IEEE P802.11  
Wireless LANs

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| LB 207 Comment Resolution for Miscellaneous part 2 | | | | |
| Date: 2014-3-01 | | | | |
| Author(s): | | | | |
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Abstract

This submission proposes resolutions for comments in multiple subclauses of TGah Draft 4.0 with the following CIDs (TOT 19 CIDs):

* 6226, 6057, 6058, 6101, 6130, 6201, 6202, 6203, 6204, 6141,
* 6200, 6214, 6215, 6094, 6096, 6131, 6097, 6132, 6211

Revisions:

* Rev 0: Initial version of the document.

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** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6226 | Joseph Levy | 18 | 9.46.1 | "  It is not clear whether BDT sequence (e.g. PS Poll+BDT) can start SIFS after the sync frame, as it may not staisfy a.2). The integration of BDT design and EDCA TXOP and sync frame design is not clear " | Please clarify BDT operations | Revised –  When the AP sends a Sync frame then it becomes the TXOP holder of the TXOP. In this case the non-AP STA that transmits the Data frame after the Sync frame (see P304L52) cannot be a BDT Initiator. The AP however can send a Sync frame within its role of a BDT initiator if it wants (but the Sync frame cannot be an NDP CTS frame). These rules are already clear. However we agree that the portion related to a.2 needs better clarification because that bullet applies only to the first frame that is sent in the BTD exchange (not of any sequence within the BDT exchange).The proposed resolution contains also some editorial changes.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6226. |

**9.47.2 Rules for BDT**

**TGah Editor: *Change the paragraph below as follows (#6226):***

A BDT sequence comprises the following:

a) The transmission of one PPDU that is either an NDP PS-Poll-Ack frame or that satisfies the following conditions:

1) Contains a Response Indication of Long Response

2) Follows the same rule as the initial frame for TXOP as defined in 9.22.2 (HCF contention based channel access (EDCA)) if the PPDU is the first frame sent by the BDT Initiator during this TXOP

3) Contains a Duration/ID field that sets the NAV

4) Contains no HT Control field with the RDG/More PPDU subfield equal to 1.

An S1G STA that transmits this PPDU is known as the BDT Initiator.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6057 | SHOUKANG ZHENG | 238.45 | 9.3.2.4a | The text is not accurate for the case that the received PPDU is identified as member PPDU based on PHY header information and is further identified as non-member PPDU based on MAC header information. If the STA resets its RID counter due to that the received PPDU is classified as a member PPDU when the RX-START.indication primitive corresponding to that PPDU is received, it can't recover the current RID counter for the case that the current RID counter is larger than the new value when the information contained in a valid MAC header (i.e., A1 and/or A2 fields) from an MPDU carried in the received PPDU is further used to determine that the received PPDU is a non-member PPDU. | Add the following text to the end of first sentence, "except for the case that the information contained in a valid MAC header (i.e., neither A1 nor A2 field contain a MAC address that corresponds to a STA that is a member of the same BSS as known at the STA) from an MPDU carried in the received PPDU is used to change the classification of the PPDU to a non-member PPDU." | Revised –  Agree in principle with the commenter. Please note that nothing forbids a STA that intends to use additional information from the MAC header to store the value of the RID counter so that if a reset occurs it can obtain the old value. To make this clear we added a note.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6057. |
| 6058 | SHOUKANG ZHENG | 239.11 | 9.3.2.4a | For the case that the received PPDU is a non-member PPDU and contains a Duration field for NAV setting but the Duration field value is smaller than the RID counter at the end of the PSDU that is carried in the received PPDU, the text is not correct for the case that the NAV counter is smaller than RID counter. | Change to "The RID counter shall start at the end of the received S1G PPDU which contains the PSDU, except when the PPDU either contains a valid nonzero Duration field that updates the NAV if the PPDU is a member PPDU or contains a valid nonzero Duration field that updates the NAV and is larger than the RID counter if the PPDU is a non-member PPDU, as described in 9.3.2.4 (Setting and resetting the NAV) or it is intended to the S1G STA in which cases the RID shall be reset." | Rejected –  The comment fails to identify a technical issue.  RID is the second virtual carrier sensing mechanism that provides protection in those cases when NAV fails to do so (i.e., if a frame contains a NAV setting value then the RID counter is reset because the NAV is set). This concept has been discussed in the TG and incorporated in the draft since D0.2 of 11ah spec while the paragraph to which the comment refers to has had no changes since D2.0. |
| 6101 | Naveen Kakani | 238.45-46 | 9.3.2.4a | "An S1G STA that receives a member PPDU shall reset its RID counter when the RX-START.indication primitive corresponding to that PPDU is received. An S1G STA that receives a non-member PPDU shall not reset the RID counter and shall update the RID counter, i.e., set it to a new value (as defined in 9.3.2.4a.1 (RID update)) that is not less than the value that the RID counter will have at the instant of time that corresponds to the end of the received PPDU." However, if the PPDU is a member PPDU for a STA, but if the STA is not the destination STA for the PPDU, the RID counter setting is not clarified. | Include a SHALL condition where RID update is performed as defined in 9.3.2.4a.1 by STAs for which the PPDU is a member PPDU but the STA is not the destination STA of the PPDU. | Revised –  Agree in principle with the comment. Proposed resolution is inline with the suggested change.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6101. |
| 6130 | Alfred Asterjadhi | 238.45 | 9.3.2.4a | Something is missing here: "An S1G STA that receives a member PPDU shall reset its RID counter when the RXSTART.indication primitive corresponding to that PPDU is received". The RID counter is updated as well as defined in 9.3.2.4a.1 (RID update). | Replace: "An S1G STA that receives a member PPDU shall reset its RID counter when the RX-START.indication primitive corresponding to that PPDU is received." with "An S1G STA that receives a member PPDU shall reset its RID counter and update it as defined in 9.3.2.4a.1(RID update) when the RX-START.indication primitive corresponding to that PPDU is received. | Revised –  Agree in principle with the comment. Proposed resolution is inline with the suggested change.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6130. |
| 6201 | Joseph Levy |  | 9.3.2.4a | RX-START.indication should be PHY-RXSTART.indication | correct it | Accepted |
| 6202 | Joseph Levy |  | 9.3.2.4a | It is not clear what "for which" refers to | Clarify that NDP CMAC and S1G\_1M PPDU are always classified as member PPDU. Suggest making this two sentances.. | Revised –  Agree in principle with the comment. Proposed resolution is inline with the suggested change (split the sentence in two sentences so that the classifications are clear).  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6202. |
| 6203 | Joseph Levy |  | 9.3.2.4a | In Figure 9-4a RID starts counting down at PHY-RXEND this is misleading because PHY may perfrom filtering, That generates a PHY-RXEND.indication(Filtered) before the end of the frame | remove the "PHY-RXEND.indication" above "start RID count down" to avoid confusion, provide clear description of different behaviors for the destinationa and other STAs | Revised –  Agree in principle with the comment. Proposed resolution is to replace “PHY-RXEND.inidcation” with “End of the received PPDU”.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6203. |
| 6204 | Joseph Levy |  | 9.3.2.4a | The NDP CMAC frame does not contain a PSDU but may have response indication other than "no response". This case should also be addressed in this paragraph. | remove "which contains the PSDU" | Accepted  Note that technically the NDP CMAC frame contains a zero length PSDU. However I agree in principle that that part of the text is redundant. |

