFailMacId INTEGER,
h2RifAssocFailAuthId OCTET STRING,
h2RifAssocFailCause INTEGER,
h2RifAbDisassocTime TimeTicks,
h2RifAbDisassocAddr DisplayString,
h2RifAbDisassocCause INTEGER,
h2RifHoFailTime     TimeTicks,
h2RifHoFailAddr     DisplayString,
h2RifHoFailCause    INTEGER
}

```

```

h2RifMtNumber OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Current number of associated MTs in this cell."
 ::= { h2RifAssocEntry 1 }

```

```

h2RifAssocCounter OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of association requests (successful and failed)
    in this cell."
 ::= { h2RifAssocEntry 2 }

```

```

h2RifFailedAssocCounter OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of failed associations in this cell.
    The reason for a failure can for example be:
    - no resources in AP
    - authentication denied."
 ::= { h2RifAssocEntry 3 }

```

```

h2RifAuthCounter OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of authentication attempts (successful and
    failed) in this cell."
 ::= { h2RifAssocEntry 4 }

```

```

h2RifAuthViolCounter OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of authentication violations in this cell."
 ::= { h2RifAssocEntry 5 }

```

```

h2RifMtMaxNumber OBJECT-TYPE
SYNTAX Gauge32
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "Peak number of associated MTs in this cell.
    Set to zero (or any other value) means that the peak
    number is reset to current number of associated MTs
    and will be updated from this time."
 ::= { h2RifAssocEntry 6 }

```

```
-- Info from latest failed association attempt
```

```

h2RifAssocFailTime OBJECT-TYPE
SYNTAX TimeTicks
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Time for the latest failed association attempt by an MT.
    The time is counted as number of 0,01 seconds after system

```

```

    start. Zero if no failure."
 ::= { h2RifAssocEntry 7 }

h2RifAssocFailMacId OBJECT-TYPE
SYNTAX INTEGER (0..223)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The H2 MAC identifier of the MT for the latest failed
    association attempt. 0 if no failure, or if there is
    no identifier."
REFERENCE
    "DLC TS: MT MAC ID"
 ::= { h2RifAssocEntry 8 }

h2RifAssocFailAuthId OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(0..92))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The MT authentication identifier for the latest failed
    association attempt. A zero length string if no failure,
    if authentication is not used, or if the identifier is
    not yet known."
REFERENCE
    "RLC TS: MT-AUTH-CONTENT"
 ::= { h2RifAssocEntry 9 }

h2RifAssocFailCause OBJECT-TYPE
SYNTAX INTEGER {
    noFail(0),          -- No association failure
    other(1),          -- Unknown or other cause
    noResources(2),    -- No MAC ID assigned. No resources.
    authentication(3), -- Authentication failure
    mismatchedResources(4) -- AP and MT capabilities do not match
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Cause of the latest failed association attempt.
    Zero if no failure."
 ::= { h2RifAssocEntry 10 }

-- Info from latest abnormal disassociation

h2RifAbDisassocTime OBJECT-TYPE
SYNTAX TimeTicks
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Time for the latest abnormal disassociation i.e. not
    requested by the MT user. The time is counted as number of
    0,01 seconds after system start. Zero if no failure."
 ::= { h2RifAssocEntry 11 }

h2RifAbDisassocAddr OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..128))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "MT address for the latest abnormal disassociation i.e. not
    requested by the MT user. The type of the address depends
    on the convergence layer. A zero length string if no
    failure."
 ::= { h2RifAssocEntry 12 }

h2RifAbDisassocCause OBJECT-TYPE
SYNTAX INTEGER {
    noFail(0),          -- No abnormal disassociation
    other(1),          -- Unknown or other cause
    mtAlive(2),        -- MT alive procedure
    authentication(3), -- Authentication failure
    mismatchedResources(4), -- AP and MT capabilities do not match
    operator(5),       -- Disassociation by network operator
    lowQoS(6),         -- Low QoS
    trafficOverload(7), -- Traffic overload
    mtPowerdown(8),    -- MT powerdown
    apPowerdown(9)     -- AP powerdown
}

```

```

    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Cause of the latest abnormal disassociation i.e. not
    requested by the MT user. Zero if no abnormal
    disassociation."
 ::= { h2RifAssocEntry 13 }

-- Info from latest failed handover

h2RifHoFailTime OBJECT-TYPE
SYNTAX TimeTicks
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Time for the latest failed handover to this AP.
    The time is counted as number of 0,01 seconds after
    system start. Zero if no failure."
 ::= { h2RifAssocEntry 14 }

h2RifHoFailAddr OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..128))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "MT address for the latest failed handover to this AP.
    The type of the address depends on the convergence layer.
    A zero length string if no failure."
 ::= { h2RifAssocEntry 15 }

h2RifHoFailCause OBJECT-TYPE
SYNTAX INTEGER {
    noFail(0),          -- No handover failure
    other(1),          -- Unknown or other cause
    noResources(2),    -- No MAC ID assigned. No resources.
    authentication(3), -- Authentication failure
    mismatchedResources(4) -- AP and MT capabilities do not match
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Cause of the latest failed handover to this AP.
    Zero if no failure."
 ::= { h2RifAssocEntry 16 }

-- Enable or disable sending of notifications

h2NotifTable OBJECT-TYPE
SYNTAX SEQUENCE OF H2NotifEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "Enable notification table."
 ::= { etsih2RifObjs 5 }

h2NotifEntry OBJECT-TYPE
SYNTAX H2NotifEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "An entry in the enable notification table."
INDEX {ifIndex}
 ::= { h2NotifTable 1 }

