IEEE P802.19

Wireless Coexistence Working Group

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|-------------------|---|
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| Re: | |
| Abstract | This file contains proposal to System Description and Reference Model clauses in response to Call for Proposals (P802.19-10/57r2). It uses IEEE draft standard template. |
| Purpose | To propose text for System Description and Reference Model clauses of P802.19.1 draft standard |
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| | |

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TV White Space Coexistence Methods

3 1. Overview

4 **1.1 Scope**

5 The standard specifies radio technology independent methods for coexistence among dissimilar or 6 independently operated TV Band Device (TVBD) networks and dissimilar TV Band Devices

7 1.2 Purpose

8 The purpose of the standard is to enable the family of IEEE 802 Wireless Standards to most effectively use
 9 TV White Space by providing standard coexistence methods among dissimilar or independently operated
 10 TVBD networks and dissimilar TVBDs. This standard addresses coexistence for IEEE 802 networks and

11 devices and will also be useful for non IEEE 802 networks and TVBDs.

12 2. Normative references

13 The following referenced documents are indispensable for the application of this document (i.e., they must 14 be understood and used, so each referenced document is cited in text and its relationship to this document is

15 explained). For dated references, only the edition cited applies. For undated references, the latest edition of 16 the referenced document (including any amendments or corrigenda) applies.

17 **3. Definitions, Abbreviations and Acronyms**

1 3.1 Definitions

2 3.2 Abbreviations and Acronyms

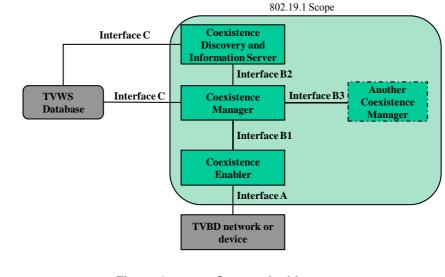
3 4. System Description

4 4.1 System Architecture

5 The 802.19.1 system architecture has three logical entities and five logical interfaces. An 802.19.1 logical 6 entity is defined by its functional role(s) and its interfaces with other 802.19.1 logical entities and with 7 external elements.

| 9 | Three | logical | entities | are. |
|---|-------|---------|-----------|------|
| / | THICC | logical | cintities | arc. |

- 10 — Coexistence Manager (CM)
- 11 — Coexistence Enabler (CE)
- 12 — Coexistence Discovery and Information Server (CDIS). 13
- 14 Five logical interfaces are:
- 15 — Interface A
- 16 - Interface B1
- 17 — Interface B2
- 18 — Interface B3
- 19 — Interface C.
- 20
- 21 The 802.19.1 system interacts with two external elements:
- 22 TVWS database
- 23 24 - TVBD network or device.
- 25 Figure 1 shows 802.19.1 system architecture.





3 **4.2 Logical entities**

1

2

4 4.2.1 Coexistence Enabler

- 5 Coexistence Enabler has the following functional roles:
- 6 Obtain information required for coexistence from TVBD network or device and provide it to CM
- Provide information required for coexistence (generated by IEEE 802.19.1 system or obtained by IEEE 802.19.1 system from external entities) to TVBD network or device
- 9 Facilitate sharing of information required for coexistence among TVBD networks or devices via the IEEE 802.19.1 system
- 11 Request TVBD network or device to perform measurements required for coexistence by itself or 12 according to commands received from CM
- 13 Obtain measurement results required for coexistence from TVBD network or device and provide them 14 to CM
- 15 Request TVBD network or device to perform reconfiguration required for coexistence according to commands received from CM
- 17 Receive information about observed or predicted events related to coexistence from TVBD network or
 18 device and provide it to CM
- Provide information about observed or predicted events related to coexistence (generated by IEEE 802.19.1 system) to TVBD network or device.

21 **4.2.2 Coexistence Manager**

- 22 Coexistence Manager has the following functional roles:
- 23 Coexistence decision making
- 24 Discovery of other CMs
- 25 Support exchange of information required for coexistence among CMs

1 — Support sharing of information required for coexistence among TVBD networks or devices.

2 4.2.3 Coexistence Discovery and Information Server

- 3 Coexistence Discovery and Information Server has the following functional roles:
- 4 Support discovery of CMs
- 5 Collect, store, aggregate, and provide information required for coexistence
- 6 Support exchange of information required for coexistence among CMs
- 7 Support sharing of information required for coexistence among TVBD networks or devices.

8 4.3 Logical Interfaces

- 9 Five logical interfaces defined in the 802.19.1 system architecture can be split into three groups:
- 10 Interfaces between 802.19.1 entities:
- 11 Interface B1
- 12 Interface B2
- 13 Interface B3
- 14 Interface between an 802.19.1 entity and TVBD network/device:
- 15 Interface A
- 16 Interface between 802.19.1 entities and TVWD database:
- 17 Interface C.
- 18
- Different interfaces in each group are distinguished by their usage, types of information exchanged, andunderlying protocols.

21 4.3.1 Interface A

- 22 Interface A between CE and TVBD network or device is used to transmit the following:
- 23 From TVBD network or device to CE:
- 24 Information required for coexistence
- 25 Measurement results required for coexistence
- 26 Information about observed or predicted events related to coexistence
- 27 From CE to TVBD network or device:
- Information required for coexistence (generated by IEEE 802.19.1 system or obtained by IEEE 802.19.1 system from external entities)
- 30 Measurement requests required for coexistence
- 31 Reconfiguration requests required for coexistence
- Information about observed or predicted events related to coexistence (generated by IEEE 802.19.1 system).

4.3.2 Interface B1

35 Interface B1 between CE and CM is used to transmit the following:

- 1 From CE to CM:
- 2 Information required for coexistence
- 3 From CM to CE:
- 4 Reconfiguration commands required for coexistence.

5 4.3.3 Interface B2

- 6 Interface B2 between CM and CDIS is used to transmit the following:
- 7 From CM to CDIS:
- 8 Information required for discovery
- 9 Information required for coexistence
- 10 From CDIS to CM:
- 11 Information required for discovery
- 12 Information required for coexistence.

13 **4.3.4 Interface B3**

- 14 Interface B3 between different CMs is used to transmit the following:
- 15 Information required for coexistence.

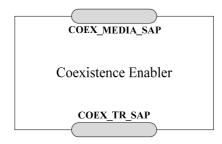
16 4.3.5 Interface C

- 17 Interface C between CM and TVWS database or between CDIS and TVWS database is used to transmit thefollowing:
- 19 From TVWS database:
- 20 Information required for coexistence.

21 5. IEEE 802.19.1 reference model

22 **5.1 General description**

23 Figure 2 illustrates reference model of Coexistence Enabler.

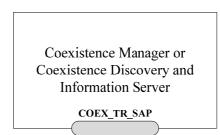


24

25 Figure 2 Reference model of Coexistence Enabler

26 Coexistence Enabler has two service access points:

- 1 Coexistence Media SAP (COEX_MEDIA_SAP)
- 2 Coexistence Transport SAP (COEX TR SAP).
- Figure 3 illustrates reference model of Coexistence Manager and Coexistence Discovery and Information Server.



5

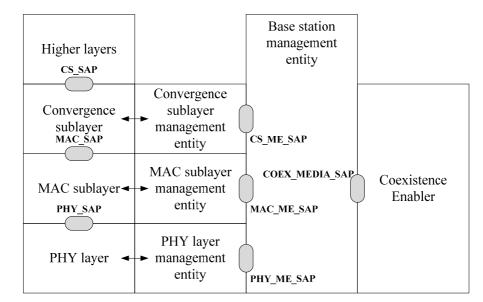
6 Figure 3 Reference model of Coexistence Manager and Coexistence Discovery and 7 Information Server

8 Coexistence Manager and Coexistence Discovery and Information Server have one service access point:

- 9 Coexistence Transport SAP (COEX_TR_SAP).
- 10

11 COEX_MEDIA_SAP defines the interface A between CE and TVBD network/device. Example reference

12 model of CE describing example implementation of interface A inside a base station is shown in Figure 4.



13

14

Figure 4 Example reference model for interface A

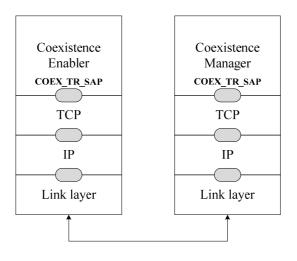
15 The left side of Figure 4 shows typical reference model of radio interface including data, control and 16 management planes for physical layer, MAC sublayer, and convergence sublayer. The middle part of 17 Figure 4 shows base station management entity. The right part of Figure 4 shows CE.

18 Typically, radio interface is implemented in such a way that it provides management interface for base 19 station management entity. In Figure 4, such interface is represented by three service access points 20 PHY ME SAP, MAC ME SAP, and CS ME SAP, corresponding to physical layer, MAC sublayer, and

convergence sublayer. This service access points can be used to obtain information from radio interface and
 to request reconfiguration of radio interface. Correspondingly, CE can use these service access points to
 implement interface A. Interface A is defined by service access point COEX_MEDIA_SAP.
 Communication between radio interface management service access points PHY_ME_SAP,
 MAC_ME_SAP, and CS_ME_SAP and CE service access point COEX_MEDIA_SAP is done via base
 station management entity.

7

8 COEX_TR_SAP provides means for Coexistence Enabler, Coexistence Manager, and Coexistence 9 Discovery and Information Server to communicate with each other and with external entities by using 10 transport services provided by underlying layers. The underlying layers could be application layer, 11 transport layer, network layer, and link layer. Example reference model of CE and CM describing example 12 of using COEX_TR_SAP for interface B1 is shown in Figure 5.



13

26

14 Figure 5 Example of using COEX_TR_SAP for interface B1

15 Information required for coexistence and reconfiguration commands that are exchanged between CE and

16 CM over interface B1 are forwarded to transport layer, for example, to TCP, for transmission. This is done

17 using COEX_TR_SAP service access point of CE and CM.

18 **5.2 Service access points**

19 **5.2.1 Coexistence Media SAP**

20 **5.2.1.1 General description**

Coexistence Media SAP (COEX_MEDIA_SAP) defines the interface A between CE and TVBD
 network/device. The Coexistence Media SAP is defined as a set of primitives that provides the following
 services:

- 24 Information service:
- 25 Used by CE to obtain information required for coexistence from TVBD network/device
 - Used by TVBD network/device to obtain information required for coexistence from CE

- 1 - Used by TVBD network/device to share information required for coexistence with other TVBD 2 networks/devices via the IEEE 802.19.1 system
- 3 — Measurement service:
- 4 - Used by CE to request TVBD network/device to perform measurements required for coexistence
 - Used by CE to to obtain measurement results required for coexistence from TVBD network/device
- 6 — Reconfiguration service:
- 7 — Used by CE to request TVBD netrwork/device to perform reconfiguration required for coexistence
- 8 Event service:
 - Used by TVBD network/device to receive information about observed or predicted events related to coexistence from CE
 - Used by CE to receive information about observed or predicted events related to coexistence from TVBD network/device.
- 12 13 14

15 16

5

9

10

11

Primitives described in Table 1 are used to define the Coexistence Media SAP.

