IEEE P802.11 Wireless LANs

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| Suggested resolution for submitted TGai comment (Specification text for Reduced Neighbor Report) |
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Abstract

This submission proposes the 802.11ai specification text of Reduced Neighbor Report for channel, band or AP redirection, as a suggested resolution to a comment submitted for IEEE 802.11 Comment Collection 8 for 802.11ai Draft 0.5[Ref-2].

# Introduction

The following comments have been submitted to IEEE 802.11 Comment Collection 8 for 802.11ai Draft 0.5[Ref-2]:

**Comments for Reduced Neighbor Report for channel switching, band switching or AP redirection:**

CID 1417, 1348(E), 1419, 1023, 1212, 1349, 1350, 1420, 1151(George), 1213, 1421, 1422, 1037, 1243, 1362,1363, 1138, 1195, 1152(E), 1139, 1140, 1070, 1068, 1069

This contribution proposes detailed changes in 802.11ai/D0.5 [Ref-2], to modify the text of the Reduced Neighbor Report element for channel switching, band switching or AP redirection.

# Conventions

In this contribution, the proposed 802.11ai Specification Document text will be presented as changes to the current TGai draft specification, 11ai/D0.5[Ref-2]. 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*; and
5. Any other text, e.g., discussions, proposed motions, etc., is in black text, but not in the context of proposed TGai specification text.

# Proposed resolution

**8.4.2.176 Reduced Neighbor Report element**

The Reduced Neighbor Report element contains channel and other information related to neighbor APs. The

format of the Reduced Neighbor Report element is shown in Figure 8.401cq.

The Element ID field is equal to the Reduced Neighbor Report value in Table 8-54.

The Length field is a 1-octet field whose value is equal to sum of lengths of the Neighbor AP Information fields.

**Figure 8.401cq — Reduced Neighbor Report element format**

The Neighbor AP Information field specifies TBTT and other information related to a group of neighbor

APs on one channel. See Figure 8.401cr.

**Figure 8.401cr — Neighbor AP Information field format**

The format of TBTT Information Header subfield is defined in Figure 8.401cs.

**Figure 8.401cs — TBTT Information Header subfield**

The TBTT Information Field Type subfield is 2 bits in length and defines the structure of the TBTT

Information field. Value 0 indicates the presence of the informative Neighbor AP Information that is used to

help the STA in AP discovery. Value 1 indicates the presence of the Neighbor AP Information that is used to

recommend the STA to switch to the channel, the band, or the neighbor AP as specified in the Neighbor AP Information field. Values 2, and 3 are reserved.

The TBTT Information Count subfield is 4 bits in length and contains the number of TBTT Information

fields that are included in the Neighbor AP Information field. A value of 0 indicates no TBTT Information

field is present. If the TBTT Information Field Type subfield is set to value 0 then the TBTT Information

Count subfield value is non-zero.

The TBTT Information Length subfield is 1 octet in length and contains the length in octets of each TBTT

Information field included in the Neighbor AP Information field. . If the TBTT Information Length subfield value is equal to 1, then the BSSID subfield is not included in the TBTT Information field. Otherwise, if the value is 7, then the BSSID subfield is included in the TBTT Information field. Other values are reserved.

Operating Class 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.

Channel Number 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.

The format of TBTT Information field is shown in Figure 8.401ct.

|  |  |  |
| --- | --- | --- |
|  | **TBTT Offset** | **BSSID** |
| Octets: | ~~0 or~~ 1 | 0 or 6 |

**Figure 8.401ct – TBTT Information field**

The TBTT Offset subfield is one octet in length. When included in Probe Response frame or FILDS Discovery frame, it 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. When included in Beacon frame, it indicates the offset in TUs, rounded down to nearest TU, to the next TBTT of an AP from the transmission of the Beacon frame. 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. If the TBTT Information Length subfield is set

to a value of 7, BSSID subfield is included in TBTT Information field to indicate neighbor AP.

A STA may send the Probe Request frame including the received BSSID on channel indicated in Neighbor

AP Information field, subject to regulations.

**10.25.3 Reduced Neighbor Report**

In Beacon, Probe Response and FILS Discovery frames, a reduced neighbor report is optionally sent by an AP with

dot11FILSActivated set to true. A reduced neighbor report contains information on neighbor APs. A

reduced neighbor report may not be exhaustive either by choice, or due to the fact that there may be neighbor

APs not known to the AP.

The Reduced Neighbor Report element contains a list of operating classes and channels along with TBTT

information for the reported neighbor APs on each operating class and channel. A Reduced Neighbor Report

element only includes channels that are consistent with the Country element in the frame in which the

Reduced Neighbor Report element appears. The reduced neighbor report contents may be derived from the

NeighborListSet parameter of the MLME-NEIGHBORREPRESP.request primitive. The contents of the

reduced neighbor report may also be configured or obtained by other means beyond the scope of this standard. Multiple Neighbor AP Information field with same operating class and channel number values may be present in a Reduced Neighbor Report element.

A serving AP shall include a value less than 255 in TBTT Offset in TUs if it is able to guarantee an accumulated

error of 1.5 TU or better on the TBTT Offset in TUs subfield.

A STA receiving a Reduced Neighbor Report may use the report to schedule passive scanning. The scheduling process is beyond the scope of this standard. A STA receiving a Reduced Neighbor

Report element with an unknown subelement identifier shall ignore the unknown subelement and continue

to process the remaining subelements.

 In the Beacon, FILS Discovery frame or Probe Response frame, if the AP considers its operating channel too congested to accommodate STAs, the AP should set the TBTT Information Field Type to 1 in the TBTT Information Header of the Neighbor AP Information field of the Reduced Neighbor AP Report element. This then informs the STA conducting the initial link setup to redirect to a channel, a band or an AP specified in the Neighbor AP Information field. If, in a Reduced Neighbor Report, multiple Neighbor AP Information fields have their TBTT Information Field Type value set to 1, then the STA shall consider the information in the first Neighbor AP Information field for redirection purposes. The decision when AP considers its operating channel too congested is implementation

specific.

The STA may switch to other channel, band or neigbor AP based on the received Reduced Neighbor Report.

If the STA detects that the TBTT Information Field Type is set to 1 and BSSID field is not included in the

TBTT Information, the STA may switch to another channel or to another band as specified in the received Operating

Class field and Channel Number field. If the STA detects that the TBTT Information Field Type is set

to 1 and BSSID field is included in the TBTT Information, the STA may switch to a neighbor AP as specified

in the received Operating Class field, Channel Number field and BSSID field.