IEEE P802.11 Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Proposed TGai Comment Resolutions for Section 8.5.8.35 | | | | |
| Date:2013-11-12 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Lei Wang | InterDigital Communications | 781 Third Ave., King of Prussia, PA 19406 | 1 858 205 7286 | leiw@billeigean.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes comment resolutions to the comments on Section 8.5.8.35 in the comment database of the TGai Working Group Technical Letter Ballot 198 on 802.11ai Draft 1.0.

# Introduction

As a response to IEEE 802.11 Working Group Technical Letter Ballot 198 for 802.11ai Draft 1.0[Ref-2], about 8 comments have been submitted on Section 8.5.8.35 FILS Discovery frame format. Those comments were assigned to Lei Wang.

This contribution provides detailed text changes in Section 8.5.8.35 based on the proposed resolutions to those assigned comments, as discussed in the contribution 13/1215r3 [Ref-5].

Please note that about 4 comments have been resolved in TGai 2012-September meeting, as shown in Motion #7 in the meeting motion file, 13/1186r0 [Ref-6]. This contribution also includes the changes of those resolved comments that are marked by Word Comment tool.

# Conventions

In this contribution, the proposed 802.11ai Specification Document text will be presented as changes to the current TGai draft specification, 11ai/D1.1[Ref-3]. The following format conventions are used:

1. The newly added text is marked as blue underline text;
2. The deleted text is marked as ~~red strikethrough text~~;
3. The unchanged text stays in black text;
4. The editorial instruction is marked as *italic text highlighted by Yellow*; and
5. The corresponding comments are included by square bracketed green text like [CID nnnn], where nnnn is the CID number as given in the TGai WGLB comment database, 11-13-1076-04-00ai-tgai-lb-198-comments-for-d1-0.

# Proposed Changes to 802.11ai/D1.1 Specification Text

*Instructions to the editor: Make the following Changes in subclause 8.5.8.35:*

**8.5.8.35 FILS Discovery frame format**

The FILS Discovery (FD) frame uses Action frame format. The format of its Action field is shown in Table 8-221f (FILS Discovery frame format).

**Table 8-221f—FILS Discovery frame format**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 1 | Category | A ~~1-octet~~ [2127] field indicating the Public Category, as specified in Table 8-38 (Category values) in 8.4.1.11 (Action field). |
| 2 | Public Action | A ~~1-octet~~ [2127] field indicating the value of the FILS Discovery frame, as specified in Table 8-210 (Public Action field values) in 8.5.8.1 (Public Action frames). |
| 3 | FD Frame Control | A 2-octet field, consisting of a number of subfields, as specified in Figure 8-502l (FD Frame Control field format). |
| 4 | Service Set Identifier  (SSID) | A variable length field with length between 1 and 32 octets, as specified by the 5-bit SSID Length field in the FD Frame Control of the FD frame. |
| 5 | FD Capability | An optional field in the FD frame. Its presence is indicated by an 1-bit Capability Presence Indicator in the FD Frame Control. The format of the 2-octet FD Capability field is shown in Figure 8-502k (Format of the FD Capability field). |
| 6 | AP's Next TBTT Offset  (ANTO) | The 1-octet AP's Next TBTT Offset (ANTO)field indicates the time offset in number of TUs, between the transmission of the FD frame and the transmission of the next Beacon frame. It is an optional field ~~in the FD frame~~, [2128] and its presence is indicated by an 1-bit ANTO Presence Indicator in the FD Frame Control. |
| 7 | AP Configuration Change Count (AP-CCC) | The 1-octet AP’s ~~Configuration Change Count (AP-~~CCC~~)~~ field is of the format as defined in 8.4.2.184. ~~is set to the version number of AP configuration parameter setting values~~. [2784,3203, 3229] [2844] It is an optional field ~~in the FD frame~~, [2128] and its presence is indicated by an 1-bit AP-CCC Presence indicator in the FD Frame Control. |
| 8 | Access Network Options (ANO) | The 1-octet field of Access Network Options (ANO) is of the format as specified in Figure 8-352 in 8.4.2.94. It is an optional field  ~~in the FD frame~~, [2128] and its presence is indicated by an 1-bit ANO Presence indicator in the FD Frame Control. |
| 9 | Primary Channel | The 1-octet Primary Channel field is present and set to the channel number of the primary channel if the FD frame is transmitted as a non-HT duplicate PPDUs; otherwise the field is not present. The presence of the field is indicated by a 1-bit Primary Channel Presence Indicator in the FD Frame Control field. |
|  |  |  |
| 10 | RSNE | The RSNE, as specified in 8.4.2.27, is optionally present in FD frame generated by STAs that have dot11RSNAActivated equal to true. |
| 11 | Reduced Neighbor Re~~;~~port | The Reduced Neighbor Report element, as specified in 8.4.2.176, is optionally present. |
| 12 | FILS Indication element | The FILS Indication element, as specified in 8.4.2.185 (FILS Indication element), is optionally present. |
| Last | Vendor-specific | One or more, optionally present. |

The format of the 2-octet FD Frame Control field is shown in 8-502l (FD Frame Control field format).