**Discussion:**

**9.3.2.4a Setting and resetting the RID**

**TGah Editor: *Change the paragraph below as follows (#6101, 6130, 6201):***

An S1G STA that receives a member PPDU shall reset and update its RID counter as defined in 9.3.2.4a.1 (RID update) when the PHY-RXSTART.indication primitive corresponding to that PPDU is received. An S1G STA that receives a non-member PPDU shall not reset the RID counter and shall update the RID counter, i.e., set it to a new value (as defined in 9.3.2.4a.1 (RID update)) that is not less than the value that the RID counter will have at the instant of time that corresponds to the end of the received PPDU.

Note – An S1G STA that can change the classification of a member PPDU to non-member PPDU as described below can store the value that the RID counter has at the PHY-RXSTART.indication so that it can update it based on the new classification.

**TGah Editor: *Change the paragraph below as follows (#6202):***

A member PPDU is a PPDU received by a STA and which was transmitted by a STA that is a member of the same BSS as the receiving STA. The S1G STA shall classify a received PPDU as a member PPDU if it is an NDP CMAC frame, or an S1G\_1M PPDU. The S1G STA shall classify a received PPDU as a member PPDU if its PREAMBLE\_TYPE is either S1G\_LONG\_PREAMBLE or S1G\_SHORT\_PREAMBLE and either of the conditions below is satisfied:

* UPLINK\_INDICATION is 1 and the PARTIAL\_AID indicates that the PPDU is addressed to the AP with which the non-AP STA is associated
* UPLINK\_INDICATION is 0 and the COLOR indicates that the PPDU is generated by the AP with which the STA is associated

A PPDU that is not a member PPDU is a non-member PPDU.

Because the PARTIAL\_AID and COLOR values obtained from received PPDUs are not globally unique, an S1G STA that has classified a PPDU as a member PPDU based on PARTIAL\_AID and/or COLOR may additionally use the information contained in a valid MAC header (i.e., neither A1 nor A2 field contain a MAC address that corresponds to a STA that is a member of the same BSS as known at the STA) from an MPDU carried in the received PPDU to change the classification of the PPDU to a non-member PPDU.

NOTE— If the PHY-RXEND.indication primitive for the received S1G PPDU contains an ERROR or FormatViolation then the S1G STA sets the EIFS as described in 9.3.7 (DCF timing relations).

**TGah Editor: *Change the paragraph below as follows (#6204, 6058):***

The RID counter shall start at the end of the received S1G PPDU, except when the PPDU either contains a valid nonzero Duration field that updates the NAV as described in 9.3.2.4 (Setting and resetting the NAV) or it is intended to the S1G STA in which cases the RID shall be reset.