Primitive Service COEX INFO OBTAINING Information Used by CE to obtain information required for coexistence from TVBD network/device. Also, used by TVBD network/device to obtain information required for coexistence from CE. COEX INFO SHARING Information Used by TVBD network/device to identify the capability of sharing information to other TVBD networks/devices via the IEEE 802.19.1 system. COEX INFO PROVISION Used by TVBD network/device to provide Information information to the IEEE 802.19.1 system for sharing with other TVBD networks/devices. COEX RCF Reconfiguration Used by CE to request reconfiguration of TVBD networks/devices required for coexistence. COEX MEAS Measurement Used by CE to request TVBD network/device to perform measurement required for coexistence and to obtain measurement results. COEX EVENT Event Used by TVBD network/device to inform CE

Description

about events related to coexistence observed or predicted by TVBD network/device. Also, used by CE to inform TVBD network/device about events related to coexistence observed or predicted by IEEE

802.19.1 system.

| 1 | 5.2.1.2 | Information | service |
|---|---------|-------------|---------|
|---|---------|-------------|---------|

2 5.2.1.2.1 COEX_INFO_OBTAINING

3 5.2.1.2.1.1 COEX_INFO_OBTAINING.request

- 4 Function
- 5 Used by CE to request information required for coexistence from TVBD network/device.
- 6 Also, used by TVBD network/device to request information required for coexistence from CE.
- 7

8 Semantics

- 9 COEX_INFO_OBTAINING.request(
- 10 CoexInfoParamIds
- 11

)

12

| Name | Туре | Description |
|------------------|------------------|---|
| CoexInfoParamIds | COEX_I_PARAM_IDs | This parameter contains list of information |
| | | parameter IDs requested by CE. |

13

14 When generated

15 Generated by CE to request information required for coexistence from TVBD network/device.

16 Generated by TVBD network/device to request information required for coexistence from CE.

17

18 Effect on receipt

19 When TVBD network/device receives this primitive, the TVBD network/device shall send 20 COEX_INFO_OBTAINING.confirm back to the CE.

21 When CE receives this primitive, CE shall send COEX_INFO_OBTAINING.confirm back to the TVBD network/device.

23 **5.2.1.2.1.2 COEX_INFO_OBTAINING.confirm**

24 Function

- 25 Used by TVBD network/device to provide information required for coexistence to CE.
- 26 Used by CE to provide information required for coexistence to TVBD network/device.
- 27

1 Semantics

- 2 COEX_INFO_OBTAINING.confirm(
- 3 CoexInfoParams
- 4)
- 5

| Name | Туре | Descri | iption | | | |
|----------------|---------------|---------------|---------------------------|--|----|-------------|
| CoexInfoParams | COEX_I_PARAMs | This param | parameter eters reques | | of | information |

6

7 When generated

- 8 Generated by TVBD network/device in response to COEX_INFO_OBTAINING.request from CE.
- 9 Generated by CE in response to COEX_INFO_OBTAINING.request from TVBD network/device.

10

11 Effect on receipt

- 12 When CE receives this primitive, it examines the received information required for coexistence.
- 13 When TVBD network/device receives this primitive, it examines the received information required for 14 coexistence.

$15 \qquad \textbf{5.2.1.2.2 COEX_INFO_SHARING}$

16 5.2.1.2.2.1 COEX_INFO_SHARING.request

17 Function

18 Used by TVBD network/device to identify the capability of sharing information to other TVBD networks/devices via the IEEE 802.19.1 system.

20

21 Semantics

- 22 COEX_INFO_SHARING.request(
- 23 InfoDestination,
- 24 CoexInfoParamIds
- 25)
- 26

| Name | Туре | Description |
|-----------------|-----------|---|
| InfoDestination | INFO_DEST | This parameter contains list of destinations to which |

| | | TVBD network/device would like to provide information for sharing with other TVBD networks/devices. |
|------------------|------------------|---|
| CoexInfoParamIds | COEX_I_PARAM_IDs | This parameter contains list of information parameter IDSs which TVBD network/device would like to share with other TVBD networks/devices. |

1

2 When generated

3 Generated by TVBD network/device to initiate the procedure to share information with other TVBD networks/devices via the IEEE 802.19.1 system.

5

6 Effect on receipt

- 7 When CE receives this primitive, CE shall send COEX_INFO_SHARING.confirm back to the TVBD
- 8 network/device.

9 5.2.1.2.2.2 COEX_INFO_SHARING.confirm

10 Function

- 11 Used by CE to inform TVBD network/device about the capability of sharing information to other TVBD
- 12 networks/devices via the IEEE 802.19.1 system.

13

14 Semantics

- 15 COEX_INFO_SHARING.confirm(
- 16 CoexInfoParamIds
- 17)

18

| Name | Туре | Description |
|------------------|------------------|--|
| CoexInfoParamIds | COEX_I_PARAM_IDs | This parameter contains list of information parameter IDs which IEEE 802.19.1 system can share with other TVBD networks/devices. |

19

20 When generated

21 Generated by CE in response to COEX_INFO_SHARING.request from TVBD network/device.

22

23 Effect on receipt

- 24 When TVBD network/device receives this primitive, it examines the received information about the
- 25 capability of sharing information to other TVBD networks/devices via the IEEE 802.19.1 system.

1 5.2.1.2.3 COEX_INFO_PROVISION

2 5.2.1.2.3.1 COEX_INFO_PROVISION.request

3 Function

- 4 Used by TVBD network/device to provide information to the IEEE 802.19.1 system for sharing with other
- 5 TVBD networks/devices.
- 6

7 **Semantics**

- 8 COEX_INFO_PROVISION.request(
- 9 InfoDestination,
- 10 CoexInfoParams
- 11)

12

| Name | Туре | Description |
|-----------------|---------------|---|
| InfoDestination | INFO_DEST | This parameter contains list of destinations to which TVBD network/device provides information. |
| CoexInfoParams | COEX_I_PARAMs | This parameter contains list of information parameters which TVBD network/device is |
| | | providing. |

13

14 When generated

15 Generated by TVBD network/device to provide information to the IEEE 802.19.1 system for sharing with 16 other TVBD networks/devices.

17

18 Effect on receipt

19 When CE receives this primitive, CE shall send COEX_INFO_PROVISION.confirm back to the TVBD 20 network/device.

21 5.2.1.2.3.2 COEX_INFO_PROVISION.confirm

22 Function

23 Used by CE to inform TVBD network/device about the status of the request to provide information to the 24 IEEE 802.19.1 system for sharing with other TVBD networks/devices.

25

26 **Semantics**

27 COEX_INFO_PROVISION.confirm(

1 InfoProvisionStatus

2)

3

| Name | Туре | Description |
|---------------------|----------|---|
| InfoProvisionStatus | I_STATUS | This parameter describes the status of information provision request issued by the TVBD network/device. |

4

5 When generated

6 Generated by CE in response to COEX_INFO_PROVISION.request from TVBD network/device.

7

8 Effect on receipt

9 When TVBD network/device receives this primitive, it examines the received information about the status 10 of the request to provide information to the IEEE 802.19.1 system for sharing with other TVBD 11 networks/devices.

12 **5.2.1.3 Reconfiguration service**

13 **5.2.1.3.1 COEX_RCF**

14 **5.2.1.3.1.1 COEX_RCF.request**

15 Function

16 Used by CE to request reconfiguration of TVBD networks/devices required for coexistence.

17

18 Semantics

19 COEX_RCF.request(

20 CoexReconParams

- 21)
- 22

| Name | Туре | Description |
|-----------------|---------------|--|
| CoexReconParams | COEX_R_PARAMs | This parameter contains list of reconfiguration parameters according to which TVBD network/device shall perform reconfiguration. |

23

24 When generated

1 Generated by CE to request reconfiguration of TVBD networks/devices required for coexistence.

2

3 Effect on receipt

- 4 When TVBD network/device receives this primitive, it performs corresponding reconfiguration. Then,
- 5 TVBD network/device shall send COEX_RCF.confirm back to the CE.

6 **5.2.1.3.1.2 COEX_RCF.confirm**

7 Function

8 Used by TVBD network/device to inform CE about the results of the request to perform reconfiguration of
 9 TVBD networks/devices required for coexistence.

10

11 Semantics

- 12 COEX_RCF.confirm(
- 13 CoexReconResults
- 14)
- 15

| Name | Туре | Descr | iption | | | | | |
|------------------|----------------|--------------------------------------|-----------|-----------|-----|--------|----|-----|
| CoexReconResutls | COEX_R_RESULTs | This | parameter | describes | the | result | of | the |
| | | reconfiguration requested by the CE. | | | | | | |

16

17 When generated

18 Generated by TVBD network/device in response to the COEX RCF.request from CE.

19

20 Effect on receipt

21 When CE receives this primitive, it examines the received information about the status of the request to 22 perform reconfiguration of TVBD networks/devices required for coexistence.

22 perform recomgutation of 1 v DD hetworks/devices required for coexi

23 5.2.1.4 Measurement service

24 **5.2.1.4.1 COEX_MEAS**

25 **5.2.1.4.1.1 COEX_MEAS.request**

26 Function

27 Used by CE to request TVBD network/device to perform measurement required for coexistence.

- 1
- 2 Semantics
- 3 COEX_MEAS.request(
- 4 CoexMeasuParams
- 5)
- 6

| Name | Туре | Description |
|-----------------|---------------|---|
| CoexMeasuParams | COEX_M_PARAMs | This parameter contains list of measurement |
| | | parameters according to which TVBD |
| | | network/device shall perform measurement. |

7

8 When generated

9 Generated by CE to request TVBD network/device to perform measurement required for coexistence.

10

11 Effect on receipt

12 When TVBD network/device receives this primitive, it performs requested measurement. Then, TVBD 13 network/device shall send COEX_MEAS.confirm back to CE.

14 **5.2.1.4.1.2 COEX_MEAS.confirm**

15 Function

16 Used by TVBD network/device to provide requested measurement results to CE.

17

18 Semantics

- 19 COEX_MEAS.confirm(
- 20 CoexMeasuResults
- 21)
- 22

| Name | Туре | Descr | iption | | | | | |
|------------------|----------------|-------|--------------|------------|------------|------|-----------|----|
| CoexMeasuResults | COEX_M_RESULTs | This | parameter | contains | list | of | results | of |
| | | measu | rement perfo | ormed by T | VBD | netw | /ork/devi | ce |

23

24 When generated

25 Generated by TVBD network/device in response to the COEX_MEAS.request from CE.

1 Effect on receipt

2 When CE receives this primitive, it examines the received measurement results required for coexistence.

3 5.2.1.5 Event service

4 **5.2.1.5.1 COEX_EVENT.indication**

5 Function

Used by TVBD network/device to inform CE about events related to coexistence observed or predicted by
 TVBD network/device.

8 Also, used by CE to inform TVBD network/device about events related to coexistence observed or predicted by IEEE 802.19.1 system.

10

11 Semantics

- 12 COEX_EVENT.indication(
- 13 CoexEventParams
- 14)
- 15

| Name | Туре | Description |
|-----------------|---------------|---|
| CoexEventParams | COEX_E_PARAMs | This parameter contains list of event parameters. |

16

17 When generated

18 Generated by TVBD network/device to inform CE about events related to coexistence observed or 19 predicted by TVBD network/device.

20 Generated by CE to inform TVBD network/device about events related to coexistence observed or 21 predicted by IEEE 802.19.1 system.

22

23 Effect on receipt

When CE receives this primitive, it examines the received information about events realted to coexistenceobserved or predicted by TVBD network/device.

When TVBD network/device receives this primitive, it examines the received information about events realted to coexistence observed or predicted by IEEE 802.19.1 system.

