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**Information technology —  
Telecommunications and information  
exchange between systems — Local  
and metropolitan area networks —  
Specific requirements —**

**Part 22:  
Cognitive Wireless RAN Medium  
Access Control (MAC) and Physical  
Layer (PHY) Specifications: Policies  
and Procedures for Operation in the  
TV Bands**

**AMENDMENT 1: Management and  
control plane interfaces and procedures  
and enhancement to the management  
information base (MIB)**

*Technologies de l'information — Télécommunications et échange  
d'information entre systèmes — Réseaux locaux et métropolitains —  
Exigences spécifiques —*

*Partie 22: Spécifications du contrôle d'accès du milieu sans fil cognitif  
(MAC) et de la couche physique (PHY) : Politiques et procédures pour  
le fonctionnement dans les bandes TV*



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IEEE Standard for Information Technology—  
Telecommunications and information exchange  
between systems  
Wireless Regional Area Networks (WRAN)—  
Specific requirements

## **Part 22: Cognitive Wireless RAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Policies and Procedures for Operation in the TV Bands**

### **Amendment 1: Management and Control Plane Interfaces and Procedures and Enhancement to the Management Information Base (MIB)**

Sponsor

**LAN/MAN Standards Committee**  
of the  
**IEEE Computer Society**

Approved 27 March 2014

**IEEE-SA Standards Board**

**Abstract:** This air interface, including the medium access control layer (MAC) and physical layer (PHY), of the fixed and portable point-to-multipoint wireless regional area networks (WRANs) operating in spectrum allocated to the Television Broadcasting Service in the frequency range of 54 MHz to 862 MHz is described in this amendment.

**Keywords:** broadband wireless access network, cognitive radio, fixed user terminals, IEEE 802.22a™, portable user terminals, radio spectrum sensing, regional area network, WRAN standards

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## Introduction

This introduction is not part of IEEE Std 802.22a-2014, IEEE Standard for Information Technology—Telecommunications and information exchange between systems—Wireless Regional Area Networks(WRAN)—Specific requirements—Part 22: Cognitive Wireless RAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Policies and Procedures for Operation in the TV Bands—Amendment 1: Management and Control Plane Interfaces and Procedures and Enhancement to the Management Information Base (MIB).

This amendment to IEEE Std 802.22-2011 defines a new clause for Management and Control Plane interfaces and procedures for operation in very high frequency and ultra-high frequency (VHF/UHF) television (TV) broadcast bands between 54 MHz and 862 MHz. The Management Information Base (MIB) structure enhancement includes changes to comply with the ASN.1 format and support for the new clause. Modifications to the existing clause on primitives for cognitive radio capabilities (Clause 10) to align it with the content in the MIB clause (Clause 13) and the new clause (Clause 14) are also defined.

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Telecommunications and information exchange  
between systems  
Wireless Regional Area Networks (WRAN)—  
Specific requirements

## Part 22: Cognitive Wireless RAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Policies and Procedures for Operation in the TV Bands

### Amendment 1: Management and Control Plane Interfaces and Procedures and Enhancement to the Management Information Base (MIB)

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<sup>1</sup> Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

## 5 System architecture

### 5.2 Management reference architecture

*Change the second paragraph of 5.2 as follows:*

Figure 5 shows an example of a management reference model for WRANs. ~~This example~~ consists of a Network Management System (NMS), a Network Control System (NCS), and managed nodes. The BS and CPEs shall collect and store the managed objects (see 5.2.4) in the format as defined in the WRAN Management Information Base (MIB). The MIB is defined and specified in Clause 13. The Network Control System contains the service flow and the associated QoS information that is pre-populated in service classes at the BS and instantiated when a CPE requests services.

*Change the fourth paragraph of 5.2 as follows:*

In the management reference architecture example in Figure 5, management information that is stored in the form of MIBs must be conveyed using SNMP messages. Use of MIBs to define the structure of management information and SNMP to convey this data is optional. If MIBs and the SNMP are not used to store and transport management information, the network operator and device manufacturers will have to specify another means to enable management functions. The management information between the CPE and the BS may be carried over a secondary management connection. The management information can also be conveyed using the normal SNMP messages.

*Change 5.2.1 as follows:*

#### 5.2.1 Service access primitives (SAPs)~~PHY/MAC to NCMS interface~~

In the Management/Control Plane, the NCMS is interfaced to the MAC and PHY layer entities of the CPE and BS through two Service Access Primitives (SAPs). The BS and CPE shall include a Control-SAP (C-SAP) and Management-SAP (M-SAP) that provide NCMS access to the control plane and management plane functions from upper layers. The M-SAP is used for less time-sensitive Management plane primitives, and the C-SAP is used for more time-sensitive Control plane primitives. The C-SAP and M-SAP interfaces are described in 5.2.1.1 and 5.2.1.2. The NCMS uses the C-SAP and M-SAP to interface with the IEEE 802.22 managed nodes.

In the Cognitive Plane, the SM is interfaced with the SSA through two SAPs. The SM uses the SM-SSF SAP to interface with the Spectrum Sensing Function on the SSA and the SM-GL SAP to interface with the Geolocation function on the SSA.

*Insert the following new subclauses (5.2.1.3 and 5.2.1.4) after 5.2.1.2:*

##### 5.2.1.3 SM-SSF SAP (SM-SSF-SAP)

The SM-SSF SAP includes, but is not limited to, primitives related to the following:

- Channel Sensing configuration
- Channel Sensing reporting

#### 5.2.1.4 SM-GL SAP (SM-GL-SAP)

The SM-GL SAP includes, but is not limited to, primitives related to the following:

- Geolocation fix calculation request
- Geolocation fix calculation results

#### 5.2.4 Managed objects

*Change 5.2.4 as follows:*

Managed information items are also known as “managed objects.” If managed objects are defined as MIBs (see Clause 13), the definition of them shall follow conventions The definition of managed objects in this standard is expressed in IETF RFC 2578. It supports a management protocol agnostic approach, including SNMP. If managed objects are not defined as MIBs, use of conventions defined in IETF RFC 2578 to define them is optional, and use of SNMP to transport this information is optional as well.

### 10 Cognitive radio capability

*Delete 10.7 to 10.7.6.4.2 (including Table 252 to Table 271) as follows:*

#### ~~10.7 Primitives for cognitive radio capabilities~~

##### ~~10.7.1 Database service primitives [and its subclauses]~~

~~The following ... 10.7.1.8 ... (latitude, longitude)~~

*NOTE—Information on database service primitives can now be found in 14.2.1.3.*

##### ~~10.7.2 BS configuration and monitoring primitives [and its subclauses]~~

~~The BS ... 10.7.2.4.2 ... another request.~~

*NOTE—Information on BS configuration and monitoring primitives can now be found in 14.2.1.4.*

##### ~~10.7.3 CPE reports the resulting available WRAN services list [and its subclauses]~~

~~The selection ... 10.7.3.3.2 ... another query.~~

*NOTE—Information on CPE reports the resulting available WRAN services list can now be found in 14.2.1.5.*

##### ~~10.7.4 Spectrum Sensing Services [and its subclauses]~~

~~The IEEE ... 10.7.4.3.2 ... PHY SSF.~~

*NOTE—Information on spectrum sensing function primitives can now be found in 14.2.2.1.*

## ~~10.7.5 Geolocation services [and its subclauses]~~

~~The PHY ... 10.7.5.3.2 ... another request.~~

*NOTE—Information on geolocation primitives can now be found in 14.2.3.1.*

## ~~10.7.6 Antenna primitives [and its subclauses]~~

~~Essential antenna ... 10.7.6.4.2 ... to EIRP.~~

*NOTE—Information on antenna primitives can now be found in 14.2.1.6.*

## 12 Parameters and connection management

### 12.1 Parameters, timers, message IEs

#### 12.1.1 MAC (dynamic service flow, multicast, ARQ, capability, and bandwidth management)

*Change Table 272 as follows:*

**Table 272—MAC parameters, timers, message IEs**

| Entity/<br>Scope | Name                 | Reference                                                                                                                                | Min value | Default<br>value | Max value             |
|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------|-----------------------|
| CPE, BS          | DSx Request Retries  | Number of Timeout Retries on DSA/DSC/DSD Requests.                                                                                       | —         | 3                | —                     |
| CPE, BS          | DSx Response Retries | Number of Timeout Retries on DSA/DSC/DSD Responses.                                                                                      | —         | 3                | —                     |
| CPE              | T6                   | Wait for registration response.                                                                                                          | —         | —                | 3 s                   |
| CPE, BS          | T7                   | Wait for DSA/DSC/DSD Response timeout.                                                                                                   | —         | —                | 1 s                   |
| CPE, BS          | T8                   | Wait for DSA/DSC Acknowledge timeout.                                                                                                    | —         | —                | 300 ms                |
| BS               | T9                   | Registration Timeout, the time allowed between the BS's sending a RNG-CMD (success) to a CPE and receiving a CBC-REQ from that same CPE. | 300 ms    | 300 ms           | —                     |
| CPE, BS          | T10                  | Wait for Transaction End timeout.                                                                                                        | —         | —                | 3 s                   |
| BS               | T13                  | The time allowed for an CPE, following receipt of a REG-RSP message to send a TFTP-CPLT message to the BS.                               | 15 min    | 15 min           | —                     |
| CPE              | T14                  | Wait for DSx-RSP/DSX-RVD Timeout.                                                                                                        | —         | —                | 200 ms                |
| BS               | T15                  | Wait for MCA-RSP.                                                                                                                        | 20 ms     | 20 ms            | —                     |
| CPE              | T16                  | Wait for bandwidth request grant.                                                                                                        | 10 ms     | —                | Service QoS dependent |
| CPE              | T18                  | Wait for CBC-RSP timeout.                                                                                                                | —         | 5 ms             | << T9                 |
| CPE, BS          | T22                  | Wait for ARQ-Reset.                                                                                                                      | —         | —                | 0.5 s                 |
| CPE              | T26                  | Wait for TFTP-RSP.                                                                                                                       | 10 ms     | 10 ms            | 200 ms                |

