IEEE P802.11
Wireless LANs

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| LB 200 Comment Resolution for subclauses 9.20.2.4-9.20.2.9  |
| Date: 2014-01-01 |
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Abstract

This submission proposes resolutions for comments in subclauses from 9.20.2.4 to 9.20.2.9 of TGah Draft 1.0 with the following CIDs:

1476, 1477, 1973

1206, 1207, 1478, 2128, 1974, 2749

1803, 1479, 1774, 1778, 1802, 1975, 2021, 2022, 2459, 2462, 2852

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 TGah Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGah Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1476 | 168.51 | 9.20.2.4 | The first inserted paragraph "When both TXOP holder and TXOP responder ..." describes the same rules as in the paragraph included in subclause 9.7.6.6 (Channel width selection for control frames) in page 163 line 13. It seems more appropriate to have these rules only in 9.7.6.6 as HCF "inherits" the rules from that subclause. | Remove paragraph starting in line 51 of page 168. | Agree with the commenter. Proposed resolution removes that paragraph.Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1476 to 1973. |
| 1477 | 168.57 | 9.20.2.4 | The paragraph/sentence starting in line 57 of page 168 is too long. | Some re-phrasing is needed. | Agree in principle with the commenter. Proposed resolution is the same as for CID 1973.Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1476 to 1973. |
| 1973 | 168.57 | 9.20.2.4 | "If an S1G STA intending to transmit 8 or 16 MHz channel width invokes a backoff procedure at the primary2MHz channel for >= 2MHz PPDU transmission using the channel busy conditions as defined in 24.3.18.5.4.1 (CCA sensitivity for devices in Type 2 channels implementing intended 8 or 16 MHz transmit channel width channel access procedure), a dynamic bandwidth operation which results in a TXVECTOR parameter CH\_BANDWIDTH of an S1G PPDU that is narrower than the intended channel width used during the back-off may be ignored."With above description, it is unclear whether a STA can transmit on a channel with bandwidth that is narrower than the intended channel.If it is not allowed, the "may" in sentence "... is narrower than the intended channel bandwidth used during the backoff may be ignored" shall be change to "shall". | If it is not allowed, the "may" in sentence "... is narrower than the intended channel bandwidth used during the backoff may be ignored" shall be change to to "shall". | Agree in principle with the commenter. However, the receiving STA does not know what back-off procedure was initiated by the transmitted or the PPDU. Hence the proposed resolution is to specify that a transmitter that initiates this particular back-off procedure shall set the Dynamic Indication bit of the RTS to 0 (so that it does not enable dynamic bandwidth).Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1476 to 1973. |
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* **Multiple frame transmission in an EDCA TXOP**

**Instructions to TGah Editor*: Change this subclause as follows:* (#866)**

Multiple frames may be transmitted in an EDCA TXOP that was acquired following the rules in 9.20.2.3 (Obtaining an EDCA TXOP) if there is more than one frame pending in the AC for which the channel has been acquired. However, those frames that are pending in other ACs shall not be transmitted in this EDCA TXOP. If a TXOP holder has in its transmit queue an additional frame of the same AC as the one just transmitted and the duration of transmission of that frame plus any expected acknowledgment for that frame is less than the remaining TXNAV timer value, then the STA may commence transmission of that frame a SIFS (or RIFS, under the conditions defined in 9.3.2.3.2 (RIFS)) after the completion of the immediately preceding frame exchange sequence, subject to the TXOP limit restriction as described in 9.20.2.2 (EDCA TXOPs). An HT STA that is a TXOP holder may transmit multiple MPDUs of the same AC within an A MPDU as long as the duration of transmission of the A MPDU plus any expected BlockAck frame response is less than the remaining TXNAV timer value. An S1G STA that is a TXOP holder may transmit multiple MPDUs of the same AC within an A-MPDU as long as the duration of transmission of the A-MPDU plus any expected (NDP) BlockAck frame response is less than the remaining TXNAV timer value.

NOTE 1-An RD responder can transmit multiple MPDUs as described in 9.26.5 (Rules for RD responder).

NOTE 2-An SF responder can transmit multiple MPDUs as described in 9.44 (Speed Frame Exchange).