1 5.2.2 Coexistence Transport SAP

2 **5.2.2.1 General description**

3 Coexistence Transport SAP (COEX_TR_SAP) provides means for Coexistence Enabler, Coexistence 4 Manager, and Coexistence Discovery and Information Server to communicate with each other and with 5 external entities by using transport services provided by underlying layers. The Coexistence Transport SAP 6 is defined as a set of primitives that provides the following service:

- 7 Transport service:
- 8 Used by CE, CM, CDIS or external entity to send coexistence protocol data unit to each other and 9 to external entities and to receive acknoledgement of such operation
- 10 Used by CE, CM, and CDIS or external entity to receive coexistence protocol data unit from each other and from external entities.
- 12 13
- Primitives described in Table 2 are used to define the Coexistence Transport SAP.
- 14 15

| Table 2 – | Coexistencre | Transport | SAP | nrimitives |
|-----------|--------------|-----------|-----|------------|

| Primitive | Service | Description |
|-------------------|-----------|--|
| CP_PACKET_SEND | Transport | Used by CE, CM, CDIS or external entity to send a coexistence protocol data unit using a transport service provider. |
| CP_PACKET_RECEIVE | Transport | Used by a transport service provider to deliever a coexistence protocol data unit to CE, CM, CDIS or external entity. |

16 **5.2.2.2 Transport service**

17 CP_PACKET_SEND

18 **CP_PACKET_SEND.request**

19 Function

20 Used by CE, CM, CDIS or external entity to request the transport service provider to transport a coexistence protocol data unit.

22

23 Semantics

- 24 CP_PACKET_SEND.request (
- 25 TransportPref,
- 26 SourceID,
- 27 DestinationID,
- 28 CoexProtocolPDU

1)

2

| Name | Туре | Description |
|-----------------|----------------|--|
| TransportPref | TRANSPORT_PREF | Transport protocol preference. |
| SourceID | TRANSPORT_ADDR | Address of the entity sending coexistence protocol |
| | | data unit. |
| DestinationID | TRANSPORT_ADDR | Address of the entity to receive coexistence |
| | | protocol data unit. |
| CoexProtocolPDU | OCTET_STRING | Coexistence protocol data unit to be transported. |

3

4 When generated

5 Generated by CE, CM, CDIS or external entity to request the transport service provider to transport a

6 coexistence protocol data unit.

7 Effect on receipt

- 8 9 The specific transport servce provider receiving this primitive attempts to transport the coexistence protocol
- data unit.

10 CP_PACKET_SEND.confirm

11 **Function**

12 Used by transport service provider to acknowledge transportation of the coexistence protocol data unit if 13 such acknowledgment is supported by the transport service provider.

14

15 **Semantics**

- 16 CP_PACKET_SEND.confirm(
- 17 TransportPref,
- 18 SourceID,
- 19 DestinationID,
- 20 TransportStatus
- 21)
- 22

| Name | Туре | Description | | |
|-----------------|----------------|--|--|--|
| TransportPref | TRANSPORT_PREF | Transport protocol preference. | | |
| SourceID | TRANSPORT_ADDR | Address of the entity sending coexistence protocol data unit. | | |
| DestinationID | TRANSPORT_ADDR | Address of the entity to receive coexistence protocol data unit. | | |
| TransportStatus | BOOLEAN | Indicates whether the transfer of coexistence protocol data unit is successful or not. | | |

1

2 When generated

- 3 Generated by the transport service provider to confirm delivery of coexistence protocol data if such acknowledgement is supported by the transport service provider.
- 5

6 *Effect on receipt*

7 When CE, CM, CDIS or external entity receives this primitive, it learns about the staus of the requested 8 delivery of coexistence protocol data.

9 **CP_PACKET_RECEIVE**

10 Function

Used by transport service provider to deliver a coexistence protocol data unit to CE, CM, CDIS or externalentity.

13

14 Semantics

- 15 CP_PACKET_RECEIVE(
- 16 TransportPref,
- 17 SourceID,
- 18 DestinationID,
- 19 CoexProtocolPDU
- 20

)

21

| Name | Туре | Description |
|-----------------|----------------|--|
| TransportPref | TRANSPORT_PREF | Transport protocol preference. |
| SourceID | TRANSPORT_ADDR | Address of the entity sending coexistence protocol |
| | | data unit. |
| DestinationID | TRANSPORT_ADDR | Address of the entity to receive coexistence |
| | | protocol data unit. |
| CoexProtocolPDU | OCTET_STRING | Coexistence protocol data unit to be delivered. |

22

23 When generated

Generated by the transport service provider when it has coexistence protocol data unit for CE, CM, CDIS or external entity.

26 Effect on receipt

27 The CE, CM, CDIS or external entity receiving this primitive gets coexistence protocol data unit.

1 5.3 Data types

2 5.3.1 Coexistence Media SAP data types

3 The following data types are defined for Coexistence Media SAP.

4 5.3.1.1 Information service data types

5 The following data types are defined for information service of Coexistence Media SAP.

```
7
      I_PARAM_ID ::= ENUMERATED{
 8
         BSSID,
 9
         SSID,
10
         BSSType,
11
         BeaconPeriod,
12
        DTIMPeriod,
13
        Timestamp,
14
        LocalTime,
15
        PHYParameterSet,
16
        CFParameterSet,
17
        IBSSATIMWindow,
\begin{array}{c} 18\\ 19\\ 20\\ 21\\ 22\\ 23\\ 24\\ 25\\ 26\\ 27\\ 28\\ 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ \end{array}
         CapabilityInformation,
         BSSBasicRateSet,
        OperationalRateSet,
         Country,
         IBSSDFSRecoveryInterval,
         Load,
         TPCTransmitPower,
         TPCLinkMargin,
        NeighbourBSSSet,
        ListOfAvailableChannels,
        NetworkChannels,
        AntennaInfo,
         TVBDInfo,
         SysEntityID,
         TVBDID,
         ListOfNeighbours,
      }
      COEX_I_PARAM_IDs ::= SEQUENCE OF I_PARAM_ID
38
39
      I_PARAM_VALUE ::= CHOICE{
40
        BSSID
                                                  STRING,
41
         SSID
                                                  STRING,
42
        BSSType
                                                  ENUMERATED,
43
        BeaconPeriod
                                                  INTEGER,
44
        DTIMPeriod
                                                  INTEGER,
45
        Timestamp
                                                  INTEGER,
46
        LocalTime
                                                  INTEGER,
47
        PHYParameterSet
                                                  PHY_PARAM_SET,
48
                                                  CF_PARAM_SET,
         CFParameterSet
```

| 1 2 3 4 5 6 | IBSSATIMWindow CapabilityInformation BSSBasicRateSet | TU, BSS_CAPA_INFO, SET OF INTEGER, |
|----------------------------|--|--|
| 4 | OperationalRateSet | SET OF INTEGER, |
| 5 | Country | STRING, |
| 7 | IBSSDFSRecoveryInterval Load | INTEGER, BSS_LOAD, |
| 8 | TPCTransmitPower | INTEGER, |
| 9 | TPCLinkMargin | INTEGER, |
| 10 | NeighbourBSSSet | NEIBR_BSS_SET, |
| 11 | ListOfAvailableChannels | LIST_TV_CHANNELS, |
| 12 | NetworkChannels | NETWORK_CHANNELS, |
| 13 | AntennaInfo | ANTENNA_INFO, |
| 14 15 | TVBDInfo | TVBD_INFO, |
| 16 | SysEntityID TVBDID | INTEGER, STRING, |
| 17 | ListOfNeighbours | LIST_NEIGHBOURS, |
| 18 | | , |
| 19 | } | |
| 20 | | |
| 21 | COEX_I_PARAM ::= SEQUENCE { | |
| 22 23 | InfoParamId I_PARAM_ID, | |
| 23 24 | InfoStatus I_STATUS, InfoParamValue I_PARAM_VAL | TIP |
| 25 | <pre>Intoparamivatue 1_PARAM_VAL }</pre> | OF |
| $\frac{25}{26}$ |] | |
| $\overline{2}\overline{7}$ | COEX_I_PARAMs ::= SEQUENCE OF COEX_ | I_PARAM |
| 28 | | |
| 29 | I_STATUS ::= ENUMERATED{ | |
| 30 | SUCCESS, | |
| 31 | NOT_AVAILABLE_NOW, | |
| 32 33 | NOTSUPPORTED, | |
| 33 34 | BUSY, | |
| 35 | | |
| 36 | J | |
| 37 38 | SYS_ENTITY_ID ::= INTEGER | |
| 39 40 | INFO_DEST ::= SEQUENCE OF SYS_ENTIT | Y_ID |
| | | |

41 Table 3 describes parameters of data types of information service of Coexistence Media SAP.

42

Table 3 - Parameters of data types of information service of Coexistence Media SAP

| Name | Туре | Valid range | Description | Note |
|--------------|--------------|------------------------------------|-----------------------------|---------------------------|
| BSSID | MAC_ADDR | N/A | The BSSID of the found BSS. | 802.11-2007 Scan. |
| SSID | OCTET_STRING | 132 octets | The SSID of the found BSS. | confirm |
| BSSType | ENUMERATED | INFRASTRUC TURE, INDEPENDENT | The type of the found BSS. | BSS Description Set |
| BeaconPeriod | INTEGER | N/A | The Beacon period of the | |

| | | | found DSS (in TII) |
|--------------|--------------|-----------------------------------|---|
| DTIMPeriod | INTEGER | As defined in | found BSS (in TU). |
| DIIMPeriod | INTEGER | frame format | The DTIM period of the BSS (in beacon periods). |
| Timeseteme | DITECED | | |
| Timestamp | INTEGER | N/A | The timestamp of the |
| | | | received frame (probe |
| | | | response/beacon) from the |
| LassiTima | NITECED | N/A | found BSS. The value of the STA fs |
| LocalTime | INTEGER | N/A | TSF timer at the start of |
| | | | |
| | | | reception of the first octet |
| | | | of the timestamp field of |
| | | | the received frame (probe |
| | | | response or beacon) from |
| | | | the found BSS. |
| PHYParameter | PHY_PARAM_ | As defined in | The parameter sets |
| Set | SET | frame format or | relevant to the PHY from |
| | | according to the | the received Beacon or |
| | | relevant PHY | Probe Response frame. If |
| | | clause | no PHY Parameter Set |
| | | | information element is |
| | | | present in the received |
| | | | frame, this parameter |
| | | | contains the channel |
| | | | number on which the |
| | | | frame was received. Valid |
| | | | channel numbers are |
| | | | defined in the relevant PHY clause. |
| CFParameter | CF PARAM | As defined in | The parameter set for the |
| Set | SET | frame format | CF periods, if found BSS |
| Set | SEI | frame format | |
| IBSSATIM | TU | As defined in | supports CF mode. The parameter set for the |
| Window | 10 | frame format | IBSS, if found BSS is an |
| willdow | | frame format | IBSS, II Ioulid BSS is all IBSS. |
| Capability | BSS_CAPA_ | As defined in | The advertised capabilities |
| Information | INFO | frame format | of the BSS. |
| BSSBasicRate | SET OF | 1127 inclusive | The set of data rates that |
| Set | INTEGER | (for each integer | must be sup-ported by all |
| Bet | INTEGER | (for each integer in the set) | STAs that desire to join |
| | | in the set | this BSS. The STAs must |
| | | | be able to receive and |
| | | | transmit at each of the |
| | | | data rates listed in the set. |
| Operational | SET OF | 1127 inclusive | The set of data rates that |
| RateSet | INTEGER | (for each integer | the STA desires to use for |
| Natuset | T TINTEX HOL | | |
| | | in the set) | communication within the |
| | | in the set) | communication within the |
| | | in the set) | BSS. The STA must be |
| | | in the set) | BSS. The STA must be able to receive at each of |
| | | in the set) | BSS. The STA must be able to receive at each of the data rates listed in the |
| | | in the set) | BSS. The STA must be able to receive at each of the data rates listed in the set. This set is a superset |
| | | in the set) | BSS. The STA must be able to receive at each of the data rates listed in the set. This set is a superset of the rates contained in |
| | | in the set) | BSS. The STA must be able to receive at each of the data rates listed in the set. This set is a superset of the rates contained in the BSSBasicRateSet |
| | | | BSS. The STA must be able to receive at each of the data rates listed in the set. This set is a superset of the rates contained in the BSSBasicRateSet parameter. |
| Country | STRING | As defined in the Country element | BSS. The STA must be able to receive at each of the data rates listed in the set. This set is a superset of the rates contained in the BSSBasicRateSet |

