IEEE P802.11  
Wireless LANs

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| LB201 Comment Resolution for Assigned Comments | | | | |
| Date: 2014-09-15 | | | | |
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Abstract

This document provides comment resolutions for CIDs 4032, 4586, 4288, 511, 4802, 4800, 4313, 4368, 4346, 4029, 4808, 4314, 4595, 5111, 5127, 5126, 5016, 5015, 4809, 4812, 4025, and 4911 and where appropriate proposed text changes to the draft. These comments address clauses 8.6.8.34, 10.44.1, 10.44.2, Appendix C, and a suggested Annex. The baseline for this comment resolution is 802.11ai Draft 2.1.

This document consists of a Table of proposed resolutions. This table is followed by red lined text changes for theses resolutions, to aid the Editor in implementing the proposed resolutions. Where the red line text is complex and is not very readable a clean text version is also provided.

**Table of Proposed Resolutions**

| **CID** | **Comment** | **Proposed Change** | **Proposed Resolution** |
| --- | --- | --- | --- |
| 4032 | The language in "Avalue of 1, it indicates that the FD Capability field is present in the FD frame. A value of 0; indicates that the FD capability field is not present in the FD frame." is somewhat unusal compared to the rest of the spec. Similarly in lines 1-25 in the subsequent page. | Suggest to rewording it to something like "When the FD Capability field is present in the FD frame this bit is set to 1, otherwise it is set to 0." Similarly, suggest to change the subsequent lines accordingly. | Revised: agree with the commenter that the text should be rephrased:  “The Capability Presence Indicator is 1 bit in length and is set to 1 to indicate that the FD Capability field is present in the FD frame. It is set to 0 to indicate that the FD capability field is not present in the FD frame. “  Notes to Editor: Resulting changes are shown in 14/1107r0 |
| 4586 | The FILS Minimum Rate definition is not clear. It is not clear what is controlled by the variable? If the minimum transmission rate controls all of the transmitted frames that the AP transmits, there are some undesired effects: - The virtual carrier sensing may not be set to as large coverage as in APs using the lowest modulation, because the control frames transmitted with higher rates may not be received. - The minimum rate may be dificult to change. Should an associated STA monitor the value of FILS Minimum Rate in order to know will AP be capable to serve the STA. - In link adaptation could benefit to use temporarily lower MCS. This performance gain is currently possible only is AP changes the value of the FILS Minimum Rate field. | Clarify may the AP change the value of the Minimum Rate subfield. Clarify the process of changing the value. Clarify are all frame types (management, control and data) considered. | Revised: agree that the text should be rephrased to make the text more clear.  Change the text to:  The 3-bit FILS Minimum Rate subfield indicates the minimum rate to be used by the AP that transmitting the FD frame and FILS STAs in subsequent transmissions between the AP and FILS STAs.  Notes to Editor: Resulting changes are shown in 14/1107r0 |
| 5111 | "The 3-bit FILS Minimum Rate subfield specifies the minimum rate used by the AP transmitting the FD frame to communicate with FILS STAs." Why should the FD frame be set at the fixed rate indicated in Table 8-273e? How does that help the FILS operation? | Please clarify; otherwise remove the subfield. | Rejected: The FILS Minimum Rate does not specify that the FD frames should be set at a fixed rate, but rather the minimum rate that the FD frames should be sent. |
| 4288 | Is no QoS 11ai AP to be rejected by STA | Delete line 29 | Rejected: Since all 802.11ai STAs are QoS STAs, then there is no such an entity as a “non-QoS 11ai AP”. |
| 4311 | The leading indicates that any of the following 3 indicates FILS, however point (i) is mandatory | Points (i) & (j) could be merged and is the main mandatory requirement. (h) is optional based on AP's capability | Revised: Agree that the comment that the text is confusing. Change the text to:  A FILS AP with dot11FILSActivated equal to TRUE shall set the FILS Capability field to 1 in the Extended Capabilities element and shall include the FILS Indication element in Beacon frames, Probe Response frames and (re)association Response frames. A FILS AP with dot11FILSActivated equal to TRUE may transmit FILS Discovery frames.  Notes to Editor: Resulting changes are shown in 14/1107r0 |
| 4802 | This allows transmission at 11 Mbps? Is that intentional? Compare 80.45, which forbids CCK for Probe Responses | Change to just say shall not be transmitted using clause 16 or clause 17 formats (but note also the reference to 22 MHz in Table 8-273b, and HR/DSSS in Tables 8-273d and 8-273e) | Revised: Agreed in principal - change text to read as follows: "If the AP transmits FD in the 2.4 GHz or 5 GHz band, the FD frame shall be transmitted at a data rate of 6 Mbps or higher, excluding all DSSS/CCK (Clause 16 or 17) data rates. Note: FILS is only supported in non-DMG infrastructure BSS. FILS is not supported in IBSS, PBSS, or MBSS.  Notes to Editor: Resulting changes are shown in 14/1107r0 |