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| Entity/<br>Scope | Name                                                 | Reference                                                                                                                                                                                                                | Min value                            | Default<br>value | Max value                             |
|------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------|---------------------------------------|
| BS               | T27 as idle timer                                    | Maximum time between unicast grants to CPE when BS believes CPE upstream transmission quality is <i>good enough</i> .                                                                                                    | CPE Ranging Response Processing Time | —                | —                                     |
| BS               | T27 as active timer                                  | Maximum time between unicast grants to CPE when BS believes CPE upstream transmission quality is <i>not good enough</i> .                                                                                                | CPE Ranging Response Processing Time | —                | —                                     |
| BS               | T28                                                  | Time allowed for the BS to complete the transmission of the backup/candidate channel list to its CPEs after initial registration by a new CPE, including the database service query.                                     | —                                    | 60 s             | $\leq T45$                            |
| CPE              | CBC Request Retries                                  | Number of retries on CBC Request.                                                                                                                                                                                        | —                                    | 3                | —                                     |
|                  | DSx Flow Control                                     | Maximum # of ongoing dynamic service flow (DSx) transactions that are ongoing.                                                                                                                                           | 1                                    | 4                | Infinite                              |
|                  | MCA Flow Control                                     | Maximum # of ongoing multicast group assignment (MCA-REQ/RSP) transactions.                                                                                                                                              | 1                                    | —                | Infinite                              |
|                  | Max # of multicast groups                            | Maximum # of multicast groups the BS supports in a cell.                                                                                                                                                                 | —                                    | —                | <del>510544</del>                     |
| BS, CPE          | T30                                                  | CPE registration Timer (see 7.7.7.3.4 and 7.14.2.11).                                                                                                                                                                    | 160 ms                               | 40.8 s           | 10,485.6 s                            |
| BS, CPE          | ARQ_BSN_MODULUS                                      | Number of unique BSN values.                                                                                                                                                                                             | —                                    | $2^{10}$         | —                                     |
| BS, CPE          | ARQ_WINDOW_SIZE                                      | Max # of un-acknowledged ARQ blocks at a given time.                                                                                                                                                                     | —                                    | —                | $\leq (\text{ARQ\_BSN\_MODULUS}) / 2$ |
| BS, CPE          | ARQ_BLOCK_LIFETIME                                   | Max time interval an ARQ block shall be managed by the Tx ARQ state machine.                                                                                                                                             | 10 $\mu$ s                           | —                | 655.36 ms                             |
| BS, CPE          | ARQ_RETRY_TIMEOUT (TRANSMITTER_DELAY/RECEIVER_DELAY) | Minimum time interval a transmitter shall wait before retransmission of a unacknowledged block.                                                                                                                          | 10 $\mu$ s                           | —                | 655.36 ms                             |
| BS, CPE          | ARQ_SYNC_LOSS_TIMEOUT                                | Max amount of time ARQ_TX_WINDOW_START or ARQ_RX_WINDOW_START shall be allowed to remain at the same value before declaring a loss of synchronization of the sender and receiver state machines for an ongoing transfer. | 10 $\mu$ s                           | —                | 655.36 ms                             |
| BS, CPE          | ARQ_RX_PURGE_TIMEOUT                                 | Time interval the receiver shall wait after successful reception of a block that does not result in advancement of ARQ_RX_WINDOW_START, before advancing ARQ_RX_WINDOW_START.                                            | 10 $\mu$ s                           | —                | 655.36 ms                             |
| BS, CPE          | ARQ_BLOCK_SIZE                                       | Size of ARQ block that SDU is fragmented into.                                                                                                                                                                           | 1 octet                              | —                | 2040 octet                            |

| Entity/<br>Scope | Name                         | Reference                                                    | Min value | Default<br>value | Max value |
|------------------|------------------------------|--------------------------------------------------------------|-----------|------------------|-----------|
| BS               | Max CPE Transmit EIRP        | Maximum CPE Transmit EIRP as negotiated during registration. | −64 dBm   | —                | +63.5 dBm |
| CPE              | Registration Request Retries | Number of retries on registration requests.                  | 3         | —                | —         |
| CPE              | Request Retries              | Number of retries on bandwidth allocation requests.          | 16        | —                | —         |

### 12.1.2 PHY (initialization, operation, and DS/US synchronization)

*Change Table 273 as follows:*

**Table 273—PHY parameters, timers, message IEs**

| Entity/<br>Scope | Name                       | Reference                                                                                                                                                                                                   | Min value    | Default<br>value | Max value |
|------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|-----------|
| BS               | DCD Interval               | Time between transmission of DCD messages.                                                                                                                                                                  | —            | —                | 10 s      |
| BS               | UCD Interval               | Time between transmission of UCD messages.                                                                                                                                                                  | —            | —                | 10 s      |
| BS               | UCD Transition             | The time the BS shall wait after repeating a UCD message with an incremented Configuration Change Count before issuing a US-MAP message referring to Upstream_Burst_Profiles defined in that UCD message.   | 2 MAC frames | —                | —         |
| BS               | DCD Transition             | The time the BS shall wait after repeating a DCD message with an incremented Configuration Change Count before issuing a DS-MAP message referring to Downstream_Burst_Profiles defined in that DCD message. | 2 MAC frames | —                | —         |
| BS               | Initial Ranging Interval   | Time between Initial Ranging opportunities assigned by the BS.                                                                                                                                              | —            | —                | 2 s       |
| BS               | CLK-CMP Interval           | Time between the clock compare measurements used for the generation of CLK-CMP messages.                                                                                                                    | 50 ms        | 50 ms            | 50 ms     |
| CPE              | Lost DS-MAP Interval (T56) | Time since last received DS-MAP message before downstream synchronization is considered lost.                                                                                                               | —            | —                | 600 ms    |
| CPE              | Lost US-MAP Interval (T57) | Time since last received US-MAP message before upstream synchronization is considered lost.                                                                                                                 | —            | —                | 600 ms    |
| CPE              | Lost SCH (T58)             | Number of SCH that can be lost until synchronization is considered lost.                                                                                                                                    | —            | —                | 15        |
| CPE              | CDMA Ranging Retries       | Number of retries on CDMA Ranging Requests.                                                                                                                                                                 | 1            | —                | 4         |
| CPE, BS          | Invited Ranging Retries    | Number of retries on inviting Ranging Requests.                                                                                                                                                             | 16           | —                | —         |
| BS               | US-MAP Process Time        | Time provided between arrival of the last bit of a US-MAP at a CPE and effectiveness of that map.                                                                                                           | 5 symbols    | —                | —         |

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| Entity/<br>Scope | Name                                 | Reference                                                                                                                                                             | Min value                     | Default<br>value                    | Max value                      |
|------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|--------------------------------|
| BS               | CPE Ranging Response Processing Time | Time allowed for a CPE following receipt of a ranging response before it is expected to reply to an invited ranging request.                                          | 10 ms                         | —                                   | —                              |
| CPE              | T1                                   | Wait for DCD timeout.                                                                                                                                                 | —                             | —                                   | 5 × DCD interval maximum value |
| CPE              | T2                                   | Wait for broadcast ranging timeout.                                                                                                                                   | —                             | —                                   | 5 × ranging interval           |
| CPE              | T3                                   | Ranging Response reception timeout following the transmission of a Ranging Request.                                                                                   | —                             | 200 ms                              | 200 ms                         |
| CPE              | T4                                   | Wait for unicast ranging opportunity. If the pending-until-complete field was used earlier by this CPE, then the value of that field shall be added to this interval. | 1 s                           | 30 min (fixed)<br>10 min (portable) | 30 min                         |
| BS               | T5                                   | Wait for Upstream Channel Change response.                                                                                                                            | —                             | —                                   | 2 s                            |
| CPE              | T12                                  | Wait for UCD descriptor.                                                                                                                                              | —                             | —                                   | 5 × UCD Interval maximum value |
| CPE              | T20                                  | Time the CPE searches for preambles on a given channel.                                                                                                               | 2 MAC frames                  | —                                   | —                              |
| CPE              | T21                                  | Time the CPE searches for DS-MAP on a given channel.                                                                                                                  | —                             | —                                   | 10 s                           |
| BS               | EIRP <sub>BS</sub>                   | EIRP of BS (DS).                                                                                                                                                      | −64 dBm                       | —                                   | 63.5 dBm                       |
| BS               | TTG                                  | <u>Transmit-receive Turnaround Gap.</u><br><del>Transmit/Receive Transition Gap</del>                                                                                 | <u>—</u><br><del>105 μs</del> | 210 μs                              | <u>—</u><br><del>333 μs</del>  |
| CPE              | RTG                                  | <u>Receive-transmit Turnaround Gap.</u>                                                                                                                               | <u>81.8 μs</u>                | <u>—</u>                            | <u>303.5 μs</u>                |
| BS               | DIUC Mandatory Exit Threshold        | CINR at or below which this DIUC can no longer be used and where change to a more robust DIUC is required.                                                            | −64 dB                        | —                                   | +63.5 dB                       |
| BS               | DIUC Mandatory Entry Threshold       | The minimum CINR required to start using this DIUC when changing from a more robust DIUC is required.                                                                 | −64 dB                        | —                                   | +63.5 dB                       |
| BS               | Boosting                             | Boosting applied to a DS allocation.                                                                                                                                  | −12 dB                        | 0 dB                                | +9 dB                          |
| BS, CPE          | BW Request Backoff Start             | Initial size of BW Request opportunity used by CPEs to contend to send BW requests to BS.                                                                             | 0                             | —                                   | 15                             |
| BS, CPE          | BW Request Backoff End               | Final size of BW Request opportunity used by CPEs to contend to send BW requests to BS.                                                                               | <u>0</u><br><del>1</del>      | —                                   | 15                             |
| BS, CPE          | UCS Notification Backoff Start       | Initial backoff window size in units of UCS Notification opportunity used by CPEs to contend to send UCS notifications to BS.                                         | 0                             | —                                   | 15                             |
| BS, CPE          | UCS Notification Backoff End         | Final size of UCS Notification opportunity used by CPEs to contend to send UCS Notification to BS.                                                                    | <u>0</u><br><del>1</del>      | —                                   | 15                             |

| Entity/<br>Scope | Name                                      | Reference                                                                                                                                      | Min value | Default<br>value | Max value |
|------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------|-----------|
| BS, CPE          | Contention-based reservation Timeout      | Number of US-MAPs to receive before contention-based reservation is attempted again for the same connection.                                   | 0+        | —                | 255       |
| BS, CPE          | BW Request opportunity size               | Size (in OFDM slots) of PHY bursts, that a CPE may use to format and transmit a bandwidth request message in a contention request opportunity. | 0+        | —                | 255       |
| BS, CPE          | UCS Notification request opportunity size | Size (in OFDM slots) of PHY bursts that a CPE may use to transmit a UCS Notification.                                                          | 0+        | —                | 255       |
| BS, CPE          | # of initial ranging codes                | Number of initial ranging CDMA codes (N).                                                                                                      | 0+        | —                | 255       |
| BS, CPE          | # of periodic ranging codes               | Number of periodic ranging CDMA codes (M).                                                                                                     | 0+        | —                | 255       |
| BS, CPE          | # of bandwidth request codes              | Number of bandwidth request CDMA codes (L).                                                                                                    | 0+        | —                | 255       |
| BS, CPE          | # of UCS notification codes               | Number of UCS notification CDMA codes (I).                                                                                                     | 0+        | —                | 255       |
| BS, CPE          | Start of CDMA codes group                 | Indicates the starting number, S, of the group of codes used for the US.                                                                       | 0         | See 6.10.3<br>—  | 255       |
| BS, CPE          | EIRP Density Level                        | EIRP Transmitted per subcarrier.                                                                                                               | −104 dBm  | —                | +23.5 dBm |
| BS, CPE          | EIRP Control                              | EIRP per subcarrier that the CPE should apply to correct its current transmission EIRP.                                                        | −104 dBm  | —                | +23.5 dBm |
| BS               | EIRP Per subcarrier                       | EIRP transmitted per subcarrier.                                                                                                               | −104 dBm  | —                | +23.5 dBm |

### 12.1.3 Coexistence

*Change Table 274 as follows:*

**Table 274—Coexistence parameters, timers, message IEs**

| Entity/<br>Scope | Name                 | Reference                                                                                                                                                | Min value    | Default<br>value | Max value       |
|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|-----------------|
| BS               | <del>Tsc (T33)</del> | <del>Time between transmission of the broadcast message of the operating backup and candidate channel sets for the purposes of spectrum etiquette.</del> | —            | —                | <del>60 s</del> |
| BS               | T32                  | Wait for the Frame Contention Response message.                                                                                                          | 1 superframe | —                | 32 superframes  |

