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| Source(s) | Krzysztof Dudzinski<br>Airspan Communications Ltd<br>Joey Chou<br>Intel<br>Erik Colban<br>NextWave Broadband Inc | [mailto:kdudzins@airspan.com]<br><br>[mailto:joey.chou@intel.com]<br><br>[mailto:ecolban@nextwavetel.com] |
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| Abstract | Sections 9.3 and 9.4 contain duplicate material. This contribution suggests the text changes to unify these sections. | |
| Purpose | Adopt the contribution and apply required changes in the text of 802.16i document. | |
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# Corrections to sections 9.3 and 9.4

*Krzysztof Dudzinski*
*Airspan Communications Ltd*
*Joey Chou*
*Intel*
*Erik Colban*
*NextWave Broadband Inc.*

## 1. Introduction

Section 9.3 defines Management information base and it deals with the particular recommendations in respect to SNMP management. This section was introduced by amendment 802.16f.

Section 9.4 proposed by 802.16i repeats most of the same recommendations as in section 9.3. It is called Mobile MIB for SNMP.

There is no need to define a separate section for mobile MIB. Instead section 9.3 should be amended to take into account new MIB modules and new interface types. Also the text should give some general conformance requirements to indicate what device should implement what MIB modules.

## 2. Text changes

***[The following changes apply to subclause 9.3]***

#### 9.3 ASN.1 Management information base

The management information base for BS and SS is defined as ~~two~~ ASN.1 MIB modules~~: wmanIfMib and wmanDevMib~~. The implementation of ~~both~~ ASN.1 MIB modules is mandatory for all BSs. The implementation of ~~both~~ ASN.1 MIB modules is mandatory for SSs~~,~~ that are managed using SNMP protocol.

***[Insert the following paragraph immediately after the first paragraph]***

The specific requirements for implementation of individual MIB modules are defined in section 9.3.3. The specific requirements for implementation of individual MIB objects in each MIB module are defined in conformance statements of the MIB modules.

***[The following three paragraphs are removed. The description of all defined MIB modules is moved to subclause 9.3.3]***

~~The wmanIfMib MIB module defines management objects relevant to the IEEE 802.16 broadband wireless interface as defined in this standard.~~

~~The wmanDevMib MIB module defines management objects relevant to the device implementing the IEEE 802.16 interface. The objects of this MIB module may refer explicitly to terms defined in the standard (e.g. configuration file encodings) but mainly provide the mandatory support required to implement, manage and test the equipment implementing the IEEE 802.16 interface.~~

~~This document also provides an informative Annex (see Annex D) to define vendor specific managed objects, such as temperature, fan and power alarms, for IEEE Std 802.16-2004 based Base Station.~~

***[The subclause 9.3.1 remains unchanged]***

***[Modify subclause 9.3.2 as follows]***

### 9.3.2 Relationship with interface MIB

This subclause describes the integration with MIB-II under Interface Group MIB defined in IETF RFC2863~~, as wmanIfMib will need to be integrated in the MIB tree. It describes where wmanIfMib is located in the MIB-II subtree, and how it can be accessed by NMS~~.

#### 9.3.2.1 MIB-~~2~~II integration

***[Modify subclause 9.3.2.1 as follows]***

##### 9.3.2.1 MIB-2 integration

The Internet Assigned Numbers Authority (IANA) has assigned the ~~following~~ ifType ieee80216WMAN to point-to-multipoint broadband wireless access. The ifType entities are defined by IANA as follows:

```
IANAifType ::= TEXTUAL-CONVENTION
        SYNTAX INTEGER {
                ~~propBWAp2Mp (184) -- prop broadband wireless access point to multipoint~~
                propBWAp2Mp (184), -- PropBroadbandWirelessAccesspt2multipt
                        -- use of this ifType for IEEE 802.16 WMAN
                        -- interfaces as per IEEE Std 802.16f is
                        -- deprecated and ifType ieee80216WMAN should be used instead.

                ieee80216WMAN (237), -- IEEE 802.16 WMAN interface
        }
```

~~WirelessMAN interface table is located under transmission subtree, as follows.~~
~~wmanIfMib ::= {transmission 184} -- WMAN interface table2~~

The amendment 802.16f-2005 defined interface type for point-to-multipoint broadband wireless access interfaces as "propBWAp2Mp (184)". This interface type is now deprecated. All new implementations of SNMP agents should use the newly allocated ifType number ieee80216WMAN (237). For backwards compatibility purposed SNMP managers shall accept this deprecated interface type.

