IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P802.11bk SA1 CRs | | | | |
| Date: 2024-12-03 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Jonathan Segev | Intel |  |  | [jonathan.segev@intel.com](mailto:jonathan.segev@intel.com) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes to address the following CIDs I-43, I-44 (total of 2 CIDs) based in Draft P802.11REVme\_D7.0, and Draft P802.11bk D3.0.

Revisions:

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 TGbk Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

**The text preceded by “Discussion” is not part of the adopted changes.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| I-43 | 32.01 | 9.4.2.300 | The FTM frame action field was modified in 11bk and added an optional Transmit power envelope field.  The modification is such that legacy devices (11az-2022) as well as more recent devices (REVmf devices including the 11bk amendment) may observe the new field. The TPE is also present in Beacon/Probe Response frame. 1. However there is no text to clarify which of the two TPE values are used the one in the Beacon or the one in the FTM 2. Legacy 802.11az compliant STAs now become non-compliant as they are now behaving not in accordance with the spec. | Clarify that inclusion of the field is limited to 11bk 320 MHz assignment and that the field overrides the Beacon/Probe Rsp frame. | Revise.  Agree in principle, see detailed discussion in R0 of submission <https://mentor.ieee.org/802.11/documents?is_dcn=1986> below.  TGbk editor make changes as detailed in R0 of <https://mentor.ieee.org/802.11/documents?is_dcn=1986> as shown below. |
| I-44 | 36.19 | 11.21.6.3.3 | The amendment makes a Shall and a Should statements regarding inclusion of Transmit Power Envelope requiring it for SP and indoor SP APs acting as an RSTA. 3 issues:  1. This makes existing ISTA non standard compliant in response to not behave as expected as they were not designed to parse the TPE in the FTM Rsp,  2. APs that are RSTA and are compatible with 802.11az non standard compliant as they do not behave in accordance with the shall and should requirements.  3. Clarify what happens when the TPE in the Beacon Prob. Rsp does not correlate with the TPE in the FTM Rsp - which one take precedence. | Limit the behavior to 11bk STAs REVmf behavior for RSTA and ISTA for inclusion of TPE in the FTM and clarify ambiguity if TPE is included in both the Beacon and FTM Rsp. | Revise.  Agree in principle, see detailed discussion in R0 of submission <https://mentor.ieee.org/802.11/documents?is_dcn=1986> below.  TGbk editor make changes as detailed in R0 of <https://mentor.ieee.org/802.11/documents?is_dcn=1986> as shown below. |

**Discussion of CIDs I-43, I-44:**

**Summary:**

Some history: submission 11-23-393 added that based on some corner case scenario of the TPE in the beacon changing between the last decoding of the beacon and the initiation of the FTM procedure. However, this is not a unique behabior to any other unassociated operation (e.g. ANQP) and creates a bunch of issues such as making legacy STAs non-compliant.

The proposed mechanism does not solve the changing in the TPE value scenario, as TPE changes may occur during an FTM session, meaning the ISTA is required to follow the Beacon’s TPE anyway.

Proposed solution is to rely on TPE in the Beacon like all other procedures executed in the associated or unassociated modes.

**Making legacy devices non-standard compliant**

The current text indicates the TPE as optionally present in all variations of the FTM frame, this is unlike other optional fields such as FTM Parameters, Ranging Parameters and others which are limited to NTB/TB or EDCA based operation.

