IEEE P802.11
Wireless LANs

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| Proposed Changes to D2.0 on the HE TB NDP feedback |
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Abstract

This submission proposes changes to the TGax Draft 2.0.

* Rev 0: Initial version of the document.
* Rev 1: text updates.
* Rev 2: spell out the equations for HE-STF.
* Rev 3: text updates, remove “spanning”

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

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

**Discussions:** In the UL OFDMA transmission, the subcarrier indices that HE-STF and the pre-HE-STF portion are populated on are tied to the RU where HE portion are populated. However the HE TB NDP feedback PPDU doesn’t have RU concept in the PPDU because of NDP. The pre-HE portion is clear in the spec: “The L-STF, L-LTF, L-SIG, RL-SIG, HE-SIG-A, and HE-SIG-B fields are referred to as the Pre-HE modulated fields, while the HE-STF, HE-LTF and Data fields are referred to as the HE modulated fields.
In the HE TB PPDU, the pre-HE modulated fields, which include L-STF, L-LTF, L-SIG, RL-SIG and HESIG-A fields, are sent only on the 20 MHz channels where the STA's HE modulated fields are located.”

But futher clarifications are needed for the HE-STF portion when HE TB NDP PPDU is transmitted.

**Proposed changes to D2.0:**

*To the TGax Editor: Add the following highlighted sentence on P.L. 485.30 as following:*

The HE TB NDP feedback PPDU has the following properties:
- Uses the HE TB PPDU format but without the Data field and with PE\_duration = 0

- Has two 4x HE-LTF symbols

- 4x HE-LTF, *TGI4,Data* is the only HE-LTF mode and GI duration combination for the HE-LTF

- The generation of HE-LTF symbols for the HE TB NDP feedback PPDU was defined in 28.3.10.10 (HE-LTF)

- The HE-STF and the Pre-HE modulated fields are transmitted only on the entire 20MHz channel where the STA is assigned.

*In addition, modify P.L. 434.52 ~ 435.29 as following:*

For a 20 MHz transmission, the frequency domain sequence for HE TB PPDUs is given by Equation (28-27).
*HES*-120:8:120 = { *M*, 0 –*M }*⋅ ( 1 + *j* ) /  (28-27).

For an HE TB NDP feedback in 20MHz channel width, the frequency domain sequence is given by Equation (28-27a)

 (28-27a)

For a 40 MHz transmission, the frequency domain sequence for HE TB PPDUs is given by Equation (28-28).

*HES*–248:8:248 = {*M*, –1, –*M*, 0 *M* –1, *M*}⋅ ( 1 + *j* ) /  (28-28)
*HES*±248 = 0

For an HE TB NDP feedback in 40MHz channel width, the frequency domain sequence is given by Equation (28-28a)

 (28-28a)

For an 80 MHz transmission, the frequency domain sequence for HE TB PPDUs is given by Equation (28-29).

*HES*–504:8:504 = { *M*, –1, *M* –1, –*M*, –1, *M,* 0 –*M*, 1, *M,* 1, –*M*, 1, –*M}* ⋅ ( 1 + *j*) /  (28-29).
*HES*±504 = 0

For an HE TB NDP feedback in 80MHz channel width, the frequency domain sequence is given by Equation (28-29a)

(28-29a)

For a 160 MHz transmission, the frequency domain sequence for HE TB PPDUs is given by Equation (28-30).

*HES*–1016:8:1016 = {*M*, –1, *M*,–1, –*M*, –1, *M*,0 –*M*, 1, *M*,1 –*M*, 1, *-M*, 0

*-M*, 1, -*M*,1, *M*, 1, -*M*,0 –*M*, 1, *M*,1 –*M*, 1, *-M*}⋅ ( 1 + *j* ) /  (28-30)
*HES*±8 = 0, *HES*±1016 = 0

For an HE TB NDP feedback in the 160MHz channel, the frequency domain sequence is given by Equation (28-30a).

(28-30a)

For an 80+80 MHz transmission, the lower 80 MHz segment for HE TB PPDUs shall use the HE-STF pattern for the 80 MHz defined in Equation (28-29).

For an 80+80 MHz transmission, the frequency domain sequence of the upper 80 MHz segment for HE TB PPDUs is given by Equation (28-31).

*HES*–504:8:504 = {*-M, 1, -M, 1, M, 1, -M, 0, -M, 1, M, 1, -M, 1, -M*}⋅ (1 + *j*)/  (28-31)
*HES*±504 = 0

For an HE TB NDP feedback, in the lower 80MHz segment of the 80+80MHz channel, the frequency domain sequence shall use the HE-STF pattern defined in Equation (28-29a).

For an HE TB NDP feedback, in the upper 80MHz segment of the 80+80MHz channel, the frequency domain sequence is given by equation (28-31a).

(28-31a)

If a 20MHz operating non-AP STA participates in the HE TB NDP feedback on a channel width greater than 20MHz, the HE-STF tone which overlaps with the DC tone of the 20MHz operating non-AP STA is not transmitted.