#### 9.3.2.2 Usage of MIB-II tables

***[In the subclause 9.3.2.2 change as follows]***

The “Interfaces” group of MIB-II, in RFC2863, has been designed to manage various sub-layers (e.g. MAC and PHY) beneath the internetwork-layer for numerous media-specific interfaces. The implementation of ifTable in SNMP managed BS and SS is mandatory.

The implementation of the ifTable for the BS shall create one row for each BS sector. Each BS sector may support different MAC versions of IEEE 802.16 standard (e.g. IEEE 802.16-2004, IEEE 802.16e-2005). The following recommendations shall be applied to each row defining a BS sector:

— ifIndex value is implementation specific
— ifType shall be set to ~~propBWAp2Mp (value of 184 as defined in 9.3.2.1)~~ ieee80216WMAN (value of 237 as defined in 9.3.2.1)
— ifSpeed shall be ~~null~~ set to "0"
— ifPhysAddress shall be set to the MAC Address of the BS sector
— All other columnar objects shall be initialized as specified in RFC2863.

~~Table 1 provides an example~~.

**Table 1—Example of the usage of ifTable objects for base station**

| ifTable | ifIndex | ifType (IANA) | ifSpeed | ifPhysAddress | ifAdminStatus | ifOperStatus |
|---|---|---|---|---|---|---|
| BS Sector 1 | 1 | ieee80216WMAN ~~propBWAp2Mp~~ | ~~Null~~ 0 | MAC address of BS sector | Administration Status | Operational Status |
| BS Sector 2 | 2 | ieee80216WMAN ~~propBWAp2Mp~~ | ~~Null~~ 0 | MAC address of BS sector | Administration Status | Operational Status |
| BS Sector 3 | 3 | ieee80216WMAN ~~propBWAp2Mp~~ | ~~Null~~ 0 | MAC address of BS sector | Administration Status | Operational Status |
| Ethernet | 4 | ethernetCsmacd | ~~Null~~ Interface Speed | MAC address | Administration Status | Operational Status |

Table 1 shows an example of the usage of ifTable for BS that supports multiple sectors. Each sector may support one of the following MAC / PHY interfaces:

• IEEE 802.16-2004, OFDM 256
• IEEE 802.16-2004, OFDMA 2048
• IEEE 802.16e, OFDMA 128
• IEEE 802.16e, OFDMA 512
• IEEE 802.16e, OFDMA 1024

The implementation of the ifTable for SS must create one row for each SS WirelessMAN interface. Additional rows may be necessary to support other network interfaces, such as Ethernet. The following recommendations must be applied to each row:

— ifIndex value is implementation specific
— ifType shall be set to ~~propBWAp2Mp (value of 184 as defined in 9.3.2.1)~~ ieee80216WMAN ieee80216WMAN (value of 237 as defined in 9.3.2.1)
— ifSpeed shall be ~~null~~ set to "0"
— ifPhys Address shall be set to the SS MAC Address (of the WirelessMAN interface)
— All other columnar objects shall be initialized as specified in RFC2863

~~Table 2 provides an example~~.

**Table 2—Example of the usage of ifTable objects for base station**

| ifTable | ifIndex | ifType (IANA) | ifSpeed | ifPhysAddress | ifAdminStatus | ifOperStatus |
|---|---|---|---|---|---|---|
| SS | 1 | ieee80216WMAN ~~propBWAp2Mp~~ | ~~Null~~ 0 | MAC address of SS | Administration Status | Operational Status |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ethernet | 2 | ethernetCsmacd | ~~Null~~ Interface Speed | MAC address | Administration Status | Operational Status |