| 4800 | Why can't non-HT duplicates be used in the 2.4 GHz band? | Clarify | Revised: There is no reason non-HT duplicates can't be used in the 2.4 GHz band. The text is corrected as: "An AP may transmit an FD frame as a non-HT duplicate PPDU."  Notes to Editor: Resulting changes are shown in 14/1107r0 |
| 4313 | Sending SSIS is currently optional | Change "shall" to "should" | Reject - while SSID is an optional field in the FD frame, if the field is included and the STA is an .11ai STA with dot11FILSActivated equal to true then the STA shall respond in the described manner. |
| 4368 | The sentence "After receiving an FD frame with the AP's Next TBTT Offset field, if a STA needs further information from the AP for its initial link setup, the STA should use the information provided by the FD AP's Next TBTT Offset field to decide whether or not to wait for the next Beacon transmission to probe the AP, or to switch to other channels." describe an implementation issue. | Suggest to delete the sentence since it is an implementation issue. | Revised: Agreed in principal - text was changed to remove all redundant frame description material and provide only procedures required for FILS operation. The sentence was deleted.  Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4346 | "...the STA should use the information provided by the FD AP's Next TBTT Offset field to decide whether or not to wait for the next Beacon transmission to probe the AP, or to switch to other channels." The link between waiting for true beacon before probing or switching does not seem right. Surely the idea of the FD is for the STA to decide if it wants to probe or not, or wait for the beacon if it needs more info (such as???). I suggest text as in Proposed Change | Replace cited text with "...the STA should use the information provided by the FD AP's Next TBTT Offset field to decide whether or not to probe the AP, wait for the next Beacon transmission, or to switch to another channel." | Revised:  Agreed in principal - text was changed to remove all redundant frame description material.  Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4029 | "... whether or not to wait for the next Beacon transmission to probe the AP, or to switch to other channels." | change to "... whether to wait for the next Beacon transmission, to probe the AP, or to switch to other channels." | Revised:  Agreed in principal - text was changed to remove all redundant frame description material.    Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4808 | "decide whether or not to wait for the next Beacon transmission to probe the AP, or to switch to other channels." -- why would you wait for the Beacon before probing? | "decide whether to wait for the next Beacon transmission, to probe the AP immediately, or to switch to other channels." | Revised:  Agreed in principal - text was changed to remove all redundant frame description material.  Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4314 | Need to indicate that AP-CSN is tied to an APs BSSID | as in comment | Revised:  Agree in principal – Change the text to "If the received FD frame contains AP-CSN subfield, as defined in 10.1.4.3.7 (AP Configuration Information Set) and the non-AP STA retains previously obtained AP Configuration Information Sets, the non-AP STA shall use the received FD AP-CSN information as follows: — The STA shall check if the BSSID in the received FD frame is equal to a BSSID in the previously obtained AP Configuration Information Sets;"  Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4595 | AP-CSN does not consider the dynamic parameters, like BSS Load, or access Delay. It is not clear why the static parameters need to be known before link setup? Especially why the change in the static parameters needs to be known? | Clarify why the STA needs to know the static parameter values, not the dynamic parameter values before it may initiate link setup? Please justify also why the dynamic parameters need not to be considered. | Reject - This is an optional procedure and only allows the STA to connect using the stored parameters if the STA desired to do so. A STA may also use dynamic parameters to make association decisions if desired. |
| 5127 | "if the values are equal, then the non-AP STA has the AP's current configuration information set that enables the non-AP STA to initiate the FILS procedure,..." If AP-CSN value has been updated more than 128 times since the STA's last visit, then the AP-CSN value is meaningless to the STA. | Fixed the problem; otherwise remove the AP-CSN feature. | Reject - It was felt that the likelihood of the AP-CSN having wrapped around and therefore causing an old AP-CSN to be mistaken for the current AP-CSN was low and if this did occur the worst thing that would happen is that the STA association would fail and the STA would not have the advantages of rapid association of FILS, and then the STA would have to use non-FILs procedures to associate.  Note: This resolution is the same as for CID 5016. |
