IEEE P802.11
Wireless LANs

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| LB233 CR Transmit Power Control  |
| Date: 2019-01-13 |
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Abstract

This submission proposes resolutions of comments received from TGax LB233.

(The proposed change is based on TGax Draft 3.3.)

* CIDs: 16448 (1 CIDs)

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.***

| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 16448 | 78.44 | 9.2.4.6a.5 | The draft needs a mechanism that provides per MCS link transmit power information so that closed loop transmit power adjustments can be made which reduce the excess margin introduced by the use of conservative estimates for various, unknown link components and allow higher throughputs to be achieved. Also note that UPH value is not useful without knowledge of the UPH sender's TX PA settings per MCS. If a value of 3 is given for UPH at MCS7, does this mean that the transmitted TX Power is 3 dB from the maximum that the PA can output, or does it mean that the power is 3 dB from where the transmitter thinks that TXEVM will be exceeded for this MCS? And how does this 3 dB relate to any other MCS? Probably need to refine the meaning of the UPH value to answer some of these questions. Note that by providing a complete list of TX power values per MCS, a single UPH response can indicate to the AP what values of MCS and Target RSSI are appropriate for each non-AP STA. | At a minimum, refine the meaning of "available power headroom" - with reference to what? To max PA power? To the point when TX EVM is expected to be exceeded? Or to what? Best to also include a link transmit power signaling mechanism to provide a reference value for the UPH parameter. | Revised- The Power Capability element in IEEE 802.11 REVmd 2.0 specifies the minimum and maximum transmit powers with which a STA is capable of transmitting in the current channel. The usage of the the minimum and maximum transmit power capability is the beyond of this standard. But, the maximum transmit power can be varied depending on the MCS, as mentioned by CID 16448. Providing the more exact power capability information of the STA can be helpful to improve the performance (e.g., the uplink power control for the HE TB PPDU). Please also refer the previous submissions, 11-17/112r5 and 11-17/123r2.TGax editor makes changes as shown in the as specified in 11-18/1779r4. |

***TGax Editor: Insert the following new subclause after 9.4.2.14 (Power Capability element):***

**9.4.2.14a UL MU Power Capability element**

The UL MU Power Capability element specifies the relative maximum transmit powers with which a STA is capable of transmitting an HE TB PPDU per MCS in the current channel when using RU size greater than or equal to 242 tones. The format of the UL MU Power Capability element is shown in Figure 9-172a (UL MU Power Capability element format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | Relative Max Transmit Power MCS1 | Relative Max Transmit Power MCS2 | … | Relative Max Transmit Power MCS11 |
| Octets: | 1 | 1 | 1 | 1 | 1 |  | 1 |

**Figure 9-172a—** **UL MU Power Capability element format**

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The UL MU Power Capability element contains 11 Relative Max Transmit Power MCS n fields in ascending order of MCS from 1 to 11.

The Relative Max Transmit Power MCS n field (where n = 1, ..., 11) is an unsigned integer in dB and encoded as the reference maximum transmit power minus the nominal maximum transmit power for an HE TB PPDU using RU size greater than or equal to 242 tones, and HE-MCS n. The reference maximum transmit power is the nominal maximum transmit power for an HE TB PPDU using RU size greater than or equal to 242 tones, and HE-MCS 0. If a STA does not support HE-MCSs 9 to 11, the Relative Max Transmit Power MCS n fields (where n = 9, ..., 11) are reserved.

The UL MU Power Capability element is included in (Re)-Association Request frames, as described in 9.3.3.6 (Association Request frame format) and 9.3.3.8 (Reassociation Request frame format).

**9.3.3.6 Association Request frame format**

***TGax Editor: Insert the following new row into Table 9-29 (Association Request frame body):***

**Table 9-29—Association Request frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| 45 | UL MU Power Capability | The UL MU Power Capability element is optionally present if dot11HEOptionImplemented is true; otherwise it is not present. |

**9.3.3.8 Reassociation Request frame format**

***TGax Editor: Insert the following rows in Table 9-31 (Reassociation Request frame body):***

**Table 9-31—Reassociation Request frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| 50 | UL MU Power Capability | The UL MU Power Capability element is optionally present if dot11HEOptionImplemented is true; otherwise it is not present. |