IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 11az HEz UL ranging amendment text | | | | |
| Date: 2018-09-11 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Liwen Chu | Marvell |  |  |  |
| Christian Berger | Marvell |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes the text for UL MU transmission in HEz ranging.

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

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

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

**9.3.1.23.9 Location variant**

***TGaz editor: change the last paragraph in 9.3.1.23.9 as follows:***

The format of the Trigger Dependent User Info field for the Location Trigger Frame is dependent on the Trigger Subtype field value in the Location Trigger Dependent Common Info field (refer to Table XXXX).

**9.4.2.246 Ranging Parameters**

***TGaz editor: add 2-bit Trigger Frame MAC Padding Duration in Figure 9-610d HEz Specific Parameters subelement format***

***TGaz editor: Add the following text before the last paragraph of 9.4.2.246:***

The Trigger Frame MAC Padding Duration field in HE Specific Parameters subelement in the NDP Parameter Set element is defined in **9.4.2.237.2 HE MAC Capabilities Information field.**.

**27.5.3 UL MU operation**

**27.5.3.5 UL MU CS mechanism**

***TGaz editor: add the following text at the end of 27.5.3.5:***

A RSTA may transmit any Sub-variant of the Location Trigger frame with the CS Required subfield set to 0 or 1 regardless of the length of the responding HE TB PPDU.

**11.22.6.4.3 Measurement Exchange in HEz Mode**

**11.22.6.4.3z.1 General**

***TGaz editor: add the following text at the end of 11.22.6.4.3z.1:***

A RSTA shall follow subclause 27.5.3 to transmit a Location Trigger frame for HEz ranging with the exception defined in subcaluse 11.22.6.4.3.

A RSTA shall not transmit a Location Trigger in an A-MPDU. A RSTA shall not transmit a Location Trigger in a VHT MU PPDU or HE MU PPDU.

An ISTA shall follow subclause 27.5.3 to transmit HE TB PPDU for HEz ranging with the exception defined in subclause 11.22.6.4.3.

**11.22.6.4.4 Measurement Exchange in VHTz Mode**

**11.22.6.4.4.1 General**

***TGaz editor: add the following text at the end of 11.22.6.4.4.1:***

An ISTA may use any AC to transmit the Ranging NDP Announcement frame.

***Discussion: the following text is about the backoff procedure of VHTz ranging. If the VHTz ranging has no LMR from the ISTA, the LMR from RSTA is the last frame in the range measurement. The successful reception of the LMR allows the ISTA to do the backoff with CWmin for the future transmission. If LMR from ISTA is the last frame in the range measurement, bullet b) in 10.23.2.2 cover the scenario. If NDP from RSTA and RSTA’s LMR are not received, the failing frame exchange (“bullet b)”) covers this scenario.***

After transmitting the Ranging NDP Announcement frame and NDP frame, the ISTA shall wait for a time interval with a value of aSIFSTime + aSlotTime + aRxPHYStartDelay. This interval begins when the MAC receives a PHY-TXEND.confirm primitive of NAP frame. If a PHY-RXSTART.indication primitive does not occur during the the time interval, the ISTA shall conclude that the transmission of the Ranging NDP Announcement frame + NDP has failed. If a PHY-RXSTART.indication primitive occurred during the the time interval, the ISTA tries to receive the NDP and the LMR frame from the RSTA addressed by the Ranging NDP Announcement frame. If the LMR is correctly received from the RSTA, the frame exchange initiated by the Ranging NDP Announcement is complete.

