IEEE P802.11
Wireless LANs

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| Proposed Resolution Text for CID 7117, 7429, 7246 |
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**8.4.2.169 Reduced Neighbor Report element [CID 5133][CIDs 6138, 6972, 6112]**

Abstract

This document presents a resolutions to CID 7117. Two main changes are included.

1. The text is modified to make it consistent with Revmc 4.0
2. Usage indicator bit deleted, bit position is assigned as reserved
3. The interpretation of the TBTT information length field is sent in a table fashion
4. The description of what is to be done with neighbor TBTT offset is changed to make it consistent with the way it was used in Revmc Draft 4.0. Note that TGai 4.0 had indicated that the offset was to be used with respect to the “transmission time” which is in general not a good approach since the time at which the field was written and the actual transmission time may be quite different due to contention and medium state.
5. A new clause is included to describe how the short ssid is computed
* Neighbor AP Information field

***Change as follows:***

The Neighbor AP Information field specifies TBTT and other information related to a group of neighbor APs on one channel. See Figure 8-571 (Neighbor AP Information field format). [CID 2708] [CID 2932][CID 4877]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | TBTT Information Header | Operating Class | Channel Number | TBTT Information subfields ~~#1~~(contains one or more TBTT Information fields)[CID 6008]  | (cells deleted from REVmc) |
| Octets: | 2 | 1 | 1 | n [CID 6272]  |  |
| * Neighbor AP Information field format
 |

 [CID 2661][REVmc][CID 6881] [Ed note, we need to show that cells were deleted from the base figure.]

The format of TBTT Information Header subfield is defined in Figure 8-572 (TBTT Information Header subfield).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B1 | B2 |  B3 | B4 B7 | B8 B15 |
| [REVmc] | TBTT Information Field Type | Filtered Neighbor AP | Reserved ~~Usage Indicator~~ | TBTT Information Count  | TBTT Information Length  |
| Bits: | 2 | 1 | 1 | 4 | 8 |
| * TBTT Information Header subfield
 |

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The TBTT Information Field Type subfield[CID 2012] is 2 bits in length and [REVmc]defines the structure of the TBTT Information field. ~~Its value is 0/.~~ Values ~~1,~~ 2, and 3 are reserved. [14/0836r3, CIDs 6942, 6046, 6469] [15/0041r1]

The length n of all TBTT Information subfields is given by the value of the TBTT Information Length within the TBTT Information Header. [CID 6272]

The Filtered Neighbor AP subfield is 1 bit in length. When included in the Probe Response frame, ~~I~~it is set to 1 if the SSID of APs in this Neighbor AP Information field matches the specific SSID in the corresponding Probe Request frame. When included in the Beacon frame, it is set to 1 if the SSID of APs in this Neighbor AP Information field matches the specific SSID in the containing Beacon frame. It is set to 0 otherwise. ~~This field is valid only in the Reduced Neighbor AP Report element in a Probe Response frame and is reserved otherwise.~~[REVmc][CIDs 6007, 6115]

The TBTT Information Count subfield[CID 2012] is 4 bits in length and contains the number of TBTT Information fields that are included in the Neighbor AP Information field, minus one. A value of 0 indicates one TBTT Information field is present. [REVmc]

The TBTT Information Length subfield[CID 2012] is 1 octet in length and contains the length in octets of the TBTT Information field that is included in the Neighbor AP Information field. The value of TBTT Information Length field is either 1, 5, 7, or 11 based on the fields in TBTT Offset subfield. Other values are reserved. [CID 2707, 2412, 2663, 3369, 2709, 2895, 3042, 3347] [CID 2519, 2819][REVmc][14/0917r2, CIDs 4878, 4522, 4876, 4521][14/0836r3][CID 6882][14/1583r3]

When the TBTT Information Field Type is equal to 1, the TBTT Information Length subfield is interpreted as shown in Table 8-XX1: [15/0041r1]

|  |  |
| --- | --- |
| TBTT Information Length Subfield Value | TBTT Information field Contents |
| 1 | AP Next TBTT Offset (ANTO) subfield |
| 5 | AP's Next TBTT Offset subfield and the Short SSID subfield.  |
| 7 | AP’s Next TBTT Offset subfield and the BSSID subfield |
| 11 | AP’s Next TBTT Offset subfield, the BSSID subfield and the Short SSID subfield |
| 2-4,6,8-10, 12-255 | Reserved |

~~- When the value of TBTT Information Length is 1, the TBTT Information field contains the AP's Next TBTT Offset (ANTO) subfield.~~

~~- When the TBTT Information Length is 5, the TBTT Information field contains the AP's Next TBTT Offset subfield and the Short SSID subfield.~~

~~- When the TBTT Information Length is 7, the TBTT Information field contains the AP's Next TBTT Offset subfield and the BSSID subfield.~~

~~- When the TBTT Information Length is 11, the TBTT information field contains the AP's Next TBTT Offset subfield, the BSSID subfield and the Short SSID subfield.~~

~~- Other values of the TBTT Information Length are reserved.~~

Operating Class[CID 2012] field is 1 octet in length and indicates the band and bandwidth of the primary channel of the APs in this Neighbor AP Information field. Valid values of Operating Class are shown in Table E-4 (Global operating classes). [REVmc]

