IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB201 Comment Resolution for Assigned Comments | | | | |
| Date: 2014-09-15 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Xiaofei WANG | InterDigital Communications, Inc. |  |  | xiaofei.wang@interdigital.com |
| Joseph LEVY | InterDigital Communications, Inc. | 2 Huntington Quadrangle Melville, NY 11747 | +1.516.835.9353 (m) | joseph.levy@interdigital.com |

Abstract

This document provides comment resolutions for CIDs 4032, 4614, 4999, 4586, 5000, 5111, 4288, 4311, 4344, 4712, 4933, 4802, 5137, 4800, 4313, 4368, 4341, 4029, 4808, 4314, 4595, 5127, 5126, 5016, 5015, 4809, 4812, 4024, 4025, 4910, 4911, 4724 and 4895, 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 subfield 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.  The ANTO Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the ANTO field is present in the FD frame. It is set to 0 to indicate that the ANTO field is not present in the FD frame.  The AP-CSN Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the AP-CSN field is present in the FD frame. It is set to 0 to indicate that the AP-CSN field is not present in the FD frame.  The ANO Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the ANO field is present in the FD frame. It is set to 0 to indicate that the ANO field is not present in the FD frame.  The CCFS-1 Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the Channel Center Frequency Segment 1 field is present in the FD frame. It is set to 0 to indicate that Channel Center Frequency Segment 1 field is not present.  The Primary Channel Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the Primary Channel field is present in the FD frame. It is set to 0 to indicate that the Primary Channel field is not present in the FD frame.  The RSN Information Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the RSN Information field is present in the FD frame. It is set to 0 to indicate that the RSN Information field is not present in the FD frame. “  Notes to Editor: Resulting changes are shown in 14/1107r2 | |
| 4614 | Every Public Action frame starts with Category and Public Action fields. This table need to conform. | Col2-Order1 should be "Category. Col2-Order2 should be "Public Action. Figure 8-589a should start with FD Frame Control field. | Revised – made changes indicated in proposed change and also corrected Action frame to be Public Action frame in the text.  Correction to text and table provided in 14/1107r2 | |
| 4999 | "The 3-bit Operating Channel Bandwidth subfield indicates the channel bandwidth of the AP, as coded in Table 8-273b (Operating Channel Bandwidth)." The Operating Channel Bandwidth is dynamic, so how this field should be set? And, how does this value help the FILS operation? | Please clarify and modify the text accordingly; | Reject: The Operating Channel is defined as: The operating channel is the channel in which beacons are transmitted. For a particular AP configuration this is not a dynamic value. Please not that this is basically the same as described in section 10.40.1, Table 10-25 (from IEEE P802.11-REVmc/D3.0). | |
| 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 transmitting the FD frame and by FILS STAs in subsequent transmissions between the AP and FILS STAs.  Note: The FILS Minimum Rate variable is an AP settable variable which affects the behaviour of the AP and the FILS STAs associated with the AP. The variable may be used to limit the coverage area and can be set to any of the acceptable rates as desired, including the currently specified minimum rate. It is anticipated that this variable will only be changed when the AP or network reconfiguration take place, hence it is not a dynamic variable.  Note to Editor: Resulting changes are shown in 14/1107r2 | |
| 5111/ 5000 | "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 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 may transmit FD frames.  Notes to Editor: Resulting changes are shown in 14/1107r2. This change addresses CIDs 4311, 4344, 4712, 4933 with the same edits. | |
| 4344 | | If FILS Indication element is mandatory how can support for "FILS by any of the following methods" be right. I think it is all of the three? | Replace "An AP FILS STA indicates its support for FILS by any of the following methods " with "An AP FILS STA sahell indicate its support for FILS by the following methods:" | Revised: Agree that the comment that the text is confusing. Change the text to:  “A FILS AP 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 may transmit FD frames. “  Notes to Editor: Resulting changes are shown in 14/1107r2. This change addresses CIDs 4311, 4344, 4712, 4933 with the same edits. |
| 4712 | | "indicates its support for FILS by any of the following methods:" -- does it just need to do one of them, or all three? Ditto for the non-AP STA below | Clarify | Revised: Agree that the comment that the text is confusing. Change the text to:  “A FILS AP 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 may transmit FD frames. “  Notes to Editor: Resulting changes are shown in 14/1107r2. This change addresses CIDs 4311, 4344, 4712, 4933 with the same edits. |
| 4933 | | line 44 - j) - Why is setting FILS capability in extended capabilities optional (one of the methods). It should be mandatory - so implementations can check easily. | See comment | Revised: Agree that at least one of the fields should be mandatory. We have set the FILS Capability field to 1 in the Extended Capabilities element. Change the text to:  “A FILS AP 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 may transmit FD frames. “  Notes to Editor: Resulting changes are shown in 14/1107r2. This change addresses CIDs 4311, 4344, 4712, 4933 with the same edits. |
