IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | CR on Clause 17 | | | | | | Date: 2019-5-10 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Youhan Kim | Qualcomm |  |  | youhank@qti.qualcomm.com | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes resolutions for the following comments from the letter ballot on P802.11ax D4.0:

20917, 20273, 20472, 20916, 21573

NOTE – Set the Track Changes Viewing Option in the MS Word to “All Markup” to clearly see the proposed text edits.

**Revision History:**

R0: Initial version.

R1: Updated during May 2019 IEEE meeting.

# CID 20917

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| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** |
| 20917 | 17.3.9.10 | 289.11 | Re CID 16089: at least  "A non-AP HE STA that transmits a non-HT or non-HT duplicate PPDU with the TXVECTOR parameter TRIGGER\_RESPONDING set to true and that is a response to a PPDU containing an MU-RTS Trigger frame received from an AP shall ensure that the arrival time of the non-HT or non-HT duplicate PPDU at the AP that transmitted the triggering PPDU is within +/-0.4 us of TXTIME + aSIFSTime + RTD of the transmission start time of the triggering PPDU, where TXTIME is that of the triggering PPDU and RTD is the round trip delay between the AP and the non-AP HE STA."  is not a PHY level synchronization accuracy requirement, it's a MAC timing requirement (it's basically saying you respond within SIFS +/- 0.4 us rather than the usual SIFS +/- 0.9 us) | Move to Clause 26 (MAC) |

**Proposed Resolution: CID 20917**

**Rejected**.

The SIFS +- 0.9 us requirement in the baseline IEEE 802.11 standard is indeed MAC timing requirement, used to aid the MAC to be able to predict when the response packet should come, and timeout when not received. Note that only one transmitter is sending the response packet in this case.

The 16usec +- 0.4 usec requirement being added in the TGax draft, on the other hand, is needed to ensure that the receiver PHY can correctly detect, synchronize and demodulate the packet which is being transmitted by multiple STAs. Hence, this is a requirement to ensure PHY performance. Thus, it is appropriate and necessary to keep the requirement in a PHY clause.

# CID 20273, 20472, 20916, 21573

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| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** |
| 20273 | 17.3.9.10 | 289.14 | The first paragraph of this section provides requirements for non-AP STA transmitting non-HT or non-HT duplicate PPDUs. This is not a HE requirement and provides additional performance requirements for non-HT STAs. This is out of scope for this amendment. | Delete the performance requirements for non-AP STAs. If it is desirable to add these requirements provide a submission to TGmd. |
| 20472 | 17.3.9.10 | 289.28 | "ensure that the arrival time of the non-HT or non-HT duplicate PPDU at the AP that transmitted the triggering PPDU is within <plusminus>0.4 <micro>s of TXTIME + aSIFSTime + RTD of the transmission start time of the triggering PPDU, where TXTIME is that of the triggering PPDU and RTD is the round trip delay between the AP and the non-AP HE STA. NOTE 1---TXTIME includes the SignalExtension, thus TXTIME + aSIFSTime is equivalent to 16 <micro>s after the end of transmission of the triggering PPDU. The STA is not expected to measure or compensate for the RTD when transmit- ting the non-HT or non-HT duplicate PPDU." -- this is confusing; see 19/0002 | Change the cited text at the referenced location to "start transmission of the non-HT or non-HT duplicate PPDU within <plusminus>0.4 <micro>s + 16 <micro>s from the end, at the STA's antenna connector, of the last OFDM symbol of the triggering PPDU (if it contains no packet extension) or of the packet extension of the triggering PPDU (if present). NOTE 1---This end instant is before any signal extension, so this is equivalent to non-HT or non-HT duplicate PPDU transmission within 0.4 <micro>s of SIFS after the end of the triggering PPDU including signal extension." |
| 20916 | 17.3.9.10 | 289.28 | Re CID 16087: still confusing to have "A non-AP STA that transmits a non-HT or non-HT duplicate PPDU with the TXVECTOR parameter TRIG- GER\_RESPONDING set to true" and then "A non-AP HE STA that transmits a non-HT or non-HT duplicate PPDU with the TXVECTOR parameter TRIGGER\_RESPONDING set to true and that is a response to a PPDU containing an MU-RTS Trigger frame received from an AP" | At the referenced location change "A non-AP HE STA that transmits a non-HT or non-HT duplicate PPDU with the TXVECTOR parameter TRIGGER\_RESPONDING set to true and that is a response to a PPDU containing an MU-RTS Trigger frame received from an AP" to "A non-AP HE STA that transmits a non-HT or non-HT duplicate PPDU with the TXVECTOR parameter TRIGGER\_RESPONDING set to true" |
| 21573 | 17.3.9.10 | 289.28 | Updates made for 27.3.14.3 regarding timing requirement of 16+-0.4usec did not get propagated to Clause 17. | Update P289L28-42 to be inline with the changes that were done for 27.3.14.3 (P609L48-L55). |

**Proposed Resolution: CID 20273**

**Revised**.

The requirement is on HE STAs responding to triggering frames, hence should be captured in TGax draft. Proposed text updates in 11-19/0830 moves the requirements to clause 27.3.14 to address the commenter’s concern that this adds “additional performance requirements for non-HT STAs”.