H2NotifEntry ::= SEQUENCE {
    h2RifAssocFailNotifOn INTEGER,
    h2RifAbDisassocNotifOn INTEGER,
    h2RifHoFailNotifOn INTEGER
}

h2RifAssocFailNotifOn OBJECT-TYPE
SYNTAX INTEGER {
    true(1),
    false(2)
}
MAX-ACCESS read-write
STATUS current

```

```

DESCRIPTION
  "If true sending of the association failure
  notification is enabled for this cell.
  Default value is false."
 ::= { h2NotifEntry 1 }

h2RifAbDisassocNotifOn OBJECT-TYPE
SYNTAX INTEGER {
  true(1),
  false(2)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
  "If true sending of the abnormal disassociation (i.e. not
  requested by the MT user) notification is enabled for this
  cell.
  Default value is false."
 ::= { h2NotifEntry 2 }

h2RifHoFailNotifOn OBJECT-TYPE
SYNTAX INTEGER {
  true(1),
  false(2)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
  "If true sending of the handover failure notification is
  enabled for this cell.
  Default value is false."
 ::= { h2NotifEntry 3 }

-- *****
-- * Mobile Terminals (MTs)
-- *****

-- MT table describing the associated MTs.

h2MtTable OBJECT-TYPE
  SYNTAX SEQUENCE OF H2MtEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "Table of associated Mobile Terminals (MTs)."
```

```

 ::= { etsih2MtObjs 1 }

h2MtEntry OBJECT-TYPE
  SYNTAX H2MtEntry
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "An entry in the MT table."
  INDEX {ifIndex, h2MtIndex}
 ::= { h2MtTable 1 }

H2MtEntry ::= SEQUENCE {
  h2MtIndex      Integer32,
  h2MtMacId     INTEGER,
  h2MtTime      TimeTicks,
  h2MtEncrAlg   EncryptionAlgorithm,
  h2MtAuthAlg   AuthenticationAlgorithm,
  h2MtProfileId1 H2ProfileType,
  h2MtAddr1     DisplayString,
  h2MtRss0      INTEGER
}

h2MtIndex OBJECT-TYPE
  SYNTAX Integer32
  MAX-ACCESS not-accessible
  STATUS current
  DESCRIPTION
    "Auxiliary variable used to identify instances
    of the columnar objects in the MT table."
 ::= { h2MtEntry 1 }

h2MtMacId OBJECT-TYPE
  SYNTAX INTEGER (1..223)
```

```

MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Assigned H2 MAC ID to the associated terminal."
REFERENCE
  "RLC TS: RLC_MAC_ID_ASSIGN_ACK
   RLC_RADIO_HANOVER_COMPLETE
   RLC_NETWORK_HANOVER_COMPLETE"
 ::= { h2MtEntry 2 }

h2MtTime OBJECT-TYPE
SYNTAX TimeTicks
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Time for association or handover. The time is counted
   as number of 0,01 seconds after system start. "
 ::= { h2MtEntry 3 }

h2MtEncrAlg OBJECT-TYPE
SYNTAX EncryptionAlgorithm
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Used encryption algorithm."
 ::= { h2MtEntry 4 }

h2MtAuthAlg OBJECT-TYPE
SYNTAX AuthenticationAlgorithm
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Used authentication algorithm."
 ::= { h2MtEntry 5 }

h2MtProfileId1 OBJECT-TYPE
SYNTAX H2ProfileType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Used H2 profile type."
 ::= { h2MtEntry 6 }

h2MtAddr1 OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..128))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "MT address. The type of the address depends on the
   convergence layer."
 ::= { h2MtEntry 7 }

h2MtRss0 OBJECT-TYPE
SYNTAX INTEGER(-1..63)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Latest measurement by the MT of received signal strength
   on current frequency. The value is indicated by a signal
   level number. 0 indicates low (RSS0=-91 dBm) and 62 indicates
   high (RSS0 > -20 dBm) received signal strength.
   -1 means that no measurement is available."
REFERENCE
  "RLC TS: RLC-DFS-REPORT-SHORT etc, LAST-OWN-BCH-RX-LEVEL
   PHY TS: SLN0"
 ::= { h2MtEntry 8 }

-- Table of interference statistics for current frequency. Measured and
-- calculated by the MT.

h2MtRss1Table OBJECT-TYPE
SYNTAX SEQUENCE OF H2MtRss1Entry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
  "Interference statistics table for an MT."
 ::= { etsih2MtObjs 2 }

```

```

h2MtRsslEntry OBJECT-TYPE
    SYNTAX H2MtRsslEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the interference statistics table for an MT."
    INDEX {ifIndex, h2MtIndex, h2MtRsslIndex}
    ::= { h2MtRsslTable 1 }

