IEEE P802.11
Wireless LANs

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| Comment resolutions for additional rules for preassociation |
| Date: 2019-09-18 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D4.0 with the following CIDs (4 CIDs):

* 20072, 21522, 20373, 20111

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised version incorporated suggestions received from review of Rev 0. Changes in green,

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.***

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| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20072 | Abhishek Patil | 424.54 | The last sentence is bit ambiguous. Revised the text to clarify that an FILS Discovery frame or a broadcast Probe Response frame when carried in HE SU PPDU or HE MU PPDU shall be contained in an S-MPDU. Further consolidate the rule with the ones in 26.17.2.3.2 and specify them in one place (this sub-clause). Avoid duplication of rules. | As in comment | Revised –Agree in principle with the comment. Proposed resolution removes redundancies, adds a statement that all Class 1 and Class 2 frames are sent as an S-MPDU and added references to these rules from other clauses of interest. The rules for inclusion of group addressed frames (including FD and PRs) are added as a separate subclause, inline with the suggestion.TGax editor to make the changes shown in 11-19/1390r1 under all headings that include CID 20072. |
| 21522 | Yongho Seok | 424.55 | "An HE AP may transmit a FILS Discovery, or a broadcast Probe Response frame in a broadcast RU of the HE MU PPDU identified by STA\_ID\_LIST of 2045, which does not exceed 242-tone RU, is in the primary 20 MHz channel and is subject to the rules defined in 27.3.2.8 (RU restrictions for 20 MHz operation)."Rules in 26.5.1.3 (RU allocation in an HE MU PPDU) shall be also subject. | Change to "... is subject to the rules defined in 26.5.1.3 (RU allocation in an HE MU PPDU) and 27.3.2.8 (RU restrictions for 20 MHz operation)." | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested change. However, since a similar rule is present in 26.17.2.3.2, the proposed resolution is to remove this paragraph from here, amend the existing text in 26.17.2.3.2, and add a new subclause to cover all the rules for group addressed MPDU delivery in MU PPDU in one place and account for the suggested change from the commenter. TGax editor to make the changes shown in 11-19/1390r1 under all headings that include CID 21522. |
| 20373 | Laurent Cariou | 431.22 | An AP collocated with a 6 GHz AP shall include an RNR describing the 6 GHz AP (26.17.2.4). In this paragraph, it says that the AP shall schedule FILS DF every 20 TUs, unless a collocated AP sends an RNR. So the "shall" statement in this paragraph does not apply to collocated APs. To ease the understanding, simplify the paragraph so that the requirement to send FILS SF applies only to 6 GHz-only APs. | Same as comment | Revised –It is correct that this statement does not apply to co-located AP. The rules in this subclause apply to the AP that operates in the 6 GHz band. While the rules in subclause 26.17.2.4 appy to the AP that is collocated with an AP that operates in the 6 Ghz band. The rule here is saying that the 6 GHz AP may omit transmitting the FILS Discovery frame if the BSSID, SSID, etc information is advertised in an RNR element advertised by a co-located AP. If this statement was to be removed, then it would not be clear what such an AP would do. Currently the case of the AP sending an unsolicited probe response when its collocated AP has set the respective bit to 1 is missing. Proposed resolution is to specify this case. TGax editor to make the changes shown in 11-19/1390r1 under all headings that include CID 20373. |
| 20111 | Alfred Asterjadhi | 189.47 | Unclear sentence. Please rephrase as " The Minimum Rate field indicates the minimum rate, in units of 1 Mbps, that the non-AP STA is allowed to use for sending HE PPDUs (see 26.17.4.3), where the rate is obtained with an HE-NSS that is less than or equal to 3 and an HE-MCS that is less than or equal to 3. | As in comment. | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested change minus the fact that this applies to any PPDU in certain conditions.TGax editor: Please replace the sentence with the following: “The Minimum Rate field indicates the minimum rate, in units of 1 Mbps, that the non-AP STA is allowed to use for sending PPDUs (see 26.17.4.3), where the rate is obtained with an HE-NSS that is less than or equal to 3 and an HE-MCS that is less than or equal to 3.” |

**Discussion: *None.***

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

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 20072, 21522):***

This subclause describes the rate selection rules for group addressed Data and Management frames, excluding the following:

* Non-STBC Beacon, ER Beacon, HE SU Beacon, and non-STBC PSMP frames
* STBC group addressed Data and Management frames
* Data frames located in an FMS stream (see 11.22.8 (FMS multicast rate processing))
* Group addressed frames transmitted to the GCR concealment address (see 11.22.16.3.5 (Concealment of GCR transmissions))
* Group addressed Data and Management frames transmitted in an HE MU PPDU (see 26.15.6a (Additional rules for group addressed frames transmitted in an HE MU PPDU))

**TGax Editor: *Insert a new subclause as follows (#CID 20072):***

26.15.6a Additional rules for HE MU group addressed frames

An HE AP may include group addressed frames in an HE MU PPDU subject to the rules defined below.

