IEEE P802.11
Wireless LANs

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| Clarification of HE TB PPDU timing requirements |
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Abstract

This submission proposes clarifications on the timing requirements for HE TB PPDUs.

Discussion

28.3.14.3 states:

A STA that transmits an HE TB PPDU in response to a triggering PPDU from an AP shall ensure that the arrival time of the HE TB PPDU at the AP is within ±0.4 µs of TXTIME + aSIFSTime + RTD from the transmission start time of the triggering PPDU, or equivalently, ensure that the transmission start time of the HE TB PPDU is within ±0.4 + 16 µs from the end of the triggering PPDU, where TXTIME is that of the triggering PPDU and RTD is the round-trip delay between the AP and the STA.(#16087)

NOTE—TXTIME contains the SignalExtension, thus TXTIME + aSIFSTime is equivalent to 16 µs after the end of transmission of the triggering PPDU(#16087). The STA is not expected to measure or compensate for the RTD when transmitting the HE TB PPDU.

This is confusing for the following reasons:

1. “transmission start time of the triggering PPDU” + TXTIME is not in fact equivalent to “end of the triggering PPDU”, because of the effects of transmitter symbol clock error. If the requirement is in terms of the actual end of the PPDU on the air, we should not mention TXTIME at all.
2. “end of the triggering PPDU” is unclear because PHY-RXEND.ind is issued after the signal extension (see 19.3.2). We should be more specific. Here we're talking about the end of the last symbol of the triggering PPDU (Subclause 28.3.4 shows the HE PPDU formats; note the PE is part of the HE PPDU).
3. Discussion of the RTD and the AP just confuses things because in fact all that matters is the timings at the STA that transmits the TB PPDU, with respect to the time the triggering PPDU arrived at that STA. We should not mention the RTD at all.

Proposed changes:

Alternative 1: change the last two paras of 28.3.14.3 to:

A STA that transmits an HE TB PPDU in response to a triggering PPDU shall ensure that the transmission start time of the HE TB PPDU is within ±0.4 + 16 µs from the end of the last symbol of the triggering PPDU (including any packet extension) at the STA’s antenna connector.

NOTE—The last symbol of the triggering PPDU is before any signal extension, so this is equivalent to ±0.4 µs + aSIFSTime from the nominal end of the PPDU including signal extension (as indicated by PHY-RXEND.indication; see 19.3.2).

Alternative 2: change the last two paras of 28.3.14.3 to:

A STA that transmits an HE TB PPDU in response to a triggering PPDU shall ensure that the transmission start time of the HE TB PPDU is within ±0.4 + 16 µs from the end of the last symbol of the triggering PPDU (i.e. including any packet extension but excluding any signal extension) at the STA’s antenna connector.

**References:**

802.11ax/D3.3 except where otherwise specified