H2MtRsslEntry ::= SEQUENCE {
    h2MtRsslIndex    INTEGER,
    h2MtRsslType    INTEGER,
    h2MtRsslPercentile INTEGER
}

h2MtRsslIndex OBJECT-TYPE
    SYNTAX INTEGER(1..5)
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Auxiliary variable used to identify instances
        of the columnar objects in the interference
        statistics table for an MT."
    ::= { h2MtRsslEntry 1 }

h2MtRsslType OBJECT-TYPE
    SYNTAX INTEGER {
        rssMin(1),
        rss5percent(2),
        rss10percent(3),
        rss20percent(4),
        rss30percent(5),
        rss40percent(6),
        rss50percent(7),
        rss60percent(8),
        rss70percent(9),
        rss80percent(10),
        rss90percent(11),
        rss95percent(12),
        rssMax(16)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Indicates type of percentile value.
        Minimum is the lowest measured interference.
        Maximum is the highest measured interference."
    REFERENCE
        "RLC TS: RLC-DFS-PERCENTILES etc, RSS-INDEX-LIST"
    ::= { h2MtRsslEntry 2 }

h2MtRsslPercentile OBJECT-TYPE
    SYNTAX INTEGER(-31..0)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Interference percentile value for current frequency
        from the latest measurement report from the MT. 0 means high
        interference and -31 means low interference.
        Example:
        If type of value is rss5percent and the percentile value is
        -20 this means that 5 per cent of the measurement samples during
        the last measurement period indicated lower interference than
        indicated by -20."
    REFERENCE
        "RLC TS: RLC-DFS-PERCENTILES etc, RSS-STATISTICS-LIST
        PHY TS: RSS1"
    ::= { h2MtRsslEntry 3 }

-- *****
-- * Data Link Control Layer (DLC)
-- *****

h2DlcTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2DlcEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION

```



```

        "DLC table."
 ::= { etsih2DlcObjs 1 }

h2DlcEntry OBJECT-TYPE
    SYNTAX H2DlcEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the DLC table."
    INDEX {ifIndex}
 ::= { h2DlcTable 1 }

H2DlcEntry ::= SEQUENCE {
    h2DlcDlMacUsage INTEGER,
    h2DlcUlMacUsage INTEGER
}

h2DlcDlMacUsage OBJECT-TYPE
    SYNTAX INTEGER(0..100)
    UNITS "Percentage"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Percentage of MAC frame used for downlink.
        %downlink + %uplink + %free = 100%.
        Average value over at least one second. The average value is
        a block average value.
        Note: In the rare case that the uplink traffic is much bigger
        than the downlink traffic the value may be misleading. The
        reason is that part of the MAC frame can not be used because of
        'MT processing delay'."
 ::= { h2DlcEntry 1 }

h2DlcUlMacUsage OBJECT-TYPE
    SYNTAX INTEGER(0..100)
    UNITS "Percentage"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Percentage of MAC frame used for uplink.
        %downlink + %uplink + %free = 100%.
        Average value over at least one second. The average value is
        a block average value.
        Note: In the rare case that the uplink traffic is much bigger
        than the downlink traffic the value may be misleading. The
        reason is that part of the MAC frame can not be used because of
        'MT processing delay'."
 ::= { h2DlcEntry 2 }

-- *****
-- * Physical Layer (PHY)
-- *****

-- Table of allowed frequencies

h2PhyFriTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2PhyFriEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Table of allowed frequencies."
 ::= { etsih2PhyObjs 1 }

h2PhyFriEntry OBJECT-TYPE
    SYNTAX H2PhyFriEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the table of allowed frequencies."
    INDEX {ifIndex, h2PhyAllowedFri}
 ::= { h2PhyFriTable 1 }

H2PhyFriEntry ::= SEQUENCE {
    h2PhyAllowedFri INTEGER,
    h2PhyFriMaxPower Integer32
}

h2PhyAllowedFri OBJECT-TYPE

```

```

SYNTAX INTEGER(0..200)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Carrier index for frequency. The frequency (MHz) can
    be calculated as 5*carrier_index+5000"
REFERENCE
    "PHY TS: RF Carriers, Carrier index"
 ::= { h2PhyFriEntry 1 }

h2PhyFriMaxPower OBJECT-TYPE
SYNTAX Integer32
UNITS "dBm"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Maximum transmitted power (in dBm) for frequency."
REFERENCE
    "PHY TS: RF Carriers, Mean EIRP"
 ::= { h2PhyFriEntry 2 }

-- PHY table

h2PhyTable OBJECT-TYPE
SYNTAX SEQUENCE OF H2PhyEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "PHY table."
 ::= { etsih2PhyObjs 2 }

h2PhyEntry OBJECT-TYPE
SYNTAX H2PhyEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "An entry in the PHY table."
INDEX {ifIndex}
 ::= { h2PhyTable 1 }

H2PhyEntry ::= SEQUENCE {
    h2PhyTopBitRate    INTEGER,
    h2PhyRxUlLevel    INTEGER,
    h2PhyFri           INTEGER,
    h2PhyTxLevel       INTEGER,
    h2PhyDfsCounter    Counter32,
    h2PhyDfsTime       TimeTicks
}

h2PhyTopBitRate OBJECT-TYPE
SYNTAX INTEGER {
    speed36Mbit(36),
    speed54Mbit(54)
}
UNITS "Mbit/s"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Top bit rate (Mbit/s) supported."
 ::= { h2PhyEntry 1 }

h2PhyRxUlLevel OBJECT-TYPE
SYNTAX INTEGER(0..7)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Power level expected for uplink signals.
    The value is indicated by a power level number
    where 0 (-71dBm) is low and 7 (-43dBm) is high."
REFERENCE
    "PHY TS: AP_Rx_UL_Level"
 ::= { h2PhyEntry 2 }

h2PhyFri OBJECT-TYPE
SYNTAX INTEGER(0..200) -- 5GHz
MAX-ACCESS read-only
STATUS current
DESCRIPTION

```

```

"Current frequency. The frequency is indicated by
carrier index. The frequency (MHz) can be
calculated as 5*carrier_index+5000"
 ::= { h2PhyEntry 3 }

```

h2PhyTxLevel OBJECT-TYPE