***Insert the following paragraphs at the end of the subclause 9.20.2.4:***

An S1G STA intending to transmit 8 or 16 MHz channel width invokes a backoff procedure at the primary 2MHz channel for >= 2MHz PPDU transmission using the channel busy conditions as defined in 24.3.18.5.4.1 (CCA sensitivity for devices in Type 2 channels implementing intended 8 or 16 MHz transmit channel width channel access procedure) shall not set the Dynamic Indication field to 1 in any RTS frame that is scheduled for transmission at the expiration of this backoff.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1206 | 169.15 | 9.20.2.7 | "a NDP frame" -- grammar | Change all "a NDP" to "an NDP". | Agree with the commenter.TGah Editor to replace “a NDP” with “an NDP” throughout the draft to become D2.0 of 802.11ah. |
| 1207 | 169.55 | 9.20.2.7 | "value +/- 8 usec" -- where does this magic number come from? | Relate to PHY characteristics, or add a note documenting how this was arrived at. | Agree in principle with the commenter. Added a note for clarification. Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1206 to 2749. |
| 1478 | 169.15 | 9.20.2.7 | An S1G STA may transmit an NDP frame to truncate any active RID. Which NDP frame? | Clarify what NDP frame needs to be sent to truncate any active RID/TXOP. | Resolution clarifies that the frame is an NDP CF-End frame (see comment resolution in 14/0031r0).Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1206 to 2749. |
| 2128 | 169.60 | 9.20.2.7 | this rule may make a negative duration value in the responded CF-End frame. | if the subtraction get a negative value, set the Duration to zero | Agree with the commenter.Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1206 to 2749. |
| 1974 | 169.53 | 9.20.2.4 | The description of the NAV matching condition is not accurate when an SIG STA receives a CF-End frame. The condition "...the Duration/ID field set to a non-zero duration value that is equal to the NAV value +/- 8 usec at the time of the reception ..."The correct meaning is the received NAV value falls in the range of [NAV -8 , NAV + 8]. | Propose modify the sentence "...the Duration/ID field set to a non-zero duration value that is equal to the NAV value +/- 8 usec at the time of the reception ..." to "...the Duration/ID field set to a non-zero duration value that falls in the range of [NAV value- 8, NAV value- 8] (in usec) at the time of the reception ..." | This is related to 9.20.2.7. Agree with the commenter. Resolution accounts for the change.Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1206 to 2749. |
| 2749 | 169.11 | 9.20.2.7 | Need to clarify "a NDP frame with Response Indication "No Response" to truncate any active RID" | Please clarify whether the NDP frame is transmitted immediately after SIFS period or after a backoff, what is the NDP frame (NDP CTS?), what is the meaning of Response Indication (is it the TXVECTOR parameter RESPONSE\_INDICATION for NDP frame). | Agree with the commenter.Resolution clarifies that the frame is an NDP CF-End frame (see comment resolution in doc 0031r0) and is transmitted after PIFS. And there is no TXVECTOR parameter REPOSNE\_INDICATION for NDPs.Revised – TGah editor to make changes shown in 14/0075r0 under the heading for CIDs from 1206 to 2749. |

* **Truncation of TXOP**

**Instructions to TGah Editor*: Change this subclause as follows:* (#866)**

When a STA gains access to the channel using EDCA and empties its transmission queue, it may transmit a CF-End frame provided that the remaining duration is long enough to transmit this frame. By transmitting the CF-End frame, the STA is explicitly indicating the completion of its TXOP. A STA that is an S1G AP may transmit an NDP CF-End frame instead of a CF-End frame. A non-S1G STA shall not transmit an NDP CF-End frame. An S1G STA that transmits a PPDU with the TXVECTOR parameter RESPONSE INDICATION equal to Long Response or an NDP (Modified) ACK with Duration Indication field equal to 1 and Duration field equal to 0, for which it does not receive, after a SIFS period, a response with the RXVECTOR's parameter RESPONSE INDICATION equal to NDP Response or Normal Response, may transmit a NDP CF-End frame, after PIFS, to truncate any active RID or NAV.(#840)

A TXOP holder that transmits a CF-End frame shall not initiate any further frame exchange sequences within the current TXOP.