Instruction to Editor: Implement the proposed text updates for CIDs 20273, 20472, 20916, 21573 in 11-19/0830r1.

**Proposed Resolution: CID 20472**

**Revised**.

The proposed text by the commenter is essentially copying the language in 27.3.14.3. Proposed text update in 11-19/0830 moves 17.3.9.10 into 27.3.14.3. This essentially ends up using the same language as that proposed by the commenter.

Instruction to Editor: Implement the proposed text updates for CIDs 20273, 20472, 20916, 21573 in 11-19/0830r1.

**Proposed Resolution: CID 20916**

**Revised**.

Proposed text update in 11-19/0830 moves 17.3.9.10 into 27.3.14.3, which incorporates the proposed text update by the commenter.

Instruction to Editor: Implement the proposed text updates for CIDs 20273, 20472, 20916, 21573 in 11-19/0830r1.

**Proposed Resolution: CID 21573**

**Revised**.

Proposed text update in 11-19/0830 moves 17.3.9.10 into 27.3.14.3, thereby updating the language for non-HT and non-HT duplicate PPDUs with that used for HE TB PPDUs as suggested by the commenter.

Instruction to Editor: Implement the proposed text updates for CIDs 20273, 20472, 20916, 21573 in 11-19/0830r1.

**Proposed Text Updates: CIDs 20273, 20472, 20916, 21573**

*TGax Editor: Delete clause 17 from D4.1.*

*TGax Editor: Update 27.3.14 at D4.1 P607L32 as shown below.*

27.3.14 Transmit requirements for PPDUs responding to triggering frames

27.3.14.1 Introduction

An AP may solicit simultaneous HE TB PPDU transmissions, or simultaneous non-HT or non-HT duplicate PPDU transmissions from multiple non-AP STAs using a triggering frame. Since there are multiple transmitters, transmission time, frequency, sampling symbol clock, and power pre-correction (in case of HE TB PPDU) by the non-AP STAs is necessary to mitigate synchronization and interference issues at the AP. Frequency and sampling clock pre-corrections are needed to prevent inter-carrier interference. Power pre-correction is necessary to control interference between HE TB PPDU transmissions from the non-AP STAs. An AP may solicit simultaneous HE TB PPDU transmissions from both Class A and Class B devices. A non-AP STA that supports HE TB PPDU transmission shall support power pre-correction as described in 27.3.14.2 and shall meet the pre-correction accuracy requirements described in 27.3.14.3.

*TGax Editor: Update 27.3.14.3 at D4.1 P608L38 as shown below.*

27.3.14.3. Pre-correction accuracy requirements

A STA compensates for carrier frequency offset (CFO) error and symbol clock error with respect to the corresponding triggering PPDU when transmitting the following types of PPDUs:

* HE TB PPDU
* Non-HT or non-HT duplicate PPDU with the TXVECTOR parameter TRIGGER\_RESPONDING set to true

NOTE — The MU-RTS Trigger frame is the only Trigger frame that solicits transmission of a non-HT or non-HT duplicate PPDU and not an HE TB PPDU. The non-HT or non-HT duplicate PPDU transmitted as a response to an MU-RTS Trigger frame carries a CTS frame.

After compensation, the absolute value of residual CFO error with respect to the corresponding triggering PPDU shall not exceed the following levels when measured at the 10% point of the complementary cumulative distribution function (CCDF) of CFO errors in AWGN at a received power of –60 dBm in the primary 20 MHz.

* HE TB PPDU : 350 Hz for data subcarriers
* Non-HT or non-HT duplicate PPDU : 2 kHz

The residual CFO error measurement on the HE TB PPDU shall be made after the HE-SIG-A field. The residual CFO error measurement on the non-HT or non-HT duplicate PPDU shall be made after the L-STF field. The symbol clock error shall be compensated by the same ppm amount as CFO error.

A STA that transmits an HE TB, non-HT or non-HT duplicate PPDU in response to a triggering PPDU shall ensure that the transmission start time of the HE TB, non-HT or non-HT duplicate PPDU is within ±0.4 µs + 16 µs from the end, at the STA’s antenna connector, of the last OFDM symbol of the triggering PPDU (if it contains no packet extension) or of the packet extension of the triggering PPDU (if present).

NOTE—This end instant is before any signal extension, so this is equivalent to HE TB PPDU transmission within 0.4 µs of SIFS after the end of the triggering PPDU including signal extension.

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