```

SYNTAX INTEGER(0..15)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Current transmit power. The value is indicated by
the coding for the power level where 0 (-15dBm) is
low and 15 (30dBm) is high."
REFERENCE
"PHY TS: Coding for AP_Tx_Level."
 ::= { h2PhyEntry 4 }

```

h2PhyDfsCounter OBJECT-TYPE

```

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of times a new operating frequency is selected."
 ::= { h2PhyEntry 5 }

```

h2PhyDfsTime OBJECT-TYPE

```

SYNTAX TimeTicks
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Time for the latest selection of a new operating frequency.
The time is counted as number of 0,01 seconds after system
start. The value 0 indicates that no frequency has been
selected dynamically."
 ::= { h2PhyEntry 6 }

```

```

-- *****
-- * Events / Notifications
-- *****

```

h2AuthViolation NOTIFICATION-TYPE

```

OBJECTS {
    h2RifAssocFailAuthId,
    h2RifAuthViolCounter
}
STATUS current
DESCRIPTION
"An authentication violation has occurred. The index of the
variables indentifies the radio interface (cell).
The notification contains the authentication identity used
when trying to associate and the number of authentication
violations for this cell."
 ::= { etsih2EventsV2 1 }

```

h2AssocFail NOTIFICATION-TYPE

```

OBJECTS {
    h2RifAssocFailMacId,
    h2RifAssocFailAuthId,
    h2RifFailedAssocCounter,
    h2RifAssocFailCause
}
STATUS current
DESCRIPTION
"An association failure has occurred. The index of the
variables indentifies the radio interface (cell).
The notification contains the H2 MAC ID of the MT (if
any), the authentication identity (if any) used when
trying to associate, the cause of the failure, and the
number of association failures for this cell."
 ::= { etsih2EventsV2 2 }

```

h2AbDisassoc NOTIFICATION-TYPE

```

OBJECTS {
    h2RifAbDisassocAddr,
    h2RifAbDisassocCause
}
STATUS current
DESCRIPTION

```

```

"An abnormal disassociation (i.e. a disassociation not
requested by the MT user) has occurred. The index of the
variables indentifies the radio interface (cell).
The notification contains the MT address (address type
depends on the convergence layer), and the cause of the
disassociation."
 ::= { etsih2EventsV2 3 }

h2HoFail NOTIFICATION-TYPE
  OBJECTS {
    h2RifHoFailAddr,
    h2RifHoFailCause
  }
  STATUS current
  DESCRIPTION
    "An handover to this cell has failed. The index of the
    variables indentifies the radio interface (cell).
    The notification contains the MT address (address type
    depends on the convergence layer), and the cause of the
    handover failure."
  ::= { etsih2EventsV2 4 }

-- *****
-- * Conformance Information
-- *****

-- Compliance statements

h2APComplv1 MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "Implementation requirements for a H2 Access Point (AP).
    RSS measurements within MT Table is optional."
  MODULE -- this module
  MANDATORY-GROUPS {
    h2ApSystemGroup, -- AP System
    h2ApSecurityGroup, -- AP Security
    h2ApClGroup, -- CLs in AP
    h2ApRifGroup, -- AP Cell
    h2ApMtGroup, -- Associated MTs
    h2ApDlcGroup, -- AP DLC
    h2ApPhyGroup, -- AP PHY
    h2ApNotifGroup -- AP Notifications
  }
  ::= { etsih2Compl 1 }

-- Units of conformance (groups)

h2ApSystemGroup OBJECT-GROUP
  OBJECTS {
    h2SysReset, -- Reset the AP
    h2SysNetId, -- H2 NET ID
    h2SysGlobalNopId, -- NOP ID. Global part
    h2SysLocalNopId, -- NOP ID. Local part
    h2SysNopUserGroup, -- Open/Closed user group
    h2SysProfileId, -- H2 profile type
    h2SysProfileVersion -- H2 profile version
  }
  STATUS current
  DESCRIPTION
    "AP System group. Contains objects for configuration
    and control of the AP system."
  ::= { etsih2Groups 1 }

h2ApSecurityGroup OBJECT-GROUP
  OBJECTS {
    h2SysUnicastDesKeyRefresh, -- Key refresh interval
    h2SysCommonDesKeyRefresh, -- Key refresh interval
    h2SysUnicast3DesKeyRefresh, -- Key refresh interval
    h2SysCommon3DesKeyRefresh, -- Key refresh interval
    h2SysDhAge, -- DH secret lifetime
    h2SysSuppEncr, -- Supported encryption
    h2SysUsedEncrUni, -- Preferred encryption
    h2SysUsedEncrMulti, -- Preferred encryption
    h2SysUsedEncrBroad, -- Preferred encryption
    h2SysSuppAuth, -- Supported authentication
    h2SysUsedAuth1, -- Preferred authentication
    h2SysUsedAuth2, -- Preferred authentication
  }

```