**TGah Editor: *Replace “PHY-RXEND.indication” with “End of the received PPDU” in Figure 9-4a (#6203):***

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6141 | Liwen Chu | 86.36 | 8.2.5.2 | In a TXOP with PV1 frames, multiple protection needs to be used since PV1 frame can't carry Duration field. | Change the subclause according to the comment. | Rejected –  The following sequence is possible: RTS, SIFS, CTS, PV1 frame, NDP Ack. In this case single protection can be used. |
| 6200 | Joseph Levy |  | 8.2.5.7 | It is not specified how the duration field of a control response frame is set if the eliciting frame is a PV1 frame | "1. make this section consistent with 8.2.5.8  2. Add in 8.2.5.7 and 8.2.5.8 how to set duration in case of a BDT exchange but the response frame is not generated by (BDT initiator+TXOP holder) in response to a short frame" | Revised—  Agree in principle with the comment. Proposed resolution is to move the text in one place, more specifically in subclause 8.2.5.2 so that it covers both cases (control response and any other frame). We also add missing portion of the condition.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6200. |

**8.2.5.8 Setting for other response frames**

**TGah Editor*: Change the following paragraph of subclause 8.2.5.8 as follows and then move it at the end of 8.2.5.2:***

For any frame that includes a Duration/ID field, transmitted by an S1G STA as a response to PV1 frames that are not part of a BDT exchange, the Duration/ID field of the frame is set to 0. For any frame transmitted by a BDT initiator that is the TXOP holder as a response to PV1 frames, the Duration/ID field of the frame is set to the value of the TXNAV timer minus the estimated time required to transmit the frame. For any frame transmitted by a BDT initiator that is not the TXOP holder as a response to PV1 frames, the Duration/ID field of the frame is set to the remaining duration of the TXOP.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6214 | Joseph Levy |  | 9.22.2.7 | After an AP transmits NDP PS-Poll Ack, in response to NDP PS Poll with no uplink data indicated, the non-AP STA is the TXOP holder while AP is the BDT initiator. In this case, the AP is not allowed to transmit multiple frames to the STA. In order to allow the AP to transmit multiple frames to the STA, as in this case, the sentence "A BDT responder can transmit multiple MPDUs as described in 9.47 (Bidirectional TXOP).." should be modified. | Modify the sentence to "A BDT initiator or responder can transmit multiple MPDUs as described in 9.47 (Bidirectional TXOP)." | Revised –  Agree in principle with the comment. Proposed resolution is inline with the suggestion.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6214. |

**9.22.2.7 Multiple frame transmission in an EDCA TXOP**

**TGah Editor: *Change the paragraph below as follows (#6214):***

NOTE 3—Within a BDT, STAs can transmit multiple MPDUs as described in 9.47 (Bidirectional TXOP).

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6215 | Joseph Levy |  | 9.47.2 | In 8.2.5.2 and 10.2.2.2, a separate BDT procedure is described using PS POLL+BDT and RTS/CTS exchange. However, this procedure is not in 9.47. | Provide description of the BDT procedure and clarify the roles of BDT initiator/responder in this scenario. | Revised –  The use of RTS/CTS in this context is more general, i.e., an AP that receives a PS-Poll can respond with an RTS/CTS exchange to protect the following BU it intends to transmit to the STA. The other case is related to the PS-Poll+BDT. While the BDT operation requires the PS-Poll+BDT to have the More Data field equal to 1 and the Response Indication of Long Response this is not the case in this portion. However we agree that some clarifications are needed here. Please also note that location of the text should be in 10.2.2.6 rather than 10.2.2.2. Proposed resolution accounts for these clarifications.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6215. |

10.2.2.2 Non-AP STA Power Management modes

**TGah Editor: *Remove the paragraph below as follows (#6215):***

**10.2.2.6 AP operation during the CP**

**TGah Editor: *Change the paragraph below as follows (#6215):***

g) A single buffered BU for a STA in the PS mode shall be forwarded to the STA after a PS-Poll has been received from that STA. Until the BU has either been successfully delivered or presumed failed due to maximum retries being exceeded further PS-Poll frames from the same STA shall be acknowledged and ignored. This prevents a retried PS-Poll from being treated as a new request to deliver a buffered BU.

For a STA using U-APSD, the AP transmits one BU destined for the STA from any AC that is not delivery-enabled in response to PS-Poll from the STA. When all ACs associated with the STA are delivery-enabled, AP transmits one BU from the highest priority AC that has a BU. The AP can respond with either an immediate data or Management frame or with an Ack frame, while delaying the responding data or Management frame. Upon receiving a PS-Poll frame, the S1G AP that intends to respond with immediate Data frame may use the RTS/CTS scheme to protect the transmission of the frame. with the More Data field equal to 0,that intends to respond with immediate Data frames

An S1G AP that sends an acknowledgement frame of type (NDP) Ack or NDP PS-Poll-Ack in response to an (NDP)PS-Poll/trigger frame that is received from an S1G STA shall set the More Data subfield of the acknowledgement frame to 0 when no BU is buffered for the STA; otherwise, it shall set it to 1. The successful reception of the acknowledgement frame provides the following indications to the S1G STA:

—If the More Data subfield is equal to 0 it indicates that no service period starts for the STA and that it may enter the doze state,

—If the More Data subfield is equal to 1 it indicates that a service period starts for the STA after a time T, starting from the end of the acknowledgement frame, after which the S1G STA shall remain in the awake state until a frame is received from the S1G AP that has the EOSP subfield equal to 1. The time T is equal to:

