IEEE P802.11
Wireless LANs

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| LB233 CR ER Beacon |
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Abstract

This submission proposes resolutions of comments received from TGax LB233.

(The proposed change is based on TGax Draft 3.0.)

* CIDs: 16123, 16091, 16925, 16152, 15127 (5 CIDs)

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.***

| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 16123 | 376.23 | 27.16.5 | "Protection of transmission in ER BSS is out of scope of this specification." is a cop-out and violates coexistence assurances | Delete this subclause | Rejected- In 802.11ax PAR, it requires to support the use case of outdoor deployment and improve robustness transmission in outdoor propagation environments. 802.11ax simulation scenario [11-14-0980-16] defines the simulation and evalution cases for outdoor in the case 4 and 4a with coverage of inter-AP space 130m. The contribution [11-14-0801] simulated transmission robustness at different CP lengths, and concludes that short CP length does not secure the robustness for outdoor cases. The longer CP is needed to improve the rubustness of transmission in the outdoor deployment case. But the legacy non-HT PPDU would not be able to provide longer CP length. For improving signal robustment in outdoor scenario (i.g., as using longer CP), the HE Beacon transmission should be in the spec.  |
| 16091 | 376.24 | 27.16.5 | ER beacons don't work for the same reason they didn't work with STBC (and got obsoleted): the AP typically has higher tx power so the AP can reach STAs but STAs can't reach the AP. The slight advantage conferred by the ability of the STA to use 10 MHz transmissions is not sufficient to overcome this | Delete Subclause 27.16.5 | Rejected- Please see resolution for CID 16123.  |
| 16925 | 376.24 | 27.16.5 | Dual-beacon (STBC beacon) was removed from the IEEE-2016 specification. Now 11ax is adding back dual-beacon (HE ER). I think we know that the industry won't build this feature due to the fact that sending this kind of beacon will encourage devices to use slow data rates thus lowering efficiency, both in-BSS efficiency and multi-BSS efficiency. | Remove this "feature" | Rejected- Please see resolution for CID 16123.  |
| 16152 | 376.27 | 27.16.5 | "in P20" is not a defined term | Change "high frequency 106-tone RU in P20" to "the higher frequency 106-tone RU of the primary 20 MHz channel" | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/xxxxr0. |
| 15127 | 376.30 | 27.16.5 | Current spec language suggests that an ER BSS is always co-located with a non-HT BSS.Does it need to be? | Clarify that a stand-alone ER BSS is permitted. | Rejected- Current spec language does not say that an ER BSS is always co-located with a non-HT BSS.A stand-alone ER BSS is permitted. |

***TGax Editor: Change the subclause 27.16.5 as follows:***

**27.16.5 ER beacon generation in an ER BSS**

An ER Beacon frame is a Beacon frame carried in HE ER SU PPDU (242-tone RU or high frequency 106- tone RU ~~in P20~~within the primary 20 MHz channel) format to provide additional link budget of downlink transmission to compensate the link budget imbalance between downlink and uplink due to introduction of UL OFDMA transmission. An HE AP may only operate an ER BSS in addition to a non-HT BSS. An ER BSS, when present, shall operate indepen-dent of the non-HT BSS and shall have a BSSID different from the non-HT BSS operated by the AP. ~~An ER BSS may have larger coverage area.~~

***TGax Editor: Change the subclause 10.6.5.8 as follows:***

**10.6.5.8 ER beacon generation in an ER BSS**

If the basic HE-MCS and NSS set of the AP that starts an ER BSS is not empty, the HE AP shall transmit ER Beacon frames and group-addressed frames in HE ER SU PPDUs(#16095) using one of the <HE-MCS, NSS> tuples included in the basic HE-MCS and NSS set. If the basic HE-MCS and NSS set of the AP that starts an ER BSS is empty, then the HE AP shall transmit the ER Beacon frame and group addressed frames in HE ER SU PPDUs using one of the mandatory <HE-MCS, NSS> tuples <MCS 0, 1>, <MCS 1, 1> for an HE ER SU PPDU.

