IEEE P802.11
Wireless LANs

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| CC08 – Normative Text for CIDs allocated to Lin Cai |
| Date: 2013-11-11 |
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Abstract

This contribution proposes resolutions to the comments on Differentiated Initial Link Setup.

# Introduction

This contribution proposes resolutions to the comments on Differentiated Initial Link Setup, including CIDs 2095 2096 2093 2020 2097 2139 2138 2137 2134 2132 2145 2140 2144 2150 2149 2148 2146 2191 2388 2418 2417 2414 2485 2547 2676 2675 2674 2673 2679 2680 2672 2698 2703 2702 2677 2699 2697 2696 2695 2694 2700 2748 2718 2808 2870 2840 2899 2886 2936 2943 2959 3054 3062 3028 2484 3060 3059 3058 3057 3056 3117 3144 3143 3142 3139 3141 3140 3175 3174 3173 3214 3239 3303 3302 3322 3345 3327 3326 3325 3323 3324 3359 3381 2701 2924 3279.

# Conventions

 ‘Track changes’ is used to show changes to revision 1.1.

# Proposed Changes to 802.11ai/D0.5 Specification Text

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[2673,2699,3057,2701,2924,3279]

**8.4.2.187** Differentiated Initial Link Setup element

*Instructions to Editor: Modify the Clause 8.4.2.187 with the following text:*

The Differentiated Initial Link Setup element includes the conditions for a STA to determine the FILSC value for the duration specified in the element. The Differentiated Initial Link Setup element is optionally present in the Beacon, and Probe Response frames. The Differentiated Initial Link Setup element is defined in Figure 8-401dq (Differentiated Initial Link Setup element format).

|  |  |  |  |
| --- | --- | --- | --- |
|  **Element ID** | **Length** | **ILS Time**  | **ILSC Information** |

 **Octets: 1 1 1 Variable**

**Figure 8-401dq—Differentiated Initial Link Setup element format**

The Element ID field is equal to the Differentiated Initial Link Setup element value in Table 8-54 (Element IDs).

The Length field is 1 octet long. It specifies the length of Differentiated Initial Link Setup element in octets.

The ILS Time field is an unsigned integer that specifies the time, expressed in units of 10 ms starting from the the beginning or the frame transmission of the Differentiated Initial Link Setup element and ending after the ILS Time elapses.[3139,3322,3140,3322,3323] [2672, 2134, 2870]

The ILSC Information field is of variable length. It indicates the conditions to determine FILSC value [3054] for the time as indicated in the ILS Time field.

The ILSC Information field contains one ILSC Type subfield and at least one of the three optional subfields including ILS User Priority, MAC Address Filter, and Vendor Specific, as specified in Figure 8-401dr (ILSC Information field format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ILSC Type**  | **ILS User Priority**  | **MAC Address Filter** | **[2191,2547]** | **Vendor Specific [2020]** |

**Octets:**  1 0 or 1 0 or 1 0 or variable length

**Figure 8-401dr—ILSC Information field format**

The ILSC Type subfield is 1 octet in length and it is used to indicate the presence of the optional subfields in the ILSC Information field, as defined in Figure 8-401ds (ILSC Type subfield format). A bit value of 1 in the User Priority, MAC Address Filter and Vendor Specific subfields indicates that the corresponding ILSC subfield is present At least one of the bits in ILSC Type subfield is set to 1 when Differentiated Initial Link Setup element is present.

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| --- | --- | --- | --- | --- |
| ILS User Priority | MAC Address Filter | Vendor Specific  | [2547,2191] | Reserved |

Bit: 1 1 1 1 5[2748,3056]

**Figure 8-401ds—ILSC Type subfield format**

The ILS User Priority subfield is defined in Figure 8-401dt (ILS User Priority subfield format[3060]). [2673,3326,2672,3326,3325,3324]

|  |  |  |  |
| --- | --- | --- | --- |
| ILS User Priority B0 | ILS User Priority B1 | ILS User Priority B2 | Reserved |

Bit: 1 1 1 5[2095]

**Figure 8-401dt—ILS User Priority subfield format[3060]**

The MAC Address Filter subfield is 1 octet in length as illustrated in Figure 8-401du (MAC Address Filter subfield). The Bit Pattern Length subfield is 3 bits in length, and the Bit Pattern subfield is 5 bits in length. B0 B2 B3 B7

|  |  |
| --- | --- |
| Bit Pattern Length | Bit Pattern |

Bits: 3 5

**Figure 8-401du—MAC Address Filter subfield**

The usage of the Bit Pattern Length subfield and Bit Pattern subfield is defined in Table 8-183aj (MAC Address Filter subfield). The Bit Pattern Length subfield specifies the number of bits and the position of the bits in the Bit Pattern subfield that are used for MAC address filtering. The values of the bits specify the MAC addresses of the STAs that are allowed to attempt initial link setup.

**Table 8-183aj—MAC Address Filter subfield**[2095]

|  |  |
| --- | --- |
| Bit Pattern Length valueB2 B1 B0 | Bit Pattern  |
| B3 | B4 | B5 | B6 | B7 |
| 001 | 0 | 0 | 0 | 0 | Used for MAC address filtering |
| 010 | 0 | 0 | 0 | Used for MAC address filtering |
| 011 | 0 | 0 | Used for MAC address filtering |
| 100 | 0 | Used for MAC address filtering |
| 101 | Used for MAC address filtering |
| 000 | Reserved |
| 110-111 | Reserved |

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| --- | --- | --- |
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[2414,2840,2899,3062, 3117,2191,3214]

[2191, 3381,3359]

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The Vendor Specific subelement has the same format as the Vendor Specific element

(see 8.4.2.28) [2020, 2676,2680,2677].