*“The Transmit Power Envelope field is optionally present. If present, it contains one or more Transmit Power Envelope elements as defined 9.4.2.160 (Transmit Power Envelope element).”*

Compared to:

*“The Ranging Parameters element is optionally present. It is present in an IFTM frame and its retransmissions, when negotiating non-TB ranging;”*

OR:

*“The Secure HE-LTF Parameters element is optionally present. It is present in an IFTM frame, if the IFTMR frame contained a Ranging Parameters element”*

OR:

*“The FTM Parameters field is optionally present. It is present in an IFTM frame and its retransmissions when negotiating EDCA based ranging”*

And supportive normative behavior:

“*If an RSTA is a standard power AP or an indoor standard power AP, the RSTA shall include at least one Transmit Power Envelope element in an FTM frame.”*

While for RSTA that are not indoor or standard power AP:

*“If an RSTA is neither a standard power AP nor an indoor standard power AP, the RSTA should include at least one Transmit Power Envelope element(s) in an FTM frame.”*

If the TPE is allowed to be included in all variants of the protocol, legacy devices are now expected to parse and behave in accordance with new functionality they don’t support, thus become non-standard compliant.

**Ambiguous expected behavior for new devices**

In additional to the legacy non-compliance issues, a separate issue is ambiguous expected behavior from new devices that supports the TPE in the FTM:

1. What takes precedence? The TPE in the FTM or the Beacon?
2. What happens if a TPE is not included in the FTM? Should an ISTA wait for the beacon?
3. Can the TPE in the beacon be different than the TPE in the FTM frame?

**Resolution:**

**TGaz editor in P802.11bk D3.0 delete paragraph insertion** **in p.36 L.17 – 26 at the end of subclause 11.21.6.3.3.**

**TGaz editor in P802.11bk D3.0 P.32 figure 9-1218 delete Transmit Power Envlope field insertion.**

**TGaz editor in P802.11bk D3.0 P.32 delete lines 6-8.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| I-10 | 32.6 | 11.21.6.3.1 | Question, can an associated STA in EMLSR mode perform ranging measurement on more than one link - this statement seems to say that one FTM session has to be specific to one link, but can there be two sessions? One per link and how is that signalled? | As in comment | Reject.  See detailed discussion in R0 of submission <https://mentor.ieee.org/802.11/documents?is_dcn=1986> below. |

**Discussion:**

FTM frames are processed at the link level rather than at the MLD layer, this means the FTM is limited to that specific link refer to 802.11be D7.0

*“35.3.14 MLD individually addressed Management frame delivery*

*…This subclause describes rules for individually addressed management frame delivery by an MLD with the exception of the following frames:…*

* *Public Action LMR frame*
* *Public Action FTM frame*
* *Public Action FTM Request frame*
* *Protected Fine Timing frame”*

This limits the context at which an FTM operates to the link level.

Furthermore 11be specificies that:

*“Between an AP MLD and a non-AP MLD, the following individually addressed MMPDUs shall be intended for an MLD: …” FTM management frames are not amongst these action frames.*

The commenter is correct that the text suggests an EMLSR STA may conduct an FTM procedure in parallel to another happening on another link, and following the EMLSR rules, e.g. data traffic.

However, this other procedure will not be an FTM procedure since the MLME API does not support multi-FTM sessions with the same AP (same MAC address).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| I-37 | 84.6 | 11.21.6.4.8.3 | "The number of NSTS/NSS used in the passive TB ranging exchanges shall be less than or equal to 4." - shouldn't that requirement be in the negotiation? | As in comment | Reject.  See detailed discussion in R1 of submission <https://mentor.ieee.org/802.11/documents?is_dcn=1986> below. |

**Discussion:**

In passive ranging, there is no negotiation of PSTA with ISTA or RSTA. As a result, for interoperability to happen a minimal common denominator is required.

The accuracy benefit going from lower to higher NSTS is a diminishing return, with 4 antennas seems to be to preferred mainstream maximum rank.

The limitation regarding Passive TB number of antennas is an IEEE 802.11az limitation which is outside the scope of this amendment dealing with 320MHz only. The 802.11az presented this limit due to simplicity, expected product cost, alignment with existing profiles and more. A higher rank in NSTS/NSS of the AP would yield higher PSTA cost (e.g. memory buffer size for p-matrix decode) that take advantage of that.

802.11bk may add a mode for 320MHz only that is higher than the 4 antennas, however the already double the size BW will yield double the size memory footprint. Going to 8 NSTS would suggest quarupale of the memory footprint.