***[Copy here the text from 802.16i draft4 starting at page 9 line 59 through to the end of page 12]***

***[Delete 9.3.3 entirely and change subclause number 9.3.2.3 to 9.3.3 as it has nothing to do with Interface MIB]***

### 9.3.~~2.~~3 Events and traps

The wmanIfMib defines objects for reporting events through mechanisms, such as traps and non-volatile logging. However, the definition and coding of events is vendor-specific. In order to assist the network operators who must troubleshoot multi-vendor equipment, the circumstances and meaning of each event should be reported as human-readable text. Therefore, the trap definitions should include the event reason encoded as display String, and is shown in the following example.

```
trapName NOTIFICATION-TYPE
      OBJECTS {ifIndex,
            eventReason,
            other useful objects
            }
      MAX-Access read-only
      STATUS current
      DESCRIPTION
            "trap description"
      ::= { Object Id }.
```

~~**9.3.3 wmanDevMib MIB Subtree**~~

~~This subclause specifies that wmanDevMib shall be accessed through the following MIB tree: iso(1).std(0).iso8802(8802).wman(16).wmanDev(1) { 1 0 8802 16 1 }~~

***[Insert new subclause 9.3.4 and children subclauses as follows]***

### 9.3.4 MIB modules

Table 3 lists all defined ASN.1 MIB modules, their status and module identity OID. The subsequent subclauses give more details about each defined MIB module.

**Table 3—List of ASN.1 MIB modules**

| MIB module name | Revision | Status | Module Identity OID |
|---|---|---|---|

| | | | |
|---|---|---|---|
| WMAN-IF-MIB | 1 | Deprecated | iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1) .transmission(10).wmanIfMib(184) |
| WMAN-DEV-MIB | 1 | Active | iso(1).std(0).iso8802(8802).wman(16).wmanDevMib(1) |
| WMAN-IF2-MIB | 1 | Active | iso(1).std(0).iso8802(8802).wman(16).wmanIf2Mib(2) |
| WMAN-IF2M-MIB | 1 | Active | iso(1).std(0).iso8802(8802).wman(16).wmanIf2mMib(3) |

#### 9.3.4.1 WMAN-IF-MIB module

The WMAN-IF-MIB MIB module defines management objects relevant to the broadband wireless interface as defined in the standard IEEE802.16-2004.
The current status of the WMAN-IF-MIB MIB module is deprecated and the module should not be implemented by the equipment compliant with the amendment IEEE802.16i. The WMAN-IF2-MIB module should be implemented instead.
The WMAN-IF-MIB MIB module is identified by module identity name wmanIfMib and shall be accessed through the following OID:
iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).transmission(10).wmanIfMib(184)

#### 9.3.4.2 WMAN-DEV-MIB module

The WMAN-DEV-MIB MIB module defines management objects relevant to the device implementing the IEEE 802.16-2004 and 802.16-2005e standards. The objects of this MIB module may refer explicitly to terms defined in the standard (e.g. configuration file encodings) but mainly provide the mandatory support required to manage the devices implementing the IEEE 802.16 interface.
The current status if the WMAN-DEV-MIB is active. The BS shall implement this MIB module. SS shall implement this MIB module if it is managed using SNMP protocol.
The WMAN-DEV-MIB MIB module is identified by module identity name wmanDevMib and shall be accessed through the following OID:
iso(1).std(0).iso8802(8802).wman(16).wmanDevMib(1)

#### 9.3.4.3 WMAN-IF2-MIB module

The WMAN-IF2-MIB MIB module defines management objects that support both fixed and mobile broadband wireless interface as defined in the IEEE 802.16e-2005 standard.
The current status of the WMAN-IF2-MIB MIB module is active. The BS shall implement this MIB module. The SS shall implement this MIB module if it is managed using SNMP protocol.
The WMAN-IF2-MIB MIB module is identified by module identity name wmanIf2Mib and shall be accessed through the following OID:
iso(1).std(0).iso8802(8802).wman(16).wmanIf2Mib(2)

#### 9.3.4.4 WMAN-IF2M-MIB module

The WMAN-IF2M-MIB MIB module defines management that support mobile broadband wireless interface as defined in the IEEE 802.16e-2005 standard.
The current status of the WMAN-IF2M-MIB MIB module is active. The BS shall implement this MIB module if it supports mobility. The MS shall implement this MIB module if it is managed using SNMP protocol.
The WMAN-IF2M-MIB MIB module is identified by module identity name wmanIf2mMib and shall be accessed through the following OID:
iso(1).std(0).iso8802(8802).wman(16).wmanIf2mMib(3)

***[Remove section 9.4]***