An S1G STA that transmits an NDP CF-End frame shall set its Duration field to 0 and shall not initiate any further frame exchange sequences within the current TXOP. A non-AP STA that is not the TXOP holder shall not transmit a CF-End frame.

A STA that is not an S1G STA shall interpret the reception of a CF-End frame as a NAV reset, i.e., it resets its NAV timer to 0 at the end of the PPDU containing this frame. After receiving a CF-End frame with a matching BSSID, an AP may respond by transmitting a CF-End frame after SIFS.

NOTE—The transmission of a single CF-End frame by the TXOP holder resets the NAV of STAs hearing the TXOP holder. There may be STAs that could hear the TXOP responder that had set their NAV that do not hear this NAV reset. Those STAs are prevented from contending for the medium until the original NAV reservation expires.

Figure 9-21 shows an example of TXOP truncation. In this example, the STA accesses the medium using EDCA channel access and then transmits a nav-set sequence (e.g., RTS/CTS) (using the terminology of Annex G). After a SIFS, it then transmits an initiator-sequence, which may involve the exchange of multiple PPDUs between the TXOP holder and a TXOP responder. At the end of the second sequence, the TXOP holder has no more data available to send that fits within the TXOP; therefore, it truncates the TXOP by transmitting a CF-End frame.

A STA that is not an S1G STA that receive the CF-End frame reset their NAV and can start contending for the medium without further delay.

An S1G STA may transmit a CF-End frame containing a value greater or equal to 0 in the Duration/ID field.(#909)

An S1G STA shall interpret the reception of a CF-End frame with the Duration/ID field set to zero as a NAV reset, i.e., it resets its NAV timer to 0 at the end of the PPDU containing this frame. After receiving a CF-End frame with the Duration/ID field set to zero and a matching BSSID, an AP may respond by transmitting a CF-End frame with the Duration/ID field set to zero after SIFS.(#909)

When an S1G STA receives a CF-End frame with the Duration/ID field set to a non-zero duration value that falls in the range of [NAV value- 8, NAV value + 8 ] (in microseconds) at the time of the reception of the PHY-RXEND.indication, it shall reset the NAV and may start contending for the medium without further delay. If the received duration value does not fall in the range of [NAV value - 8, NAV value + 8] microseconds at the time of the reception of the PHY-RXEND.indication, the STA shall discard the CF-End frame.

NOTE – A NAV value that varies within +/- 8 microseconds boundaries is permitted and accounts for any inaccuracies (e.g., due to clock drifting) to the NAV counter at the receiving STA prior to reception of the CF-End frame. After receiving a CF-End frame with a matching BSSID, an S1G AP may respond by transmitting a CF-End frame after SIFS in which the value of the Duration field is set to the value obtained from Duration field of the received CF-End frame adjusted by subtraction of aSIFSTime and the time required to transmit the CF-End frame in unit of microseconds. If the adjusted value is a negative value the Duration field of the CF-End frame is set to 0.

TXOP truncation shall not be used in combination with L-SIG TXOP protection when the HT Protection field of the HT Operation element is equal to nonmember protection mode or non-HT mixed mode.

**Instructions to TGah Editor*: Add the following row immediately after the row for NDP CTS in Table 9-1b:***

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| * **RESPONSE\_INDICATION value for NDP MAC frames**
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| **NDP MAC Frame type** | **RESPONSE\_INDICATION value** |
| … |  |
| NDP CTS | No Response |
| NDP CF-End | No Response |

