IEEE P802.11
Wireless LANs

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| Comment resolutions for transmit power control - part 2 |
| Date: 2019-05-01 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D4.0 with the following CIDs (2 CIDs):

* 20017, 20022

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Removed changes regarding the amendment of the last paragraph of 26.15.7 which was done to be inline with motioned text in 11/0097r3, since there is a separate comment for that, addressed in another document (see 11-19/964).
* Rev 2: Incoporated suggestions received offline. Changes highlighted in this color.
* Rev 3: Incorporated suggestions received from Mark, Laurent. Changes highlighted in this color.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20017 | Abhishek Patil | 148.20 | It would be beneficial for a 2.4/5 AP to provide TPC information for it's co-located with a 6GHz AP. This way a probe request sent to the 6GHz AP can honor the TCP requirements. | Add TCP element to the list of Optional Sub-elements | Revised –Agree in principle with the comment. Currently the transmit power control related elements are only being provided within Management frames sent by the AP itself. However, for the 6 GHz band a co-located AP that is co-located in the lower band is required to advertise the information for the co-located AP in the 6 GHz band. This is done via Neighbor Report, RNR IEs that contain the parameters for the 6 GHz band APs. Since transmit power is one of the parameters to be advertised by the co-located AP the proposed resolution is to add these elements to the Neighbor Report and update the normative text accordingly. In addition, HE-related IEs which are missing from the list of IEs that are present in the NR IE list are added. Namely HE Capabilities, HE Extended Capabilities, and HE Operation IE.TGax editor to make the changes shown in 11-19/0594r4 under all headings that include CID 20017. |
| 20022 | Abhishek Patil | 154.24 | RNR should provide an indication that the advertised AP has enabled TPC constraints. | Add a bit to BSS Parameter subfield to indicate if the reported AP has TPC enabled. Further, add TPC element of the reported AP as a sub-element to Neighbor Report element. When the TPC bit in BSS Parameter subfield in RNR is set to 1, a receiving STA may send a Neighbor Report ANQP query to gather TPC info of the reported AP and use appropriate TxPower when probing the reported AP. | Revised –Agree in principle with the comment but not with certain specific details. Currently the RNR element has a plurality of bits that provide functionality that can be used to provide similar behavior, avoiding the addition of a new bit. The following are a couple of considerations for this case:1. Use of OCT Recommended. A co-located AP may set this bit to 1 to indicate that the STAs perform association via the reporting AP in the lower band (once association is finalized the STA will have the required TPC parameters to interact with the reported AP). Note that currently this functionality is recommended and not required. It would be beneficial if such functionality is a requirement for the non-AP STA (i.e., OCT Recommended to be OCT Required but this is out of scope of this comment and is being tackled instead by CID 20370).
2. Use of 20 TU Probe Response Active. A co-located AP may set this bit to 1 to indicate that the reported AP generated unsolicited Probe Responses every 20 TUs, which can contain the TPC parameters. When the reported AP has declared such functionality, the STA needs to wait for 20 TU to receive the Probe Response, which in turn will contain the required parameters.

Hence, these two modes can be used to obtain similar functionality. However, it is indeed beneficial for the NR element to include TPC-related elements, as pointed out in another CID 20017, for which the proposed resolution is to add these elements to the list of the optional subelements and to update the normative behavior accordingly.TGax editor to make the changes shown in 11-19/0594r4 under all headings that include CID 20022. |

**Discussion: *None.***

* **Neighbor Report element**

***TGax Editor: Insert new rows in Table 9-173 as follows and update the reserved row (#CID 20017, 20022):***

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| Table 9-173 -- Optional subelement IDs for Neighbor report |
| Subelement ID | Name | Extensible |
| … |  |  |
| 9 | Country | No |
| 10  | Power Constraint | No |
| 58 | Transmit Power Envelope | Yes |
| 198 | HE 6 GHz Band Capabilities | Yes*(#20017, 20022)* |

***TGax Editor: Insert new paragraphs below as follows (#CID 20017, 20022):***

…

The VHT Operation subelement is the same as the VHT Operation element as defined in 9.4.2.158 (VHT Operation element).

The Country subelement is the same as the Country element as defined in 9.4.2.x (Country element).

The Power Constraint subelement is the same as the Power Constraint element as defined in 9.4.2.x (Power Constraint element).