—0 if the acknowledgment frame is an Ack frame or is an NDP(PS-Poll-)Ack frame with the Idle Indication subfield equal to 0

—the value indicated in the Duration field of the frame if the frame is an NDP (PS-Poll-)Ack frame with the Idle Indication subfield equal to 1.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6094 | Robert Stacey | 6.49 |  | Not an abbreviation or acronym | Avoid a term like (short) beacon interval since parentheticals typically apply to the words preceding it. Maybe use "beacon interval" as the general term and have "short beacon interval" and "normal [or long] beacon interval" apply in specific instances. Term definitions belong in 3.2. | Revised –  Agree in principle with the comment. The proposed resolution is to account for the suggested change.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6094. |
| 6096 | Robert Stacey |  |  | (short) beacon interval vs short beacon interval vs beacon interval. The meaning these terms is very unclear. Sometimes one term is used, but then later in the same context another variant is used. For example, in 8.2.4.2.8 (More Data field) the term beacon interval is used at P77L40 but two paragraphs later the term (short) beacon interval is used at P77L54. None of the terms are defined. Prior to this amendment it was reasonably clear that beacon interval was the interval between beacons. I have no idea what new meanings are. Or the distinction between the terms. | Remove prefix (short) or short. The distinction between short beacon interval and a beacon interval does not appear to be relavant. If they are indeed different intervals, then clarification is required throughout. | Revised –  Agree in principle with the comment. The proposed resolution is to account for the suggested change.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6096. |
| 6131 | Alfred Asterjadhi | 341.341 | 10.1.3.10.2 | While there are declarative statements pointing out that the units of certain fields (e.g., listen interval, etc) are in short beacon interval or beacon interval, a normative statement to clearly indicate these two cases is missing. | Add a normative statement to indicate that when short beacon interval element is received by the AP then all units that rever to a beacon interval shall refer to the short beacon interval. | Revised –  Agree in principle with the comment. The proposed resolution is to account for the suggested change.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6131. |

**3.4 Abbreviations and acronyms**

**TGah Editor: *Change the paragraph below as follows (#6094, 6096):***

**TGah Editor: *Replace “T(S)BTT” with “TBTT or TSBTT” throughout the draft and remove the abbreviation (#6094, 6096).***

8.2.4.1.8 More Data field

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

An S1G AP sets the More Data field to 1 in group addressed frames when additional group addressed BUs remain to be transmitted by the AP during this beacon interval or short beacon interval (see 10.1.3.10.2). The S1G AP sets the More Data field to 0 in group addressed frames transmitted by the AP when no more group addressed BUs remain to be transmitted by the AP during this beacon interval or short beacon interval.

8.4.1.6 Listen Interval field

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

The Listen Interval field is used to indicate to the AP how often an S1G STA with dot11NonTIMModeActivated equal to false or a non-S1G STA in power save mode wakes to listen to Beacon frames. It is also used to indicate to an AP the duration during which an S1G STA with dot11NonTIMModeActivated equal to true is required to transmit at least one frame that is addressed to the associated AP. The value of ~~this parameter is~~ the Listen Interval parameter ~~of the MLME-ASSOCIATE.request or MLME-REASSOCIATE.request~~ used by MLME primitives is determined from the Listen Interval field as described in this subclause and is expressed in units of ~~B~~beacon ~~I~~interval if dot11ShortBeaconInterval is false and in units of short beacon interval if dot11ShortBeaconInterval is true (see 10.1.3.10.2). The length of the Listen Interval field is 2 octets. The Listen Interval field is illustrated in Figure 8-68 (Listen Interval field).

8.4.2.6 TIM element

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

The DTIM Period field indicates the number of beacon intervals or short beacon intervals between successive DTIMs. If all TIMs are DTIMs, the DTIM Period field has the value 1. The DTIM Period value 0 is reserved. The DTIM period field is a single octet. If dot11ShortBeaconInterval is equal to true, the DTIM Period field is set to dot11ShortBeaconDTIMPeriod. If dot11ShortBeaconInterval is equal to false, the DTIM Period field is set to dot11DTIMPeriod (see 10.1.3.10.2).

8.4.2.188 RPS element

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

The PRAW Periodicity subfield indicates the period of current PRAW occurrence in the unit of beacon interval if dot11ShortBeaconInterval is false and in the unit of short beacon interval if dot11ShortBeaconInterval is true (see 10.1.3.10.2).

The PRAW Start Offset subfield indicates the offset value from the end of the frame that carries the current RPS element to the S1G Beacon frame that the first window of the PRAW appears, in units of beacon interval or short beacon interval.

8.4.2.190 AID Request element

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

The AID Request Interval field indicates to the AP

—The listen interval, in units of beacon interval or short beacon interval as defined in 8.4.1.6 (Listen Interval field), during which the TIM STA wakes to receive S1G Beacon frames when the Non-TIM Mode Switch field is equal to 0, TIM Mode Switch field is equal to 1, and the Group Address Present field is equal to 0.