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| Entity/<br>Scope | Name                      | Reference                                                                                                                                                                                                                                                                                                                                  | Min value    | Default<br>value | Max value      |
|------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|----------------|
| BS               | FCW                       | Frame Contention Window: number of superframes during which a BS (FC_DST) accumulates the frame contention requests before reacting to it and responding to the FC_SRCs.                                                                                                                                                                   | 0 superframe | —                | 16 superframes |
| BS               | SCWBackoff_Max            | Integer denoting the maximum superframes for the SCW backoff window.                                                                                                                                                                                                                                                                       | <u>0</u>     | —                | <u>15</u>      |
| BS               | Frame_Contention_Min      | Number of frames not available for contention at a BS in a coexistence situation.                                                                                                                                                                                                                                                          | 0            | 2                | 8              |
| BS               | FCN_range                 | Exponent in base 2 defining the extent of the range of the random number FCN.                                                                                                                                                                                                                                                              | 4            | —                | 16             |
| BS               | SF_release                | Number of superframes after which the BS releases the frames won by another BS through frame contention.                                                                                                                                                                                                                                   | —            | 5                | —              |
| CPE              | T <sub>CBP</sub><br>(T34) | The minimum time between transmissions of a CBP packet carrying its MAC address for identification by nearby CPEs and BSs for coexistence purpose, as well as by spectrum monitoring systems to identify potential interference situations. Timing value may depend on the regulatory domain where the WRAN system operates (see Annex A). | 8 s          | —                | 15 min         |
| BS               | SCWBackoff_Timer (T35)    | Backoff timer that controls exiting or continuation of Frame contention procedure.                                                                                                                                                                                                                                                         | —            | —                | SCWBackoff_Max |

#### 12.1.4 Security

*Change Table 275 as follows:*

**Table 275—Security parameters, timers, message IEs**

| Entity/<br>Scope | Name                             | Reference                                                                                                      | Min value        | Default<br>value  | Max value                                                     |
|------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------|------------------|-------------------|---------------------------------------------------------------|
| CPE              | EAP Authentication Timer (T36)   | Timeout period between sending SCM EAP-Start or EAP-Transfer (8.2.2.5).                                        | 2 s              | 10 s              | 30 s                                                          |
| CPE              | Authentication Grace Timer (T37) | Amount of time after authentication is complete that must pass before re-authentication is complete (8.2.2.5). | 5 min<br>(300 s) | 10 min<br>(600 s) | <del>6 h (21,600 s)</del><br><del>35 days (3,024,000 s)</del> |
| CPE              | Max #of Authentication Attempts  | Maximum # of Times a CPE is allowed to attempt EAP Authentication (8.2.2.5).                                   | <del>1 s</del>   | <del>5 s</del>    | <del>10 s</del>                                               |
| CPE              | Operational Wait Timeout (T38)   | Timeout period between sending of Key Request messages from the Op Wait state (8.2.3.2.4).                     | 1 s              | 1 s               | 10 s                                                          |
| CPE              | Rekey Wait Timeout (T39)         | Timeout period between sending of Key Request messages from the Rekey Wait state (8.2.3.2.4).                  | 1 s              | 1 s               | 10 s                                                          |
| CPE              | GTEK/TEK Grace Time (T40)        | Time interval, in seconds before the estimated expiration of a GTEK/TEK (8.2.3.2.4).                           | 5 min<br>(300 s) | 1 h<br>(3600 s)   | 3.5 days<br>(302,400 s)                                       |

| Entity/<br>Scope | Name                                      | Reference                                                                                                           | Min value                                         | Default<br>value      | Max value                                                 |
|------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------|-----------------------------------------------------------|
| BS               | AK Lifetime                               | Lifetime BS assigns to new AK.                                                                                      | 1 day<br>(86,400 s)                               | 7 days<br>(604,800 s) | 70 days<br>(6,048,000 s)                                  |
| BS               | TEK Lifetime                              | Lifetime BS assigns to new TEK.                                                                                     | 30 min<br>(1800 s)                                | 12 h<br>(43,200 s)    | 7 days<br>(604,800 s)                                     |
| BS, CPE          | SCM Flow Control                          | The maximum number of concurrent SCM transactions.                                                                  | 0<br>(Default:<br>unlimited # of<br>transactions) | —                     | 255                                                       |
| BS, CPE          | Number of Supported Security Associations | The maximum # of supported security associations.                                                                   | 2                                                 | —                     | 2+m where<br>m is the<br>number of<br>multicast<br>groups |
| BS, CPE          | PN_WINDOW_SIZE                            | Window that defines the acceptable PNs for received PDUs that are to be processed by encryption/decryption process. | 16                                                | —                     | 512                                                       |
| BS               | T17                                       | Time allowed for CPE to complete CPE Authorization and Key Exchange.                                                | 5 min                                             | 5 min                 | —                                                         |

#### 12.1.5 Cognitive radio capabilities (SM, SSA, incumbent protection, QP management)

*Change Table 276 as follows:*

**Table 276—Cognitive radio capability parameters, timers, message IEs**

| Entity/<br>Scope | Name                            | Reference                                                                                                                                                                                                                                                                                                           | Min value      | Default<br>value | Max value |
|------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|-----------|
| <del>CPE</del>   | <del>T19</del>                  | <del>Time DS channel remains unusable.</del>                                                                                                                                                                                                                                                                        | —              | —                | —         |
| CPE              | T29                             | Wait for BLM-ACK timeout.                                                                                                                                                                                                                                                                                           | 10 ms          | —                | 300 ms    |
| BS               | T31                             | Wait for BLM-REP timeout.                                                                                                                                                                                                                                                                                           | 1 MAC<br>Frame | —                | —         |
| CPE              | BLM-REP Retries                 | Number of retries allowed for sending BLM-REP.                                                                                                                                                                                                                                                                      | —              | 3                | —         |
| BS, CPE          | Channel Availability Check Time | The time during which a channel SHALL be checked for the presence of licensed incumbent signals having a level above the Incumbent Detection Threshold prior to the commencement of WRAN operation in that channel and, in the case of TV, a related channel at an EIRP level that can affect the measured channel. | —              | 30 s             | —         |
| BS, CPE          | Non-Occupancy Period            | The required period during which WRAN device transmissions SHALL NOT occur in a given channel because of the detected presence of an incumbent signal in that channel above the Incumbent Detection Threshold, or in the case of TV, above a given EIRP level.                                                      | 10 min         | —                | —         |

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| Entity/<br>Scope | Name                                                            | Reference                                                                                                                                                                                                                                                                                                                                                           | Min value | Default<br>value                                                                                            | Max value |
|------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------|-----------|
| BS, CPE          | Channel Detection Time                                          | The maximum time taken by a WRAN device to detect a licensed incumbent signal above the Incumbent Detection Threshold within a given channel during normal WRAN operation.                                                                                                                                                                                          | —         | $\leq 2$ s<br>to $\geq 90\%$<br>Probability<br>of Detection<br>with a False<br>Alarm rate<br>of $\leq 10\%$ | —         |
| BS, CPE          | Channel Setup Time                                              | The window of time that may be taken by a WRAN CPE to transmit control information to a WRAN base station in order to establish operation with that base station at the prescribed power or, in the case of TV, at or below the allowable EIRP within a given channel.                                                                                              | —         | 2 s                                                                                                         | —         |
| BS, CPE          | Channel Opening Transmission Time (Aggregate transmission time) | The aggregate duration of control transmissions by WRAN devices during the Channel Setup Time, which starts at the end of the Channel Availability Check Time.                                                                                                                                                                                                      | —         | 100 ms                                                                                                      | —         |
| BS, CPE          | Channel Move Time (In-service monitoring)                       | The time taken by a WRAN system to cease all interfering transmissions on the current channel upon detection of a licensed incumbent signal above the relevant Incumbent Detection Threshold, or in the case TV, to alternatively reduce its EIRP to that which is allowable within a given channel upon detection of a TV signal in the same or a related channel. | —         | 2 s                                                                                                         | —         |
| BS, CPE          | Channel Closing Transmission Time (Aggregate transmission time) | The aggregate duration of control transmissions by the WRAN devices during the Channel Move/EIRP Reduction Time, which starts upon detection of a licensed incumbent signal above the relevant Incumbent Detection Threshold.                                                                                                                                       | —         | 100 ms                                                                                                      | —         |
| BS, CPE          | Channel Number                                                  | The channel number to be sensed by the SSF (10.4).                                                                                                                                                                                                                                                                                                                  | 0         | —                                                                                                           | 255       |
| BS, CPE          | Channel Bandwidth                                               | The bandwidth of the channel to be sensed by the SSF (10.4).                                                                                                                                                                                                                                                                                                        | —         | 6/7/8 MHz<br>(depending<br>on<br>regulatory<br>domain)                                                      | —         |
| BS, CPE          | Maximum Probability of false alarm                              | In sensing modes 0 and 1 this value specifies the maximum probability of false alarm for each sensing mode decision in the signal present array.                                                                                                                                                                                                                    | 0.0       | —                                                                                                           | 0.255     |
| BS, CPE          | NumSensingPeriods                                               | Number of sensing periods field in a Sensing Window Specification Array entry.                                                                                                                                                                                                                                                                                      | 0         | 1                                                                                                           | 127       |
| BS, CPE          | SensingPeriodDuration                                           | Duration of sensing period field (in units of OFDM symbols) in a Sensing Window Specification Array entry.                                                                                                                                                                                                                                                          | 0         | 16                                                                                                          | 1023      |
| BS, CPE          | SensingPeriodInterval                                           | Periodicity of Sensing period field in a Sensing Window Specification Array entry.                                                                                                                                                                                                                                                                                  | 0         | 200                                                                                                         | 2047      |

