IEEE P802.11 Wireless LANs

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| Proposed Resolution for CIDs 289, 218, and 50 |
| Date:2013-02-20 |
| 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 |
| Jarkko Kneckt | Nokia | Otaniementie 19b, FIN-02210 Espoo, Finland |  | Jarkko.Kneckt@nokia.com |
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Abstract

This submission proposes resolutions to the comments, CID 289, CID 218, and CID 50, in the TGai/D0.2 review comments database, regarding the primary channel indication in FILS Discovery frame when transmitted as non-HT duplicate PPDU to 40, 80 or 160 MHz bandwidths, and a information field name clarification.

# Introduction

In TGai/D0.2 review comment database, 13/0036r9 [Ref-4], Comments of CID 289, CID 218, and CID50 are as follows:

***Comment CID 289: by Jarkko Kneckt (11-13-0018r0)***

*The FD frame may be transmitted to as non-HT duplicate PPDU to large (40, 80, 160 MHz) bandwidths. When the FD frame is transmitted to these bandwidths the receiver cannot detect the primary channel of the FD frame transmitter from the information of the frame. The receiver needs to detect the primary channel in order to be able to transmit the frames required for FILS. When the primary channel information is not available, the STA needs to use time and energy for its discovery. The primary channel information should be present in the FD frame in order to achieve the FILS goal, fast initial link setup.*

***Proposed change:***

*Add an optional primary channel information element that is present in the FD frame when it is transmitted to primary channel and at least one secondary channel.*

***Comment CID 218: Jarkko Kneckt (11-13-0018r0)***

*The BSSDescriptionSet, BSSDescriptionFromMeasurementPilotSet and BSSDescriptionFromFDSet should contain the primary channel information of the reported BSS. The informatoin sets contain a lot of channel specific information, but none of them contain the channel number / primary channel of the reported BSS. The 802.11ac defines extended BSS load element and knowledge of hte overlapping channels helps to use the obtained information.*

***Proposed Change:***

*Add country and channel number to the BSSDescriptionSet, BSSDescriptionFromMeasurementPilotSet and BSSDescriptionFromFDSet elements.*

***Comment CID 50: Yunsong Yang (11-13-0019r0)***

*The term is inaccurate since the definition is about a time offset to the next TBTT*

***Proposed Change:***

*Change "AP's TBTT" to "AP's Next TBTT Offset"*

Note that the proposed change does not provide any specific changes to the TGai Draft Specification. In addition, further discussions are needed regarding how to indicate the primary channel when a FILS Discovery frame is transmitted as non-HT duplicate PPDU to large (40, 80, 160 MHz) bandwidth.

This contribution proposes detailed resolutions for the comments of CIDs 289, 218 and 50.

# Conventions

In this contribution, the proposed 802.11ai Specification Document text will be presented as modifications to the TGai draft specification 802.11ai/D0.4[Ref-3]. The following format conventions are used:

1. The new added text is marked as blue underline text;
2. The deleted text is marked as ~~red strikethrough text~~;
3. The unchanged baseline standard text stays in black text in the context of proposed TGai specification text;
4. The editorial instruction is marked as *italic text highlighted by Yellow*;
5. The quoted TGai SFD text is marked as *green italic text*; and
6. Any other text, e.g., discussions, proposed motions, etc., is in black text, but not in the context of proposed TGai specification text.

# Discussions

**Discussions about Comment CID 289:**

Based on Section 10.25.2 in TGai Draft Specification Document, TGai/D0.3[Ref-3], the FILS Discovery frame may be transmitted as non-HT duplicate PPDUs at 20MHz of the 20, 40, 80 and160 MHz (given the DFS ownership of the transmitter) at 5GHz band.

Comment CID 289 in TGai draft review comment database, 13/0036r9 [Ref-4], pointed out that, when transmitted as non-HT duplicated PPDUs, the FILS Discovery frame should contain the primary channel indication information.

The FILS Discovery frame is designed to be a small-size frame that may be transmitted between Beacon frames, to facilitate a fast initial link setup. The frame size is an important design consideration. To add primary channel information as an optional item, we suggest using an optional information field, instead of an optional information element, as the encoding of information element introduces two additional overhead bytes. Such information field should be present, when the FD frame is transmitted to larger than 20 MHz channel.

In addition, under the understanding that a larger bandwidth channel consists of multiple of 20MHz channels within the same band, the primary channel can be identified by an one-byte channel number, as the band information is implied in the channel where the STA receives the FILS Discovery frame.