—The listen interval, in units of beacon interval or short beacon interval as defined in 8.4.1.6 (Listen Interval field), during which the non-TIM STA is required to transmit at least one PS-Poll or trigger frame to the AP when the Non-TIM Mode Switch field is equal to 1, TIM Mode Switch is equal to 0, and the Group Address Present field is equal to 0.

—The multicast listen interval, in units of beacon interval or short beacon interval (see 10.1.3.10.2), during wihch the non-AP STA wakes up to receive the S1G Beacon frames that signal the presence of group addressed BUs for the group MAC address contained in the Group Address field. In this case the Group Address Present field is equal to 1 and the TIM Mode Switch field and Non-TIM Mode Switch field are equal to any value.

The AID Switch Count field indicates a countdown value, in units of beacon interval or short beacon interval, that the AP sets for the non-AP STA to switch to the new AID or to activate the multicast AID. It indicates the duration after which the (multicast) listen interval starts and the counter that corresponds to the AID Switch Count field starts upon transmission of the AID Response element. The AID Switch Count field is set to 0 in an AID Response element that is carried in a (Re) Association Response frame.

8.4.2.191 AID Response element

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

The AID Response Interval field indicates to the non-AP STA:

—The listen interval, in units of beacon interval or short beacon interval as defined in 8.4.1.6 (Listen Interval field), during which the TIM STA wakes to receive S1G Beacon frames. The S1G Beacon frames that the TIM STA wakes up to listen either include a TIM element that can include their new AID or include a Page Slice element that indicates the assignment of the new AID in the corresponding page slices.

—The listen interval, in units of beacon interval or short beacon interval as defined in 8.4.1.6 (Listen Interval field), during which the non-TIM STA is required to transmit at least one PS-Poll or trigger frame to the AP.

—The multicast listen interval, in units of beacon interval or short beacon interval (see 10.1.3.10.2), during which the non-AP STA is required to wake up for receiving the S1G Beacon frames that signal the presence of group addressed BUs for the group MAC address contained in the Group Address field of the eliciting AID Switch Request frame. The (multicast) listen interval will start from the first TBTT or TSBTT that follows the expiration of the AID switch counter obtained from the AID Switch Count field of this element.

**9.22.5.1 General**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

Restricting uplink channel access to a small number of STAs and spreading their uplink access attempts over a much longer period of time might improve the medium utilization’s efficiency by reducing collisions. When dot11RAWOptionActivated is true, an AP may allocate a medium access interval called RAW (Restricted Access Window) for a group of STAs within a beacon interval or short beacon interval (see 10.1.3.10.2) and broadcast this information using S1G Beacon frame.

An AP may allocate more than one RAW by including more than one RAW Assignment field in the RPS element within a beacon interval or short beacon interval with different RAW parameters. The AP may also assign periodic RAWs to a group of TIM STAs where the periodicity information is indicated in the RPS element (see 8.4.2.188 (RPS element)).

**9.22.5.8 Periodic RAW (PRAW) operation**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

PRAW allocation may be indicated by an RPS element included in S1G Beacon frames and/or Probe Response frames. Once a PRAW is allocated, the allocation indication is broadcasted by the AP such that every TIM STA can identify the allocation of PRAW. However, it is not necessary for an AP to indicate the PRAW allocation in every S1G Beacon frame transmitted in the beacon interval or short beacon interval for which PRAW is allocated. The parameters in the RAW Assignment subfield for PRAW shall not be changed until updated PRAW information is broadcasted. A non-AP STA updates the PRAW information and accesses the channel according to the parameters in the RAW Assignment subfield of the PRAW indicated by the Periodic Operation Parameters subfield of the most recently received RPS element.

**9.44.1 TWT overview**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

Target wake times (TWTs) allow STAs to manage activity in the BSS by scheduling STAs to operate at different times in order to minimize contention and to reduce the required amount of time that a STA utilizing a power management mode needs to be awake. STAs that request a TWT agreement are called TWT requesting STAs and the STAs which respond to their requests are TWT responding STAs. A TWT requesting STA is assigned specific times to wake and exchange frames with the TWT responding STA. A TWT requesting STA communicates wake scheduling information to its TWT responding STA and the TWT responding STA devises a schedule and delivers TWT values to the TWT requesting STA when a TWT agreement has been established between them. When explicit TWT is employed, a TWT requesting STA wakes and performs a frame exchange and receives the next TWT information in a response from the TWT responding STA. When implicit TWT is used, the TWT requesting STA calculates the Next TWT by adding a fixed value to the current TWT value. STAs need not be made aware of the TWT values of other STAs. The maximum number of active TWT agreements between any pair of STAs cannot exceed 8, since the TWT Flow Identifier field of the TWT element comprises 3 bits. TWT responding STAs may protect TWT times with protection mechanisms including, but not limited to NAV-setting frame exchanges. TWT responding STAs that are APs may additionally protect TWT times using RAW scheduling. TWT requesting STAs may wake at times other than TWT. An AP that is a TWT requesting STA shall not be in Doze state for a duration that exceeds the value of the dot11MaxAwayDuration during a beacon interval or short beacon interval, as defined in 10.2.2.20 (AP Power management),.