| | | 1 | r | |
|-------------|-----------|---------------|-------------------------------|-------------|
| | | | domain in which the STA | |
| | | | is located and to configure | |
| | | | its PHY for operation in | |
| | | | that regulatory domain. | |
| | | | Present only when TPC | |
| | | | functionality is required, | |
| | | | as specified in 11.8, or | |
| | | | when dot11MultiDomain | |
| | | | CapabilityEnabled is true. | |
| IBSSDFS | NITECED | 1255 | | |
| | INTEGER | 1255 | Only present if BSSType | |
| Recovery | | | = INDEPENDENT. The | |
| Interval | | | time interval that is used | |
| | | | for DFS recovery. Present | |
| | | | only when DFS | |
| | | | functionality is required. | |
| Load | BSS LOAD | As defined in | The values from the BSS | |
| | _ | frame format | Load information element | |
| | | | if such an element was | |
| | | | present in the probe | |
| | | | response or Beacon frame, | |
| | | | else null. | |
| TPCTransmit | INTEGER | | The Transmit Power field | 802.11-2007 |
| Power | INTEGER | | shall be set to the transmit | |
| rowei | | | | TPC report |
| | | | power used to transmit the | |
| | | | frame containing the TPC | MLME- |
| | | | Report element. The field | TPCADAPT |
| | | | is coded as a signed | .confirm |
| | | | integer in units of decibels | |
| | | | relative to 1 mW. The | |
| | | | maximum tolerance for | |
| | | | the transmit power value | |
| | | | reported in the TPC | |
| | | | Response element shall be | |
| | | | ± 5 dB. This tolerance is | |
| | | | defined as the difference, | |
| | | | in decibels, between the | |
| | | | reported power value and | |
| | | | the actual EIRP of the | |
| | | | | |
| | | | STA (measured when | |
| | | | transmitting 1500 octet | |
| TROLL | D IND GED | | frames). | |
| TPCLink | INTEGER | | The Link Margin field | |
| Margin | | | contains the link margin at | |
| | | | the time and for the rate at | |
| | | | which the frame | |
| | | | containing the TPC | |
| | | | Request element was | |
| | | | received. The field is | |
| | | | coded as a signed integer | |
| | | | in units of decibels. The | |
| | | | LinkMargin field shall be | |
| | | | set to 0 and shall be | |
| | | | ignored when a TPC | |
| | | | Report element is included | |
| | | | | |
| 1 | 1 | | in a Beacon frame or | |
| | | | Probe Response frame. | |

| | | | The measurement method of Link Margin is beyond | |
|-----------------------------|----------------------|------------------------------------|---|--|
| | | | the scope of this standard. | |
| Neighbour BSSSet | NEIBR_BSS_ SET | Specified in the regulatory domain | Report the neighbor of an BSS Repot the channel of the neighbor BSS | 11k Neighbour report |
| ListOfAvailable Channels | LIST_TV_ CHANNELS | | | 802.11af 802.22 |
| Network Channels | NETWORK_ CHANNELS | | The parameter reports the network channels that TV band devices and networks are operating on. | 802.11af IEEE 802.22 M-WRAN- SERVICE- REPORT |
| AntennaInfo | ANTENNA_ INFO | | Specifying the antenna information of TV band devices. | IEEE 1900.6 |
| TVBDInfo | TVBD_INFO | | The value identifies the type of device at the geolocation registering | IEEE 802.22 IEEE 802.11 device types are denoted as WLAN STA and WLAN AP |
| NeighbourBSS Set | NEIBR_BSS_ SET | Specified in the regulatory domain | Report the neighbor of an BSS. Repot the channel of the neighbor BSS. | 802.11k Neighbour report |
| SysEntityID | INTEGER | | Logical ID of IEEE 802.19.1 system entity. | Parameters added for |
| TVBDID | STRING | | This TVBDID can be the FCC ID | TVBD |
| ListOfAvailable Channels | LIST_TV_CHAN NELS | | This parameter gives the list of availe channels (TV channels) as decided by the IEEE 802.19.1 system. | From IEEE 802.19.1 system to TVBDs |
| ListOf Neighbours | LIST_ NEIGHBOURS | | This parameters gives the TVBD ID, TVBDInfo, occupied channels, mobility (fixed, moible), | |

1

2 5.3.1.2 Reconfiguration service data types

3 The following data types are defined for reconfiguration service of Coexistence Media SAP.

```
COEX_R_OBJ_ID ::= ENUMERATED{
```

```
5
6
7
8
         ChannelSwitch,
```

```
ChangeTransmitPower,
```

```
Scheduling
```

```
1
    }
 2
3
    R_PROFILE_PARAM_ID ::= ENUMERATED{
 4
5
6
7
      NewRegulatoryClass,
       ChannelNumber,
      ChannelSwitchMode,
      ChannelSwitchCount,
 8
      DSELocalPowerConstraint,
9
      NewNetworkChannels,
10
      DisallowedChannels,
11
      OperatingChannels,
12
       Scheduling
13
       ...
14
    }
15
16
    R_PROFILE_PARAM _VALUE ::= CHOICE{
17
       NewRegulatoryClass
                                           INTEGER,
18
       ChannelNumber,
                                           INTEGER,
19
       ChannelSwitchMode
                                           CHANNEL_SWITCH_MODE,
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
                                          INTEGER,
       ChannelSwitchCount
       DSELocalPowerConstraint
                                           INTEGER,
       NewNetworkChannels
                                           NET CHANNELs,
       DisallowedChannels
                                           SET OF INTEGER,
                                           SET OF INTEGER,
       OperatingChannels
       Schedule
                                           SCHEDULE,
       ••••
     }
     R_PROFILE_PARAM ::= SEQUENCE{
       ReconProfileParamID
                                          R_PROFILE_PARAM_ID,
       ReconProfileParamValue
                                          R_PROFILE_PARAM_VALUE
     }
     COEX_R_PROFILE ::= SEQUENCE OF R_PROFILE_PARAM
35
36
    COEX_R_PARAM ::= SEQUENCE {
37
       CoexReconObjID
                                           COEX_R_OBJ_ID,
38
       CoexReconProfile
                                           COEX_R_PROFILE
39
     }
40
41
     COEX_R_PARAMS ::= SEQUENCE OF COEX_R_PARAM
42
43
    R_STATUS ::= ENUMERATED{
44
      SUCCESS,
45
       NOTSUPPORTED,
46
       BUSY,
47
       TOANOTHERVALUE,
48
       ...
49
     }
50
51
    COEX_R_RESULT ::= SEQUENCE {
52
       CoexReconObjID COEX_R_OBJ_ID,
53
54
55
       ReconStatus
                              R_STATUS,
                              COEX_R_PARAMs
                                                      OPTIONAL
       CoexReconParams
     }
56
57
     COEX_R_RESULTs ::= SEQUENCE of COEX_R_RESULT
```

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- 1
- Table 4 and Table 5 describe parameters of data types of reconfiguration service of Coexistence Media SAP. 2 3
- 4
- 5

Table 4 - Parameters of data types of reconfiguration service of Coexistence Media SAP

| Name | Туре | Valid range | Description | Note |
|------------------------|-------------------------|---|--|--|
| NewRegulatory Class | INTEGER | | The New Regulatory Class field is set to the number of the regulatory class after the channel switch, as defined in Annex J in IEEE 802.11 standards | 802.11-2007 Channel Switch 802.11y Extended Channel |
| NewChannel Number | INTEGER | As specified in the regulatory domain | The number of the new channel to be switched to. | Switch |
| ChannelSwitch Mode | CHANNEL_ SWITCH_MODE | 0 or 1 | A Channel Switch Mode set to 1 means that the STA in a BSS to which the frame containing the element is addressed shall transmit no further frames within the BSS until the scheduled channel switch. A STA in an IBSS may treat a Channel Switch Mode field set to 1 as advisory. A Channel Switch Mode set to 0 does not impose any requirement on the receiving STA. | |
| ChannelSwitch Count | INTEGER | Specifies the number of TBTTs until the channel switch event, as described for the Channel Switch Announcement element. | The Channel Switch Count field either shall be set to the number of TBTTs until the STA sending the Channel Switch Announcement element switches to the new channel or shall be set to 0. A value of 1 indicates that the switch shall occur immediately before the next TBTT. A value of 0 indicates that the switch shall occur at any time after the frame containing the element is transmitted. | |
| DSELocal Power | INTEGER | Maximum 4w | The local maximum transmit power for a | 802.11y |

| Constraint | | channel is thus defined as the maximum transmit power level specified for the channel in the Country element minus the local power constraint specified for the channel in the DSE Power Constraint frame. | 802.11af |
|------------------------|-------------------|---|-------------|
| NewNetwork Channels | NET_ CHANNELS | Specifies the network channels and maximum transmit power in a regulation domain that the TVBD are allowed to operate in TV band. The parameter has been defined in subclause 5.2.1.2 but is used for reconfiguration purpose. The parameter is used here to indicate the network channels that the TVBD should change to. | 802.11af |
| Disallowed Channels | SET OF INTEGER | The parameter is used for disallowing a number of channels among the list of available channels from the TVWS database. | IEEE 802.22 |
| Operating Channels | SET OF INTEGER | The parameter is used to select chanels for operation from the list of available channels | IEEE 802.22 |

Table 5 – Parameters of data types of reconfiguration service of Coexistence Media SAP

| Name | Туре | Valid range | Description | Note |
|-------------|------------------------|--|---|-----------------------------|
| BSSType | BSS_TYPE | INFRASTRUC TURE, INDEPENDENT, ANY BSS | Determines whether infrastructure BSS, IBSS, or both, are included in the scan. | 802.11-2007 Scan.request |
| BSSID | STRING | Any valid individual orbroadcast MAC address | Identifies a specific or wildcard BSSID. | |
| SSID | STRING | 032 octets | Specifies the desired SSID or the wildcard SSID. | |
| ScanType | ENUMERATED | ACTIVE, PASSIVE | Indicates either active or passive scanning. | |
| ProbeDelay | INTEGER | N/A | Delay (in microseconds) to be used prior to transmitting a Probe frame during active scanning. | |
| ChannelList | SEQUENCE OF INTEGER | Each channel will be selected from the valid channel | Specifies a list of channels that are examined when scanning for a BSS. | |