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| Entity/<br>Scope | Name                                              | Reference                                                                                                                                                                                                    | Min value                                                                | Default<br>value                                            | Max value                                                                 |
|------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------|
| BS, CPE          | Sensing Window Specification Array                | Array containing Sensing Window specification for each signal type enumerated in Signal Type Array.                                                                                                          | 1×sizeof (NumSensingPeriods+SensingPeriodDuration+SensingPeriodInterval) | —                                                           | 32×sizeof (NumSensingPeriods+SensingPeriodDuration+SensingPeriodInterval) |
| BS, CPE          | Signal Type Array                                 | Bitmap that indicates which signal types are to be sensed for in a given regulatory domain.                                                                                                                  | —                                                                        | Set on a regulatory domain-by-domain basis (see Table A.11) | —                                                                         |
| BS, CPE          | Sensing Mode                                      | The sensing mode a CPE supports. Negotiated during CPE initialization. Various modes are described in Table 238.                                                                                             | —                                                                        | No Sensing                                                  | —                                                                         |
| BS, CPE          | Signal Present Decision                           | Indication of whether a signal of a specific type has been detected. All unused values are reserved.                                                                                                         | 0x00 (Absent)                                                            | 0x7F (No Decision could be made)                            | 0xFF (Signal Present)                                                     |
| BS, CPE          | Confidence Metric                                 | Confidence with which sensing can determine the signal type.                                                                                                                                                 | 0x00 (No Confidence)                                                     | —                                                           | 0xFF (Full confidence)                                                    |
| BS, CPE          | Mean RSSI                                         | Mean of M RSSI measurements.                                                                                                                                                                                 | −104 dBm                                                                 | —                                                           | +23.5 dBm                                                                 |
| BS, CPE          | Standard Deviation of RSSI                        | Standard deviation of the M RSSI measurements.                                                                                                                                                               | +0.0 dB                                                                  | —                                                           | +25.5 dB                                                                  |
| BS, CPE          | RSSI <sub> detection<sub> threshold</sub></sub>   | Energy detection threshold indicating the presence of an incumbent, other WRAN system, or interference.                                                                                                      | −120 dBm                                                                 | —                                                           | −10 dBm                                                                   |
| BS, CPE          | Microphone Protection Radius                      | Radius of the contour within which the WRAN system cannot operate due to potential interference with the microphone.                                                                                         | 0.1 km                                                                   | —                                                           | 100 km                                                                    |
| BS, CPE          | T <sub>Candidate_Channel_Refresh</sub> (T41)      | Maximum time interval allowed before sensing is performed on the candidate channel to ensure that no incumbents are detected.                                                                                | 1 s                                                                      | 6 s                                                         | 10 s                                                                      |
| BS, CPE          | T <sub>Backup_Channel_Refresh</sub> (T42)         | Maximum time interval allowed before sensing is performed on the backup channel to ensure that no incumbents are detected.                                                                                   | 1 s                                                                      | 6 s                                                         | 10 s                                                                      |
| BS, CPE          | T <sub>Candidate_to_Backup_Transition</sub> (T43) | Minimum time duration without detection of any incumbent for a candidate channel to transition to the backup channel.                                                                                        | 1 s                                                                      | 30 s                                                        | 100 s                                                                     |
| BS, CPE          | T <sub>Ch_Move</sub> (T44)                        | Maximum time to ensure that the channel move information is successfully conveyed to all the associated CPEs and BS (self-coexistence mode).                                                                 | 1 s                                                                      | —                                                           | 10 s                                                                      |
| BS, CPE          | T <sub>No_DB</sub> (T45)                          | Maximum WRAN operation time without access to the incumbent database service.                                                                                                                                | 0.1 h                                                                    | —                                                           | 72 h                                                                      |
| BS               | T <sub>Wait_Before_Channel_Move</sub> (T46)       | Waiting time before which the BS moves to the first backup channel. This is used to make sure that all the CPEs are ready to move to the backup channel before BS switches operation to this backup channel. | 1 frame                                                                  | —                                                           | 256×16 frames                                                             |

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| Entity/<br>Scope | Name                                           | Reference                                                                                                                                                                                                                                                                                                                                                                          | Min value | Default<br>value | Max value     |
|------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------|---------------|
| CPE              | $T_{\text{Wait\_Before\_Channel\_Move}}$ (T59) | Waiting time before which the CPE moves to its backup channels if it no longer hears from its BS. This is used to make sure that the CPE waits long enough after its UCS Notification so that the BS has had time to move to a backup channel, if it decided to do so.                                                                                                             | 1 frame   | —                | 256×16 frames |
| BS, CPE          | $T_{\text{Refresh\_Database\_Info}}$ (T47)     | The prescribed time by the WRAN operator to refresh the incumbent database service.                                                                                                                                                                                                                                                                                                | 0.1 h     | —                | 72 h          |
| BS, CPE          | $T_{\text{Clear\_N}}$ (T48)                    | Lapser Timer keeps track of whether the Operating Channel N has been cleared using spectrum sensing.                                                                                                                                                                                                                                                                               | 0.1 s     | —                | 60 s          |
| BS, CPE          | $T_{\text{Clear\_N-1}}$ (T49)                  | Lapser Timer keeps track of whether the Adjacent Channel N–1 has been cleared using spectrum sensing.                                                                                                                                                                                                                                                                              | 0.1 s     | —                | 60 s          |
| BS, CPE          | $T_{\text{Clear\_N+1}}$ (T50)                  | Lapser Timer keeps track of whether the Adjacent Channel N+1 has been cleared using spectrum sensing.                                                                                                                                                                                                                                                                              | 0.1 s     | —                | 60 s          |
| BS, CPE          | $T_{\text{Loss\_of\_BS\_Contact}}$ (T51)       | Initiated when the CPE loses contact with the BS.                                                                                                                                                                                                                                                                                                                                  | 1 s       | —                | 600 s         |
| BS, CPE          | $T_{\text{Range1}}$ (T52)                      | Used for terrestrial geolocation. Initiated when the downstream burst leaves the BS (i.e., at the start of the frame preamble).                                                                                                                                                                                                                                                    | 1 TU      | —                | 1000 TU       |
| BS, CPE          | $T_{\text{INsents}}$ (T53)                     | The parameter $T_{\text{INsents}}$ is used to verify that in-band sensing has been done within the required In-service monitoring period. The $T_{\text{INsents}}$ parameter is driven by the regulatory domain requirements. See Annex A.                                                                                                                                         | 0.1 s     | —                | 60 s          |
| BS, CPE          | $T_{\text{OUTsents}}$ (T54)                    | The parameter $T_{\text{OUTsents}}$ is used to verify that out-of-band sensing has been done within the required “Acquiring a channel monitoring period” specified in Annex A, Table A.13 (30 s in the US). This value would be used to either initialize a “lapse timer” for each channel in the backup/candidate list at each CPE so that it is compared to $T_{\text{sents}}$ . | 0.1 s     | —                | 60 s          |
| BS, CPE          | $T_{\text{sentsin}}$ (T55)                     | $T_{\text{sentsin}}$ parameter corresponds to the maximum length of time required to carry out the sensing process on an in-band channel (N, N–1, or N+1). Manufacturers need to specify the sensing time required to detect the specified signals with required accuracy (see Figure 176).                                                                                        | 1 ms      | —                | 160 ms        |
| CPE              | $T_{\text{sentsout}}$ (T60)                    | $T_{\text{sentsout}}$ parameter corresponds to the maximum length of time required to carry out an out-of-band sensing process for a specified channel N (i.e., N, N–1, and N+1). Manufacturers need to specify the sensing time required to detect the specified signals out-of-band with required accuracy (see Figure 178).                                                     | 20 ms     | —                | 160 ms        |
| BS, CPE          | ISO 3166 IETF Country Code                     | 3-character, ASCII string denoting the regulatory domain of operation (e.g., “USA” is for United States of America).                                                                                                                                                                                                                                                               | —         | 3 characters     | —             |

| Entity/<br>Scope | Name              | Reference                                                                                                                                                                                                                                                                                                                                                       | Min value | Default<br>value | Max value |
|------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------|-----------|
| BS, CPE          | TA <sub>CBP</sub> | Timing Advance of the CBP burst (see step 2 of 10.5.2.3). Note that the geolocation process will have to pre-adjust TA <sub>CBP</sub> depending on the distance between the two CPE to be geolocated and the reference CPEs so that the delays measured by Vernier <sub>3</sub> fall within the symbol cyclic prefix (e.g., 74.68 μs corresponding to 22.4 km). | −1024 TU  | —                | +1024 TU  |

### 13 MIB structure

*Change the third list item in the dashed list in the preliminary text of Clause 13 as follows:*

- ~~wranIfBsSfMgmtMib: wranIfBsSfMgmt~~ Basic MIB for managing items related to Service Flow configuration, instantiation, and management

### 13.1 MIB description

#### 13.1.1 wranDevMib

*Change the dashed list in 13.1.1 as follows:*

- wranDevBsObjects: MIB objects to be implemented by the SNMP agent in BS
- wranDevCpeObjects: MIB objects to be implemented by the SNMP agent in CPE
- wranDevCommonObjects: MIB objects to be implemented by the SNMP agent in BS/CPE
- ~~wranDevMibConformance: MIB objects related to conformance~~

#### 13.1.1.1 wranDevBsObjects

##### 13.1.1.1.1 wranDevBsSoftwareUpgradeTable

##### 13.1.1.1.1.1 wranDevBsSoftwareUpgradeEntry

*Change 13.1.1.1.1.9 as follows:*

##### 13.1.1.1.1.1.9 wranDevBsSoftwareUpgradeTimeStamp

This value is a timestamp to indicate when the last SW ~~download~~ or activation took place.

*Change 13.1.1.1.2 and its subclauses as follows:*

#### **13.1.1.1.2 wranDevBsNotification**

This group of objects relates to SNMP traps on the BS. There is a control element that enables/disables the traps (wranDevBsTrapControl) and ~~whether or not what event information is logged when a trap is sent~~ (wranDevBsTrapDefinition) ~~when an event is logged~~.

##### **13.1.1.1.2.1 wranDevBsTrapControl**

Defines control elements for traps. This is a 2-bit field that enables setting a trap to indicate when a BS event is logged (wranDevBsEvent) or when a event log buffer size overruns the configured threshold (wranDevBsLogBuffExceedThreshold).

##### **~~13.1.1.1.2.2~~ 13.1.1.1.2.1.1 wranDevBsTrapDefinitionwranDevBsTrapPrefix**

This object groups all of the notification objects for the BS. It is defined to be compatible with SNMPv1, following Sections 8.5 and 8.6 of IETF RFC 2758. It is a compound object made up of the contents of a logged BS event (wranDevBsEventTrap) and the indication of when the ratio of the portion used to total size of event log has been exceeded (wranDevBsLogBuffExceedThresholdTrap).

##### **~~13.1.1.1.2.1.2~~ wranDevBsTrapControlRegister**

This is ... ~~wranDevBsLogBuffExceedThresholdTrapControl~~.

##### **~~13.1.1.1.2.2~~ wranDevBsEventTrapControl**

This trap ... ~~wranDevCmnEventTable~~.

##### **~~13.1.1.1.2.2.1~~ wranDevBsEventTrap**

This object is a compound object that contains information that describes the event that is logged. This trap is caught when wranDevBsEvent in wranDevBsTrapControl is set.

##### **~~13.1.1.1.2.2.2~~ 13.1.1.1.2.2.1 wranDevBsLogBuffExceedThresholdTrap**

This trap is sent when the size of the event log buffer is greater than the configured threshold object is a compound object that indicates the index of an entry (defined by wranDevCmnEventLogEntry) in wranDevCmnEventLogConfigTable and the object in that entry that defines the ratio (defined by wranDevCmnEventLogResidualBuffThreshold) of used capacity in Event Log versus total capacity. This trap is caught when wranDevBsLogBuffExceedThreshold in wranDevBsTrapControl is set.

### 13.1.1.2 wranDevCpeObjects

*Change 13.1.1.2.2 and its subclauses as follows:*

#### 13.1.1.2.2 wranDevCpeNotification

This group of objects relates to SNMP traps on the BSCPE. There is a control element that enables/disables the traps (wranDevCpeTrapControl) and whether or not what event information is logged when a trap is sent (wranDevCpeTrapDefinition) when an event is logged.

##### 13.1.1.2.2.1 wranDevCpeTrapControl

Defines control elements for traps. This is a 2-bit field that enables setting a trap to indicate when a CPE event is logged (wranDevCpeEvent) or when a event log buffer size overruns the configured threshold (wranDevCpeLogBuffExceedThreshold).

##### 13.1.1.2.2.1.1 wranDevCpeTrapDefinition~~wranDevCpeTrapPrefix~~

This object groups all of the notification objects for the BSCPE. It is defined to be compatible with SNMPv1, following Sections 8.5 and 8.6 of IETF RFC 2758. It is a compound object made up of the contents of a logged BS event (wranDevCpeEventTrap) and the indication of when the ratio of the portion used to total size of event log has been exceeded (wranDevCpeLogBuffExceedThresholdTrap).