**9.49.1 SST Overview**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

An SST AP is an S1G AP with dot11SelectiveSubchannelTransmissionPermitted equal to true. During aperiodic SST operation, an SST AP indicates the set of enabled SST operating channels in an SST Operation element and the subset of SST channels that SST STAs are allowed to access during a beacon interval or short beacon interval (see 10.1.3.10.2) in the SST element that is transmitted in the S1G Beacon frame that initiates that interval. During periodic SST operation, an SST AP indicates the subset of SST channels that SST STAs are allowed to access during a beacon interval or short beacon interval in an RPS element that has a value of 1 in the Periodic RAW Indication subfield.

SST STAs operating in an SST BSS are allowed to transmit on an SST channel during a beacon interval or short beacon interval only if the channel is permitted for SST use as indicated by the SST AP in an SST element included in the S1G Beacon frame that initiates thatinterval or as indicated by an RPS element in the case of periodic SST operation.

**9.49.2 Aperiodic SST operation**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

An SST AP shall include the SST element in the S1G Beacon frame that immediately precedes a beacon interval or short beacon interval when it allows SST operation within that interval (see Figure 9-94 (Selective Subchannel Transmission channel transmission permission allocations from SST element)).

An SST STA may select one or more SST channels from the enabled SST operating channels as indicated in the SST Operation element transmitted by the SST AP with which it is associated. The SST STA may operate on those SST channels for the beacon interval or short beacon interval following a TBTT or TSBTT if a local S1G Beacon frame with an SST element indicating that a subset of the enabled SST channel(s) are allowed for SST operation has been received by the SST STA during that interval. The STA shall not transmit frames on the indicated allowed SST channels with a bandwidth that is greater than the Maximum Transmission Width specified in the SST element. If no local S1G Beacon frame is received following a TBTT or TSBTT, then no SST STA transmission is allowed during the beacon interval or short beacon interval that begins at that TBTT or TSBTT except on the primary channel of the BSS. If an SST STA receives a local S1G Beacon framewhich contains no SST element, the SST STA may transmit on the primary channel of the BSS a PPDU of width up to the BSS bandwidth indicated in the S1G Beacon frame during the beacon interval or short beacon interval that immediately follows the reception of the S1G Beacon frame.

An SST STA shall not transmit to the AP on an SST operating channel that is not indicated as allowed by the AP in the SST element. The set of allowed SST channels indicated by the AP in the SST element (#3134) is dynamic and can change every beacon interval or short beacon interval.

An SST AP shall not be away from the primary channel of the BSS for a duration of time that exceeds the value of the dot11MaxAwayDurationduring a beacon interval or short beacon interval, as defined in 10.2.2.20 (AP Power management),.

**9.49.3 Periodic SST Operation**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

During aperiodic SST operation, an SST AP signals explicit permission of SST STA transmissions during each single beacon interval or short beacon interval in which SST operation is activated by transmitting the SST element. During periodic SST operation, an SST AP signals permission of SST STA transmissions over multiple beacon intervals or short beacon intervals through the transmission of the RPS element with the Channel Indication Presence bit equal to 1 and the Periodic RAW Indication bit equal to 1.

Periodic SST operation shall follow the procedure in 9.49.2 (Aperiodic SST operation) with the additional requirement that the SST AP shall transmit at least one RPS element with the Channel Indication Presence bit set to 1 and the Periodic RAW Indication bit set to 1 preceding the first beacon interval or short beacon interval during which SST operation is permitted and no SST element shall be transmitted. The periodicity, validity, and start offset of the periodic SST operation are indicated in the Periodic Operation Parameters subfield of the RAW Assignment field of RPS element. When the RPS element is used to indicate a periodic SST sounding schedule, the RAW Type subfield of the RPS element is set to Sounding RAW and the RAW Type Options subfield of the RPS element is set to SST Sounding RAW.

**9.50.5.2 Procedure**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

Channel bandwidth for sector training shall be a width up to the BSS bandwidth indicated in the S1G Beacon frame during the beacon interval. The AP may transmit NDP CTS frames for sector sounding in parallel (e.g., with a value of S1G\_DUP\_2M for the TXVECTOR parameter FORMAT and a value of CBW8 for the TXVECTOR parameter CH\_BANDWIDTH in a BSS with an operating width of 8MHz). The Bandwidth Indication field in the sounding frames (in NDP\_2M CTS frame) and the Channel Indication field in the Sounding RAW shall comply with the TXVECTOR parameter CH\_BANDWIDTH.

**10.1.3.10.1 General**

**TGah Editor: *Change the paragraphs below as follows (#Ed):***

An S1G AP schedules an S1G Beacon frame at intervals given by the dot11BeaconPeriod or dot11ShortBeaconPeriod as described in 10.1.2.1 (TSF for infrastructure and PBSS networks). The Timestamp field of the S1G Beacon frame shall be set to the 4 least significant octets of the transmitting STA’s TSF timer at the time that the start of the data symbol, containing the first bit of the Timestamp field, is transmitted by the PHY plus the transmitting STA’s delays through its local PHY from the MAC-PHY interface to its interface with the WM.