| | | C .1 | 1 | [|
|--------------|-------------------|-------------------|---------------------------------------|--------------|
| | | range for the | | |
| | | appropriate PHY | | |
| M. Classed | NITECED | and carrier set. | The minimum time (in | |
| MinChannel | INTEGER | ProbeDelay | The minimum time (in | |
| Time | | | TU) to spend on each | |
| | DITECED | | channel when scanning. | |
| MaxChannel | INTEGER | MinChannelTime | The maximum time (in | |
| Time | | | TU) to spend on eachchannel when | |
| | | | | |
| ChManaraTara | Ch MEASU | 0.1.2 | scanning. | .11-2007 |
| ChMeasuType | Ch_MEASU_ TYPE | 0,1,2 | 0: Basic request; 1: Clear channel | |
| | LILL | | assessment (CCA) request | measure |
| | | | 2: Receive power | ment request |
| | | | indication (RPI) histogram | |
| | | | request | |
| Channel | INTEGER | Specified in | Channel number for which | |
| Number | INTEGER | regulatory domain | the measurement request | |
| Inumber | | regulatory domain | applies | |
| StartTime | INTEGER | | The parameter specifies | |
| StartTime | INTEGER | | the time at which the | |
| | | | requested measurement, as | |
| | | | specified by the | |
| | | | MeasurementType | |
| | | | parameter, shall start. A | |
| | | | value of 0 shall indicate it | |
| | | | shall start immediately. | |
| Duratioin | INTEGER | | The Measurement | |
| Duration | INTEGER | | Duration field shall be set | |
| | | | to the duration of the | |
| | | | requested measurement, as | |
| | | | specified by the | |
| | | | MeasurementType | |
| | | | parameter, expressed in | |
| | | | TUs. | |
| LinkMeasu | STRING | Any valid | The address of the peer | 802.11k |
| PeerAdd | | individual | MAC entity to which the | Link |
| | | MAC address | Link Measure Request | measure |
| | | | shall be sent. | ment |
| LinkMeasu | INTEGER | | The transmit power to be | |
| TxPower | | | used when transmitting | |
| | | | the Link Measurement | |
| | | | Request frame and | |
| | | | included in the | |
| | | | frame body | |
| LinkMeasu | INTEGER | | The maximum transmit | |
| MaxiTxPower | | | power to be used by the | |
| | | | transmitting STA on its | |
| | | | operating channel. | |
| Sensing | SENSING_ | | Specification consists of: | 802.22 |
| Window | WINDOW | | NumSensingPeriods | SM-SSF |
| | | | SensingPeriodDuration | |
| | | | SensingPeriodInterval | |
| SignalType | SIGNAL_TYPE | | The interger number | |
| | | | specifies the following | |
| | | | specifies the following | |

| | | 1 | 1 | |
|--------------|-------------|---------|-----------------------------|---------------------|
| | | | types of signals to be | |
| | | | sensed by the spectrum | |
| | | | sensor. | |
| | | | 0: Any Signal Type | |
| | | | 1: IEEE 802.22 WRAN | |
| | | | 2: ATSC | |
| | | | 3: DVB-T | |
| | | | 4: ISDB-T | |
| | | | 5: NTSC | |
| | | | 6: PAL | |
| | | | 7: SECAM | |
| | | | 8: Wireless Microphone | |
| | | | | |
| | | | 9: IEEE 802.22.1 Sync | |
| | | | Burst | |
| | | | 10: IEEE 802.22.1 PPDU | |
| | | | MFS1 | |
| | | | 11: DVB-TIEEE 802.22.1 | |
| | | | PPDU | |
| | | | MSF2 | |
| | | | 12: IEEE 802.22.1 PPDU | |
| | | | MSF3 | |
| | | | 13: Medical telemetry | |
| | | | devices | |
| | | | 14: Studio-transmitter link | |
| | | | 15-24 Reserved | |
| SensingMode | SENSING_ | | Mode 0: For each signal | |
| Sensingwoode | MODE | | type the SSF generates a | |
| | MODE | | binary decision as to | |
| | | | whether the signal is | |
| | | | | |
| | | | present in the television | |
| | | | channel | |
| | | | Mode 1: Same as sensing | |
| | | | mode 0 with the addition | |
| | | | of a confidence metric for | |
| | | | binary decision | |
| | | | Mode 2: For each signal | |
| | | | type the spectrum sensor | |
| | | | generates an estimate of | |
| | | | the field strength of that | |
| | | | Signal | |
| | | | Mode 3: Same as sensing | |
| | | | mode 2 with the standard | |
| | | | deviation of the field | |
| | | | strength estimate from | |
| | | | sensing mode 2. | |
| | | | | |
| Datast | DEAL | 1(0.70 | Mode4: reserved | IEEE 1000 (|
| Detection | REAL | -160~70 | The parameter specifies | IEEE 1900.6 |
| Threshold | | | the noise power in dBm. | |
| Performance | PERF_METRIC | | Parameter that indicates | |
| Metric | | | the quality of sensing. | |
| Geolocation | STRING | | Reques to obtain the | IEEE 802.22 |
| | | | geolocation information of | GL-SAP, |
| 1 | | 1 | | |
| | | | the TV band devices. | 802.11af, |
| | | | the TV band devices. | 802.11af, 1900.6 |

1 5.3.1.3 Measurement service data types

2 The following data types are defined for measurement service of Coexistence Media SAP.

```
3
 4
     COEX_M_OBJ_ID ::= ENUMERATED{
 5
        802.11BSSScan,
 6
        802.11ChannelMeasu,
 7
        802.11kLinkMeasu,
 8
        802.22Sensing
9
     }
10
11
     M_PROFILE_PARAM_ID ::= ENUMERATED{
12
       BSSType,
13
       BSSID,
14
       SSID,
15
       ScanTYpe,
16
       ProbeDelay,
17
       ChannelList,
18
       MinChannelTime,
19
       MaxChannelTIme,
20
       ChMeasuType,
21
22
       ChannelNumber,
       StartTime,
23
       Duration,
24
25
26
27
28
29
       LinkMeasuPeerAdd,
       LinkMeasuTxPower,
       LinkMesuMaxiTxPower,
       SensingWindow,
       SignalType,
       SensingMode,
30
       DetectionThreshold,
31
       PerformanceMetric,
32
       Geolocation,
33
       ....
34
     }
35
36
     M PROFILE PARAM VALUE ::= CHOICE {
37
       BSSType
                                            BSS TYPE,
38
       BSSID
                                            STRING,
39
       SSID
                                            STRING,
40
                                            SCAN_TYPE,
       ScanType
41
       ProbeDelay
                                            INTEGER,
42
       ChannelList
                                           SEQUENCE OF INTEGER,
43
       MinChannelTIme
                                           INTEGER,
44
       MaxChannelTime
                                           INTEGER,
45
       ChMeasuType
                                           CH MEASU TYPE,
46
       ChannelNumber
                                           INTEGER,
47
       StartTime
                                            INTEGER,
48
       Duration
                                            INTEGER,
49
       LinkMeasuPeerAdd
                                           STRING,
50
       LinkMeasuTxPower
                                           INTEGER,
51
       LinkMeasuMaxiTxPower
                                            INTEGER,
52
       SensingWindow
                                            SENSING_WINDOW,
53
       SignalType
                                            SIGNAL_TYPE,
```

```
1
        SensingMode
                                             SENSING_MODE,
 2
3
        DetectionThreshold
                                             REAL,
                                             PERF_METRIC,
        PerformanceMetric
 456789
        Geolocation
                                             STRING,
        ...
     }
     M_PROFILE_PARAM ::= SEQUENCE{
       MeasuProfileParamID
                                             M PROFILE PARAM ID,
10
        MeasuProfileParamValue
                                             M_PROFILE_PARAM_VALUE
11
     }
12
13
     COEX_M_PROFILE ::= SEQUENCE OF M_PROFILE_PARAM
14
15
     COEX_M_PARAM ::= SEQUENCE{
16
       CoexMeasuObjID
                                             COEX_M_OBJ_ID,
17
        CoexMeasuProfile
                                             COEX_M_PROFILE
18
     }
19
20
     COEX_M_PARAMS ::= SEQUENCE OF COEX_M_PARAM
21
22
23
24
25
26
27
28
29
30
31
32
33
34
     M_STATUS ::= ENUMERATED{
        SUCCESS,
        NOTSUPPORTED,
       BUSY,
        ••••
     }
     M_RESULT_PARAM_ID ::= ENUMERATED{
       BSSID,
        SSID,
       BSSType,
       BeaconPeriod,
      DIMPeriod,
35
36
37
       TimeStamp,
      LocalTime,
      PHYParameterSet,
38
      CFParameterSet,
39
       IBSSATIMWindow,
40
      CapabilityInformation,
41
       BSSBasicRateSet,
42
       OperationalRateSet,
43
       Country,
44
       IBSSDFSRecoveryInterval,
45
       Load,
46
       ChMeasuType,
47
       ChannelNumber,
48
        StartTime,
49
       Duration,
50
       ChMeasuReport,
51
52
53
54
       TransmitPower,
       LinkMagin,
        RCPI,
        RSNI,
55
        ReceiveAntennaID,
56
        TransmitAntennaID,
57
        SensingResult,
```

| $1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 24 \\ 25 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 22 \\ 30 \\ 31 \\ 22 \\ 30 \\ 31 \\ 22 \\ 30 \\ 31 \\ 22 \\ 30 \\ 31 \\ 22 \\ 30 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 32 \\ 31 \\ 31$ | <pre>Geolocation, } M_RESULT_PARAM_VALUE ::= CHOICE{ BSSID SSID BSST BeaconPeriod DIMPeriod TimeStamp LocalTime PHYParameterSet CFParameterSet IBSSATIMWindow CapabilityInformation BSSBasicRateSet OperationalRateSet Country IBSSDFSRecoveryInterval Load ChMeasuType ChannelNumber StartTime Duration ChMeasuReport TransmitPower LinkMargin RCPI RSNI ReceiveAntennaID TransmitAntennaID</pre> | STRING, STRING, BSS_TYPE, INTEGER, INTEGER, INTEGER, INTEGER, PHY_PARAM_SET, CF_PARAM_SET, TU, BSS_CAPA_INFO, SET OF INTEGER, SET OF INTEGER, STRING, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, REAL, REAL, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, |
|---|---|--|
| 33 34 35 36 | SensingResult Geolocation } | SENSING_RESULT, STRING, |
| 37 38 | , M_RESULT_PARAM ::= SEQUENCE{ | |
| 39 40 41 42 | MeasuResultParamID MeasuResultParamValue } | M_RESULT_PARAM_ID, M_RESULT_PARAM_VALUE |
| 43 44 | M_RESULT_PARAMs ::= SEQUENCE OF M_R | ESULT_PARAM |
| 45 46 47 48 49 50 51 52 | <pre>COEX_M_RESULT ::= SEQUENCE{ CoexMeasuObjID MeasuStatus MeasuResultParams } COEX_M_RESULTs ::= SEQUENCE of COEX</pre> | COEX_M_OBJ_ID, M_STATUS, M_RESULT_PARAMS |
| 52 53 | Table 6 describes parameters of data types of measu | rement service of Coexistence Media SAP. |
| <i>с</i> 4 | | |

| Name | Туре | Valid range | Description | Note |
|---------------------------|-----------------------------------|-----------------------------|---|---------------------|
| BSSID | STRING | N/A | The BSSID of the found BSS. | 802.11-200 Scan. |
| | | | The SSID of the found | confirm |
| SSID | STRING | 132 octets | BSS. | |
| | | INFRASTRUC | | BSS |
| | | TURE, | The type of the found | Description |
| BSSType | BSS TYPE | INDEPENDENT | BSS. | Set |
| <i>2</i> 1 | | | The Beacon period of the | |
| BeaconPeriod | INTEGER | N/A | found BSS (in TU). | |
| | | As defined in | The DTIM period of the | |
| DTIM Period | INTEGER | frame format | BSS (in beacon periods). | |
| | | | The timestamp of the | |
| | | | received frame (probe | |
| | | | response/beacon) from the | |
| Timestamp | INTEGER | N/A | found BSS. | |
| 1 11100 44111p | Intribulit | 1011 | The value of the STA fs | |
| | | | TSF timer at the start of | |
| | | | reception of the first octet | |
| | | | of the timestamp field of | |
| | | | the received frame (probe | |
| | | | response or beacon) from | |
| LocalTime | INTEGER | N/A | the found BSS. | |
| Local I line | INTEGER | 10/11 | The parameter sets | |
| | | | relevant to the PHY from | |
| | | | the received Beacon or | |
| | | | Probe Response frame. If | |
| | | | no PHY Parameter Set | |
| | | | information element is | |
| | | | present in the received | |
| | | | frame, this parameter | |
| | | | contains the channel | |
| | | As defined in | number on which the | |
| | | frame format or | frame was received. Valid | |
| | | according to the | channel numbers are | |
| PHYParameter | PHY PARAM | relevant PHY | defined in the relevant | |
| Set | SET | clause. | PHY clause. | |
| 501 | SET | Clause. | | |
| CFParameter | CF PARAM | As defined in | The parameter set for the CF periods, if found BSS | |
| Set | SET | frame format | | |
| 501 | SET | | supports CF mode. | |
| ΙΟςς Α ΤΙΝ | | As defined in | The parameter set for the | |
| IBSSATIM Window | TU | frame format | IBSS, if found BSS is an IBSS. | |
| | 10 | As defined in | The advertised capabilities | |
| | | | The advertised capabilities | 1 |
| Capability | DSS ADA INIEO | | | |
| | BSS_APA_INFO | frame format | of the BSS. | |
| Capability | BSS_APA_INFO | | of the BSS. The set of data rates that | |
| Capability | BSS_APA_INFO | | of the BSS. The set of data rates that must be sup-ported by all | |
| Capability | BSS APA INFO | | of the BSS. The set of data rates that must be sup-ported by all STAs that desire to join | |
| Capability | BSS APA INFO | frame format | of the BSS. The set of data rates that must be sup-ported by all STAs that desire to join this BSS. The STAs must | |
| Capability Information | | frame format 1127 inclusive | of the BSS. The set of data rates that must be sup-ported by all STAs that desire to join this BSS. The STAs must be able to receive and | |
| Capability | BSS_APA_INFO SET OF INTEGER | frame format | of the BSS. The set of data rates that must be sup-ported by all STAs that desire to join this BSS. The STAs must | |