An HE AP shall not include a Beacon frame in an HE MU PPDU.

An HE AP that includes a group addressed frame in an HE MU PPDU shall ensure that the frame is included in a broadcast RU of the HE MU PPDU. The AP shall additionally ensure that the following are satisfied for the broadcast RU:

* The RU allocation complies with the rules in 26.5.1.3 (RU allocation in an HE MU PPDU) and 27.3.2.8 (RU restrictions for 20 MHz operation)
* The <HE-MCS, NSS> tuple shall have a mandatory HE-MCS and NSS = 1
* The broadcast RU shall be located within:
	+ The primary 20 MHz channel if the group addressed frame is a FILS Discovery or a broadcast Probe Response frame, except when the primary 20 MHz channel does not coincide with a PSC and the AP is a 6 GHz-only AP, in which case the broadcast RU may be in a PSC that is within the BSS operating channel width (see 26.17.2.3 (Scanning in the 6 GHz band)). The broadcast RU size shall not exceed 106 subcarriers if the MU PPDU has a bandwidth that is greater than 20 MHz.
	+ The primary 20 MHz channel if the group addressed frame is addressed to at least one associated non-AP STA that has not declared to be in the awake state. The broadcast RU size shall not exceed 106 subcarriers if the MU PPDU has a bandwidth that is greater than 20 MHz.
	+ The bandwidth, which is indicated as supported in reception by one or more associated non-AP STAs, if the group addressed frame is addressed only to those non-AP STAs and the STAs have declared to be in the awake state. The broadcast RU size shall not exceed the minimum common bandwidth that is supported in reception by all STAs in the HE Capabilities element they transmit or in the most recently sent OM Control or OMN frames.
	+ The SST subchannel if the group addressed frame is addressed to one or more SST STAs, the primary 20 MHz channel does not coincide with the subchannel assigned to the SST STAs and the frame is not addressed to any STAs other than the SST STAs in that subchannel (see 26.8.7.2 (SST operation)). The broadcast RU size shall not exceed106 subcarriers if the SST subchannel is 20 MHz.
* The TXVECTOR parameters listed below shall be set as follows:
	+ HE\_LTF\_TYPE to 2xHE-LTF and GI\_TYPE to 0u8s\_GI or 1u6s\_GI, or HE\_LTF\_TYPE to 4xHE-LTF and GI\_TYPE to 3u2s\_GI
	+ FEC\_CODING to BCC\_CODING
	+ STBC to 0
	+ DCM to 0
	+ DOPPLER to 0
	+ BEAMFORMED to 0
	+ NOMINAL\_PACKET\_PADDING to 16 μs
	+ NO\_SIG\_EXTN to false in the 2.4 GHz band and true otherwise
	+ BEAM\_CHANGE as defined in 26.11.3 (BEAM\_CHANGE)
	+ STA\_ID\_LIST element as defined in 26.11.1 (STA\_ID\_LIST)

Group addressed frames transmitted in an HE MU PPDU shall be sent as an S-MPDU (see Table 9-532 (A-MPDU contents in the S-MPDU context)) except for group addressed Data frames, which may also be sent as an A-MPDU subject to the rules in 10.13.4 (A-MPDU aggregation of group addressed Data frames).*(#21522, 20072)*

* Additional rules for PPDUs sent in the 6 GHz band

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 21522, 20072):***

*(#21522, 20072)*

An HE STA that transmits a PPDU that is not sent in response to a Trigger frame in the 6 GHz band and that contains a frame, which is not a control response frame, with the Address 1 field or the Address 3 field set to the MAC address of an HE AP with which it is not associated and from which it has received a FILS Discovery frame or an HE Operation element shall ensure that the PPDU meets the following conditions:

* The bandwidth of the PPDU is less than or equal to the operating bandwidth of the HE BSS as indicated in the BSS Operating Channel Width subfield of the FILS Discovery frame or in the Channel Width subfield of the HE Operation element sent by the AP
* The PPDU is transmitted with a number of spatial streams that is less than or equal to the maximum number of spatial streams of the HE BSS as indicated in the Maximum Number of Spatial Stream subfield of the FILS Discovery frame or in the Basic HE-MCS and NSS Set field of the HE Operation element sent by the AP
* If the PPDU is an HE PPDU, then the PPDU is transmitted with an <HE-MCS, NSS> tuple provid­ing a data rate that is greater than or equal to the minimum rate indicated in the FILS Minimum Rate field (if present) of the FILS Discovery frame or in the Minimum Rate field of the HE Operation ele­ment sent by the AP.
* If the PPDU is a non-HT PPDU then the PPDU is transmitted with a data rate that is greater than or equal to the minimum of <R, 54 Mb/s>, where R is the minimum rate indicated in the FILS Mini­mum Rate field (if present) of the FILS Discovery frame or in the Minimum Rate field of the HE Operation element sent by the AP*(#21522, 20072)*