An S1G Beacon frame scheduled at TSBTT that is not a TBTT may include the elements from the minimum set of elements shown in Table 8-49a (Minimum and full set of optional elements). An S1G Beacon frame scheduled at TBTT shall include the S1G Beacon Compatibility element as the first optional element and may include all the other elements from the full set of elements shown in Table 8-49a (Minimum and full set of optional elements). Note that the S1G Beacon Compatibility element replaces the following fields of the Beacon frame body: Timestamp, Beacon Interval and Capability Information which are not included in an S1G Beacon frame. The S1G Beacon Compatibility element shall be generated no later than the Timestamp field of the S1G Beacon frame that carries the element and not earlier than 231-1 microseconds. A STA can reconstruct the 8 octet TSF timer at the AP by concatenating the 4 octet TSF Completion field in the S1G Beacon Compatibility element with the Timestamp field in the S1G Beacon frame as described in 10.1.3.10.3 (TSF timer accuracy with S1G Beacon).

**10.1.3.10.2 Generation of S1G Beacon frames**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

In an infrastructure BSS, S1G Beacon frames shall be transmitted by an S1G AP. Each S1G STA in an IBSS shall transmit S1G Beacon frames. An AP with dot11ShortBeaconInterval equal to true shall further define the timing for the BSS by sending S1G Beacon frames according to the dot11ShortBeaconPeriod. The value for the dot11ShortBeaconPeriod shall be such that dot11BeaconPeriod = *n* x dot11ShortBeaconPeriod, where *n* is a positive integer. This defines a series of TSBTTs exactly dot11ShortBeaconPeriod TUs apart. If *n* is greater than 1, the Next TBTT field shall be present in S1G Beacon frames transmitted at TSBTT that is not a TBTT; otherwise it shall not be present in S1G Beacon frames. Time 0 is defined to be a TBTT or TSBTT with the S1G Beacon frame being a DTIM. At each TBTT or TSBTT, the AP shall schedule an S1G Beacon frame as the next frame for transmission. At each TBTT or TSBTT the AP should suspend the decrementing of the backoff timer for any pending non-beacon transmission and transmit the S1G Beacon frame according to the medium access rules specified in Clause 9 (MAC sublayer functional description). The beacon period is included in S1G Beacon and (Short) Probe Response frames, and a STA shall adopt that beacon period when joining the S1G BSS and S1G IBSS, i.e., the STA shall set its dot11BeaconPeriod to that beacon period. If dot11ShortBeaconInterval is equal to true, the short beacon period included in the Short Beacon Interval element shall be carried in an S1G Beacon and (Short) Probe Response frames. An S1G STA shall adopt that short beacon period when joining the S1G BSS or S1G IBSS, i.e., the STA shall set its dot11ShortBeaconInterval to true and its dot11ShortBeaconPeriod to that short beacon period.

**10.2.2.20 AP Power management**

**TGah Editor: *Change the paragraphs below as follows (#6094, 6096, 6131):***

The AP shall operate in active mode during a beacon interval or short beacon interval if the AP PM subfield in the S1G Beacon frame transmitted at the TBTT or TSBTT is equal to 0. Similarly, the AP shall operate in active mode during one or more RAWs defined by an RPS element with the RAW Assignment type equal to Generic RAW, Sounding RAW, Triggering Frame RAW or Simplex RAW with RAW Type Options equal to 1 or 2.

An AP that transmits an S1G Beacon frame whose AP PM subfield value is 1 should include an RPS element in the S1G Beacon frame that includes an omni RAW during which all STAs are allowed to access (i.e., the RPS element contains a RAW Assignment field with RAW Type field equal to 2 and RAW Type Options subfield equal to 2). The omni RAW may be used for association of new STAs. The AP that does not include the RPS element with the omni RAW, shall be awake for an amount of time not less than *BI* minus dot11MaxAwayDuration immediately following the S1G Beacon frame where *BI* is equal to the value of the beacon interval if dot11ShortBeaconInterval is false and is equal to short beacon interval if dot11ShortBeaconInterval is true.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6097 | Robert Stacey | 375.19 |  | "to obtain a fresh PN for each MPDU". This statement does not relate to the first part of the sentence. The first part of the sentence describes how the BPN is updated and not how the PN is formed. A fresh PN is obtained by virtue of the fact that the sequence number increases with each MSDU, the fragment number changes with each fragment of an MSDU and the BPN is changed according to the rules referenced above. All of these conditions are necessary. | Either delete "to obtain a fresh PN, so that the PN never repeats..." or clarify the conditions that ensure that in a fresh PN is generated per MPDU. | Accepted |

**11.4.3.3.1 General**

**TGah Editor: *Change the paragraph below as follows (#6097):***

For secure PV1 MPDUs, CCMP encrypts the payload of a plaintext MPDU and encapsulates the resulting cipher text using the following steps:

a) When the Sequence Number of the MPDU is less than the previous Sequence Number and satisfies the BPN update conditions in 11.4.3.2a (Construction of the CCMP Header for PV1 MPDUs) for that TID/ACI, increment the Base PN so that the PN never repeats for the same temporal key and TID/ACI. Note that retransmitted MPDUs are not modified on retransmission.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6132 | Alfred Asterjadhi | 1 | 1 | CIDs 5345 and 5123 of the previous LB205 was not incorporated in the draft because the instructions to the editor were not clear for such changes to be incorporated. Provide a clear comment resolution that addresses CID 5345. | As in comment. | Revised –  Agree in principle with the comment. Proposed resolution is to provide a clear comment resolution for CID 5345.  TGah editor to make the changes shown in 11-15/0266r0 under all headings that include CID 6132. |