| Nomo | Type | Volid rongo | Decarintian | N |
|-----------|------------------------|---------------------|------------------------------|-------|
| Table 6 - | - Parameters of data t | ypes of measurement | service of Coexistence Media | a SAP |

| D (C) | DITECT | | | |
|-------------|-----------|----------------------|------------------------------|-------------|
| RateSet | INTEGER | (for each integer | the STA desires to use for | |
| | | in the set) | communication within the | |
| | | | BSS. The STA must be | |
| | | | able to receive at each of | |
| | | | the data rates listed in the | |
| | | | set. This set is a superset | |
| | | | of the rates contained in | |
| | | | the BSSBasicRateSet | |
| | | | | |
| | | | parameter. | |
| | | | The information required | |
| | | | to identify the regulatory | |
| | | | domain in which the STA | |
| | | | is located and to configure | |
| | | | its PHY for operation in | |
| | | | that regulatory domain. | |
| | | | Present only when TPC | |
| | | | functionality is required, | |
| | | | as specified in 11.8, or | |
| | | | when | |
| | | An Jaffin of the di- | | |
| | OTDDIC | As defined in the | dot11MultiDomainCapabi | |
| Country | STRING | Country element | lityEnabled is true. | |
| | | | Only present if BSSType | |
| | | | = INDEPENDENT. The | |
| | | | time interval that is used | |
| IBSSDFS | | | for DFS recovery. Present | |
| Recovery | | | only when DFS | |
| Interval | INTEGER | 1255 | functionality is required. | |
| inter var | INTEGER | 1200 | The values from the BSS | |
| | | | Load information element | |
| | | | | |
| | | | if such an element was | |
| | | | present in the probe | |
| | | As defined in | response or Beacon frame, | |
| Load | BSS_LOAD | frame format | else null. | |
| Measurement | CH_MEASU_ | 0,1,2 | 0: Basic request; | .11-2007 |
| Туре | TYPE | | 1: Clear channel | measure |
| ~ 1 | | | assessment (CCA) request | ment report |
| | | | 2: Receive power | 1 |
| | | | indication (RPI) histogram | |
| | | | request | |
| Channel | INTEGER | Specified in | • | |
| | INTEGER | Specified in | channel number for which | |
| Number | | regulatory domain | the measurement report | |
| | | | applies | |
| StartTime | INTEGER | | The parameter specifies | |
| | | | the time at which the | |
| | | | requested measurement, as | |
| | | | specified by the | |
| | | | MeasurementType | |
| | | | parameter, has started. A | |
| | | | value of 0 shall indicate it | |
| | | | shall start immediately. | |
| D | DITECT | | ~ | |
| Duratioin | INTEGER | | The Measurement | |
| | | | Duration field shall be set | |
| | | | to the duration of the | |
| | | | requested measurement, as | |
| | | | specified by the | |
| | | | MeasurementType | |
| | | | measurement i ype | |

| | | | . 1: | 1 |
|---------------|-----------|-------------------|------------------------------|---------|
| | | | parameter, expressed in TUs. | |
| ChMeasu | CH_MEASU_ | | Result of selected | |
| Report | REPORT | | measurement. See the | |
| Кероп | KLI OKI | | following tables for the | |
| | | | parameter description of | |
| | | | BasicReport, CCAReport | |
| | | | and RPIhistogramReport | |
| | | | The contents of the | 802.11k |
| | | | Transmit Power field of | Link |
| | | | the received Link | measure |
| | | | Measurement Report | ment |
| | | As defined in the | frame. Present | |
| | | TPC Report | only(#1472) if ResultCode | |
| TransmitPower | INTEGER | element | = SUCCESS. | |
| | | | The contents of the Link | |
| | | | Margin field of the | |
| | | | received Link | |
| | | | Measurement Report | |
| | | As defined in the | frame. Present | |
| | | TPC Report | only(#1472) if Result- | |
| LinkMargin | INTEGER | element | Code = SUCCESS. | |
| | | As defined in | The RCPI level of the | |
| | | 15.4.8.5 | corresponding Link | |
| | | (Received | Measurement Request | |
| | | Channel Power | frame received at the | |
| | | Indicator | reporting STA. Present | |
| | | Measurement(11k | only(#1472) if ResultCode | |
| | |)), or 17.3.10.6 | = SUCCESS. | |
| | | (Received Chan- | | |
| | | nel Power | | |
| | | Indicator | | |
| | | Measure- | | |
| | | ment(11k)), or | | |
| | | 18.4.8.5 | | |
| | | (Received | | |
| | | Channel Power | | |
| | | Indicator | | |
| | | Measurement(11k | | |
| RCPI | REAL |)) | | |
| | | | The RSNI of the | |
| | | | corresponding Link | |
| | | | Measurement Request | |
| | | A 1 0 1 1 | frame received at the | |
| | | As defined in | reporting STA. Present | |
| DON | DEAL | 7.3.2.41 (RSNI | only(#1472) if ResultCode | |
| RSNI | REAL | element(11k)) | = SUCCESS | |
| Receive | INTEGER | 0~255 | The Antenna ID | |
| AntennaID | | | corresponding to the | |
| | | | antenna on which the Link | |
| | | | Measurement Request | |
| | | | frame was received at the | |
| | | | report-ing STA. Antenna | |
| | | | ID is defined in 7.3.2.29 | |
| | | | (EDCA Parameter Set | |
| | | | element). | |

| Transmit AntennaID | INTEGER | 0~255 | The Antenna ID corresponding to the antenna used to transmit the Link Mea-surement Report frame. Antenna ID is defined in 7.3.2.29 (EDCA Parameter Set element). | |
|-----------------------|--------------------|-------|---|--|
| SensingResult | SENSING_ RESULT | | Return the result of spectrum measurement for the selected sensing mode. | |
| Geolocation | String | | Result of geolocation measurement | IEEE 802.22 GL-SAP, 802.11af and 1900.6 |

1

2 5.3.1.4 Event service data types

3 The following data types are defined for event service of Coexistence Media SAP.

| 5 6 7 8 9 | COEX_E_ID ::= ENUMERATED{ NewBSSStart, Interference, NewChannelAdded, ChannelRemoved, | |
|--|--|---|
| 10 | NeighbourChange, | |
| 11 12 | InformationForSharing, NetworkChannelChanged, | |
| 13 | | |
| 14 | } | |
| 15 16 17 18 19 20 21 22 23 24 25 | <pre>E_PARAM_ID ::= ENUMERATED{ BSSID, NeighbourChange, InterferenceLevels, AddedChannelList, RemovedChannelList, UpdatedNetworkChannels }</pre> | |
| 26 27 28 29 30 31 32 33 34 35 | <pre>E_PARAM_VALUE ::= CHOICE { BSSID NeighbourChange InterferenceLevels AddedChannelList RemovedChannelList UpdatedNetworkChannels }</pre> | STRING, NEIGHBOUR_CHANGE, INTERFERENCE_LEVELS, LIST_TV_CHANNELS, LIST_TV_CHANNELS, NETWORK_CHANNELS, |
| 36 | E_PARAM ::= SEQUENCE { | |

```
1
2
3
4
5
6
7
8
9
10
       EventParamID
                                           E_PARAM_ID
       EventParamValue
                                           E_PARAM_VALUE
     }
     E_PARAMs ::= SEQUENCE OF E_PARAM
     COEX_E_PARAM ::= SEQUENCE {
       CoexEventId COEX_E_ID
       CoexEvenParams
                             E_PARAMs
     }
11
12
     COEX_E_PARAMs ::= SEQUENCE OF COEX_E_PARAM
13
```

14 Table 7 describes parameters of data types of event service of Coexistence Media SAP.

15

16

Table 7 – Parameters of data types of event service of Coexistence Media SAP

| Name | Туре | Valid range | Description | Note |
|--------------------------------|-------------------------|--|--|--------------------------------|
| BSSID | STRING | Any valid individual or broadcast MAC address | Identifies a specific or wildcard BSSID that just started. | 11-2007 Start(a new BSS) |
| Neighbour Change | NEIGHBOUR_ CHANGE | | A set of BSSID that | 802.11-2007 |
| InterfereLevels | INTERFERENCE _LEVELs | | | 802.19.1 specific |
| AddedChannel List | LIST_TV_ CHANNELS | Specified in regulatory domain | This parameter indicates the changes on the available channels by specifying a list of channel numbers that become available. | 802.19.1 specific |
| Removed ChannelList | LIST_TV_ CHANNELS | Specified in regulatory domain | This parameter indicates the changes on the available channels by specifiying a list of channel numbers that are no more available. | 802.19.1 specific |
| Neighbour Change | NEIGHBOUR_ CHANGE | | A set of BSSID that | 802.19.1 |
| Updated Network Channels | NET_ CHANNELS | | Indicates the changes of network channels | 802.19.1 |

17

18 **5.3.1.5 Common data types**

19 The following common data types are defined. They are used in the data type definitions of several services20 of Coexistence Media SAP.

