IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Co-BF 2x LDPC | | | | | | Date: 2025-9-16 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Sameer Vermani | Qualcomm Technologies Inc. |  |  |  | | Youhan Kim | Qualcomm Technologies Inc. |  |  |  | | Meriam Rezk | Qualcomm Technologies Inc. |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes text update on 11bn D1.0 to clarify how the 2xLDPC field may be set in the Co-BF Invite and Response frames.

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

## Background

See 11/25-1609r0 for the discussion on this proposed text update.

## Proposed Text Update

*Instruction to TGbn Editor: Update 11bn D1.0 subclause 37.15.2.1.4 as shown below.*

37.15.2.1.4 Co-BF transmission procedure

In order to perform Co-BF transmission, a Co-BF coordinating AP and a Co-BF coordinated AP shall follow the rules defined in 37.15.2.1.3 (Frame exchange sequence for Co-BF), and shall additionally follow the rules defined in this subclause.

The Co-BF Invite frame shall include the following information:

* The minimum number of data OFDM symbols of the Co-BF transmission
* The maximum number of data OFDM symbols of the Co-BF transmission
* The PHY version of the Co-BF transmission
* The bandwidth of the Co-BF transmission
* The puncturing pattern of the Co-BF transmission
* The GI and the LTF size of the Co-BF transmission
* The maximum total number of spatial streams allowed for the Co-BF coordinated AP of the Co-BF transmission
* The number of recipient STAs of the Co-BF transmission that are associated with the Co-BF coordinating AP
* The STA ID of each recipient STA of the Co-BF transmission that is associated with the Co-BF coordinating AP
* The number of spatial streams for each recipient STA of the Co-BF transmission that is associated with the Co-BF coordinating AP
* Whether ICF and ICR frame exchange is included between the Co-BF coordinating AP and its associated recipient STAs before Co-BF transmission
* The duration of the ICF and ICR frame exchange between the Co-BF coordinating AP and its associated recipient STAs before Co-BF transmission, which includes the SIFS between the ICF and the ICR, if the ICF and ICR frame exchange is included.

If the Co-BF coordinated AP accepts the Co-BF invite, the Co-BF Response frame shall include the following information:

* The suggested number of data OFDM symbols of the Co-BF transmission. The suggested value shall not be smaller than the minimum number of data OFDM symbols indicated by the Co-BF coordinating AP in the Co-BF Invite frame.

NOTE—The Co-BF coordinating AP might ignore the Co-BF coordinated AP’s suggestion

* The PHY version of the Co-BF transmission
* Whether extra LTF to be used in the Co-BF transmission is allowed by the Co-BF coordinated AP
* The number of recipient STAs of the Co-BF transmission that are associated with the Co-BF coordinated AP
* The STA ID of each recipient STA of the Co-BF transmission that is associated with the Co-BF coordinated AP
* The MCS for each recipient STA of the Co-BF transmission that is associated with the Co-BF coordinated AP
* The number of spatial streams for each recipient STA of the Co-BF transmission that is associated with the Co-BF coordinated AP
* Whether 2xLDPC will be used for each recipient STA of the Co-BF transmission that is associated with the Co-BF coordinated AP
* If the minimum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame corresponds to Navbits > 3888 bits for a user of the coordinated AP, then the coordinated AP may indicate that 2xLDPC will be used for the user in the Co-BF Response frame.
* If the minimum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame corresponds to Navbits ≤ 3888 bits for a user of the coordinated AP, then the coordinated AP shall not indicate that 2xLDPC will be used for the user in the Co-BF Response frame.
* Whether ICF and ICR frame exchange is included between the Co-BF coordinated AP and its associated recipient STAs before Co-BF transmission
* The duration of the ICF and ICR frame exchange between the Co-BF coordinated AP and its associated recipient STAs before Co-BF transmission, which includes the SIFS between the ICF and the ICR, if the ICF and ICR frame exchange is included.

To help the coordinated AP choose an appropriate LDPC codeword length, the minimum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame should be greater than or equal to 0.5 times the maximum number of data OFDM symbols of the Co-BF transmission indicated in the Co-BF Invite frame.

If the Co-BF coordinated AP rejects the Co-BF invite, the Co-BF Response frame should include the reason for rejection.

In each of the Co-BF Invite and Co-BF Response frames, if there is information for more than one user, the users are ordered according to the number of spatial streams in non-increasing order.

The Co-BF Trigger frame is used to ensure time and frequency synchronization between the two data PPDUs, and conveys the information needed to construct a common preamble for the two data PPDUs. The Co-BF Trigger frame shall include the following information:

* The value to be set in the Length field in the L-SIG field of the PPDU of the Co-BF transmission
* A coordinating AP shall not choose a value for the Length field in the L-SIG field of the Co-BF PPDU in the Co-BF Trigger frame that corresponds to a number of OFDM symbols in the Data field which is smaller than the minimum number of data OFDM symbols the coordinating AP had indicated in the Co-BF Invite frame.
* The PHY version of the Co-BF transmission
* The bandwidth of the Co-BF transmission
* The puncturing pattern of the Co-BF transmission
* The BSS color of the Co-BF coordinating AP
* The BSS color of the Co-BF coordinated AP
* The TXOP duration to be set in the TXOP field in the U-SIG of the Co-BF transmission
* The number of UHR-SIG symbols of the Co-BF transmission
* The GI and the LTF size of the Co-BF transmission
* The number of UHR-LTF symbols of the Co-BF transmission
* The total number of recipient STAs of the Co-BF transmission
* The STA ID of each recipient STA of the Co-BF transmission
* Which BSS each recipient STA of the Co-BF transmission belongs to
* NOTE—the BSS is identified by the BSS color
* The MCS of each recipient STA of the Co-BF transmission
* The spatial configuration of each recipient STA of the Co-BF transmission
* Whether 2xLDPC will be used for each recipient STA of the Co-BF transmission

The order of user information in the Co-BF Trigger frame shall be the same as the order of users in the UHR-SIG User field for the Co-BF transmission. The ordering of user information follows the rules described in 38.3.15.9.5 (User Specific field). In addition to the above rules, the order of user information of the users associated with the Co-BF coordinating AP in the Co-BF Trigger frame shall be the same as that in the Co-BF Invite frame. The order of user information of the users associated with the Co-BF coordinated AP in the Co-BF Trigger frame shall be the same as that in the Co-BF Response frame.

The user information in the Co-BF Trigger frame and in the UHR-SIG of the Co-BF transmission corresponds to all the recipient STAs that are indicated in the Co-BF Invite and Co-BF Response frames. The number of spatial streams for each recipient STA interpreted from the spatial configuration in the Co-BF Trigger frame shall be the same as the number of spatial streams for the same STA that is indicated in the Co-BF Invite and Co-BF Response frames. The MCS and 2xLDPC bit for each recipient STA indicated in the Co-BF Trigger frame shall be the same as the MCS and 2xLDPC bit indicated in the Co-BF Response frame

The Co-BF coordinating AP and the Co-BF coordinated AP shall follow the rules defined in 38.3.24 (Transmit requirement for UHR Co-BF sounding sequence and Co-BF transmission) to apply frequency pre-correction to the PPDUs containing the Co-BF Trigger frame and the Co-BF data frames.

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