```

        h2SysUsedAuth3,      -- Preferred authentication
        h2SysUsedAuth4,      -- Preferred authentication
        h2SysUsedAuth5      -- Preferred authentication
    }
STATUS current
DESCRIPTION
    "AP Security group. Contains AP objects for configuration
    of H2 security."
 ::= { etsih2Groups 2 }

h2ApClGroup OBJECT-GROUP
OBJECTS {
    h2ClId    -- Type of convergence layer
}
STATUS current
DESCRIPTION
    "AP convergence layer group. Describes the convergence layers
    supported by the AP."
 ::= { etsih2Groups 3 }

h2ApRifGroup OBJECT-GROUP
OBJECTS {
    h2RifNumber,      -- Number of cells
    h2RifUserInfo,    -- User info
    h2RifApId,        -- H2 AP ID
    h2RifMcastType,   -- Multicast or n*unicast
    h2RifMtAlivePeriod, -- MT alive period
    h2RifMtAliveLimit, -- MT alive limit
    h2RifNeighbApId,  -- AP ID of neighbour cell
    h2RifHoFromNeighbCounter, -- # HOs from neighbour
    h2RifMtNumber,    -- Current number of associated MTs
    h2RifAssocCounter, -- # association requests
    h2RifFailedAssocCounter, -- # failed associations
    h2RifAuthCounter, -- # authentication requests
    h2RifAuthViolCounter, -- # authentication violations
    h2RifMtMaxNumber, -- Max number of associated MTs
    h2RifAssocFailTime, -- Latest association failure: Time
    h2RifAssocFailMacId, -- Latest association failure: MAC ID
    h2RifAssocFailAuthId, -- Latest association failure: MT id
    h2RifAssocFailCause, -- Latest association failure: Cause
    h2RifAbDisassocTime, -- Latest abnormal disassoc: Time
    h2RifAbDisassocAddr, -- Latest abnormal disassoc: MT address
    h2RifAbDisassocCause, -- Latest abnormal disassoc: Cause
    h2RifHoFailTime, -- Latest handover failure: Time
    h2RifHoFailAddr, -- Latest handover failure: MT addr
    h2RifHoFailCause, -- Latest handover failure: Cause
    h2RifAssocFailNotifOn, -- Enable/disable notification
    h2RifAbDisassocNotifOn, -- Enable/disable notification
    h2RifHoFailNotifOn -- Enable/disable notification
}
STATUS current
DESCRIPTION
    "AP cell group. Contains AP objects for configuration
    and performance per H2 interface (cell) of the AP."
 ::= { etsih2Groups 4 }

h2ApMtGroup OBJECT-GROUP
OBJECTS {
    h2MtMacId,        -- H2 MAC ID
    h2MtTime,         -- Association/handover time
    h2MtEncrAlg,      -- Encryption algorithm
    h2MtAuthAlg,      -- Authentication algorithm
    h2MtProfileId1,   -- H2 Profile type
    h2MtAddr1         -- MT address
}
STATUS current
DESCRIPTION
    "MT table group. Describes all associated MTs in a cell."
 ::= { etsih2Groups 5 }

h2ApMtRssGroup OBJECT-GROUP
OBJECTS {
    h2MtRss0,        -- MT RSS0
    h2MtRss1Type,    -- MT RSS1 percentile type
    h2MtRss1Percentile -- MT RSS1 percentile value
}
STATUS current
DESCRIPTION

```

```

    "MT table RSS group. Contains RSS0 and RSS1 measurements
    done by the MT."
 ::= { etsih2Groups 6 }

h2ApDlcGroup OBJECT-GROUP
OBJECTS {
    h2DlcDlMacUsage, -- Downlink MAC frame usage (%)
    h2DlcUlMacUsage -- Uplink MAC frame usage (%)
}
STATUS current
DESCRIPTION
    "AP DLC group. Describes DLC objects in the AP."
 ::= { etsih2Groups 7 }

h2ApPhyGroup OBJECT-GROUP
OBJECTS {
    h2PhyAllowedFri, -- Frequency index
    h2PhyFriMaxPower, -- Max transmit power
    h2PhyTopBitRate, -- Top bit rate supported
    h2PhyRxUlLevel, -- Expected received power level
    h2PhyFri, -- Current frequency
    h2PhyTxLevel, -- Current transmit power
    h2PhyDfsCounter, -- # of frequency changes
    h2PhyDfsTime -- Time for latest frequency change
}
STATUS current
DESCRIPTION
    "AP PHY group. Describes PHY objects in the AP."
 ::= { etsih2Groups 8 }

h2ApNotifGroup NOTIFICATION-GROUP
NOTIFICATIONS {
    h2AuthViolation, -- authentication violation
    h2AssocFail, -- association failure
    h2AbDisassoc, -- abnormal disassociation
    h2HoFail -- handover failure
}
STATUS current
DESCRIPTION
    "Basic notifications for a H2 AP."
 ::= { etsih2Groups 9 }

END

```

Annex C (normative): ETSI-H2ETHCL-MIB. Ethernet CL MIB Module

```
-- *****
-- * ETSI BRAN HIPERLAN Type 2 (H2)
-- * Ethernet Convergence Layer Management Information Base (MIB)
-- *****

-- This MIB is an extension of ETSI-H2-MIB and describes the Ethernet
-- Convergence Layer (CL) of a H2 device.

-- The REFERENCE clauses within the OBJECT-TYPE constructs refer to
-- HIPERLAN Type 2 technical specifications (TS):
-- Ethernet CL TS: TS 101 493-2 Packet based Convergence Layer
-- Part 2: Ethernet Service Specific Convergence Sublayer

ETSI-H2ETHCL-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE          FROM SNMPv2-SMI
    MacAddress                      FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP      FROM SNMPv2-CONF
    ifIndex                          FROM RFC1213-MIB
    h2MtIndex, h2ClIndex              FROM ETSI-H2-MIB
    etsih2EthClMib, etsih2EthClMibModuleRoot FROM ETSI-H2-REG;

-- *****
-- * Module Identity
-- *****

etsih2EthClMibModule MODULE-IDENTITY
    LAST-UPDATED "0005230900Z" -- May 23, 2000
    ORGANIZATION "ETSI BRAN Project"
    CONTACT-INFO
        "ETSI BRAN Project
        F-06921 Sophia Antipolis Cedex
        France
        E-Mail: secretariat@etsi.fr"
    DESCRIPTION
        "The MIB module for management of HIPERLAN Type 2 (H2)
        Ethernet Convergence Layer (CL)."
```

REVISION "0005230900Z" -- May 23, 2000

DESCRIPTION "Initial version."