##### 13.1.1.2.2.1.2 wranDevCpeEventTrap~~wranDevCpeTrapControlRegister~~

This object is a compound object that contains information that describes the event that is logged. This trap is caught when wranDevCpeEvent in wranDevCpeTrapControl is set. ~~This is a 2-bit bitmap that enables the two BS traps that are available: wranDevCpeEventTrapControl, wranDevBsLogBuffExceedThresholdTrapControl.~~

##### 13.1.1.2.2.1.3 wranDevCpeLogBuffExceedThresholdTrap

This object is a compound object that indicates the index of an entry (defined by wranDevCmnEventLogEntry) in wranDevCmnEventLogConfigTable and the object in that entry that defines the ratio (defined by wranDevCmnEventLogResidualBuffThreshold) of used capacity in Event Log versus total capacity. This trap is caught when wranDevCpeLogBuffExceedThreshold in wranDevCpeTrapControl is set.

##### 13.1.1.2.2.2 wranDevCpeEventTrapControl

~~This trap ... wranDevCmnEventTable.~~

##### 13.1.1.2.2.2.1 wranDevBsLogBuffExceedThresholdTrap

~~This trap ... configured threshold.~~

### 13.1.1.3 wranDevCommonObjects

#### 13.1.1.3.1 wranDevCmnEventLog

##### 13.1.1.3.1.1 wranDevCmnEventLogConfigTable

*Change the subclauses of 13.1.1.3.1.1 as follows:*

##### 13.1.1.3.1.1.1 wranDevCmnEventLogConfigEntry

This object ... wranDevCmnDeviceIndex.

##### ~~13.1.1.3.1.1.1.1~~ ~~13.1.1.3.1.1.1.2~~ wranDevCmnDeviceIndex

Index value ... wranDevCmnEventLogConfigTable.

##### ~~13.1.1.3.1.1.1.2~~ ~~13.1.1.3.1.1.1.3~~ wranDevCmnEventLogEntryLimit

Maximum number ... is reached.

##### ~~13.1.1.3.1.1.1.3~~ ~~13.1.1.3.1.1.1.4~~ wranDevCmnEventLogLifeTimeLimit

A value of 0 means that an entry is kept indefinitely. Any other value, it is the maximum time an entry can exist in wranDevCmnEventLogTable. If this value is changed while entries exist in wranDevCmnEventLogTable, entries older than this limit will be discarded.

##### ~~13.1.1.3.1.1.1.4~~ ~~13.1.1.3.1.1.1.5~~ wranDevCmnEventLogEntryLimitPerEventId

The number ... per event.

##### ~~13.1.1.3.1.1.1.5~~ ~~13.1.1.3.1.1.1.6~~ wranDevCmnEventLogSeverityThreshold

Minimum severity ... Event Log.

##### ~~13.1.1.3.1.1.1.6~~ ~~13.1.1.3.1.1.1.7~~ wranDevCmnEventLogWrapAroundBuffEnable

Indication of ... when full.

##### ~~13.1.1.3.1.1.1.7~~ ~~13.1.1.3.1.1.1.8~~ wranDevCmnEventLogLatestEvent

Index of ... Event Log.

##### ~~13.1.1.3.1.1.1.8~~ ~~13.1.1.3.1.1.1.9~~ wranDevCmnEventLogPersistenceSupported

Indication of ... of device.

##### ~~13.1.1.3.1.1.1.9~~ ~~13.1.1.3.1.1.1.10~~ wranDevCmnEventLogResidualBuffThreshold

Threshold ratio ... is issued.

#### 13.1.1.3.1.2 wranDevCmnEventTable

*Change 13.1.1.3.1.2.1 as follows:*

##### 13.1.1.3.1.2.1 wranDevCmnEventEntry

This object defines the parameters of an event entry in the `wranDevCmnEventTable`. Each entry is indexed by ~~`wranDevCmnDeviceIndex` and `wranDevCmnEventIdentifier`~~.

#### 13.1.1.3.1.3 wranDevCmnEventLogTable

*Change 13.1.1.3.1.3.1 and 13.1.1.3.1.3.1.1 as follows:*

##### 13.1.1.3.1.3.1 ~~wranDevCmnEventLogEntry~~wranDevCmnEventEntry

Each entry ... several parameters.

###### 13.1.1.3.1.3.1.1 wranDevCmnEventId

A counter used to index entries in the Event Log. When it reaches the maximum value, it will ~~with~~-wrap-around if configured to wrap-around or the log will be flushed if it is not configured to wrap-around.

*Change 13.1.1.3.2 as follows:*

#### 13.1.1.3.2 wranDevCmnSnmpAgent

This compound object deals with the common objects (`wranDevCmnSnmpAgent` and `wranDevCmnSnmpV1V2TrapDestTable`) related to SNMP agent configuration.

*Change 13.1.1.3.3 and its subclauses as follows:*

#### 13.1.1.3.3 wranDevCmnDeviceConfig

This compound attribute contains the following:

- `wranDevCmnResetDevice`: Object that is used to reset the device
- ~~`wranDevMibGroups`~~`wranDevMibConformance`: MIB objects that are required for conformance
- `wranDevMibCompliance`: MIB objects that are required for conformance

##### 13.1.1.3.3.1 wranDevCmnResetDevice

There are ... reset itself.

##### 13.1.1.3.3.2 ~~wranDevMibGroups~~wranDevMibConformance

This object ... each group.

**13.1.1.3.3.2.1 wranDevMibBsGroup**

This MIB group is mandatory. It is made up of wranDevBsTrapControl.  
~~wranDevBsTrapControlRegister.~~

**13.1.1.3.3.2.2 wranDevMibBsSwUpgradeGroup**

This MIB group is ~~mandatory~~<sup>optional</sup>. It is a compound object made up of wranDevBsVendorId, wranDevBsHwId, wranDevBsCurrentSwVersion, wranDevBsDownloadSwVersion, wranDevBsUpgradeFileName, wranDevBsSoftwareUpgradeAdminState, wranDevBsDownloadSwProgress, wranDevBsSoftwareUpgradeTimeStamp. It contains the values of the most recent/current entry in wranDevBsSoftwareUpgradeTable.

**13.1.1.3.3.2.3 wranDevMibCpeGroup**

This MIB group is mandatory. It is a compound object made up of wranDevCpeMicConfigSetting, ~~wranDevCpeVendorId~~<sup>wranDevBsVendorId</sup>, wranDevCpeHwId, ~~wranDevCpeConfigFileVersion~~<sup>wranDevCpeSwVersion</sup>, wranDevCpeUpgradeFileName, wranDevCpeSwTftpServer, wranDevCpeTftpServerTimeStamp, ~~wranDevCpeTrapControl~~<sup>wranDevCpeTrapControlRegister</sup>. It contains the values of the most recent/current entry in wranDevCpeConfigFileEncodingTable for a particular CPE.

**13.1.1.3.3.2.4 wranDevMibCmnGroup**

This MIB ... wranDevCmnEventLogTable.

**13.1.1.3.3.2.5 wranDevMibBsNotificationGroup**

This MIB ... wranDevBsLogBuffExceedThresholdTrap.

**13.1.1.3.3.2.6 wranDevMibCpeNotificationGroup**

This MIB ... wranDevCpeLogBuffExceedThresholdTrap.

**13.1.1.3.3.2.7 wranDevCpeTrapControlGroup**

Contains objects related to enabling/disabling CPE device traps.

**13.1.1.3.3.2.8 wranDevBsTrapControlGroup**

Contains objects related to enabling/disabling BS device traps.

**13.1.1.3.3.3 wranDevMibCompliance**

This object indicates which MIB groups in wranDevMibGroups are optional and which ones are mandatory.

### 13.1.2 wranIfBsMib

*Change 13.1.2.1 and 13.1.2.1.1 as follows:*

#### 13.1.2.1 wranIfBsFm

Exceptions and fault events can be reported by using the traps defined in this MIB. wranIfBsFm is made up of the following MIBs: wranIfBsTrapControl, wranIfBsTrapControlRegister, wranIfBsTrapDefinition, wranIfBsNotificationObjectsTable, wranIfBsCpeNotificationObjectsTable, wranIfBsFmMibGroups, and wranIfBsFmMibCompliance, and wranIfBsThresholdConfigTable.

##### 13.1.2.1.1 wranIfBsTrapControl wranIfBsTrapControlRegister

This MIB is a bitmap that is used to disable/enable the following BS traps:

wranIfBsCpeDynamicServiceNotification  
wranIfBsCpeDynamicServiceFailNotification,  
wranIfBsCpeRssiStatusChangeNotification  
wranIfBsSignalPowerMetricsStatusNotification,  
wranIfBsCpeEIRPStatusChangeNotification,  
wranIfBsCpeRegisterNotification,  
wranIfBsCpeScmNotification, wranIfBsCpeScmFailNotification,  
wranIfBsCpeStartupStatusChangeNotification,  
wranIfBsThroughputMetricsNotification,  
wranIfBsNetworkEntryMetricsNotification,  
wranIfBsPacketErrorRateChangeNotification,  
wranIfBsUserMetricsChangeNotification,  
wranIfBsCoexistenceStatusNotification,  
wranIfBsCpeCbpReceptionNotification,  
wranIfBsCpeWiMicBeaconMSF1Notification,  
wranIfBsCpeWiMicBeaconMSF12Notification,  
wranIfBsCpeWiMicBeaconMSF123Notification,  
wranIfBsInterFrameSensingStatusNotification,  
wranIfBsMeasurementStatusNotification  
wranIfBsBasicCapabilityNotification, wranIfBsRangingNotification, and  
wranIfBsAuthMetricsNotification. Enable of a trap indicates that the trap will be recorded in wranIfBsCpeNotificationObjectsTable.

*Insert the following new subclauses (13.1.2.1.2 to 13.1.2.1.2.14) after 13.1.2.1.1:*

**NOTE**—For instructions for the former 13.1.2.1.2, see the new 13.1.2.1.3.

##### 13.1.2.1.2 wranIfBsTrapDefinition

This object defines BS related traps for configuration, accounting, performance, and SCM management aspects in wranIfBsMib.

#### 13.1.2.1.2.1 wranIfBsDynamicServiceTrap

This trap contains information related to updating the configuration of either provisioned service flows (wranIfBsProvSfTable) or active service flows (wranIfBsActiveSfTable).

#### 13.1.2.1.2.2 wranIfBsSignalPowerMetricsTrap

This trap contains information related to updating of signal power metrics (wranIfBsSignalPowerMetricsTable).

#### 13.1.2.1.2.3 wranIfBsRegNotificationTrap

This trap contains the information related to indicating successful registration of a CPE (wranIfBsCpeRegCapabilityRspTable).

#### 13.1.2.1.2.4 wranIfBsScmNotificationTrap

This trap contains the information related to updating the configuration of the SCM protocol capabilities on a CPE (wranIfBsCpeScmCapabilityConfigTable) or current authentication status (wranIfBsCpeScmAuthConfigTable).

#### 13.1.2.1.2.5 wranIfBsStartupStatusTrap

This trap contains the information related to changes in a CPE's status with regard to network entry (wranIfBsStartupMetricsTable).

#### 13.1.2.1.2.6 wranIfBsTxMetricsTrap

This trap contains the information related to changes in throughput metrics (wranIfBsThroughputMetricsTable) or ARQ metrics (wranIfBsArqMetricsTable).