***TGax Editor: Change the subclause 10.6.5.3 as follows:***

**10.6.5.3 Rate selection for other group addressed Data and Management frames**

If the BSSBasicRateSet parameter is empty and the Basic HT-MCS Set field of the HT Operation parameter of the MLME-START.request primitive or Basic HT-MCS Set field of the HT Operation parameter of the SelectedBSS parameter of the MLME-JOIN.request primitive is empty and the basic VHT-MCS and NSS set is not empty, the frame shall be transmitted in a VHT PPDU using one of the <VHT-MCS. NSS> tuples included in the basic VHT-MCS and NSS set.

If the BSSBasicRateSet parameter is empty and the Basic HT-MCS Set field of the HT Operation parameter of the MLME-START.request primitive or Basic HT-MCS Set field of the HT Operation parameter of the SelectedBSS parameter of the MLME-JOIN.request primitive is empty and the basic VHT-MCS and NSS set is empty and the basic HE-MCS and NSS set is not empty, the frame shall be transmitted in an HE SU PPDU, HE ER SU PPDU, or HE MU PPDU using one of the <HE-MCS, NSS> tuples, subject to the following constraints:

— If the frame is carried in an HE (ER) SU PPDU or in the RU intended for more than one STA in the HE MU PPDU, the <HE-MCS, NSS> tuples are in the basic HE-MCS and NSS set.

— If the frame is carried in the RU intended for a single STA in the HE MU PPDU, the <HE-MCS, NSS> tuples are in the supported HE-MCS and NSS Set of the single STA.

In a non-S1G STA, if the BSSBasicRateSet parameter, the Basic HT-MCS Set field of the HT Operation parameter of the MLME-START.request primitive or Basic HT-MCS Set field of the HT Operation parameter of the SelectedBSS parameter of the MLME-JOIN.request primitive, ~~and~~ the basic VHT-MCS and NSS set, and the basic HE-MCS and NSS set are empty (e.g., a scanning STA that is not yet associated with a BSS), the frame shall be transmitted in a non-HT PPDU using one of the mandatory PHY rates.

***TGax Editor: Insert a new subclause as follows:***

27.16.1a HE BSS functionality in 6 GHz band

**27.16.1a.1 Rate selection for group addressed Data and Management frames**

STBC group addressed Data and Management frames shall be transmitted in an HE SU PPDU, HE ER SU PPDU, or HE MU PPDU using a <HE-MCS, NSS> tuple in the mandatory HE-MCS and NSS Set.

If the basic HE-MCS and NSS set is empty, non-STBC group addressed Data and Management frames shall be transmitted in one of the following PPDU formats:

— A non-HT PPDU using one of the mandatory PHY rates.

— An HE SU PPDU, HE ER SU PPDU, or UL HE MU PPDU using a <HE-MCS, NSS> tuple in the mandatory HE-MCS and NSS Set.

If the basic HE-MCS and NSS set is not empty, non-STBC group addressed Data and Management frames shall be transmitted in one of the following PPDUs:

— A non-HT PPDU using one of the mandatory PHY rates when the BSSBasicRateSet parameter is empty.

— A non-HT PPDU using one of the rates included in the BSSBasicRateSet parameter when the BSSBasicRateSet parameter is not empty.

— An HE SU PPDU or HE ER SU PPDU using the <HE-MCS, NSS> tuples in the basic HE-MCS and NSS set.

— An HE MU PPDU using the <HE-MCS, NSS> tuples in the basic HE-MCS and NSS set when the frame is carried in the RU intended for more than one STA in the HE MU PPDU.

— An HE MU PPDU using the <HE-MCS, NSS> tuples in the supported HE-MCS and NSS Set of the single STA when the frame is carried in the RU intended for a single STA in the HE MU PPDU.