**Figure 8-502l—FD Frame Control field format**

The 5-bit SSID Length field indicates the length of the SSID field in the FD frame, in unit of octets. The value of this field plus 1 is equal to the length of the SSID field.

~~All presence indicator fields indicate the presence of the specific field in the FD frame. A value of 1 indicates that this field is present in the FD frame.~~ [2129]

The Capability presence indicator is 1 bit in length. If it is set to 1, it indicates the FD Capability field is present in the FD frame; otherwise, it indicates the FD capability field is not present in the FD frame. [2129]

The ANTO presence indicator is 1 bit in length. If it is set to 1, it indicates the ANTO field is present in the FD frame; otherwise, it indicates the ANTO field is not present in the FD frame. [2129]

The AP-CCC presence indicator is 1 bit in length. If it is set to 1, it indicates the AP-CCC field is present in the FD frame; otherwise, it indicates the AP-CCC field is not present in the FD frame. [2129]

The ANO presence indicator is 1 bit in length. If it is set to 1, it indicates the ANO field is present in the FD frame; otherwise, it indicates the ANO field is not present in the FD frame. [2129]

The Primary Channel presence indicator is 1 bit in length. If it is set to 1, it indicates the Primary Channel field is present in the FD frame; otherwise, it indicates the Primary Channel field is not present in the FD frame. [2129]

The FD Capability field contains the information that advertises the capabilities of the STA transmitting the FD frame. Its length is 2octets. The format of the FD Capability field is shown in Figure 8-502k (Format of the FD Capability field).



**Figure 8-502k—Format of the FD Capability field** [2684]

The sub-fields ESS~~,~~ and Privacy~~, and QoS~~ [2684] are interpreted as specified in 8.4.1.4.

A value of 1 in the 1-bit Multiple BSSIDs present field indicates that the Multiple BSSID element is included in the Beacon frame.

The 3-bit Operating Channel Bandwidth subfield indicates the channel bandwidth of the AP, as coded in Table 8-221g (Operating Channel Bandwidth).

**Table 8-221g—Operating Channel Bandwidth**

|  |  |
| --- | --- |
| **Operating Channel Bandwidth**  **Subfield (3 bits)** | **Channel Bandwidth** |
| 0 | 20 MHz or 22 MHz |
| 1 | 40 MHz |
| 2 | 80 MHz |
| 3 | 160 MHz or 80+80 MHz |
| 4 – 7 | Reserved |

The 3-bit Nss subfield indicates the number of spatial streams, as coded in Table 8-221h (Number of spatial streams (Nss)).

**Table 8-221h—Number of spatial streams (Nss)**

|  |  |
| --- | --- |
| **Nss Subfield (3 bits)** | **Nss** |
| 0 | 1 |
| 1 | 2 |
| 2 | 3 |
| 3 | 4 |
| 4 | 5 to 8 |
| 5 – 7 | Reserved |

The 3-bit PHY Type subfield is defined as in Table 8-221i (PHY Type subfield).

**Table 8-221i—PHY Type subfield** [CID 3012]

|  |  |
| --- | --- |
| **PHY Type subfield**  **(3 bits)** | **PHY Type** |
| 0 | HR/DSSS (See Clause 17) |
| 1 | ERP-OFDM (See Clause 18 and Clause 19) |
| 2 | HT (See Clause 20) |
| 3 | VHT (See Clause 22) |
| 4 – 7 | Reserved |

The 3-bit FILS Minimum Rate subfield specifies the minimum rate which is used by the AP transmitting the FD frame to communicate with FILS STAs.

Depending on the PHY Type subfield values specified in Table 8-221i (PHY Type subfield), the FILS minimum rate is represented as a bit rate value or as an MCS value in Table 8-221j (FILS Minimum Rate sub-field). If an MCS value is provided, then the FILS Minimum Rate can be derived from the MCS value and the PHY Type in the FD Capability field.

**Table 8-221j—FILS Minimum Rate subfield**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FILS Minimum Rate subfield (3 bits)** | **FILS Minimum Rate / MCS** | | | |
| **If PHY type=0 (HR/DSSS)** | **If PHY type=1 (ERP-OFDM)** | **If PHY type=2 (HT)** | **If PHY type=3 (VHT)** |
| 0 | 1 Mbps | 6 Mbps | MCS=0 | MCS=0 |
| 1 | 2 Mbps | 9 Mbps | MCS=1 | MCS=1 |
| 2 | 5.5 Mbps | 12 Mbps | MCS=2 | MCS=2 |
| 3 | 11 Mbps | 18 Mbps | MCS=3 | MCS=3 |
| 4 | Reserved | 24 Mbps | MCS=4 | MCS=4 |
| 5 – 7 | Reserved | Reserved | Reserved | Reserved |

# References

1. IEEE Std 802.11mc/D1.5
2. IEEE Std 802.11ai/D1.0
3. IEEE Std 802.11ai/D1.1
4. 11-13-1076-04-00ai-tgai-lb-198-comments-for-d1-0
5. 11-13-1215-03-00ai-proposed-resolution-to-assigned-tgai-lb-198-comments
6. 11-13-1186-00-00ai-tgai-motion-deck