#### 13.1.2.1.2.7 wranIfBsNetEntryMetricsTrap

This trap contains the information related to updates in network entry and re-entry latency measurements (wranIfBsNetworkEntryMetricsTable).

#### 13.1.2.1.2.8 wranIfBsPktErrorTrap

This trap contains the information related to updates in packet error rate measurements (wranIfBsPacketErrorRateTable).

#### 13.1.2.1.2.9 wranIfBsUserMetricsTrap

This trap contains the information related to updates in tracking the number of active and non-active users (wranIfBsUserMetricsTable).

#### 13.1.2.1.2.10 wranIfBsCoexistenceTrap

This trap contains the information related to updates in tracking ongoing coexistence transaction (e.g., On-Demand Frame Contention in wranIfBsCoexistenceStatusTable), discovery of new potential coexistence sources (wranIfBsCoexistenceSourceTable), discovery of resource usage in neighboring networks (wranIfBsCoexistenceResourceListTable), and updates to a BS's own coexistence configuration (wranIfBsCoexistenceCurrentConfigTable).

#### 13.1.2.1.2.11 wranIfBsBasicCapabilityTrap

This trap contains the information related to updates in tracking updates to the basic capability configuration of CPEs (wranIfBsCpeBasicCapabilityRspTable).

#### 13.1.2.1.2.12 wranIfBsRangingTrap

This trap contains the information related to updates in tracking status of ranging of (wranIfBsCpeRngCapabilityCmdTable).

#### 13.1.2.1.2.13 wranIfBsAuthMetricsTrap

This trap contains the information related to updates in tracking updates to authentication metrics (wranIfBsAuthenticationMetricsTable).

#### 13.1.2.1.2.14 wranIfBsDynamicServiceMetricsTrap

This trap contains the information related to updates in tracking metrics for current provisioned and active service flows (wranIfBsAuthenticationMetricsTable).

*To create a new 13.1.2.1.3 with subclauses, change the former 13.1.2.1.2 and its subclauses as follows:*

*NOTE—For instructions for the former 13.1.2.1.3, see the deletions after the new 13.1.2.1.3.1.20.*

#### ~~13.1.2.1.3~~ 13.1.2.1.2 wranIfBsNotificationObjectsTablewranIfBsCpeNotificationObjectsTable

This table contains objects that represents notifications reported in BS fault traps. The table is made up of one or more entries.

#### ~~13.1.2.1.3.1~~ 13.1.2.1.2.1 wranIfBsNotificationObjectsEntry ~~wranIfBsCpeNotificationObjectsEntry~~

This MIB is a compound object that represents an entry in the MIB object ~~wranIfBsNotificationsObjectsTable~~wranIfBsCpeNotificationsObjectsTable.

#### 13.1.2.1.3.1.1 wranIfBsNotificationObjectsIndex

Index of entry in the table.

#### ~~13.1.2.1.3.1.1~~ 13.1.2.1.2.1.1 wranIfBsNotificationMacAddrwranIfBsCpeNotificationMacAddr

The MAC ... the notification.

#### 13.1.2.1.3.1.3 wranIfBsDynamicServiceType

Indication if the configuration for a provisioned or active service flow has been configured.

#### 13.1.2.1.3.1.4 wranIfBsDynamicServiceNotificationIndex

Index into wranIfBsProvSfTable or wranIfBsActiveSfTable that indicates which service flow configuration was added/updated.

**13.1.2.1.3.1.5 wranIfBsSignalPowerNotificationIndex**

Index into wranIfBsSignalPowerMetricsTable that indicates the entry that contains updated signal power metrics data.

**13.1.2.1.3.1.6 wranIfBsBsRegCapabilityNotificationIndex**

Index into wranIfBsCpeRegCapabilityRspTable that indicates the entry that contains updated registration for a CPE.

**13.1.2.1.3.1.7 wranIfBsScmNotificationType**

Indication if the configuration of the SCM protocol or the authentication status of a CPE has been updated.

**13.1.2.1.3.1.8 wranIfBsScmNotificationIndex**

Index into wranIfBsCpeScmCapabilityConfigTable that indicates which CPE has updated their SCM configuration, or wranIfBsCpeScmAuthConfigTable that indicates which CPE has had their authentication status updated.

**13.1.2.1.3.1.9 wranIfBsStartupNotificationIndex**

This contains the index of entry in wranIfBsStartupMetricsTable that contains data on any changes in a CPE's status with regard to network entry.

**13.1.2.1.3.1.10 wranIfBsTxMetricsType**

Indication if throughput metrics contained or ARQ Metrics in have been updated.

**13.1.2.1.3.1.11 wranIfBsTxMetricsNotificationIndex**

Index into wranIfBsThroughputMetricsTable that indicates changes in measure throughput metrics, or wranIfBsArqMetricTable that indicates changes in ARQ performance.

**13.1.2.1.3.1.12 wranIfBsNetEntryMetricsNotificationIndex**

This contains the index of entry in wranIfBsNetworkEntryMetricsTable that contains data on any changes in network entry and re-entry latency measurements.

**13.1.2.1.3.1.13 wranIfBsPktErrorMetricsNotificationIndex**

This contains the index of entry in wranIfBsPacketErrorRateTable that contains data on any changes in packet error rate measurements.

**13.1.2.1.3.1.14 wranIfBsUserMetricsNotificationIndex**

This contains the index of entry in wranIfBsUserMetricsTable that contains data on any changes in the number of active and non-active users in the cell.

#### **13.1.2.1.3.1.15 wranIfBsCoexMetricsType**

Indication if ongoing On-Demand Frame Coexistence Transactions, discovery of new potential coexistence resources, discovery of the resource usage in neighboring networks, and whether a BS's own coexistence configuration have been updated.

#### **13.1.2.1.3.1.16 wranIfBsCoexNotificationIndex**

Index into wranIfBsCoexistenaceStatusTable that indicates changes in ongoing On-Demand Frame Contention transactions, wranIfBsCoexistenceSourceTable that indicates changes in the discovery of new potential coexistence sources, wranIfBsCoexistenceResourceListTable that indicates discovery of resource usage in neighboring networks, or wranIfBsCoexistenceCurrentConfigTable that indicates whether a BS's own coexistence configuration have been updated.

#### **13.1.2.1.3.1.17 wranIfBsBasicNotificationIndex**

This contains the index of entry in wranIfBsCpeBasicCapabilityRspTable that contains data on any changes in tracking updates to the basic capability configuration of CPEs.

#### **13.1.2.1.3.1.18 wranIfBsRngNotificationIndex**

This contains the index of entry in wranIfBsCpeRngCapabilityCmdTable that contains data on any changes in tracking updates to the status of ranging of CPEs.

#### **13.1.2.1.3.1.19 wranIfBsAuthNotificationIndex**

This contains the index of entry in wranIfBsAuthenticationMetricsTable that contains data on any changes in tracking updates to authentication metrics.

#### **13.1.2.1.3.1.20 wranIfBsDynSrvMetricsNotificationIndex**

This contains the index of entry in wranIfBsServiceFlowMetricsTable that contains information related to tracking metrics of ongoing.

#### **13.1.2.1.2.1.2 wranIfBsCpeStartupStatusChange**

~~This object ... initialization procedures.~~

~~...~~

#### **13.1.2.1.2.1.17 wranIfBsIntraFrameSensingStatus**

~~Indication when ... been changed.~~

#### **13.1.2.1.3 wranIfBsThresholdConfigTable**

~~This MIB ... 13.1.2.1.3.1.4 ... EIRP alarm.~~

*Insert the following new subclauses (13.1.2.1.4 with its subclauses and 13.1.2.1.5) after 13.1.2.1.3.1.20:*

#### **13.1.2.1.4 wranIfBsFmMibGroups**

This object helps define which MIB groups are available in this module (wranIfBsFm) and which MIB objects are part of each group.

##### **13.1.2.1.4.1 wranIfBsFmTrapControlGroup**

This group contains objects related to enabling/disabling traps use for management of the BS.

##### **13.1.2.1.4.2 wranIfBsFmNotificationGroup**

This group contains objects related to traps used for management of the BS.

##### **13.1.2.1.5 wranIfBsFmMibCompliance**

MIB objects that are optional or mandatory for wranIfBsFm compliance.

*Change 13.1.2.2 as follows:*

#### **13.1.2.2 wranIfBsCm**

This MIB contains various objects related to Configuration Management. Within this MIB, the following tables are handled: wranIfBsCpeRngCapabilityReqTable, wranIfBsCpeRngCapabilityCmdTable, wranIfBsCpeBasicCapabilityReqTable, wranIfBsCpeBasicCapabilityRspTable, wranIfBsCpeRegCapabilityReqTable, wranIfBsCpeMeasSupportReqTable, wranIfBsCpeRegCapabilityRspTable, wranIfBsCpeMeasSupportRspTable, wranIfBsCpeAntennaGainTable, wranIfBsScmCapabilityConfiguration, wranIfBsCpeScmCapabilityConfigTable, wranIfBsScmAuthConfigTable, wranIfBsActionsTable, wranIfBsCpeMulticastConfigTable, wranIfBsCoexistenceConfigTable, wranIfBsCpeBasicCapabilityCmn, wranIfBsCpeRegCapabilityCmn, wranIfBsCpeMeasSupportCmn, wranIfBsCpeSystemParametersTable, wranIfBsCpeRegCapabilityCmn, wranIfBsCmMibGroups, and wranIfBsCmMibCompliance. For CBC-REQ/RSP and REG-REQ/RSP there are two MIB object groups that represent entries that are common to Basic and Registered Capability negotiation.

##### **13.1.2.2.1 wranIfBsCpeRngCapabilityReqTable**

###### **13.1.2.2.1.1 wranIfBsCpeRngCapabilityReqEntry**

*Change the subclauses of 13.1.2.2.1.1 as follows:*

###### **13.1.2.2.1.1.1 wranIfBsCpeRngCapabilityReqIndex**

Index of entry in the table.

**13.1.2.2.1.1~~13.1.2.2.1.1.1~~ wranIfBsCpeMacAddress**

The MAC ... the BS.

**13.1.2.2.1.1~~13.1.2.2.1.1.2~~ wranIfMmpPn**

Current value ... is used.

**13.1.2.2.1.1~~13.1.2.2.1.1.3~~ wranIfCiphertextIcv**

Calculated value ... (see 8.2.4.6.1.2).

**13.1.2.2.1.1~~13.1.2.2.1.1.4~~ wranIfRngAnomaly**

Indication of ... ranging process.

*Change 13.1.2.2.2 and its subclauses as follows:*

**13.1.2.2.2 wranIfBsCpeRngCapabilityCmdTable**

This object provides a table containing the ranging configuration the BS is specifying for CPE in the RNG-CMD during network entry. Each table is made up of multiple entries, one for each CPE that a RNG-CMD is sent to, that is defined by wranIfBsCpeRngCapabilityCmdEntry wranIfBsCpeRngCapabilityRspEntry.

**13.1.2.2.2.1 wranIfBsCpeRngCapabilityCmdEntry**

This object ... network entry.

**13.1.2.2.2.1.1 wranIfBsCpeRngCapabilityCmdIndex**

Index of entry in the table.

**13.1.2.2.2.1~~13.1.2.2.2.1.1~~ wranIfBsCpeMacAddress**

MAC Address ... initial ranging.