| 1 | TU ::= INTEGER | | |
|--|---|---------|---|
| 2 3 | PHY_PARAM_SET ::= SET{ | | |
| 4 | aSlotTime | | INTEGER |
| 5 | aSIFSTime | | INTEGER |
| 6 | aCCATime | | INTEGER |
| 7 | aPHY-RX-START-Delay | | INTEGER |
| 8 | aRxTxTurnaroundTime | | INTEGER |
| 9 | aTxPLCPDelay | | INTEGER |
| 10 | aRxPLCPDelay | | INTEGER |
| 11 | aRxTxSwitchTime | | INTEGER |
| 12 | aTxRampOnTime | | INTEGER |
| 13 | aTxRampOffTime | | INTEGER |
| 14 | aTxRFDelay | | INTEGER |
| 15 | aRxRFDelay | | INTEGER |
| 16 | aAirPropagationTime | | INTEGER |
| 17 | aMACProcessingDelay | | INTEGER |
| 18 | aPreambleLength | | INTEGER |
| 19 | aPLCPHeaderLength | | INTEGER |
| 20 | aMPDUDurationFactor | | INTEGER |
| 21 | aMPDUMaxLength | | INTEGER |
| 22 | aCWmin | | INTEGER |
| 23 24 | aCWmax | | INTEGER |
| 24 | } | | |
| 25 26 | CF PARAM SET ::= SET{ | | |
| 27 | CfpCount | INTEGER | |
| $\frac{27}{28}$ | CfpPeriod | INTEGER | |
| 29 | CfpMaxDur | TU | |
| 30 | | | |
| 20 | CipDurRem | TU | |
| 31 | CfpDurRem } | TU | |
| 31 32 | <pre>CIpDurRem }</pre> | TU | |
| 31 32 33 | | τυ | |
| 31 32 33 34 | } | TU | BOOLEAN |
| 31 32 33 34 35 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS</pre> | TU | BOOLEAN |
| 31 32 33 34 35 36 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable</pre> | TU | BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest</pre> | TU | BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 43 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 43 44 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 43 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ \end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck }</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ \end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck } BSS_LOAD ::= SET{</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ \end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck } BSS_LOAD ::= SET{ STACount</pre> | TU | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ 53\\ \end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck } BSS_LOAD ::= SET{ STACount CHUtilization</pre> | | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ 53\\ 54 \end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck } BSS_LOAD ::= SET{ STACount CHUtilization AvailableAddmissionCa</pre> | | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ 53\\ 54\\ 55\end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck } BSS_LOAD ::= SET{ STACount CHUtilization</pre> | | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |
| $\begin{array}{c} 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ 49\\ 50\\ 51\\ 52\\ 53\\ 54\end{array}$ | <pre>} BSS_CAPA_INFO ::= SET{ ESS IBSS CFPollable CFPollRequest Privacy ShortPreamble PBCC ChannelAgility SpectrumMgmt QoS ShortSlotTime APSD DSSSOFDM DelayedBlockAck ImmediateBlockAck } BSS_LOAD ::= SET{ STACount CHUtilization AvailableAddmissionCa</pre> | | BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN BOOLEAN |

| 1 2 3 | NeighbourBSSId NeighbourBSSChannel } | BSSID, INTEGER |
|--|--|---|
| 4 5 6 | NEIBR_BSS_SET ::= SEQUENCE OF NEIBR_ | _BSS |
| 7 | TV_CHANNEL_NUMBER ::= INTEGER | |
| 8 9 10 | TV_CHANNEL_NUMBERS ::= SEQUENCE OF 7 | IV_CHANNEL_NUMBER |
| 11 | TV_POWER_LIMIT ::= INTEGER | |
| 12 13 | TV_POWER_LIMITS ::= SEQUENCE OF TV_1 | POWER_LIMIT |
| 14 15 16 17 18 19 20 21 | <pre>LIST_TV_CHANNELS ::= SEQUENCE{ NumTVChannels TimeStamp TVChannelNums TVChannelPowerLimits }</pre> | INTEGER, TU, TV_CHANNEL_NUMBERS, TV_POWER_LIMITS |

- 22 Table 8 describes parameters of LIST_TV_CHANNELS data type.
- 23
- 24

Table 8 – Parameters of LIST TV CHANNELS data type

| Name | Туре | Valid range | Description | Note |
|--------------------------|------------------------|------------------------|---|-------------------------------|
| NumberOfTV Channels | INTEGER | Dependens on counry | The number of available TV channels. The parameter also specifies the vector size of information element xxx.2 and xxx.3 | 802.11af whitespace map |
| TimeStamp | TU | | It indicates the TSF timestamp when a STA accesses TV bands database to get the White Space Map information | |
| TVChannel Numbers | SEQUENCE OF INTEGER | | Specifies the list of TV channels for a given regulatory domin | |
| TVChannel PowerLimits | SEQUENCE OF INTEGER | | Specifies the power constraints of availbel TV channels | |

| 26 | NETWORK_CHANNEL ::= SEQUENCE{ | |
|----|-------------------------------|----------|
| 27 | OperationClass | INTEGER, |
| 28 | NumberofNetworkChannels | INTEGER, |
| 29 | NetworkChannelNumber | INTEGER, |
| 30 | NetworkChPowerConstraint | REAL |
| 31 | } | |
| 32 | | |

1 Table 9 describes parameters of NETWORK_CHANNEL data type.

3

Table 9 – Parameters of NETWORK CHANNEL data type

| Name | Туре | Valid range | Description | Note |
|----------------------------------|---------|-------------|---|--|
| NumberOf Network Channel | INTEGER | | The number of available network channels for 802.11 devices. The parameter also specifies the vector size of information element xxx.1, xxx.2 and xxx.3 | 802.11af network channel enablement |
| OperationClass | INTEGER | | It indicates the operation classes that the listed network channels apply. | |
| Network Channel Number | INTEGER | | Specifies the list of network channels for a given regulatory domin | |
| NetworkCh Power Constraint | rREAL | | Specifies the power constraints of availbel network channels | |

4

```
5
     NETWORK_CHANNELS ::= SEQUENCE OF NETWORK_CHANNEL
6
7
8
9
10
    POLARIZATION ::= ENUMERATED{
       Linear,
       Elliptical,
       Circular,
11
12
        ...
    }
13
14
15
16
17
18
19
    ANTENNA_GAIN ::= SEQUENCE {
      Country
                                             STRING,
        TVChannelNumber
                                             TV_CHANNEL_NUMBER,
        AntennaGain
                                             REAL
     }
20
21
22
23
24
25
26
27
28
29
30
     ANTENNA_GAINS ::= SEQUENCE OF ANTENNA_GAIN
     ANTENNA_INFO ::= SEQUENCE{
       AntennaBandwidth
                                            REAL,
                                            REAL,
       AntennaBeamPointing
                                            REAL,
       AntennaBeamwidth
                                            REAL,
       AntennaDirectivityGain
                                            REAL,
       AntennaHeight
       AntennaPolarization
                                            POLARIZATION,
       AntennaGains
                                            ANTENNA_GAINS
     }
31
32
     Table 10 describes parameters of ANTENNA INFO data type.
```

²

Table 10 - Parameters of ANTENNA_INFO data type

| Name | Туре | Valid range | Description | Note |
|----------------------------|-------------------|-------------|---|--------|
| Antenna Bandwidth | REAL | | Bandwidth of the antenna used at the TV band devices. | 1900.6 |
| AntennaBeam Pointing | REAL | | The DataSeet.AntennaBeamPo inting parameter specifies the beam pointing direction of the antenna used at the spectrum measurement module by giving the azimuthal angle with respect to North and elevation angle with respect to the horizon. | |
| Antenna Beamwidth | REAL | | Beamwidth of the antenna used at the spectrum measurement module, normally specified as half- power horizontal and vertical beamwidth. | |
| Antenna DirectivityGain | REAL | | Directivity gain in dBi of the antenna radiation pattern at the TV band devices. | |
| AntennaHeight | REAL | | Height of the antenna in meters with respect to sea level. (cf. 6.3.32) | |
| Antenna Polarization | ENUMERATED | | Polarization of the antenna used at the TV band devices. (cf. 6.3.32) | |
| | | | 0: Linear polarization1: Circular polarization2: Elliptical polarization | |
| AntennaGain | ANTENNA_ GAINS | | Power gain in dB of the antenna used at the TV band devices for a list of TV channels. | |

2

3 TVBD_INFO ::= ENUMERATED{
4 WRAN_BS,
5 WRAN_CPE,
6 WLANSTA,
7 WLANAP,
8 MAN_AP,
9 MAN_STA
10 ...
11 }
12
13 NEIGHBOUR ::= SEQUENCE{

```
1
        TVBDID,
                                             STRING,
 2
3
        TVBDInfo
                               TVBD_INFO,
                                            LIST_TV_CHANNELS,
        TVBDOccupiedChannels,
 4
       Mobility
                                            MOBILITY,
5
6
7
        ...
     }
 8
     LIST_NEIGHBOURS ::= SEQUENCE OF NEIGHBOUR
 9
10
    MOBILITY ::= ENUMERATED{
11
       FIXED,
12
      MOBILE,
13
        ....
14
    }
15
16
     CHANNEL_SWITCH_MODE ::= ENUMERATED{
17
       TXRestricted,
18
       NOTRestricted
19
     }
20
21
22
23
    BSS_TYPE ::= ENUMERATED{
     INFRASTRUCTURE,
       INDEPENDENT,
24
25
       ANYBSS
     }
26
27
28
29
30
     SCAN_TYPE ::= ENUMERATED{
     ACTIVE,
        PASSIVE
    }
31
32
33
34
35
     CH MEASU TYPE ::= ENUMERATED{
       BASIC,
        CCA,
        RPI
36
     }
37
38
     SENSING_WINDOW ::= SEQUENCE{
39
        NumSensingPeriods
                                           INTEGER,
40
        SensingPeriodDuration
                                           INTEGER,
41
        SensingPeriodInterval
                                           INTEGER
42
     }
43
```

44 Table 11 describes parameters of SENSING_WINDOW data type.

45

| Table 11 – | Parameters | of SENSING_ | WINDOW | data | type |
|-------------|-------------|----------------|----------|------|------|
| I doite I I | 1 urumeters | OI DEI IDII IO | 11110011 | uuuu | type |

| Name | Туре | Valid range | Description | Note |
|---------------------------|---------|-------------|---|-------------------|
| NumSensing Periods | INTEGER | 0 to 63 | The number of sensing periods | |
| SensingPeriod Duration | INTEGER | 0 to 1023 | Duration of each sensing in terms of the number symbols | 802.22 SM- SSF |

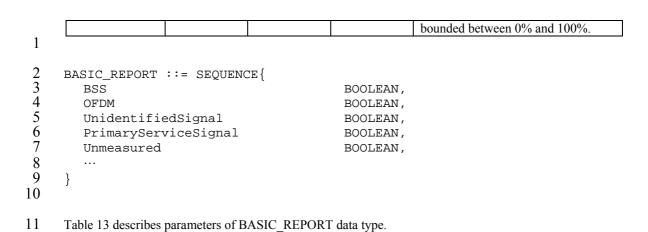
| 1 | SensingPeriod Interval | INTEGER | 0 to 2047 | Duration of interval in terms of the number of frames. | |
|---|--|--|-----------|--|--|
| $ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\\21\\22\\23\\24\\25\\26\\27\\28\\29\\30\\31\\32\end{array} $ | <pre>Any, 802.22WRAN, ATSC, DVB_T, ISDB_T, NTSC, PAL, SECAM, Microphone, 802.22.1Syr 802.22.1PPI 802.22.1PPI 802.22.1PPI 802.22.1PPI MedicalTele Studio, } SENSING_MODE Hard, HardWithCor Soft,</pre> | <pre>, ncBurst, DUMFS1, DUMSF2, DUMSF3, e, ::= ENUMERATEI nfidenceValue, nfidenceValue := SEQUENCE{ ed INT</pre> | | | |

- 33 Table 12 describes parameters of PERF_METRIC data type.
- 34

35

Table 12 – Parameters of PERF METRIC data type

| Name | Туре | Valid range | Description | Note |
|---------------|---------|-------------|-------------|--|
| PerfMetricPd | INTEGER | | | When the PerformanceMetric.pd is specified sensors perform sensing by setting the rate of detection according to this value. Rate of detection is expressed as a percentage bounded between 0% and 100%. |
| PerfMetricPfa | INTEGER | | | When the PerformanceMetric.pfa is specified sensors perform sensing by setting the rate of false alarm according this value. Rate of false alarm is expressed as a percentage |