The HE 6 GHz Band Capabilities subelement is the same as the HE 6 GHz Band Capabilities element as defined in 9.4.2.x (HE Extended Capabilities element).*(#20017, 20022)*

**26.15.7 Additional rules for pre-association in the 6 GHz band**

An HE AP may transmit a FILS Discovery, or a broadcast Probe Response frame in a broadcast RU of the HE MU PPDU identified by STA\_ID\_LIST of 2045, which does not exceed 242-tone RU, is in the primary 20 MHz channel and is subject to the rules defined in 27.3.2.8 (RU restrictions for 20 MHz operation). The HE AP transmitting the HE MU PPDU shall set the TXVECTOR parameter HE\_LTF\_TYPE to 2xHE-LTF or 4xHE-LTF and FEC\_CODING to BCC\_CODING for the broadcast RU. FILS Discovery and broadcast Probe Responses shall be carried in an S-MPDU (see Table 9-532 (A-MPDU contents in the S-MPDU context)).

An HE STA that transmits an HE PPDU that is not an HE TB PPDU in the 6 GHz band and that contains a frame with the Address 1 field or the Address 3 field set to the MAC address of an HE AP with which it is not associated and from which it has received a FILS Discovery frame or an HE Operation element shall ensure that the HE PPDU meets the following conditions:

* The bandwidth of the HE PPDU is less than or equal to the operating bandwidth of the HE BSS as indicated in the BSS Operating Channel Width subfield of the FILS Discovery frame or in the Channel Width subfield of the HE Operation element sent by the AP
* The HE PPDU is transmitted with a number of spatial streams that is less than or equal to the maximum number of spatial streams of the HE BSS as indicated in the Maximum Number of Spatial Stream subfield of the FILS Discovery frame or in the Basic HE-MCS and NSS Set field of the HE Operation element sent by the AP
* The HE PPDU is transmitted with a rate that is greater than or equal to the minimum rate indicated in the FILS Minimum Rate field (if present) of the FILS Discovery frame or in the Minimum Rate field of the HE Operation element.

***TGax Editor: Change the paragraph below as follows (#CID 20017, 20022):***

An HE STA that transmits an HE PPDU that is not an HE TB PPDU in the 6 GHz band and that contains a frame with the Address 1 field or the Address 3 field set to the MAC address of an AP with which it is not associated shall determine a local maximum transmit power for that transmission following the rules in 11.7.5 (Specification of regulatory and local maximum transmit power levels), if the local maximum transmit power is received in Transmit Power Envelope elements and/or combinations of Country elements and Power Constraint elements in the most recent Beacon or Probe Response frame received on the channel from that AP or in the most recent Neighbor Report element received from a reporting AP that is co-located with the AP. The STA is not required to determine the local maximum transmit power when transmitting to an AP if the STA has not received any Management frame that contains the local maximum transmit power information for that AP for the past DTIM interval.*(#20017, 20022)*

**26.17.2.4 Out of band discovery of a 6 GHz BSS**

An AP that operates in the 2.4 GHz or 5 GHz bands and that is co-located with one or more APs operating in the 6 GHz band, shall include the Advertisement Protocol element in Beacon and Probe Response frames that it transmits and shall support responding with a Neighbor Report ANQP element (9.4.5.19 Neighbor Report ANQP element) carrying one or more Neighbor Report elements (see 9.4.2.36 (Neighbor Report element)) that include at least the SSID information of all the co-located APs operating in the 6 GHz band.

NOTE 1—The Neighbor Report ANQP-element can also carry Neighbor Report elements containing information on 6 GHz APs that are not co-located.

NOTE 2—It is recommended that the AP responds with a GAS comeback delay of zero.

An AP may set the 20 TU Probe Responses Active subfield to 1 in a Reduced Neighbor Report, or Neighbor Report element it transmits if all 6 GHz APs of the same ESS that operate in the corresponding channel and that might be detected by a STA receiving this frame are transmitting unsolicited Probe Response frames every 20 TUs (see 26.17.2.3.3 (AP behavior for fast passive scanning)).

***TGax Editor: Insert a paragraph below as follows (#CID 20017, 20022):***

An AP that transmits a Neighbor Report element containing an HE Operation subelement shall include the 6 GHz Operation Information field in the HE Operation subelement if the reported AP operates in the 6 GHz band; otherwise the HE Operation subelement shall not include the 6 GHz Operation Information field. *(#20017, 20022)*