**13.1.2.2.2.1~~13.1.2.2.2.1.2~~ wranIfBSCpeStationId**

Station ID ... initial ranging.

**13.1.2.2.2.1~~13.1.2.2.2.1.3~~ wranIfTimingAdvance**

Timing advance ... Table 44.

**13.1.2.2.2.1~~13.1.2.2.2.1.4~~ wranIfEirpPerSubcarrier**

EIRP per ... Table 44.

**13.1.2.2.2.1~~13.1.2.2.2.1.5~~ wranIfOffsetFreqAdjust**

Offset frequency ... Table 44.

#### **13.1.2.2.2.1.7~~13.1.2.2.2.1.6~~ wranIfRangingStatus**

Ranging status ... Table 44.

#### **13.1.2.2.2.1.8~~13.1.2.2.2.1.7~~ wranIfActionSuperFrameNum**

The Action ... Table 44.

#### **13.1.2.2.2.1.9~~13.1.2.2.2.1.8~~ wranIfCdmaCode**

The CDMA ... Table 44.

#### **13.1.2.2.2.1.10~~13.1.2.2.2.1.9~~ wranIfTxOpportunityOffset**

The Transmission ... Table 44.

### **13.1.2.2.3 wranIfBsCpeBasicCapabilityReqTable**

*Change 13.1.2.2.3.1 and its subclauses as follows:*

#### **13.1.2.2.3.1 wranIfBsCpeBasicCapabilityReqEntry**

This object is a compound object that contains ~~the requested configuration of basic information on capabilities by that a CPE has declared to a BS during network entry. The list of objects used to make up~~ wranIfBsCpeBasicCapabilityReqEntry can be found in wranIfBsCpeBasicCapabilityCmn (13.1.2.2.16).

##### **~~13.1.2.2.3.1.1 wranIfBsCpeBasicCapabilityReqEntryIndex~~**

~~A unique ... this table.~~

~~...~~

##### **~~13.1.2.2.3.1.11 wranIfCpeSemFlowControl~~**

~~Maximum number ... in 7.7.11.3.3.3.~~

### **13.1.2.2.4 wranIfBsCpeBasicCapabilityRspTable**

*Change 13.1.2.2.4.1 as follows:*

#### **13.1.2.2.4.1 wranIfBsCpeBasicCapabilityRspEntry**

This object is a compound object that contains the configuration of basic capabilities BS has selected for a CPE during network entry. This table reflects the current configuration of a CPE's basic capabilities. The list of objects used to make up wranIfBsCpeBasicCapabilityRspEntry can be found in wranIfBsCpeBasicCapabilityCmn (13.1.2.2.16).

~~NOTE—The relevant objects that make up this entry are described in 13.1.2.2.3.1.1 to 13.1.2.2.3.1.11. All items defined for the entry will need to move to the beginning of the ASN.1 formatting of wranIfBsMib.~~

## 13.1.2.2.5 wranIfBsCpeRegCapabilityReqTable

*Change 13.1.2.2.5.1 and its subclauses as follows:*

### 13.1.2.2.5.1 wranIfBsCpeRegCapabilityReqEntry

This object is a compound object that contains the information on the capabilities information for which that a CPE has requested confirmation from declared to the BS, e.g., through sending a REG-REQ to the BS. The objects that make up the entry are defined in wranIfBsCpeRegCapabilityCmn (13.1.2.2.17). A REG-REQ message comprises objects within this compound object, wranIfBsCpeAntennaGainTable (13.1.2.2.9), and wranIfBsCpeMeasSupportReqTable (13.1.2.2.6).

#### 13.1.2.2.5.1.1 ~~wranIfBsRegisteredCpeMacAddress~~

~~MAC address ... configured capabilities.~~

~~...~~

#### 13.1.2.2.5.1.24 ~~wranIfCpeRegistrationTimer~~

~~CPE Registration ... in 7.7.7.3.5.~~

*Change 13.1.2.2.6 and its subclauses as follows:*

### 13.1.2.2.6 ~~wranIfBsCpeMeasSupportReqTable~~wranIfBsCpeMeasurementSupportReqTable

A compound object representing the Measurement Support IE of REG-REQ/RSP in 7.7.7.3.4.7. It is made up of multiple entries, one for each signal type ~~for which sensing is supported by sensing~~. Each entry is defined by ~~wranIfBsCpeMeasSupportReqEntry~~ wranIfBsCpeMeasurementSupportReqEntry. Entries for a CPE are ~~only~~ present only if the value for wranIfSensModeSupportArray is anything other than “No Sensing.”

#### 13.1.2.2.6.1 ~~wranIfBsCpeMeasSupportReqEntry~~ ~~wranIfBsCpeMeasurementSupportReqEntry~~

A compound object representing entries of Measurement Support IE of REG-REQ in 7.7.7.3.4.7. It is made up of multiple objects. A CPE will have one entry for each Signal Type in the Signal Type Array of the Measurement Support IE. The rest of the objects that represent each entry are defined in wranIfBsCpeMeasSupportCmn (13.1.2.2.18).

#### 13.1.2.2.6.1.1 ~~wranIfMeasurementSupportEntryIndex~~

~~A unique ... wranIfBsCpeMeasurementSupportReqTable.~~

~~...~~

### ~~13.1.2.2.6.1.9 wranIfMeasurementRecSensPeriodInterval~~

~~Recommended length ... of frames.~~

### 13.1.2.2.7 wranIfBsCpeRegCapabilityRspTable

*Change 13.1.2.2.7.1 as follows:*

#### 13.1.2.2.7.1 wranIfBsCpeRegCapabilityRspEntry

This object is a compound object that contains the capabilities information that a BS has configured for a the CPE, e.g., through sending a REG-RSP to the CPE. wranIfRegCapabilityPermanentStationId is unique to REG-RSP. The objects that make up the entry are defined in wranIfBsCpeRegCapabilityCmn (13.1.2.2.17). A REG-RSP message comprises objects within this compound object and wranIfBsCpeMeasSupportRspTable (13.1.2.2.8).

~~NOTE 1 — As with CBC RSP, the entries will contain the objects that have scope in both REG-REQ and REG-RSP object types as the REG-REQ objects; e.g., this entry will be made up of objects in 13.1.2.2.5.1.1 13.1.2.2.15.1.24.~~

~~NOTE 2 — In addition to having the objects in 13.1.2.2.5.1.1 through 13.1.2.2.5.1.24, this compound object will have an object containing the permanent station Id when CPE privacy (see 8.7) is being used.~~

*Change 13.1.2.2.8 and 13.1.2.2.8.1 as follows:*

### 13.1.2.2.8 ~~wranIfBsCpeMeasSupportRspTable~~wranIfBsCpeMeasurementSupportRspTable

A compound object representing the Measurement Support IE of REG-REQ/RSP in 7.7.7.3.4.7. It is made up of multiple entries, one for each signal type that sensing supports. Each entry is defined by ~~wranIfBsCpeMeasSupportRspEntry~~wranIfBsCpeMeasurementSupportRspEntry.

#### 13.1.2.2.8.1 ~~wranIfBsCpeMeasSupportRspEntry~~ wranIfBsCpeMeasurementSupportRspEntry

A compound object representing entries of Measurement Support IE of REG-RSP in 7.7.7.3.4.7. It is made up of multiple objects. A CPE will have one entry for each Signal Type in the Signal Type Array of the Measurement Support IE. Entries for a CPE are ~~only~~ present only if the value for wranIfSensModeSupportArray is anything other than “No Sensing.” The rest of the objects that represent each entry are defined in wranIfBsCpeMeasSupportCmn (13.1.2.2.18).

~~NOTE — This will contain the same objects types, e.g., this entry will be made of the objects in 13.1.2.2.6.1.1 through 13.1.2.2.6.1.9.~~

*Change 13.1.2.2.10 and its subclauses as follows:*

#### **13.1.2.2.10 wranIfBsScmCapabilityConfiguration~~wranIfBsCapabilitiesConfigTable~~**

This MIB provides a bitmap that describes the cryptographic suites that the BS supports. The list of suites is provided in Table 193. ~~This table is analogous to the wranIfBsCpeBasicCapabilityRspTable and wranIfBsCpeRegCapabilityRspTable, except there is ... contains all the entries specified in wranIfBsCpeBasicCapabilityRspEntry and wranIfBsCpeRegCapabilityRspEntry.~~

##### **13.1.2.2.10.1 wranIfBsCapabilitiesConfigEntry**

~~This object ... (wranIfBsMaxNumRegReqAttempts)].~~

##### **13.1.2.2.10.1.1 wranIfBsMaxNumRegReqAttempts**

~~This object ... is 5.~~

~~...~~

##### **13.1.2.2.10.1.37 wranIfBsT17**

~~Time allowed ... key exchange.~~

*Change 13.1.2.2.11 and its subclauses as follows:*

#### **13.1.2.2.11 wranIfBsCpeScmCapabilityConfigTable~~wranIfBsMeasurementSupportTable~~**

This MIB provides a table that provides contains a listing for the security capabilities for each CPE. Each CPE stores this table, with one entry for itself. On the BS, this table is made up of multiple entries, one for each CPE. Entries on the BS table do not contain the wranIfBsCpeEapTlsTlsCredential object. Each entry is defined by wranIfBsCpeScmCapabilityConfigEntry. The list of capabilities is listed in Table 193. ~~A compound object representing default values that a BS uses ... is defined by wranIfMeasurementSupportEntry.~~

##### **13.1.2.2.11.1 wranIfBsCpeScmCapabilityConfigEntry~~wranIfBsMeasurementSupportEntry~~**

~~This object is a compound object that provides the definition of the entries wranIfBsCpeScmCapabilityConfigTable. A compound object representing entries of wranIfBsMeasurementSupportTable ... Signal Type Array of the Measurement Support IE.~~

~~NOTE This object is made up ... recommendations in Annex A.~~

##### **13.1.2.2.11.1.1 wranIfBsCpeScmCapabilityConfigIndex**

Index of entry in the table.

##### **13.1.2.2.11.1.2 wranIfBsCpeScmCapabilityConfigMacAddress**

The MAC address of the CPE.

#### **13.1.2.2.11.1.3 wranIfBsCpeScmCapabilityConfiguration**

This MIB provides a bitmap that describes the cryptographic suites that the CPE supports. The list of suites is provided in Table 193.

#### **13.1.2.2.11.1.4 wranIfBsCpeEapTlsTtlsCredentialSize**

Size, in number of octets, of X.509 certificate that defines the credential the CPE exchanges with the AAA server to perform authentication.

#### **13.1.2.2.11.1.5 wranIfBsCpeEapTlsTtlsCredential**

X.509 certificate that defines the credential the CPE exchanges with the AAA server to perform authentication.

*Insert the following new subclauses (13.1.2.2.12 to 13.1.2.2.12.1.11) after 13.1.2.2.11.1.5:*

*NOTE—For instructions for the former 13.1.2.2.12, see the new 13.1.2.2.13.*

#### **13.1.2.2.12 wranIfBsCpeScmAuthConfigTable**

This MIB provides a table that provides the configuration of the SCM attributes (e.g., timers and other items relating to the authorization process). This table is made up of one entry, defined by wranIfBsScmAuthConfigEntry.

#### **13.1.2.2.12.1 wranIfBsCpeScmAuthConfigEntry**

This object is a compound object that defines an entry in wranIfBsScmAuthConfigTable.

##### **13.1.2.2.12.1.1 wranIfBsScmAuthConfigIndex**

Index of entry in the table.