| 5126 | "if the values are equal, then the non-AP STA has the AP's current configuration information set that enables the non-AP STA to initiate the FILS procedure,..." What is the FILS procedure exactly? Please explain or give a reference where it's defined. | As in comment. | Revised: - agreed in principle. Change text to read as follows:  Change the text to read as follows:  “ - if the values are equal, then the non-AP STA may use the information contained in the AP configuration Information Set to initiate the FILS procedure (as defined in 10.44.3, 10.44.4 or 10.44.5), without waiting for next Beacon frame or Probe Response frame; “[13/1295r2]  Note to Editor: Resulting changes are shown in 14/1107r0  Note: this resolution is the same as for CID 5015. |
| 5016 | "if the values are equal, then the non-AP STA has the AP's current configuration information set that enables the non-AP STA to initiate the FILS procedure,..." If AP-CSN value has been updated more than 128 times since the STA's last visit, then the AP-CSN value is meaningless to the STA. | Fixed the problem; otherwise remove the AP-CSN feature. | Reject - It was felt that the likelihood of the AP-CSN having wrapped around and therefore causing an old AP-CSN to be mistaken for the current AP-CSN was low and if this did occur the worst thing that would happen is that the STA association would fail and the STA would not have the advantages of rapid association of FILS, and then the STA would have to use non-FILs procedures to associate.  Note: This resolution is the same as for CID 5127. |
| 5015 | "if the values are equal, then the non-AP STA has the AP's current configuration information set that enables the non-AP STA to initiate the FILS procedure,..." What is the FILS procedure exactly? Please explain or give a reference where it's defined. | As in comment. | Revised: agree in principle  Change the text to read as follows:  “ - if the values are equal, then the non-AP STA may use the information contained in the AP configuration Information Set to initiate the FILS procedure (as defined in 10.44.3, 10.44.4 or 10.44.5), without waiting for next Beacon frame or Probe Response frame;“[13/1295r2]  Note to Editor: Resulting changes are shown in 14/1107r0  Note: this resolution is the same as for CID 5126. |
| 4809 | It is not clear which test the "Otherwise" applies to | Make it clear | Revised: Text has been revised to clarify the meaning: [13/1295r2] [13/1295r2 CID 2940]  “If the received FD frame contains AP-CSN subfield, as defined in 10.1.4.3.7 (AP Configuration Information Set) and the non-AP STA retains previously obtained AP Configuration Information Sets, the non-AP  STA shall use the received FD AP-CSN information as follows:   * The STA shall check if the BSSID in the received FD frame is equal to a BSSID in the previously obtained AP Configuration Information Sets; * If yes, the STA compares the AP-CSN value in the received FD frame to the AP-CSN value associated with the BSSID in the AP Configuration Information Sets; * if the values are equal, then the non-AP STA may use the information contained in the AP configuration Information Set to initiate the FILS procedure (as defined in 10.44.3, 10.44.4 or 10.44.5), without waiting for next Beacon frame or Probe Response frame; [13/1295r2] * Otherwise, the non-AP STA follow the procedures specified in 10.1.4.2 and 10.1.4.3.”   Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4812 | How exactly does the FILS Indication element allow this? | Clarify | Revised:  Agree in principal - there is really no procedure for using the FILS Indication element in the section. The use of the FILS Indication element is covered in the security section 11.11.2.1. There is no procedure associated with this and hence the text has been removed.  Note to Editor: Resulting changes are shown in 14/1107r0 |
| 4025 | MIB syntax errors: The sequence does not include all the elements of the table. The elements do not have an object identifier ("::= { <something> <a number> }". "dot11DILS..." is probably a typo. | Fix these errors. I strongly recommend compiling the MIB (see baseline annex C for a link to a MIB compiler) and fixing new errors. | Reject - The comment has not provided an actionable text change, which can be adopted to satisfy the comment. |
| 4911 | Add an Annex to explain the system requirements for FILS. | FILS defines a protocol that is used across a fairly complex system of ESS's. It would be good to add a description to the Annex to explain how the system works and what is required to execute the protocol. Similar work was done for GAS/ANQP. | Reject - The comment has not provided an actionable proposed change, as no text changes are provided. |