**10.23.2.2 EDCA backoff procedure**

***TGaz editor: change subclause 10.23.2.2 as follows:***

……

The backoff procedure shall be invoked by an EDCAF when any of the following events occurs:

* An MA-UNITDATA.request primitive is received that causes a frame with that AC to be queued for transmission such that one of the transmit queues associated with that AC has now become non-empty and any other transmit queues associated with that AC are empty; the medium is busy on the primary channel as indicated by any of the following:
* physical CS;
* virtual CS;
* a nonzero TXNAV timer value;
* a mesh STA that has dot11MCCAActivated true and a nonzero RAV timer value, and the backoff timer has a value of 0 for that AC.
* The transmission of the MPDU in the final PPDU transmitted by the TXOP holder during the TXOP for that AC has completed and the TXNAV timer has expired, and the AC was a primary AC. (See 10.23.2.7 (Sharing an EDCA TXOP)).
* The transmission of an MPDU in the initial PPDU of a TXOP fails, as defined in this subclause, and the AC was a primary AC.
* The transmission attempt collides internally with another EDCAF of an AC that has higher priority, that is, two or more EDCAFs in the same STA are granted a TXOP at the same time.
* The transmission attempt of a STA coordinated by an MM-SME collides internally with another STA coordinated by the same MM-SME (see 11.32 (MMSL cluster operation)), which is indicated to the first MAC entity with a PHY-TXBUSY.indication(BUSY) primitive as response to the PHY-TXSTART.request primitive.

1. if an ISTA2RSTA LMR was not negotiated , the last frame (i.e. RSTA2ISTA LMR) of the exchange initiated by Ranging NDP Announcement has completed and the TXNAV timer has expired

In addition, the backoff procedure may be invoked by an EDCAF when:

1. The transmission by the TXOP holder of an MPDU in a non-initial PPDU of a TXOP fails, as defined in this subclause.

NOTE—A STA can perform a PIFS recovery, as described in 10.23.2.8 (Multiple frame transmission in an EDCA TXOP), or perform a backoff, as described in the previous paragraph, as a response to transmission failure within a TXOP. How it chooses between these two is implementation dependent.

A STA that performs a backoff within its existing TXOP shall not extend the TXNAV timer value (see 10.23.2.8 (Multiple frame transmission in an EDCA TXOP)).

NOTE—In other words, the backoff is a continuation of the TXOP, not the start of a new TXOP.

If the backoff procedure is invoked for reason a) above, the value of CW[AC] shall be left unchanged. If the backoff procedure is invoked for reason b) or f) above, the value of CW[AC] shall be reset to CWmin[AC].

If the backoff procedure is invoked for reason c), d), e), or g) above, or the transmission failure of a non-initial frame by the TXOP holder, the value of CW[AC] shall be updated as follows before invoking the backoff procedure:

* If the QSRC[AC] or the QLRC[AC] has reached dot11ShortRetryLimit or dot11LongRetryLimit respectively, CW[AC] shall be reset to CWmin[AC].
* If dot11RobustAVStreamingImplemented is true and either the QSDRC[AC] or the QLDRC[AC] has reached dot11ShortDEIRetryLimit or dot11LongDEIRetryLimit, respectively, CW[AC] shall be reset to CWmin[AC].
* Otherwise,
* If CW[AC] is less than CWmax[AC], CW[AC] shall be set to the value (CW[AC] + 1) × 2 – 1.
* (#364)Else, CW[AC] shall be set to CWmax[AC].

**10.23.2.8 Multiple frame transmission in an EDCA TXOP**

***TGaz editor: change the first paragraph in 10.23.2.8 as follows:***

A frame exchange, in the context of multiple frame transmission in an EDCA TXOP, may be one of the following:

— A frame not requiring immediate acknowledgment (such as a group addressed frame or a frame transmitted with an acknowledgment policy that does not require immediate acknowledgment) or an A-MPDU containing only such frames

— A frame requiring acknowledgment (such as an individually addressed frame transmitted with an acknowledgment policy that requires immediate acknowledgment) or an A-MPDU containing at least one such frame, followed after SIFS by a corresponding acknowledgment frame

— Either

— a VHT NDP Announcement frame followed after SIFS by a VHT NDP followed after SIFS by a PPDU containing one or more VHT Compressed Beamforming frames, or

— a Beamforming Report Poll frame followed after SIFS by a PPDU containing one or more VHT Compressed Beamforming frames, or

— a Ranging NDP Announcement followed after SIFS by a HE NDP frame followed after SIFS by a HE NDP frame followed after SIFS by a LMR frame