##### **13.1.2.2.12.1.2 wranIfBsT36**

EAP Authentication Timer, T36.

##### **13.1.2.2.12.1.3 wranIfBsT37**

Authentication Grace Timer, T37.

##### **13.1.2.2.12.1.4 wranIfBsMaxNumAuthAttempts**

Maximum number of Authentication Attempts.

##### **13.1.2.2.12.1.5 wranIfBsT38**

Operational Wait Timeout, T38.

##### **13.1.2.2.12.1.6 wranIfBsT39**

Rekey Wait Timeout, T39.

**13.1.2.2.12.1.7 wranIfBsT40**

GTEK/TEK Grace time, T40.

**13.1.2.2.12.1.8 wranIfBsAkLifetime**

Lifetime BS assigns to new AK.

**13.1.2.2.12.1.9 wranIfBsTekLifetime**

Lifetime BS assigns to new TEK.

**13.1.2.2.12.1.10 wranIfBsMaxNumSa**

Maximum number of SAs for which a CPE can be authorized.

**13.1.2.2.12.1.11 wranIfBsT17**

Time for CPE to complete authentication and key exchange.

*To create a new 13.1.2.2.13 with subclauses, change the former 13.1.2.2.12 and its subclauses as follows:*

*NOTE—For instructions for the former 13.1.2.2.13, see the new 13.1.2.2.14.*

**13.1.2.2.13 13.1.2.2.12 wranIfBsActionsTable**

This object ... wranIfBsActionsEntry.

**13.1.2.2.13.1 ~~13.1.2.2.12.1~~ wranIfBsActionsEntry**

This object ... given time.

**13.1.2.2.13.1.1 wranIfBsActionsIndex**

Index of entry in this table.

**13.1.2.2.13.1.1 ~~13.1.2.2.12.1.1~~ wranIfBsCpeActionsMacAddress**

This uniquely ... MAC address.

**13.1.2.2.13.1.3 ~~13.1.2.2.12.1.2~~ wranIfBsCpeActionsRngCpe** **wranIfBsCpeActionsRangeCpe**

When set, ... is read.

**13.1.2.2.13.1.4 ~~13.1.2.2.12.1.3~~ wranIfBsCpeActionsDeRegCpe**

When set ... is specified.

**13.1.2.2.13.1.5 ~~13.1.2.2.12.1.4~~ wranIfBsCpeActionsSchedule** **wranIfBsCpeActionsStatus**

This object ... executed properly.

*To create a new 13.1.2.2.14 with subclauses, change the former 13.1.2.2.13 and its subclauses as follows:*

*NOTE—For instructions for the former 13.1.2.2.14, see the new 13.1.2.2.15.*

**13.1.2.2.14~~13.1.2.2.13~~ wranIfBsCpeMcastConfigTablewranIfBsCpeMulticastConfigTable**

This table ... multicast group.

**13.1.2.2.14.1~~13.1.2.2.13.1~~ wranIfBsCpeMcastConfigEntrywranIfBsCpeMulticastEntry**

This object ... membership configuration.

**13.1.2.2.14.1.1 wranIfBsCpeMcastConfigIndex**

Index of entry in this table.

**13.1.2.2.14.1.2~~13.1.2.2.13.1.1~~ wranIfBsCpeMcastMacAddresswranIfBsCpeMacAddress**

This object ... wranIfBsCpeMulticastCid.

**13.1.2.2.14.1.3~~13.1.2.2.13.1.2~~ wranIfBsCpeMcastSidwranIfBsMulticastSid**

This object ... multicast group.

**13.1.2.2.14.1.4~~13.1.2.2.13.1.3~~ wranIfBsCpeMcastPeriodicAllocParameterM  
wranIfBsMulticastPeriodicAllocationParameterM**

This object ... multicast transmission.

**13.1.2.2.14.1.5~~13.1.2.2.13.1.4~~ wranIfBsCpeMcastPeriodicAllocParameterK  
wranIfBsMulticastPeriodicAllocationParameterK**

This object ... multicast transmission.

**13.1.2.2.14.1.6~~13.1.2.2.13.1.5~~ wranIfBsCpeMcastPeriodicAllocParameterN  
wranIfBsMulticastPeriodicAllocationParameterN**

This object ... multicast transmission.

*To create a new 13.1.2.2.15 with subclauses, change the former 13.1.2.2.14 and its subclauses as follows:*

*NOTE—For instructions for the former 13.1.2.2.15, see the new 13.1.2.2.23.*

**13.1.2.2.15~~13.1.2.2.14~~ wranIfBsCoexistenceConfigTable**

This table ... CBP transmission.

**13.1.2.2.15.1~~13.1.2.2.14.1~~ wranIfBsCoexistenceConfigEntry**

This object ... wranIfBsCoexistenceConfigTable.

**13.1.2.2.15.1.1 wranIfBsCoexistenceConfigIndex**

Index of entry in this table.

**13.1.2.2.15.1.2~~13.1.2.2.14.1.1~~ wranIfBsT34**

This governs ... is 300 s.

**13.1.2.2.15.1.3~~13.1.2.2.14.1.2~~ wranIfBsT33**

Time between ... spectrum etiquette.

**13.1.2.2.15.1.4~~13.1.2.2.14.1.3~~ wranIfBsT32**

Wait for ... (FC-RSP) message.

**13.1.2.2.15.1.5~~13.1.2.2.14.1.4~~ wranIfBsFcw**

Frame contention ... to them.

**13.1.2.2.15.1.6~~13.1.2.2.14.1.5~~ wranIfBsScwBackoffMax**

Maximum number ... backoff window.

**13.1.2.2.15.1.7~~13.1.2.2.14.1.6~~ wranIfBsFcMin**

Number of ... the BS.

**13.1.2.2.15.1.8~~13.1.2.2.14.1.7~~ wranIfBsFcnRange**

Exponent, base 2, ... the FCN.

**13.1.2.2.15.1.9~~13.1.2.2.14.1.8~~ wranIfBsSfRel**

Number of ... frame contention.

**13.1.2.2.15.1.10~~13.1.2.2.14.1.9~~ wranIfBsT35**

SCW Backoff ... Contention Procedure.

*Insert the following new subclauses (13.1.2.2.16 to 13.1.2.2.22.1) after 13.1.2.2.15.1.10:*

**13.1.2.2.16 wranIfBsCpeBasicCapabilityCmn**

This MIB object is a group containing objects that are common to wranIfBsCpeBasicCapabilityReqEntry and wranIfBsCpeBasicCapabilityRspEntry.

**13.1.2.2.16.1 wranIfBsCpeBasicCapabilityIndex**

Index of entry in wranIfBsCpeBasicCapabilityReqTable or wranIfBsCpeBasicCapabilityRspTable.

#### 13.1.2.2.16.2 wranIfBasicCapabilityNumAttempts

The current number of attempts that a CPE has attempted basic capability configuration during network entry. This item is set to 0 upon successful completion of registration process and a CPE is admitted into the network. This item is incremented every time a CPE attempts basic capability configuration, but is unsuccessful. If this value reaches the limit set by `wranIfBsMaxNumCbcReqAttempts`, then the BS shall reject the network entry request from the CPE. This object is only pertinent for entries in `wranIfBsCpeBasicCapabilityRspTable` (as the decision to reject basic capability negotiation is made by BS).

#### 13.1.2.2.16.3 wranIfBasicCapabilityMacAddress

The MAC address of the CPE attempting basic capability configuration.

#### 13.1.2.2.16.4 wranIfBasicCapabilityStationId

The Station ID of the CPE attempting basic capability configuration.

#### 13.1.2.2.16.5 wranIfBasicCapabilityMacPduTxandConstruction

An integer value that indicates the methods for transmission and construction of MAC PDUs that the CPE supports. This reflects the setting of the IE defined in 7.7.11.3.1.

#### 13.1.2.2.16.6 wranIfBasicCapabilityMaxCpeTxEirp

An integer value, encoded in hexadecimal, that indicates the maximum EIRP for which the CPE is configured. This reflects the setting of the IE defined in 7.7.11.3.2.1.

#### 13.1.2.2.16.7 wranIfBasicCapabilityCpeDemodulator

A bit map that encodes the DIUCs that the CPE supports. This reflects the setting of the IE defined in 7.7.11.3.2.2.1.

#### 13.1.2.2.16.8 wranIfBasicCapabilityCpeModulator

A bit map that encodes the UIUCs that the CPE supports. This reflects the setting of the IE defined in 7.7.11.3.2.2.2.

#### 13.1.2.2.16.9 wranIfBasicCapabilityCpeScmVersionSupport

Indicator of what version of the SCM protocol that the CPE supports. This reflects the setting of the IE defined in 6.9.11.3.3.1.

#### 13.1.2.2.16.10 wranIfBasicCapabilityCpePnWindowSize

Size of PN\_WINDOW (see 7.4) that is used to protect against replay attacks. This reflects the setting of the IE defined in 7.7.11.3.3.2.

#### 13.1.2.2.16.11 wranIfBasicCapabilityCpeScmFlowControl

Maximum number of ongoing SCM transactions that the CPE can support. This reflects the setting of the IE defined in 7.7.11.3.3.3.

## 13.1.2.2.17 wranIfBsCpeRegCapabilityCmn

This MIB object is a group containing objects that are common to wranIfBsCpeRegCapabilityReqEntry and wranIfBsCpeRegCapabilityRspEntry.

### 13.1.2.2.17.1 wranIfRegCapabilityIndex

Index for unique entry in tables relating to registered capabilities.

### 13.1.2.2.17.2 wranIfRegCapabilityMacAddress

MAC address of CPE that is currently registered with BS.

### 13.1.2.2.17.3 wranIfRegCapabilityReqNumAttempts

The current number of attempts that a CPE has attempted network entry. This item is set to 0 upon successful completion of registration process and a CPE is admitted into the network. This item is incremented every time a CPE attempts registration, but is unsuccessful. If this value reaches the limit set by wranIfBsMaxNumRegReqAttempts, then the CPE shall restart network entry process.

### 13.1.2.2.17.4 wranIfRegCapabilityNMEAlocStringSize

Size of NMEA location string of the CPE in REG-REQ (see 7.7.7.3.1), in octets.

### 13.1.2.2.17.5 wranIfRegCapabilityNMEAlocString

NMEA location string of the CPE in REG-REQ (see 7.7.7.3.1).

### 13.1.2.2.17.6 wranIfRegCapabilityCsConfig

Indication in REG-REQ/RSP of how the provider will operate the CPE on an ongoing basis; either with the Ethernet CS only or the IP CS (see 7.7.7.3.2).

### 13.1.2.2.17.7 wranIfRegCapabilityIpVersion

What version of the IP protocol (either v4 or v6) indicate in REG-REQ/RSP the CPE supports (see 7.7.7.3.3).

### 13.1.2.2.17.8 wranIfRegCapabilityIpRohcSupport

Indicator in REG-REQ/RSP of whether CPE supports IP Robust Header Compression (ROHC) (see 7.7.7.3.4.1).

### 13.1.2.2.17.9 wranIfRegCapabilityArqSupport

ARQ Support IE of REG-REQ/RSP in 7.7.7.3.4.2.

### 13.1.2.2.17.10 wranIfRegCapability2ndMgmtArqWindowSize

Secondary Management flow - ARQ Window Size IE of REG-REQ/RSP defined in 7.7.8.9.17.2.