```
::= { etsih2EthClMibModuleRoot 1 }

-- *****
-- * Major Structure
-- *****

-- Conformance area, containing groups and compliance specifications
etsih2EthClConfs OBJECT IDENTIFIER ::= { etsih2EthClMib 1}
etsih2EthClGroups OBJECT IDENTIFIER ::= { etsih2EthClConfs 1}
etsih2EthClCompl OBJECT IDENTIFIER ::= { etsih2EthClConfs 2}

-- Subtree for objects
etsih2EthClObjs OBJECT IDENTIFIER ::= { etsih2EthClMib 2}

-- *****
-- * Ethernet CL Extension of CL Table in H2 MIB
-- *****

h2EthClTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2EthClEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Extension of CL Table in H2 MIB containing general CL
        objects."
    ::= { etsih2EthClObjs 1 }

h2EthClEntry OBJECT-TYPE
```

```

SYNTAX H2EthClEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "An entry in the extension of H2 CL table."
INDEX {ifIndex, h2ClIndex}
 ::= { h2EthClTable 1 }

H2EthClEntry ::= SEQUENCE {
    h2EthClQoS INTEGER
}

h2EthClQoS OBJECT-TYPE
SYNTAX INTEGER(1..8)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Indicates support for a priority mechanism to enable
    Quality of Service (QoS) according to IEEE 802.1p.
    1 means best effort (no support). All traffic is
    treated equal.
    2-8 indicates number of priorities (queues). Each
    queue has a separate DLC connection."
REFERENCE
    "Ethernet CL TS: Mapping between IEEE 802.1p and DLCC-ID."
 ::= { h2EthClEntry 1 }

-- *****
-- * Ethernet CL Extension of Mobile Terminal (MT) Table in H2 MIB
-- *****

h2EthClMtTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2EthClMtEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Extension of MT Table in H2 MIB containing Ethernet CL
        specific objects."
    ::= { etsih2EthClObjs 2 }

h2EthClMtEntry OBJECT-TYPE
    SYNTAX H2EthClMtEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the Ethernet CL extension of H2 MT table."
    INDEX {ifIndex, h2MtIndex}
    ::= { h2EthClMtTable 1 }

H2EthClMtEntry ::= SEQUENCE {
    h2EthClMtAddr MacAddress,
    h2EthClMtQoS INTEGER
}

h2EthClMtAddr OBJECT-TYPE
    SYNTAX MacAddress
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "IEEE 802 MAC address of the associated terminal."
    REFERENCE
        "Ethernet CL TS: IEEE 802 MAC Address IE"
    ::= { h2EthClMtEntry 1 }

h2EthClMtQoS OBJECT-TYPE
    SYNTAX INTEGER(1..8)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Indicates support for a priority mechanism to enable
        Quality of Service (QoS) according to IEEE 802.1p.
        1 means best effort (no support). All traffic is
        treated equal.
        2-8 indicates number of priorities (queues). Each
        queue has a separate DLC connection."
    REFERENCE
        "Ethernet CL TS: Mapping between IEEE 802.1p and DLCC-ID."
    ::= { h2EthClMtEntry 2 }

```



```
-- *****
-- * Conformance Information
-- *****

-- Compliance statements

h2EthClAPComplv1 MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "Implementation requirements for a H2 Access Point (AP)
    supporting the Ethernet CL. MT Table part is optional."
  MODULE -- this module
  MANDATORY-GROUPS { h2EthClApGroup }
  ::= { etsih2EthClCompl 1 }

-- Units of conformance (groups)

h2EthClApGroup OBJECT-GROUP
  OBJECTS {
    h2EthClQoS
  }
  STATUS current
  DESCRIPTION
    "AP Ethernet CL."
  ::= { etsih2EthClGroups 1 }

h2EthClApMtGroup OBJECT-GROUP
  OBJECTS {
    h2EthClMtAddr,
    h2EthClMtQoS
  }
  STATUS current
  DESCRIPTION
    "MT Table part of AP Ethernet CL."
  ::= { etsih2EthClGroups 2 }

END
```

Annex D (normative): ETSI-H2ATMCL-MIB. ATM UNI CL MIB Module

```

-- *****
-- * ETSI BRAN HIPERLAN Type 2 (H2)
-- * ATM UNI Convergence Layer Management Information Base (MIB)
-- *****

-- This MIB is an extension of ETSI-H2-MIB and describes the ATM UNI
-- Convergence Layer (CL) of a H2 device.