An HE STA that transmits a PPDU that is not sent in response to a Trigger frame in the 6 GHz band and that contains a frame, which is not a control response frame, with Address 1 field or Address 3 field set to the MAC address of the AP to which it is associated shall ensure that the PPDU meets the following conditions:

* If the PPDU is a non-HT (duplicate) PPDU then the PPDU is transmitted with a data rate that is greater than or equal to the minimum of <R, 54 Mb/s>, where R is the minimum rate indicated in the Minimum Rate field of the HE Operation element sent by the AP.
* If the PPDU is an HE PPDU then the PPDU is transmitted with an <HE-MCS, NSS> tuple providing a data rate that is not less than the data rate indicated in the Minimum Rate field of the HE Operation element sent by the AP. *(#21522, 20072)*

An HE STA that transmits a PPDU that is not an HE TB PPDU in the 6 GHz band and that contains a frame with the Address 1 field set to the MAC address of an AP with which it is not associated shall determine a local maximum transmit power for that transmission following the rules in 11.7.5 (Specification of regulatory and local maximum transmit power levels), if the local maximum transmit power is received in Transmit Power Envelope elements and combinations of Country elements and Power Constraint elements in the most recent Beacon or Probe Response frame received on the channel from that AP or in the most recent Neighbor Report element, if any, received from a reporting AP that is co-located with the AP. *(#21522, 20072)*

* AP behavior for fast passive scanning

(#15122)An AP operating in the 6 GHz band that is not co-located with an AP operating in the 2.4 GHz band or 5 GHz band is referred to as a 6 GHz-only AP.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 21522, 20072):***

A 6 GHz only AP shall schedule for transmission FILS Discovery frames as described in 11.46.2.1 (FILS Discovery frame transmission), except that the following apply:

* If the FILS Discovery frame is contained in a DL HE MU PPDU then itshall be included in the broadcast RU of the DL HE MU PPDU as defined in 26.15.a..
* The transmission of FILS Discovery frames may be omitted if a broadcast Probe Response frame or a Beacon frame is scheduled for transmission at that target transmit time instead of the FILS Discovery frame, or if the AP does not intend to be discovered by STAs.
* The AP shall set dot11FILSFDFrameBeaconMaximumInterval to a nonzero value that is less than or equal to 20 TUs, and shall follow the rules in 11.1.3.8 (Multiple BSSID procedure) if dot11Mul­tiBSSIDImplemented is true.

An AP operating in the 6 GHz band that is co-located with an AP that transmits a Reduced Neighbor Report and/or a Neighbor Report element reporting that 6 GHz AP may schedule for transmission a FILS Discovery frame every dot11FILSFDFrameBeaconMaximumInterval.

An AP operating in the 6 GHz band that is co-located with an AP that transmits a Reduced Neighbor Report and/or a Neighbor Report element with the 20 TU Probe Responses Active subfield reporting that 6 GHz AP shall schedule for transmission an unsolicited broadcast Probe Response frame every dot11FILSFDFrameBeaconMaximumInterval.

An AP operating in the 6 GHz band may send an unsolicited broadcast Probe Response frame, and shall follow the rules in 11.1.3.8 (Multiple BSSID procedure) if dot11MultiBSSIDImplemented is true. The Probe Response frame may be included in the broadcast RU of a DL HE MU PPDU as defined in 26.15.6a.

An HE AP operating in the 6 GHz band that transmits a FILS Discovery frame carrying an FD Capability field shall set the PHY Index subfield to 4.*(#21522, 20072)*

**26.11.4 BSS\_COLOR**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 20072):***

An HE STA that transmitted an HE Operation element shall set the TXVECTOR parameter BSS\_COLOR as follows:

* For an HE SU PPDU, HE ER SU PPDU or DL HE MU PPDU, the parameter BSS\_COLOR is set to the value indicated in the BSS Color subfield of the HE Operation element if all the recipient STAs are members of the HE STA's HE BSS or the PPDU carries at least one triggering frame.
* For an HE SU PPDU, HE ER SU PPDU, or DL HE MU PPDU the parameter BSS\_COLOR is set to 0 if the HE STA expects that at least one intended recipient STA is not a member of the HE STA’s HE BSS and the PPDU does not carry a triggering frame.*(#20072)*

…

An HE STA that received an HE SU PPDU, HE ER SU PPDU, or HE MU PPDU with the RXVECTOR parameter BSS\_ COLOR equal to 0 shall not discard the HE PPDU.*(#20072)*