***Discussion:*** CID 5345: **The comment was**: “*This subclause describes how an S1G AP and a non-AP set the STA Type Support field to define its station type or supported station types. However these terminologies are used across the draft also to define the signaling for certain features. But the terminology that is used to indicate the same thing differs from one subclause to another. For example in some cases the STA Type setting is used for such an indication, in certain cases whether the device is a sensor or non-sensor STA is used. This makes it confusing.”*

With proposed change:

“*Ensure that the same terminology for conditional support of certain features (depending on the STA Type Support field) across the draft is coherent and inline with the terminology defined in this subclause to avoid confusion. Same observation within this subclause as well.*”

**The proposed resolution was** “Revised” however the instructions to the editor were not clear enough to make the change.

8.4.2.28 EDCA Parameter Set element

**TGah Editor: *Change the table titles below as follows (#6132, Ed):***

Table 8-144—Default EDCA Parameter Set element parameter values if dot11OCBActivated is false or the STA is a non-sensor STA

Table 8-145a—Default EDCA Parameter Set element parameter values if the STA is a sensor STA

**TGah Editor: *Change the row below of Table 8-258a5 as follows (#6132, Ed):***

**Table 8-258a5—Subfields of the S1G Capabilities Info field**

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| --- | --- | --- |
| STA Type Support | If sent by an AP, this subfield indicates the STA types that are supported by the AP.  If sent by a non-AP STA, this subfield indicates the STA type of the non-AP STA. | If sent by an AP:  Set to 0 if the AP supports both sensor STAs and non-sensor STAs.  Set to 1 if the AP supports only sensor STAs.  Set to 2 if the AP supports only non-sensor STAs.  3 is reserved.  If sent by a non-AP STA:  Set to 1 if the STA is a sensor STA.  Set to 2 if the STA is a non-sensor STA.  0 and 3 are reserved. |

**9.24.1 Introduction**

**TGah Editor: *Change the paragraph below as follows (#6132):***

A DMG STA shall support the HT-immediate block ack extension. A DMG STA shall not use the HT-delayed block ack extension. An S1G STA that sets the STA Type Support subfield in a transmitted S1G Capabilities element to 0 or 2, as described in 10.48.7 (S1G BSS type and STA type)), shall support the HT-immediate block ack extension. An S1G STA that sets the A-MPDU Supported field in the S1G Capabilities element to 1 shall support the HT-Immediate block ack extension. An S1G STA that sets the HT-Delayed Block Ack field in the S1G Capabilities element to 1 shall support the HT-delayed block ack extension.

**10.48.7 S1G BSS type and STA type**

**TGah Editor: *Change this subclause as follows (#6132):***

S1G non-AP STAs are categorized into two types, sensor STAs and non-sensor STAs.

A non-AP STA that is a sensor STA shall set the STA Type Support subfield in the S1G Capabilities element it transmits to 1. A non-AP STA that is a non-sensor STA shall set the STA Type Support subfield in the S1G Capabilities element it transmits to 2.

There are three types of S1G BSS that an S1G AP can set up: sensor BSS, non-sensor BSS, or mixed BSS. A sensor BSS only supports sensor STAs. A non-sensor BSS supports only non-sensor STAs. A mixed BSS supports both sensor STAs and non-sensor STAs.

An AP may declare a non-sensor BSS by transmitting the S1G Capabilities element in Beacon frames or (Short) Probe Response frames in which the STA Type Support subfield is 2 (i.e., it indicates that only non-sensor STAs are allowed to associate and operate with that AP).

An AP may declare a sensor BSS by transmitting the S1G Capabilities element in Beacon frames or (Short) Probe Response frames in which the STA Type Support subfield is 1 (i.e., it indicates that only sensor STAs are allowed to associate and operate with that AP).

An AP may declare a mixed BSS by transmitting the S1G Capabilities element in a Beacon or a (Short) Probe Response frame in which the STA Type Support subfield is 0 (i.e., it indicates that any type of STA is allowed to associate and operate with that AP).

An S1G AP that indicates support for sensor STAs shall not indicate minimum MCS restrictions.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 6211 | Joseph Levy |  | 9.3.2.7 | When a STA receives a RTS addressed to it, it shall reset its RID counter as specified in 238.45; In this case, the checking of RID counter is not meaningful, because RID counter has already been reset, which may lead to incorrect conclusion of "NAV indicates idle" | Inset the phrase "before receiving the RTS frame" after the phrase "NAV indicates idle" in 241.54 and 242.4. | Rejected –  As indicated by the comment the RID counter is always reset by a STA that receives an RTS frame addressed to it. Hence, in these cases, it is the NAV counter that determines whether the “NAV indicates idle” or not. The addition of the RID counter in this declarative statement is to clarify that the S1G STA has two counters to check (RID counter and NAV counter). Additionally please note that the proposed change is technically not correct because the NAV idle check is performed at the end of the reception of the RTS frame not before receiving the RTS frame as suggested by the proposed change. |