| 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 principle - 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 17) data rates. Note: FILS is only supported in non-DMG infrastructure BSS. FILS is not supported in IBSS, PBSS, or MBSS.  Note to Editor: Resulting changes are shown in 14/1107r2 |
| 5137 | | Can FILS work on other frequency band? It is not necessary to mention the frequency band of FILS since it it is a MAC feature. Suggest to remove the sentence "If transmitted in the 2.4 GHz or 5 GHz band, the FD frame shall be transmitted at a data rate of 6Mbps or higher" |  | Reject: The 6 MHz rate is a PHY requirement for the 2.4 GHz and 5 GHz bands. Also, no actionable text changes have been supplied. |
| 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."  Note to Editor: Resulting changes are shown in 14/1107r2 |
| 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 principle – change text to remove all redundant frame description material and provide only procedures required for FILS operation. The sentence was deleted.  Changes are shown in 14/1107r2 |
| 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 principle – change text to remove all redundant frame description material.  Changes are shown in 14/1107r2 |
| 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 principle – change text to remove all redundant frame description material.    Changes are shown in 14/1107r2 |
| 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 principle – change text to remove all redundant frame description material.  Changes are shown in 14/1107r2 |
| 4314 | | Need to indicate that AP-CSN is tied to an APs BSSID | as in comment | Revised:  Agree in principle – Change the text to "If the received FD frame contains the 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 14/1107r2 |
| 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 one or more FILS procedures (as defined in 10.44.3, 10.44.4 and 10.44.5), without waiting for next Beacon frame or Probe Response frame; “[13/1295r2]  Note to Editor: Resulting changes are shown in 14/1107r2  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 one or more FILS procedures (as defined in 10.44.3, 10.44.4 and 10.44.5), without waiting for next Beacon frame or Probe Response frame;“[13/1295r2]  Note to Editor: Resulting changes are shown in 14/1107r2  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 the 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 so, 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 one or more FILS procedures (as defined in 10.44.3, 10.44.4 and 10.44.5), without waiting for next Beacon frame or Probe Response frame; [13/1295r2] * If the non-AP STA has not successfully associated with an AP using the above procedures, it shall follow the procedures specified in 10.1.4.2 and 10.1.4.3. [13/1295r2] [13/1295r2 CID 2940]”   Note to Editor: Resulting changes are shown in 14/1107r2 |
| 4812 | | How exactly does the FILS Indication element allow this? | Clarify | Revised:  Agree in principle - 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 14/1107r2 |
| 4024 | | The MIB is incomplete. Specifically, it has no compliance requirements for FILS. | Add a group for mandatory FILS objects and one (if needed) for optional FILS objects. Add a compliance statement citing these group(s). Add the dot11FILSActivated to the appropriate existing "base" group by deprecating, copying into a new group and citing the new group from the main compliance statement. | Reject - The comment has not provided an actionable text change, which can be adopted to satisfy the comment. |
| 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 - While the errors noted in the comment need to be corrected. The comment has not provided an actionable text change, which can be adopted to satisfy the comment. |
| 4910 | | There are no updates to the MIB (even though there is a variable defined) | Updated the MIB | 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. |
| 4724 | | "station may respond with a single Beacon or Probe Response frame addressed to broadcast address, to two or more received Probe Request frames" -- this suggests a station may send an additional Beacon (additional to the ones it normally sends after TBTTs) | Reword to make it clear the options are (a) send a single PR or (b) just wait until the next Beacon goes out as usual | Revised – agreed in principle, change text to read:  dot11OmitReplicateProbeResponses OBJECT-TYPE  SYNTAX TruthValue  MAX-ACCESS read-write [CID 2107]  STATUS current  DESCRIPTION  "This is a control variable. It is written by an external management entity. Changes take effect for the next Probe Response frame.  This attribute, when true, indicates that the station may respond to two or more received Probe Request frames with a single Probe Response frame addressed to broadcast address. Alternatively, the station may respond to one or more received Probe Request frames by omitting the response of the Probe Response frame and allowing the transmission of the Beacon frame at TBTT to be the response."  DEFVAL { false }  Note to Editor: Resulting changes are shown in 14/1107r2 |
| 4895 | | The description sounds like a dot11Implemented variable, not a dot11Activated variable | Use more dot11Activated-like wording | Revised – this comment was address by the text changes made by motion 90, 11-13/1186r5. |