Channel Number[CID 2012] field is 1 octet in length and indicates the last known primary channel of the APs in this Neighbor AP Information field. Channel Number is defined within an Operating Class as shown in Table E-4 (Global operating classes). [REVmc]

~~The format of TBTT Information field when the TBTT Information Field Type is 0 is shown in Figure 8-573 (TBTT Information field format when TBTT Information Field Type is 0).~~

|  |  |  |  |
| --- | --- | --- | --- |
| ~~[14/0836r3]~~ | ~~TBTT Offset~~  | ~~Optional Subelements BSSID~~ | ~~Short-SSID~~ |
| ~~Octets:~~ | ~~1~~ | ~~0 or 6~~ | ~~0 or 4~~ |
| * ~~TBTT Information field format when TBTT Information Field Type is 0 [15/0041r1]~~
 |

~~[15/0041r1]~~TheTBTT Information ~~Set field~~ subfield when the Information Field Type is 0 contains one or more TBTT Information fields. The TBTT Information field is defined in Figure 8-575 (TBTT Information field).

|  |  |
| --- | --- |
|  | Neighbor AP TBTT Offset |
| Octets | 1 |

**Figure 8-575-TBTT Information field when TBTT Information Field Type is 0**

The Neighbor AP TBTT Offset subfield is 1 octet in length and indicates the offset in TUs, rounded down to nearest TU, to the next TBTT of an AP from the immediately prior TBTT of the AP that transmits this
element. The value 254 indicates an offset of 254 TUs or higher. The value 255 indicates an unknown offset value

~~When the value of TBTT Information Length is greater than or equal to 1, the TBTT Information field contains the TBTT Offset subfield. The TBTT Offset in TUs subfield is 1 octet in length and indicates the offset in TUs, rounded down to the nearest TU, to next TBTT of an AP from the immediately prior TBTT of the AP that transmits this element. and. The value 254 to indicates an offset of 254 TUs or higher. The value 255 indicates an unknown offset value. [REVmc and CID 4238][CIDs 6286, 6883, 6047, 6494, 6273] [15/0041r1]~~

~~The Optional Subelements field contains zero or more subelements, each consisting of a 1-octet Subelement ID field, a 1-octet Length field, and a variable-length Data field, as shown in Figure 8-578 (Subelement format). Any optional subelements are ordered by nondecreasing Subelement ID. [15/0041r1]~~

The format of TBTT Information field when TBTT Information Field Type is equal to 1 is shown in Figure 8-573a (TBTT Information field format when TBTT Information Field Type is 1).

|  |  |  |  |
| --- | --- | --- | --- |
| [15/0041r1]  | APs Next TBTT Offset  |  BSSID | Short-SSID |
| Octets: | 1 | 0 or 6 | 0 or 4 |
| * TBTT Information field format when TBTT Information Field Type is 1 [15/0041r1]
 |

The AP's Next TBTT Offset (ANTO) subfield in the TBTT Information field indicates the time offset in number of TUs, rounded down to the nearest TU, between the transmission of the current frame and the next TBTT of a neighbor AP. If the BSSID or Short-SSID subfield is present, the neighbor AP is identified by the BSSID or the Short SSID. The value 254 is used to indicate an offset of 254 TUs or higher. The value 255 is used to indicate an unknown offset value. The Short SSID is calculated as give 8.4.2.169.2.[15/0041r1]

***Instruction to Editor: Add the following clause after 8.4.2.169.1***

8.4.2.169.2 Calculating the Short SSID

The Short SSID field is a 32-bit field containing a 32-bit CRC. The Short SSID is calculated over the SSID carried in SSID element carried in the beacon or probe response frame This SSID is referred to as the *calculation fields*.

The Short SSID is calculated using the following standard generator polynomial of degree 32:

*G*(*x*) = *x*32 + *x*26 + *x*23 + *x*22 + *x*16 + *x*12 + *x*11 + *x*10 + *x*8 + *x*7 + *x*5 + *x*4 + *x*2 + *x* + 1

The Short SSID is the ones complement of the sum (modulo 2) of the following:
 a) The remainder of *x*k (*x*31 + *x*30 + *x*29 + …+ *x*2 + *x* + 1) divided (modulo 2) by *G*(*x*), where *k* is the
number of bits in the calculation fields, and

 b) The remainder after multiplication of the contents (treated as a polynomial) of the calculation fields
by *x*32 and then division by *G*(*x*).

The Short SSID field is transmitted commencing with the coefficient of the highest-order term.

As a typical implementation, at the transmitter, the initial remainder of the division is preset to all ones and
is then modified by division of the calculation fields by the generator polynomial *G*(*x*). The ones
complement of this remainder is transmitted, with the highest-order bit first, as the Short SSID field.
At the receiver, the initial remainder is preset to all ones and the serial incoming bits of the calculation fields and Short SSID, when divided by *G*(*x*), results (in the absence of transmission errors) in a unique nonzero remainder value. The unique remainder value is the polynomial:

 *x*31 + *x*30 + *x*26 + *x*25 + *x*24 + *x*18 + *x*15 + *x*14 + *x*12 + *x*11 + *x*10 + *x*8 + *x*6 + *x*5 + *x*4 + *x*3 + *x* + 1

 [CIS 2013, 2303][CID 4540]