-- The REFERENCE clauses within the OBJECT-TYPE constructs refer to
-- HIPERLAN Type 2 technical specifications (TS):
-- UNI CL TS: TS 101 763-2 Cell based Convergence Layer
-- Part 2: UNI Service Specific Convergence Sublayer

ETSI-H2ATMCL-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE          FROM SNMPv2-SMI
    MODULE-COMPLIANCE, OBJECT-GROUP      FROM SNMPv2-CONF
    ifIndex                               FROM RFC1213-MIB
    h2MtIndex, h2ClIndex                  FROM ETSI-H2-MIB
    etsih2AtmClMib, etsih2AtmClMibModuleRoot FROM ETSI-H2-REG;

-- *****
-- * Module Identity
-- *****

etsih2AtmClMibModule MODULE-IDENTITY
    LAST-UPDATED "0005210900Z" -- May 21, 2000
    ORGANIZATION "ETSI BRAN Project"
    CONTACT-INFO
        "ETSI BRAN Project
        F-06921 Sophia Antipolis Cedex
        France
        E-Mail: secretariat@etsi.fr"
    DESCRIPTION
        "The MIB module for management of HIPERLAN Type 2 (H2)
        ATM UNI Convergence Layer (CL)."
```

REVISION "0005210900Z" -- May 21, 2000

```

    DESCRIPTION
        "Initial version."
    ::= { etsih2AtmClMibModuleRoot 1 }

-- *****
-- * Major Structure
-- *****

-- Conformance area, containing groups and compliance specifications
etsih2AtmClConfs OBJECT IDENTIFIER ::= { etsih2AtmClMib 1}
etsih2AtmClGroups OBJECT IDENTIFIER ::= { etsih2AtmClConfs 1}
etsih2AtmClCompl OBJECT IDENTIFIER ::= { etsih2AtmClConfs 2}

-- Subtree for objects
etsih2AtmClObjs OBJECT IDENTIFIER ::= { etsih2AtmClMib 2}

-- *****
-- * ATM UNI CL Extension of CL Table in H2 MIB
-- *****

h2AtmClTable OBJECT-TYPE
    SYNTAX SEQUENCE OF H2AtmClEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Extension of CL Table in H2 MIB containing general CL
        objects."
    ::= { etsih2AtmClObjs 1 }

h2AtmClEntry OBJECT-TYPE
    SYNTAX H2AtmClEntry
    MAX-ACCESS not-accessible
    STATUS current
```

```

DESCRIPTION
    "An entry in the extension of H2 CL table."
INDEX {ifIndex, h2ClIndex}
 ::= { h2AtmClTable 1 }

H2AtmClEntry ::= SEQUENCE {
    h2AtmClNetworkPrefix OCTET STRING,
    h2AtmClVerSupport    INTEGER
    }

h2AtmClNetworkPrefix OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(0..13))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "NSAP network prefix. If NSAP addressing is not used the
    value is a zero length string."
REFERENCE
    "UNI CL TS: ATM Address"
 ::= { h2AtmClEntry 1 }

h2AtmClVerSupport OBJECT-TYPE
SYNTAX INTEGER(1..15)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The supported UNI version(s). In case multiple UNI are
    supported the values of the corresponding UNI versions are
    added.
    1 = ATM Forum UNI version 3.1
    2 = ATM Forum UNI version 4.0
    4 = Mobility enhanced UNI
    8 = ITU-T Q.2931 UNI."
REFERENCE
    "UNI CL TS: UNI Version"
 ::= { h2AtmClEntry 2 }

-- *****
-- * ATM UNI CL Extension of Mobile Terminal (MT) Table in H2 MIB
-- *****

-- The MT Table of the H2 MIB describes associated MTs. For ATM UNI CL
-- the MT Table is extended with:
-- 1) Capability Table.
-- 2) VCI Mapping Table
-- NOTE: These tables contains effective (used) attributes that are
-- negotiated during association.

-- MT UNI CL Capability Table

h2AtmClMtCapTable OBJECT-TYPE
SYNTAX SEQUENCE OF H2AtmClMtCapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "MT Capability Table. Extension of MT Table in
    H2 MIB. Contains attributes negotiated during
    association."
 ::= { etsih2AtmClObjs 2 }

h2AtmClMtCapEntry OBJECT-TYPE
SYNTAX H2AtmClMtCapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "An entry in the MT Capability Table."
INDEX {ifIndex, h2MtIndex}
 ::= { h2AtmClMtCapTable 1 }

H2AtmClMtCapEntry ::= SEQUENCE {
    h2AtmClMtEsi          OCTET STRING,
    h2AtmClMtLowerRangeVci INTEGER,
    h2AtmClMtUpperRangeVci INTEGER,
    h2AtmClMtMaxVcc      INTEGER,
    h2AtmClMtMaxDlcc     INTEGER,
    h2AtmClMtDlPeakCellRate INTEGER,
    h2AtmClMtUlPeakCellRate INTEGER,
    h2AtmClMtUniVersion  INTEGER
    }

```

```

    }

h2AtmClMtEsi OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE(0..6))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "End system identifier of MT. If not available the
        value is a zero length string."
    REFERENCE
        "UNI CL TS: ATM Address"
    ::= { h2AtmClMtCapEntry 1 }

h2AtmClMtLowerRangeVci OBJECT-TYPE
    SYNTAX INTEGER(0..65535)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Lower bound VCI value that is supported by the device.
        Default value is 0."
    REFERENCE
        "UNI CL TS: ATM VC Identifier Range"
    ::= { h2AtmClMtCapEntry 2 }

h2AtmClMtUpperRangeVci OBJECT-TYPE
    SYNTAX INTEGER(0..65535)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Upper bound VCI value that is supported by the device.
        Default value is 255."
    REFERENCE
        "UNI CL TS: ATM VC Identifier Range"
    ::= { h2AtmClMtCapEntry 3 }

h2AtmClMtMaxVcc OBJECT-TYPE
    SYNTAX INTEGER(0..1023)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Maximum number of simultaneous ATM connections that is
        supported by the device. Default value is 32."
    REFERENCE
        "UNI CL TS: Number of supported ATM connections"
    ::= { h2AtmClMtCapEntry 4 }