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

**CID 4032**

Instructions to Editor: Modify the text of the 8.6.8.34, page 67, line 1 (Draft 2.1) with the following changes:

The Capability Presence Indicator subfield 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. [13/1339r1][14/0412r3][CIDs 4056, 4641, 4166, 4165, 4645, 4648, 4646, 4651, 4647, 4644, 4650, 4649]

The ANTO Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the ANTO field is present in the FD frame. It is set to 0 to indicate that the ANTO field is not present in the FD frame. [13/1339r1][14/0412r3][CID 4033, 4064, 4252, 4643]

The AP-CSN Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the AP-CSN field is present in the FD frame. It is set to 0 to indicate that the AP-CSN field is not present in the FD frame. [13/1339r1][14/0412r3]

The ANO Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the ANO field is present in the FD frame. It is set to 0 to indicate that the ANO field is not present in the FD frame. [13/1339r1][14/0412r3]

The CCFS-1 Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the Channel Center Frequency Segment 1 field is present in the FD frame. It is set to 0 to indicate that Channel Center Frequency Segment 1 field is not present. [13/1534r0][14/0412r3][CID 4167]

The Primary Channel Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the Primary Channel field is present in the FD frame. It is set to 0 to indicate that the Primary Channel field is not present in the FD frame. [13/1339r1][14/0412r3]

The RSN Information Presence Indicator subfield is 1 bit in length and is set to 1 to indicate that the RSN Information field is present in the FD frame. It is set to 0 to indicate that the RSN Information field is not present in the FD frame. [13/1043r1][14/0412r3]

**CID 4614**

Instruction to Editor: Modify the first part of the text of the 8.6.8.34, page 65, line 30 (Draft 2.1) with the following changes

* FILS Discovery frame format

The FILS Discovery (FD) frame uses Public Action frame format. The format of its Action field is shown in Table 8-273a (FILS Discovery frame format).

|  |  |  |
| --- | --- | --- |
| * FILS Discovery frame format | | |
| Order | Information | Notes |
| 1 | Category |  |
| 2 | Public Action |  |
| 3 | FILS Discovery Information field | [CID 4617] |
| 4 | Short Neighbor Report element [CID 5133] | Short Neighbor Report element is optionally present. |
| 5 | FILS Indication element | The FILS Indication element is optionally present. |
| 6 | Vendor Specific element | One or more Vendor Specific elements are optionally present. |