**Red Lined Text Changes for the Proposed Resolutions:**

**CID 4032**

Instructions to Editors: Modified the text of the 8.6.8.34, page 67, line 1 (Draft 2.1) with the following change:

The Capability Presence Indicator is 1 bit in length and is set to 1 to indicate that the FD Capability field is present in the FD frame. It is set to 0 to indicate that the FD capability field is not present in the FD frame. [CIDs 4056, 4641, 4166, 4165, 4645, 4648, 4646, 4651, 4647, 4644, 4650, 4649] [CID 4032]

**CID 4586**

Instructions to Editors: Modified the text of the 8.6.8.34, page 69, line 28 (Draft 2.1) with the following change:

The 3-bit FILS Minimum Rate subfield indicates the minimum rate used by the AP transmitting the FD Frame and FILS STAs in subsequent transmissions between the AP and FILS STAs.

**CID 4311**

Instructions to Editors: Insert the following paragraph to Section 10.44.1, page 92, line 52 (Draft 2.1):

A FILS AP with dot11FILSActivated equal to TRUE shall set the FILS Capability field to 1 in the Extended Capabilities element and shall include the FILS Indication element in Beacon frames, Probe Response frames and (re)association Response frames. A FILS AP with dot11FILSActivated equal to TRUE may transmit FILS Discovery frames.

**CID 4029, 4314, 4346, 4368, 4800, 4802, 4808, 4809, 4812, 5015, 5016, 5126**

Instruction for the editors: please replace the text in Section 10.44.2 (Draft 2.l) with the following text. A redlined version as well as a clean version is provided below.

Proposed Text for updated section 10.44.2 redlined text:

**10.44.2 FILS Discovery frame generation and usage [CID 4804, 4806][CID 4029, 4314, 4346, 4368, 4800, 4802, 4808, 4809, 4812, 5015, 5016, 5126]**

**10.44.2.1 FILS Transmission**

An AP supporting FILS Discovery in which dot11FILSActivated is equal to true may generate and transmit FD frames. If the AP transmits the FD frame in the 2.4 GHz or 5 GHz band, the FD frame shall be transmitted at a data rate of 6 Mbps or higher, excluding all DSSS/CCK (Clause 16 or 17) data rates. Note: FILS is only supported in non-DMG infrastructure BSS. FILS is not supported in IBSS, PBSS, or MBSS. [CID 4798] [CID 4802]

An AP may transmit an FD frame as a non-HT duplicate PPDU. When an FD frame is transmitted as a non-HT duplicate PPDU, its primary channel shall be indicated by its Primary Channel field. [CID 4800]

If an AP transmits a FD frame as a non-HT duplicate PPDU in an 80+80 MHz channel bandwidth, the Channel Center Frequency Segment 1 (CCFS-1) field shall be present in the FD frame and is set to the channel center frequency of the frequency segment 1 for an 80+80 MHz VHT operating channel. [CIDs 4798, 4801]

An AP transmitting an FD frame may transmit the FD frame between Beacon frame instances. The interval between the transmission of a Beacon frame and a subsequent FD frame shall be no less than the interval indicated in the dot11FILSFDframeBeaconMinimumInterval. The transmission interval between any two transmitted FD frames shall be no less than the interval indicated in the dot11FILSFDframeBeaconMinimumInterval.

The transmitted FD frame shall contain the FILS Discovery Information Field.

**10.44.2.2 FILS Reception**

A STA that is scanning with dot11FILSActivated equal to true and having received an FD frame will compare the received SSID in the FD frame with the SSID parameter or SSID list provide to the STA previously in a MLME-SCAN request primitive. If the STA has the ReportingOption in the MLME-SCAN request equal to IMMEDIATE and if the SSID in the FD frame matches the SSID parameter or one of the SSIDs in the SSID list the STA shall issue an MLME-SCAN.confirm primitive with the information obtained from the received FD frame immediately after the reception of the FD frame, with the result-code equal to INTERMEDIATE\_SCAN\_Result. If the STA has the Reporting Option not equal to IMMEDIATE, then the STA will follow the procedures as indicated in 10.1.4.1.

[CID 4368, 4346, 4029, 4808]

If the received FD frame contains AP-CSN subfield, as defined in  10.1.4.3.7 (AP Configuration Information Set) and the non-AP STA retains previously obtained AP Configuration Information Sets, the non-AP STA shall use the received FD AP-CSN information as follows:[13/1295r2]

If the received FD frame contains AP-CSN subfield as defined in 10.1.4.3.7 (AP Configuration Information Set) and the non-AP STA retains previously obtained AP Configuration Information Sets, the non-AP STA shall use the received FD AP-CSN information as follows:

* The STA shall check if the BSSID in the received FD frame is equal to a BSSID in the previously obtained AP Configuration Information Sets;
* If yes, the STA compares the AP-CSN value in the received FD frame to the AP-CSN value associated with the BSSID in the AP Configuration Information Sets;
* if the values are equal, then the non-AP STA may use the information contained in the AP configuration Information Set to initiate the FILS procedure (as defined in 10.44.3, 10.44.4 or 10.44.5), without waiting for next Beacon frame or Probe Response frame; [13/1295r2]
* Otherwise, the non-AP STA follows the procedures specified in 10.1.4.2 and 10.1.4.3. [13/1295r2] [13/1295r2 CID 2940][CID 4809, 4812, 5015, 5016, 5126]

Proposed Text for updated section 10.44.2 clean text:

**10.44.2 FILS Discovery frame generation and usage [CID 4804, 4806][CID 4029, 4314, 4346, 4368, 4800, 4802, 4808, 4809, 4812, 5015, 5016, 5126]**

**10.44.2.1 FILS Transmission**

An AP supporting FILS Discovery in which dot11FILSActivated is equal to true may generate and transmit FD frames. If the AP transmits the FD frame in the 2.4 GHz or 5 GHz band, the FD frame shall be transmitted at a data rate of 6 Mbps or higher, excluding all DSSS/CCK (Clause 16 or 17) data rates. Note: FILS is only supported in non-DMG infrastructure BSS. FILS is not supported in IBSS, PBSS, or MBSS. [CID 4798] [CID 4802]

An AP may transmit an FD frame as a non-HT duplicate PPDU. When an FD frame is transmitted as a non-HT duplicate PPDU, its primary channel shall be indicated by its Primary Channel field. [CID 4800]

If an AP transmits a FD frame as a non-HT duplicate PPDU in an 80+80 MHz channel bandwidth, the Channel

Center Frequency Segment 1 (CCFS-1) field shall be present in the FD frame and is set to the channel center frequency of the frequency segment 1 for an 80+80 MHz VHT operating channel. [CIDs 4798, 4801]

An AP transmitting an FD frame may transmit the FD frame between Beacon frame instances. The interval between the transmission of a Beacon frame and a subsequent FD frame shall be no less than the interval indicated in the dot11FILSFDframeBeaconMinimumInterval. The transmission interval between any two transmitted FD frames shall be no less than the interval indicated in the dot11FILSFDframeBeaconMinimumInterval.

The transmitted FD frame shall contain the FILS Discovery Information Field.

**10.44.2.2 FILS Reception**

A STA that is scanning with dot11FILSActivated equal to true and having received an FD frame will compare the received SSID in the FD frame with the SSID parameter or SSID list provide to the STA previously in a MLME-SCAN request primitive. If the STA has the ReportingOption in the MLME-SCAN request equal to IMMEDIATE and if the SSID in the FD frame matches the SSID parameter or one of the SSIDs in the SSID list the STA shall issue an MLME-SCAN.confirm primitive with the information obtained from the received FD frame immediately after the reception of the FD frame, with the result-code equal to INTERMEDIATE\_SCAN\_Result. If the STA has the Reporting Option not equal to IMMEDIATE, then the STA will follow the procedures as indicated in 10.1.4.1.

[CID 4368, 4346, 4029, 4808]

If the received FD frame contains AP-CSN subfield, as defined in  10.1.4.3.7 (AP Configuration Information Set) and the non-AP STA retains previously obtained AP Configuration Information Sets, the non-AP STA shall use the received FD AP-CSN information as follows:[13/1295r2]

If the received FD frame contains AP-CSN subfield, as defined in 10.1.4.3.7 (AP Configuration Information Set) and the non-AP STA retains previously obtained AP Configuration Information Sets, the non-AP

STA shall use the received FD AP-CSN information as follows:

* The STA shall check if the BSSID in the received FD frame is equal to a BSSID in the previously obtained AP Configuration Information Sets;
* If yes, the STA compares the AP-CSN value in the received FD frame to the AP-CSN value associated with the BSSID in the AP Configuration Information Sets;
* if the values are equal, then the non-AP STA may use the information contained in the AP configuration Information Set to initiate the FILS procedure (as defined in 10.44.3, 10.44.4 or 10.44.5), without waiting for next Beacon frame or Probe Response frame; [13/1295r2]
* Otherwise, the non-AP STA follows the procedures specified in 10.1.4.2 and 10.1.4.3. [13/1295r2] [13/1295r2 CID 2940][CID 4809, 4812, 5015, 5016, 5126]

**References:**

1. **IEEE 802.11-14/0565r18, TGai LB201 comments on D2.0, Marc Emmelmann, 2014-07-14**
2. **IEEE P802.11ai™/D2.1, July 2014**