h2AtmClMtMaxDlcc OBJECT-TYPE
    SYNTAX INTEGER(0..63)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Maximum number of simultaneous DLC connections that are
        supported by the device. Default value is 1."
    REFERENCE
        "UNI CL TS: Number of supported DLC connections"
    ::= { h2AtmClMtCapEntry 5 }

h2AtmClMtDlPeakCellRate OBJECT-TYPE
    SYNTAX INTEGER (0..65535)
    UNITS "Cells/s"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Peak cell rate that is supported in downlink direction.
        Default value is 2360 Cells/s (approx 1Mbit/s)."
    REFERENCE
        "UNI CL TS: Peak Cell Rate"
    ::= { h2AtmClMtCapEntry 6 }

h2AtmClMtUlPeakCellRate OBJECT-TYPE
    SYNTAX INTEGER (0..65535)
    UNITS "Cells/s"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Peak cell rate that is supported in uplink direction.
        Default value is 2360 Cells/s (approx 1Mbit/s)."
    REFERENCE

```

```

"UNI CL TS: Peak Cell Rate"
 ::= { h2AtmClMtCapEntry 7 }

h2AtmClMtUniVersion OBJECT-TYPE
 SYNTAX INTEGER {
   uni31(1), -- ATM Forum UNI version 3.1
   uni40(2), -- ATM Forum UNI version 4.0
   muni(4), -- Mobility enhanced UNI
   q2931(8) -- ITU-T Q.2931 UNI
 }
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
  "UNI version."
 REFERENCE
  "UNI CL TS: UNI Version"
 ::= { h2AtmClMtCapEntry 8 }

-- MT UNI CL VCI Mapping Table

h2AtmClMtVciMappingTable OBJECT-TYPE
 SYNTAX SEQUENCE OF H2AtmClMtVciMappingEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
  "VCI Mapping Table. Extension of MT Table in H2 MIB."
 ::= { etsih2AtmClObjs 3 }

h2AtmClMtVciMappingEntry OBJECT-TYPE
 SYNTAX H2AtmClMtVciMappingEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
  "An entry in the VCI Mapping Table."
 INDEX { ifIndex, h2MtIndex, h2AtmClVciIndex }
 ::= { h2AtmClMtVciMappingTable 1 }

H2AtmClMtVciMappingEntry ::= SEQUENCE {
   h2AtmClVciIndex INTEGER,
   h2AtmClVciHigh INTEGER,
   h2AtmClVciDlccId INTEGER,
   h2AtmClVciPriority INTEGER
 }

h2AtmClVciIndex OBJECT-TYPE
 SYNTAX INTEGER(0..255)
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
  "Auxiliary variable used to identify instances of the columnar
  objects in the table of VCI mappings."
 ::= { h2AtmClMtVciMappingEntry 1 }

h2AtmClVciHigh OBJECT-TYPE
 SYNTAX INTEGER(0..65535) -- 16 bits
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
  "High VCI value for this entry. The low VCI value for this
  entry is the high value of the preceding entry + 1. Each
  entry (=VCI interval) describes a continuous set of VCI values."
 REFERENCE
  "UNI CL TS: Connection Mapping and annex B.1"
 ::= { h2AtmClMtVciMappingEntry 2 }

h2AtmClVciDlccId OBJECT-TYPE
 SYNTAX INTEGER(0..63) -- 6 bits
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
  "DLCC-ID for this entry (VCI interval)."
 REFERENCE
  "UNI CL TS: Connection Mapping and annex B.1"
 ::= { h2AtmClMtVciMappingEntry 3 }

h2AtmClVciPriority OBJECT-TYPE
 SYNTAX INTEGER(0..7)
 MAX-ACCESS read-only

```

```

STATUS current
DESCRIPTION
  "The priority of the DLC connection in terms of QoS.
  0 is highest priority."
REFERENCE
  "UNI CL TS: Connection Mapping and annex B.1"
  ::= { h2AtmClMtVciMappingEntry 4 }

-- *****
-- * Conformance Information
-- *****

-- Compliance statements

h2AtmClAPComplv1 MODULE-COMPLIANCE
STATUS current
DESCRIPTION
  "Implementation requirements for a H2 Access Point (AP)
  supporting ATM UNI CL. MT Table part is optional."
MODULE -- this module
MANDATORY-GROUPS { h2AtmClApGroup }
  ::= { etsih2AtmClCompl 1 }

-- Units of conformance (groups)

h2AtmClApGroup OBJECT-GROUP
OBJECTS {
  h2AtmClNetworkPrefix,
  h2AtmClVerSupport
}
STATUS current
DESCRIPTION
  "AP ATM UNI CL."
  ::= { etsih2AtmClGroups 1 }

h2AtmClApMtGroup OBJECT-GROUP
OBJECTS {
  h2AtmClMtEsi,
  h2AtmClMtLowerRangeVci,
  h2AtmClMtUpperRangeVci,
  h2AtmClMtMaxVcc,
  h2AtmClMtMaxDlcc,
  h2AtmClMtDlPeakCellRate,
  h2AtmClMtUlPeakCellRate,
  h2AtmClMtUniVersion,
  h2AtmClVciHigh,
  h2AtmClVciDlccId,
  h2AtmClVciPriority
}
STATUS current
DESCRIPTION
  "MT Table part of AP ATM UNI CL."
  ::= { etsih2AtmClGroups 2 }

END

```

History

Document history		
V1.1.1	October 2000	Publication