FD

The FILS Discovery Information field is shown in Figure 8-589a (FILS Discovery Frame Action Information field format [CIDs 4804, 4617, 4614]).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | |  | | |  |  |
|  |  |  |  | |  | | |  |  |
|  |  |  |  | |  | | |  |  |
|  |  |  |  | |  | | |  |  |
|  |  |  |  | |  | | |  |  |
|  |  |  |  | |  | | |  |  |
|  | FD Frame Control | SSID | | FD Capability (conditional) | |  |
| Octets: | 2 | 1-32 | | 0 or 2 | |  |
|  |  |  |  | |  | | |  |  |
| [CID 4161] | AP’s Next TBTT Offset (ANTO) (conditional) [CIDs 4031, 4055, 4616, 4250] | AP Configuration Sequence Number (APCSN) (conditional) | Access Network Options (ANO) (conditional) | | Primary Channel (conditional) | | | Channel Center Frequency Segment 1 (conditional) | RSN Information  (conditional) |
| Octets: | 0 or 1 | 0 or 1 | 0 or 1 | | 0 or 1 | | | 0 or 1 | 0 or 4 |
|  |  |  |  | |  | | |  |  |
| * FILS Discovery Information field format [14/0412r3][CIDs 4804, 4617] | | | | | | | | | |

[14/0412r3]

*Note to Editor: the rest of this clause is unchanged.*

**CID 4586**

Instructions to Editor: Modify the text of the 8.6.8.34, page 69, line 28 (Draft 2.1) with the following changes:

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

**CID 4311**

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

A FILS AP 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 may transmit FD 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, 4029, 4314, 4595, 5127, 4346, 4368, 4800, 4802, 4808, 4809, 4812, 5015, 5016, 5126]**

**10.44.2.1 FILS Discovery Frame 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 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 dot11FILSFDframeBeaconMinimumInterval. The transmission interval between any two transmitted FD frames shall be no less than the interval indicated in dot11FILSFDframeBeaconMinimumInterval.

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

**10.44.2.2 FILS Discovery Frame Reception**

If a FILS STA has the ReportingOption in the MLME-SCAN.request not equal to IMMEDIATE, then the STA shall follow the procedures indicated in 10.1.4.1 and not the procedures provided in this clause.

A scanning FILS STA that receives an FD frame should compare the received SSID in the FD frame with the SSID parameter or SSID list provided 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 ResultCode equal to INTERMEDIATE\_SCAN\_RESULT.

[CID 4368, 4346, 4029, 4808]

If the received FD frame contains the 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 the 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 so, 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 one or more FILS procedures (as defined in 10.44.3, 10.44.4 and 10.44.5), without waiting for next Beacon frame or Probe Response frame; [13/1295r2]
* If the non-AP STA has not successfully associated with an AP using the above procedures, it shall follow 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, 4029, 4314, 4595, 5127, 4346, 4368, 4800, 4802, 4808, 4809, 4812, 5015, 5016, 5126]**

**10.44.2.1 FILS Discovery Frame 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 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 dot11FILSFDframeBeaconMinimumInterval. The transmission interval between any two transmitted FD frames shall be no less than the interval indicated in dot11FILSFDframeBeaconMinimumInterval.

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

**10.44.2.2 FILS Discovery Frame Reception**

If a FILS STA has the ReportingOption in the MLME-SCAN.request not equal to IMMEDIATE, then the STA shall follow the procedures indicated in 10.1.4.1 and not the procedures provided in this clause.

A scanning FILS STA that receives an FD frame should compare the received SSID in the FD frame with the SSID parameter or SSID list provided 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 ResultCode equal to INTERMEDIATE\_SCAN\_RESULT.

[CID 4368, 4346, 4029, 4808]

If the received FD frame contains the 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 the 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 so, 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 one or more FILS procedures (as defined in 10.44.3, 10.44.4 and 10.44.5), without waiting for next Beacon frame or Probe Response frame; [13/1295r2]
* If the non-AP STA has not successfully associated with an AP using the above procedures, it shall follow 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]

**CID 4724**

**Instructions for Editor: please modify the text of C.3, page 122, line 58 (Draft 2.1) with the following changes:**

dot11OmitReplicateProbeResponses OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write [CID 2107]

STATUS current

DESCRIPTION

"This is a control variable. It is written by an external management entity. Changes take effect for the next Probe Response frame.

This attribute, when true, indicates that the station may respond to two or more received Probe Request frames with a single Probe Response frame addressed to broadcast address. Alternatively, the station may respond to one or more received Probe Request frames by omitting the response of the Probe Response frame and allowing the transmission of the Beacon frame at TBTT to be the response."

DEFVAL { false }

**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**