- 12
- 13

Table 13 – Parameters of BASIC_REPORT data type

| Name | Туре | Valid range | Description | Note |
|------------------------|---------|-------------|---|------|
| BSS | BOOLEAN | | BSS bit, which shall be set to 1 when at least one valid MPDU was received in the channel during the measurement period from another BSS or IBSS. Otherwise, the BSS bit shall be set to 0 | |
| OFDM | BOOLEAN | | bit shall be set to 0. OFDM preamble bit, which shall be set to 1 when at least one sequence of short training symbols, as defined in 17.3.3, was detected in the channel during the measurement period without a subsequent valid Signal field (see 17.3.4). This may indicate the presence of an OFDM preamble, such as highperformance RLAN/2 (HIPERLAN/2). Otherwise, the OFDM preamble bit shall be set to 0. | |
| Unidentified Signal | BOOLEAN | | May be set to 1 when significant power is detected in the channel during the measurement period that cannot be characterized as radar, an OFDM preamble, or a valid | |

| | | MPDU. Otherwise, the Unidentified Signal bit shall be set to 0. The definition of significant power is implementation dependent. |
|--------------------------|---------|--|
| PrimaryService Signal | BOOLEAN | Shall be set to 1 when primary service signals was detected operating in the channel during the measurement period. The algorithm to detect radar shall satisfy regulatory requirements and is outside the scope of this standard. Otherwise, the Radar bit shall be set to 0. |
| Unmeasured | BOOLEAN | Shall be set to 1 when this channel has not been measured. Otherwise, the Unmeasured bit shall be set to 0. When the Unmeasured field is set to 1, all the other bit fields shall be set to 0. |

1

```
2 CCA_REPORT ::= SEQUENCE{
3 CCABUSY REAL,
4 ...
5 }
6
```

```
7 Table 14 describes parameters of CCA_REPORT data type.
```

8

9

Table 14 – Parameters of CCA_REPORT data type

| Name | Туре | Valid range | Description | Note |
|---------|------|-------------|--|------|
| CCABusy | REAL | From 0 to 1 | The CCA Busy Fraction field shall contain the fractional duration over which CCA indicated the channel was busy during the measurement duration. The resolution of the CCA busy measurement is in microseconds. The CCA Busy Fraction value is defined as Ceiling (255 * | |
| | | | [Duration CCA indicated channel was busy | |

| | | (microseconds)] / (1024 * | |
|--|--|---------------------------|--|
| | | [Measurement duration | |
| | | (TUs)])). | |
| | | | |

| 2 | RPI_REPORT ::= SEQUENCE{ | |
|----|--------------------------------|----------|
| 3 | RPIHistogramReportRPI0Density0 | INTEGER, |
| 4 | RPIHistogramReportRPI0Density1 | INTEGER, |
| 5 | RPIHistogramReportRPI0Density2 | INTEGER, |
| 6 | RPIHistogramReportRPI0Density3 | INTEGER, |
| 7 | RPIHistogramReportRPI0Density4 | INTEGER, |
| 8 | RPIHistogramReportRPI0Density5 | INTEGER, |
| 9 | RPIHistogramReportRPI0Density6 | INTEGER, |
| 10 | RPIHistogramReportRPI0Density7 | INTEGER |
| 11 | } | |
| 12 | | |

- 12
- 13 Table 15 describes parameters of RPI_REPORT data type.
- 14
- 15

| Table 15 – Parameters of RPI REPORT data typ | Table | 15 – Parameters | of RPI | REPORT | data type |
|--|-------|-----------------|--------|--------|-----------|
|--|-------|-----------------|--------|--------|-----------|

| Name | Туре | Valid range | Description | Note |
|--|---------|-------------|---|------|
| RPIHistogram ReportRPI0 Density0 | INTEGER | 0~255 | Density for Power ≤ -87 | |
| RPIHistogram ReportRPI0 Density1 | INTEGER | 0~255 | Density for $-87 <$ Power ≤ -82 | |
| RPIHistogram ReportRPI0 Density2 | INTEGER | 0~255 | Density for $-82 < Power \leq -77$ | |
| RPIHistogram ReportRPI0 Density3 | INTEGER | 0~255 | Density for $-77 <$ Power ≤ -72 | |
| RPIHistogram ReportRPI0 Density4 | INTEGER | 0~255 | Density for $-72 <$ Power ≤ -67 | |
| RPIHistogram ReportRPI0 Density5 | INTEGER | 0~255 | Density for $-67 < Power \leq -62$ | |
| RPIHistogram ReportRPI0 Density6 | INTEGER | 0~255 | Density for $-62 < Power \le -57$ | |
| RPIHistogram ReportRPI0 Density7 | INTEGER | 0~255 | Density for –57 < Power | |

16

17 CH_MEASU_REPORT ::= CHOICE{

| 18 | BasicReport | BASIC_REPORT, |
|----|-------------|---------------|
| 10 | | |

- 19 20 21 CCAReport CCA_REPORT, RPI_REPORT
- RPIHistogramReport }

```
September 2010
```

```
1
2
3
4
5
6
7
8
9
10
    INTERVAL ::= SEQUENCE{
       IntervalStart
                              REAL,
       IntervalStop
                              REAL
     }
    CONFIDENCE_LEVEL ::= SEQUENCE{
       ConfidenceLevelValue
                                         REAL,
       ConfidenceLevelInterval
                                         INTERVAL
    }
11
12
13
    MODEORESULT ::= SEQUENCE {
       SignalType
                            SIGNAL_TYPE,
14
       Presence
                              BOOLEAN
15
     }
16
17
    MODEORESULTS ::= SEQUENCE OF MODEORESULT
18
```

19 Table 16 describes parameters of MODE0RESULT data type.

20

21

Table 16 – Parameters of MODE0RESULT data type

| Name | Туре | Valid range | Description | Note |
|------------|-------------|-------------|--|-------------|
| SignalType | SIGNAL_TYPE | | | |
| Presence | BOOLEAN | 0 or 1 | For each signal type the SSF generates a binary decision as to whether the signal is present in the television channel | IEEE 802.22 |

22

```
23 MODE1RESULT ::= SEQUENCE{
24 Mode0Result MODE0RESULT,
25 ConfidenceLevel CONFIDENCE_LEVEL
26 }
27 
28 MODE1RESULTS ::= SEQUENCE OF MODE1RESULT
29
```

- 30 Table 17 describes parameters of MODE1RESULT data type.
- 31
- 32

Table 17 – Parameters of MODE1RESULT data type

| Name | Туре | Valid range | Description | Note |
|----------------|-------------|-------------|--|-------------|
| SignalType | SIGNAL_TYPE | | | |
| SignalPresence | BOOLEAN | | For each signal type the SSF generates a binary decision as to whether the signal is present in the television channel | IEEE 802.22 |

| Level | CONFIDENCE_ LEVEL | | Confidence of measurement result for each type of signal specified | IEEE 1900. |
|---|---|--|---|--------------------|
| MODE2RESULT | ::= SEQUENCE{ | | | |
| SignalTyp | | NAL_TYPE, | | |
| Strength } | REA | L | | |
| J | | | | |
| MODE2RESULTS | S ::= SEQUENCE O | F MODE2RESULT | | |
| Table 18 describe | es parameters of MODE | 2RESULT data type | ð. | |
| | | | | |
| | Table 18 – Pa | arameters of MODE2 | 2RESULT data type | |
| Name | Туре | Valid range | Description | Note |
| SignalType | SIGNAL TYPE | | | |
| Strength | REAL | | For each signal type the | IEEE 802.2 |
| 5 | | | SSF generates an estimate | |
| | | | of the field strength of that | |
| | | | signal | |
| | | | | |
| Mode2Resu StandardD } MODE3RESULTS | eviation REA | F MODE3RESULT | signal | Note |
| Mode2Resu StandardD MODE3RESULTS Fable 19 describe | lt MOD eviation REA g ::= SEQUENCE O es parameters of MODE Table 19 – Pa Type | L F MODE3RESULT C3RESULT data type grameters of MODE3 | signal e. BRESULT data type | Note |
| Mode2Resu StandardD MODE3RESULTS Fable 19 describe | lt MOD eviation REA S ::= SEQUENCE O es parameters of MODE Table 19 – Pa Table 19 – Pa SIGNAL_TYPE | L F MODE3RESULT C3RESULT data type grameters of MODE3 | signal e. BRESULT data type Description | |
| Mode2Resu StandardD MODE3RESULTS Fable 19 describe | lt MOD eviation REA g ::= SEQUENCE O es parameters of MODE Table 19 – Pa Type | L F MODE3RESULT C3RESULT data type grameters of MODE3 | SRESULT data type Description For each signal type the SSF generates an estimate of the field strength of that | Note IEEE 802.2 |
| Mode2Resul StandardDo MODE3RESULTS Fable 19 describe | lt MOD eviation REA S ::= SEQUENCE O es parameters of MODE Table 19 - Pa Table 19 - Pa SIGNAL_TYPE REAL | L F MODE3RESULT C3RESULT data type grameters of MODE3 | SRESULT data type Description For each signal type the SSF generates an estimate of the field strength of that signal | IEEE 802.2 |
| Mode2Resul StandardDo MODE3RESULTS Fable 19 describe SignalType Strength | lt MOD eviation REA S ::= SEQUENCE O es parameters of MODE Table 19 – Pa Table 19 – Pa SIGNAL_TYPE | L F MODE3RESULT C3RESULT data type grameters of MODE3 | SRESULT data type Description For each signal type the SSF generates an estimate of the field strength of that signal The standard deviation of | |
| Mode2Resu StandardDo MODE3RESULTS Fable 19 describe | lt MOD eviation REA S ::= SEQUENCE O es parameters of MODE Table 19 - Pa Table 19 - Pa SIGNAL_TYPE REAL | L F MODE3RESULT C3RESULT data type grameters of MODE3 | SRESULT data type Description For each signal type the SSF generates an estimate of the field strength of that signal | IEEE 802.2 |

23

24 SENSING_RESULT ::= CHOICE{

```
1
       Mode0Results
                             MODEORESULTs,
 234567
                            MODE1RESULTs,
       ModelResults
                            MODE2RESULTs,
       Mode2Results
       Mode3Results
                            MODE3RESULTs
    }
    TRANSMISSIONINTERVAL ::= SEQUENCE {
8
9
      TransmissionStart
                                          ΤU,
       TransmissionDuration
                                          ΤU,
10
       TransmissionChannel
                                         Network_CHANNEL
11
    }
12
13
    TRANSMISSIONSEQUENCE ::= SEQUENCE OF TRANSMISSIONINTERVAL
14
15
    SCHEDULE ::= SEQUENCE {
16
      SchedulingStartTime
                                         ΤU,
17
       SchedulingPeriodDuration
                                         ΤU,
18
                                         INTEGER,
       NumberOfSchedulingPeriods
19
       TransmissionSequence
                                         TRANSMISSIONSEQUENCE
20
21
22
23
24
25
26
27
28
29
    }
     INTERFERENCE_LEVEL ::= SEQUENCE{
       NetworkChannel
                                          NETWORK CHANNEL,
       Interference
                                          REAL
     }
     INTERFERENCE_LEVELs ::= SEQUENCE OF INTERFERENCE_LEVEL
    NEIGHBOUR_CHANGE ::= SEQUENCE{
30
       AddedBSSs
                          SEQUENCE OF STRING,
31
       RemovedBSSs
                            SEQUENCE OF STRING
32
     }
33
```

34 5.3.2 Coexistence Transport SAP data types

35 The following data types are defined for Coexistence Transport SAP.

36 37 TRANSPORT_PREF ::= ENUMERATED{ 38 TCP, 39 UDP, 40 HTTP, 41 SNMP, 42 ••• 43 } 44 45 TRANSPORT_ADDR ::= OCTET_STRING 46

47 6. Procedures and protocols

1 6.1 Generic procedures for information exchange

- 2 **6.2 Protocols**
- **3 7. Coexistence mechanisms and algorithms**