 **(#866)**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1803 | 170.34 | 9.20.2.10 | Notations are confusing in Table 9-20a | Use for instance Secondary4 instead of Secondary80, and Secondary2 instead of Secondary40 | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
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| 1479 | 170.24 | 9.20.2.9 | In Table 9-20a the first column has some typos. | Replacethe following in the first column of table 9-20a: "secondary" with "secondary2", "secondary40" with "secondary4", "secondary80" with "secondary8". | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
| 1774 | 170.21 | 9.20.2.9 | The channels indicated idle by the channel-list parameters in PHY-CCA.indication is not correct. For example, if PHY-CCA.indication {primary}, that means the primary 2MHz (or primary 1MHz, depending on definition of "primary" for EDCA) channel is idle, NOT "None" as indicated in current Table 9-20a. | Fix table and also coordinate with channel-list parameter definitions in Section 7.3.5.11.2 | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
| 1778 | 171.20 | 9.20.2.9 | Specification text should not suggest what kind of use-case a device should be when it is performing 1MHz backoff. | Remove the "(e.g. for Sensor type STA)" | Accepted – TGah editor to make the changes proposed by the commenter. |
| 1802 | 170.48 | 9.20.2.9 | Inconsistent notation for Primary 2MHz , etc, sometimes using lower case and sometimes using upper case | Use the same case consistently | Accepted –TGah Editor to replace “Primary” with “primary” in all occurrences that are not part of defining a field and to replace “Secondary” with “secondary” in all occurrences that are not part of defining a field. |
| 1975 | 170.22 | 9.20.2.9 | There are a few typos in Table 9-20a--Channels indicated idle by the channel-list parameter.1. Row 4, column 1, "secondary", should it be "secondary 2"2. Row 5, column 1, "secondary 40", should it be "secondary 4"3. Row 6, column 1, "secondary 80", should it be "secondary 8" | Please correct the typos. | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
| 2021 | 170.30 | 9.20.2.9 | There is no such thing as "secondary 1MHz CCA sensing" in >=2MHz BSS, as defined in clause 24. | Remove the row of secondary1 in table 9-20a | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
| 2022 | 170.34 | 9.20.2.9 | "Secondary40" and "Secondary80"? | Change to secondary4 and secondary8 | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
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| 2025 | 171.20 | 9.20.2.9 | "If an S1G STA (e.g., Sensor type STA) invokes a backoff procedure at the primary 1MHz channel for 1MHz PPDU transmission...", for >=2MHz BSS, there is no such thing as primary 1MHz CCA sensing and backoff procedure, and secondary 1MHz CCA, therefore this backoff procedure is only for 1MHz BSS. | Change " at the primary 1MHz channel for 1MHz PPDU transmission..." to "in a 1MHz BSS". | Rejected –According to table 9-20a (in D1.1 of 802.11ah) a PHY-CCA indication of primary2 indicates that the primary1 is idle in which case an S1G STA that has started a backoff procedure in the primary 1MHz can transmit according to that statement. Hence, there is no inconsistency in the current draft. |
| 2459 | 170.21 | 9.20.2.9 | Having secondary1 and secondary40/80 is confusing, and also incompatible with the secondary4/8 in 24.3.18.5.5 | Use the single-digit versions throughout | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |
| 2462 | 171.20 | 9.20.2.9 | What does the "e.g." in "If an S1G STA (e.g., Sensor type STA)" mean? | Say either "If a Sensor type S1G STA" or "If an S1G STA", without a parenthesis | Agree with the commenter. Resolution is to remove parenthesis and content therein. Revised – TGah editor to make changes proposed in CID 1778. |
| 2852 | 170.21 | 9.20.2.9 | Channel list of Table 9-20a is not completed. For example, a primary 2MHz is missing. | Correct the Table 9-20a and Table 7-5--Channel-list parameter elements (if is necessary). | Rejected –Agree with the commenter. But this issue is already resolved. See Discussion below. |

**Discussion:** *All rejected comments in the above headings are because doc 13/1522r0 already resolves the issues raised by the commenters (see table below which can be found in 13/1522r0).*

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| **Table 9-20a—Channels indicated idle by the channel-list parameter** |
| **PHY-CCA.indication channel-list element** | **Idle channels** |
| primary1 | None |
| ~~secondary1~~ | ~~Primary 1 MHz channel~~ |
| primary2 | Primary 1 MHz channel |
| secondary2 | Primary 2 MHz channel |
| secondary4~~0~~ | Primary 2 MHz channel and secondary 2 MHz channel |
| secondary8~~0~~ | Primary 2 MHz channel, secondary 2 MHz channel and secondary 4 MHz channel |