**10.44.6 Differentiated Initial Link Setup**

*Instructions to Editor: Modify the Clause 10.44 with the following text:*

To limit the number of STAs that attempt link setup concurrently[2695], the differentiated link setup procedure provides a method for an AP to moderate the rate non-AP STAs transmiting initial link setup frames to the AP[2093, 2132]. The initial link setup request frame [2134,2870] refers to as the first frame initializing the link setup procedure; either association request frame or authentication request frame.

**10.44.6.1 AP procedures for differential initial link setup**

*Instructions to Editor: Modify Clause 10.25.4.1 with the following text:*

An AP with dot11FILSActivated equal to true may include the Differentiated Initial Link Setup element in Beacon and Probe Response frames, and set the ILS Time and ILSC Information fields to limit the number of STAs that are allowed to attempt link setup[2694,3173] concurrently.

[2694]The AP may set an ILS Time which is reserved for high priority link setup, and may set the ILS User Priority subfield, MAC Address Filter subfield, and/or Vendor Specific subfield to specify a subset of STAs that may attempt initial link setup during the reserved ILS Time specified in the element[2137]. [2138]

An AP may set the ILS UP B0, B1 and B2[2095] to 1 to indicate high priority link setup without additional delays for the STAs that have frames with UP 4-7 enqueued within their transmission queue(s), STAs that have frames with UP 0-3 enqueued within their transmission queue(s), and STAs that have no frame enqueued within their transmission queue(s) , respectively; and to 0 otherwise[2140] An AP should always allow a STA that has frames with UP 4-7 enqueued in their transmission queue(s) to attempt initial link setup before STAs that have frames with UP 0-3, and the STAs that have no frame enqueued in their transmission queue(s). [2140, 2139,2959,3345] .

An AP may set the Bit Pattern Length subfield in the MAC Address Filter subfield to decide the number of bits used for MAC address filtering; and specify the bit pattern in the Bit Pattern subfield to allow STAs with specific MAC addresses to transmit initial link setup request frames immediately. The more bits used for MAC address filtering, the fewer number of STAs are allowed to transmit an initial link setup request frame immediately. How an AP sets the bit pattern in the Bit Pattern subfield is beyond the scope of this specification.[2697, 3144, 3327,2936]

 [2097, 2144,2145,2696,2698].

An AP may set one or more vendor specific criteria in Vendor Specific subfield to allow a set of STAs that satisfy the specified criteria to transmit initial link setup request frames to the AP without additional delays.[2697,2679, 2675,2674]

[2146,]

**10.44.6.2 Non-AP STA procedures for differentiated initial link setup**

*Instructions to Editor: Modify Clause 10.25.4.2 with the following text:*

When a non-AP STA with dot11FILSActivated and dot11DILSActivated[3174] equal to true receives a Beacon, Probe Response frame that includes Differentiated Initial Link Setup element, the STA shall check the ILSC information subfield to determine if it satisfies the condition specified in each and every optional subfield that is present. If the STA satisfies all of the conditions specified in the present optional subfields, including the ILS UP, MAC address filter, and Vendor Specific [3175], the STA has an FILSC value of 1 and it shall proceed with a fast initial link setup with the AP without additional delays. Otherwise, the STA shall have a FILSC value of 0 and shall postpone the link setup with the AP until the time specified in ILS Time field elapses.[2148,2149] [2418,2417,2886] Each time a STA with dot11FILSActivated and dot11DILSActivated equal to true receives a Beacon and/or Probe Response frame which includes Differentiated Initial Link Setup element, the STA shall check the ILSC information subfield and update its FILSC value; the STA shall also update its link setup timer to the ILS Time value in the latest received Differentiated Initial Link Setup element if the STA's FILSC value is 0. [2703,2138,2700] All categories of STAs can transmit an initial link setup request frame to [2870]the AP after this time expires.

[2096,2150,3058]When the ILS User Priority subfield is present, the ILS User Priority condition is satisified if the STA has frames with UP 4-7 enqueued within the transmission queue(s) and the ILS User Priority B0 is 1, or if the STA has frames with UP 0-3 enqueued within their transmission queue(s) and the ILS User Priority B1 is 1, or if the STA has no frame enqueued within their transmission queue(s) and the ILS User Priority B2 [2943, 2673,2959,3143.3142,3141] is 1. [3059, 2673,3239]

If MAC Address Filter subfield is present, a STA shall exclusive-OR (XOR) the last 5 LSBs of its MAC address with B3 to B7[2095] of the Bit Pattern subfield in MAC Address Filter subfield. If the last n bits of the result are zero, where n is specified in the Bit Pattern Length field, the MAC address condition is satisfied.

If Vendor Specific subfield is present, a STA shall check the OI subfield. If the STA can understand the OI subfield, the STA shall check the following Vendor Specific Category subfield. Otherwise, the STA shall skip and ignore the Vendor Specific Category subfield and assume the condition specified in Vendor Specific Category is not satisfied[2702].

[2703]

**Annex C[3174]**

(normative)

***Insert new MIB variables as shown below***

Dot11DILSActivated OBJECT-TYPE

SYNTAX Boolean

MAX-ACCESS Read-Only

STATUS Current

Description

“This is a capability variable. Its value is determined by device capabilities. This attribute, when true, indicates that the station implementation is capable of supporting fast initial link setup category. The capability is disabled, otherwise.”

DEFVAL{false}