IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | D3.0 CID 17100 | | | | | | Date: 2018-11-08 | | | | | | 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 D3.0:

17100

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.

# CID 17100

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| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** |
| 17100 | 28.3.11.16 | 536.44 | PHY does not know the destination STA's capability. MAC does. Hence, P536L44 ~ P537L62 need to be moved to Clause 27. | Create a section for Midamble operation in Clause 27, and move this portion to Clause 27. |

**Proposed Resolution: CID 17100**

**Revised.**

Agree with the commenter that capabilities related normative text should be under Clause 27. Proposed text update for CID 17100 in 11-18/1848r0 creates a subclause 27.17 for Midamble operation.

**Proposed Text Updates: CID 17100**

*TGax Editor: Add a new subclause 27.17 at D3.2 P393L8 as shown below. Also, edit subclause 28.3.11.16 as shown below.*

*NOTE: Text updates for 27.17 and 28.3.11.16 are shown side-by-side below to help the readers and editor undertand better on how some texts from 28.3.11.16 are being to 27.17 without any technical changes.*

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| * 1. Midambles operation   An HE STA shall not set the TXVECTOR parameter DOPPLER to 1 when transmitting an HE SU, HE ER SU or HE MU PPDU unless the HE STA has received an HE Capabilities element with the Doppler Rx subfield equal to 1 in the HE PHY Capabilities Information field from each of the intended receipient STAs.  An HE STA shall not send a Trigger frame with the the Doppler subfield set to 1 in the Common Info field unless the HE STA has received an HE Capabilities element with the Doppler Tx subfield equal to 1 in the HE PHY Capabilities Information field from each of the intended receipient STAs of the Trigger frame.  An HE STA shall not set the TXVECTOR parameter HE\_LTF\_TYPE to 1xHE-LTF when transmitting an HE SU PPDU with TXVECTOR parameter DOPPLER set to 1 unless the HE STA has received an HE Capabilities element from each of the intended receipient STAs in which all the following conditions are met in the HE PHY Capabilities Information field:   * Midamble Tx/Rx 2x And 1x HE-LTF subfield is equal to 1, and * HE SU PPDU With 1x HE-LTF And 0.8 µs GI subfield is equal to 1.   An HE STA shall not set the TXVECTOR parameter HE\_LTF\_TYPE to 1xHE-LTF when transmitting an HE ER SU PPDU with TXVECTOR parameter DOPPLER set to 1 unless the HE STA has received an HE Capabilities element from each of the intended receipient STAs in which all the following conditions are met in the HE PHY Capabilities Information field:   * Midamble Tx/Rx 2x And 1x HE-LTF subfield is equal to 1, and * HE ER SU PPDU With 1x HE-LTF And 0.8 µs GI subfield is equal to 1.   An HE STA shall not set the TXVECTOR parameter HE\_LTF\_TYPE to 2xHE-LTF when transmitting an HE SU, HE ER SU or HE MU PPDU with TXVECTOR parameter DOPPLER set to 1 unless the HE STA has received an HE Capabilities element with the Midamble Tx/Rx 2x And 1x HE-LTF subfield equal to 1 in the HE PHY Capabilities Information field.    A non-AP HE STA shall not set the Doppler Tx subfield to 1 in the HE PHY Capabilities Information field of the HE Capabilities element unless the STA supports all the following conditions:   * Able to transmit HE TB PPDUs with midambles using LTF type of 4x HE-LTF * Able to transmit HE TB PPDUs with midambles using LTF type of 2x HE-LTF if the STA has set the Midamble Tx/Rx 2x And 1x HE-LTF subfield to 1 in the HE PHY Capabilities Information field of the HE Capabilities element * Able to transmit HE TB PPDUs using full bandwidth UL MU-MIMO with midambles using LTF type of 1x HE-LTF if the STA has set the Midamble Tx/Rx 2x And 1x HE-LTF subfield to 1 and Full Bandwidth UL MU-MIMO subfield to 1 in the HE PHY Capabilities Information field of the HE Capabilities element   When transmitting an HE SU or HE ER SU PPDU, an HE STA shall not set the TXVECTOR parameter NUM\_STS whose indicated number of space-time streams is greater than that indicated in the Midamble Tx/Rx Max NSTS subfield in the HE PHY Capabilities Information subfield of the HE Capabilities element received from any of the intended recipient STA(s).  When transmitting an HE MU PPDU, an HE STA shall not set the TXVECTOR parameter NUM\_STS[*u*] whose indicated number of space-time streams is greater than that indicated in the Midamble Tx/Rx Max NSTS subfield in the HE PHY Capabilities Information subfield of the HE Capabilities element received from any of the intended recipient STA(s) addressed by the corresponding user *u*.  When transmitting a Trigger frame with the Doppler subfield set to 1 in the Common Info field, an HE AP shall not set the Number of Spatial Streams subfield in the User Info field whose indicated number of space-time streams is greater than that indicated in the Midamble Tx/Rx Max NSTS subfield in the HE PHY Capabilities Information subfield of the HE Capabilities element received from the STA addressed in the User Info field. | * + - 1. Midambles   An HE STA may include midambles in an HE PPDU transmission in fast varying channels, i.e., channels with high Doppler, to facilitate channel estimation update during the PPDU. Midambles are only insterted if *NSTS* ≤ 4. The recipient might use the midambles to compensate the channel estimation if it is varying fast in channels with high Doppler.  If the Doppler field of the HE-SIG-A field is set to 1 in an HE SU PPDU, HE ER SU PPDU, or HE MU PPDU, or if the Doppler subfield in the Common Info field in the Trigger frame preceding an HE TB PPDU is set to 1 , then midambles are present in the Data field of the HE PPDU every *MMA* OFDM symbols, where *MMA* is either 10 or 20 as indicated by the NSTS And Midamble Periodicity field in the HE-SIG-A field (see 28.3.10.7 (HE-SIG-A)) or by the Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field in the Trigger frame (see 9.3.1.22 (Trigger frame format)).  Each midamble is the same as the HE-LTF field(s) in the preamble of the same PPDU as defined in 28.3.10.10 (HE-LTF), as shown in Figure 28-43 (HE PPDU with midamble).  An HE STA shall not transmit an HE MU PPDU with midambles present and with MU-MIMO on an RU.    The scrambling and encoding process of the bits in the Data field OFDM symbols before and after each midamble are the same as the case where midamble is not present.  if(#15526) present, the number of midamble periods, *NMA* , in a PPDU is calculated by Equation (28-113).  where *NSYM* is as defined in 28.3.11.5 (Coding).  As shown in Figure 28-43 (HE PPDU with midamble), the first midamble is inserted immediately after the *MMA*-th OFDM symbol in the Data field, and a midamble is not inserted after the last data OFDM symbol if mod(*NSYM*, *MMA*) = 0. At the end of an HE PPDU, if mod(*NSYM*, *MMA*) = 1, there is also no midamble inserted before the last OFDM symbol, as shown in Figure 28-44 (Midamble at the end of an HE PPDU).   |  | | --- | |  | | * HE PPDU with midamble |      |  | | --- | |  | | * Midamble at the end of an HE PPDU |   In an HE SU PPDU, HE ER SU PPDU, or HE MU PPDU, if the Doppler field of HE-SIG-A field is set to 1 and *NSYM* ≤ *MMA* + 1, there is no midamble present in the current PPDU. In this case, the Doppler field setting to 1 indicates that the current channel between the transmitter and the recipient is with high channel Doppler, and recommends that midamble may be used for the PPDUs of the reverse link. |

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