In summary, the contribution proposes an 1-byte optional information field in the FILS Discovery (FD) frame, where the 1-byte information field indicates the channel number of the primary channel, and its presence is indicated by an 1-bit presence indicator in the FD frame control field. This optional primary channel information field is present when the FD frame is transmitted as non-HT duplicate PPDUs at 20MHz of the 40, 80 and160 MHz (given the DFS ownership of the transmitter) at 5GHz band.

**Discussions about Comment CID 218:**

Comment CID 218 actually has three aspects, i.e., adding the primary channel information of the reported BSS to the following three parameter sets for MLME-SCAN.confirm primitive:

1. BSSDescriptionSet,
2. BSSDescriptionFromMeasurementPilotSet, and
3. BSSDescriptionFromFDSet

The comment is valid for 3), i.e., for the case of BSSDescriptionFromFDSet, as the FD frame is transmitted as non-HT Duplicate PPDUs when the channel bandwidth of the BSS is larger than 20MHz. Therefore, the primary channel information provided in FD frame shall be included in the parameter sets for MLME-SCAN.confirm primitive.

However, for 1) and 2) cases, the comment does not actually apply to 1), because Beacon frame and Probe Response frame are not transmitted as non-HT Duplicate PPDUs, instead, only on the primary channel, when the channel bandwidth of the BSS is larger than 20MHz.

Also, the comment does not apply to 2), because the operation channel information is already included in the BSSDescriptionFromMeasurementPilotSet.

Therefore, this contribution proposes the following resolution to Comment CID 218:

1. Accept the suggested change of adding “primary channel number” to BSSDescriptionFromFDSet;
2. Reject the suggested changes of adding country and channel number to the BSSDescriptionSet, BSSDescriptionFromMeasurementPilotSet.

**Discussions about Comment CID 50:**

Comment CID 50 suggests a different name for the information field “AP’s Next TBTT” in the FILS Discovery frame, to reflect the actual value carried by this information field. The contribution proposes to accept this comment.

# Proposed 802.11ai Specification Text

The following proposed 802.11ai Specification Document text will be presented as modifications to the TGai draft specification 802.11ai/D0.4[Ref-3].

*Instructions to Editor: in Section 6.3.3.3.2, page 11, line 47, insert the following row to the* BSSDescriptionFromFDSet *after Neighbor AP‘s Next TBTT Offset row:*

|  |  |  |  |
| --- | --- | --- | --- |
| Primary Channel | Integer | 0-255 | The Primary Channel of the advertised BSS.  |

*Instructions to Editor: make the following two changes in Section 8.5.8.34, Table 8-221f:*

1. *Page 39,line 59, change the row for “AP’s Next TBTT (ANT)” as shown below;*
2. *page 40, line 24, insert a new row for “Primary Channel” after FD Security row.*

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

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| ...... | ...... | ...... |
| 6 | AP's Next TBTT Offset(ANTO) | The 1-octet AP's Next TBTT Offset (ANT) 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, and its presence is indicated by an 1-bit ANTO Presence Indicator in the FD Frame Control. |
| ...... | ...... | ...... |
| 10 | Primary Channel  | The 1-octet Primary Channel field is set to the channel number of the primary channel when the FD frame is transmitted as a non-HT duplicate PPDUs; otherwise the field is not present. It is an optional field in the FD frame. The presence of the field is indicated by an 1-bit Primary Channel Presence Indicator in the FD Frame Control field. |
| ...... |  |  |

*Instructions to Editor: in Section 8.5.8.34, page 40, replace Figure 8-460o by the following figure:*



**Figure 8-460o — FD Frame Control field format**

*Instructions to Editor: in Section 10.25.2, page 57, line 8, change the paragraph as follows:*

The DFS owner may transmit FILS Discovery frame at 5 GHz band as non-HT duplicate PPDUs~~(given the DFS ownership of the transmitter) at 5GHz band~~. When a FILS Discovery frame is transmitted as non-HT duplicate PPDUs, it shall include the Primary Channel field.

# Straw-Polls and Motions

The following lists the draft straw-polls and motions that are intended to present to the TGai Group in next Face-to-Face meeting.

**Motion-1:** Accept the text proposed in Section 4 of this contribution (13/0192r1) as the resolution to Comments, CID 218, CID 289, and CID 50 in TGai review comment database (13/0036r9).

Yes: \_\_\_\_\_\_\_\_\_\_\_\_; No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; Abstain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Move:

Second:

# References:

1. 11-12-0151-15-00ai-Proposed-Specification-Framework-Document.docx
2. IEEE Std 802.11 – 2012
3. IEEE Std 802.11ai/D0.4
4. 11-13-0036-09-00ai-tgai-draft-review-combined-comments
5. 11-12-0772-01-00ai-non-ht-duplicate-fils-advertisement
6. 11-12-1262-03-00ai-fils-frame-content