IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Miscellaneous Part 1 | | | | |
| Date: 2015-12-05 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Alfred Asterjadhi | Qualcomm Inc. | 5775 Morehouse Dr, San Diego, CA 92109 | +1-858-658-5302 | aasterja@qti.qualcomm.com |
| Naveen Kakani | Qualcomm Inc. | 2100 Lakeside Boulevard, Suite 475, Richardson TX 75082 | +1-940-594-5522 | nkakani@qti.qualcomm.com |

Abstract

This submission proposes resolutions for multiple comments related to TGah D5.0 (17 CIDs):

* 8054, 8064, 8073, 8141, 8143, 8181, 8300, 8183, 8283
* 8324, 8326, 8479, 8029, 8487, 8166, 8206, 8281

Revisions:

* 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.***

# PARS I

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 8054 | Stephens, Adrian | 72.42 | "The SCRAMBLER\_OR\_CRC is present"  Editorial nit, missing "parameter". Bigger nit, this parameter conflates two unrelated purposes. | Split the parameter into two separate parameters and describe them separately. Don't forget missing "parameter" after the name of the parameter in text. | Revised –  Agree that the “parameter” is missing after the text. Note that the parameter provides signaling from the PHY to the MAC regarding a transmitted frame that is used by the MAC to determine whether a received response, after SIFS, is intended for the transmitter. When the transmitted frame is an NDP PS-Poll this information is the CRC of the frame, and when the frame is a non-NDP frame this information is the SCRAMBLER. Hence, the parameter provides information used for the same purpose. Proposed resolution provides better clarifications for this.  TGah editor: Replace the last paragraph of the subclause with:  “The SCRAMBLER\_OR\_CRC parameter is present if dot11S1GOptionImplemented is true. The value of SCRAMBLER\_OR\_CRC parameter depends on the type of the transmitted frame:  —When transmitting a non-NDP frame the value of the SCRAMBLER\_OR\_CRC parameter is the Scrambler Initialization value in the Service field after scrambling (i.e., [B0:B6] of the Service field]) (as defined in 24.3.9.2 (SERVICE field)) of the frame.  —When transmitting an NDP CMAC frame the value of the SCRAMBLER\_OR\_CRC parameter is the calculated CRC value in the SIG/SIG-A field (as defined in 24.3.8.2.1.5 (CRC calculation for S1G SIG-A fields)):   * When the frame is an NDP\_1M CMAC frame the value of SCRAMBLER\_OR\_CRC parameter is equal to [B26:B29] of the SIG field * When the frame is an NDP\_2M CMAC frame the value of SCRAMBLER\_OR\_CRC parameter is equal to [B38:B41] of the >=2 MHz SIG-A field. |
| 8064 | Stephens, Adrian | 83.49 | "In a frame that is a fragment: When both the originator and the addressed recipient support the fragment BA procedure, the addressed recipient returns an NDP BlockAck frame after a SIFS, according to the procedure defined in 9.3.2.10a (Fragment BA procedure)"   1) In a set of alternatives, it is always better to label the last one "otherwise". As it happens this condition has a logical error in the case that the frame is not an A-MPDU, nor VHT single MPDU and it is not fragmented.  2. This requires non-S1G STAs to transmit NDP Block Ack frames. | Change the conditions so that: 1. All conditions are described 2. Only S1G STAs are described by the new text.  Recommend changing the condition to "In frame containing a fragmented MSDU transmitted by an S1G STA", and move it above the old "otherwise". Then undo the changes to the old "otherwise" condition. | Revised –  Agree in principle with the commenter. Note that it is specified only for S1G STAs in 9.3.2.10. Proposed resolution accounts for the proposed changes in 1.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8064. |
| 8073 | Stephens, Adrian | 102.14 | "wherein the calculation fields is the SSID field in the S1G Beacon frame" Multiple problems: 1) grammar; 2) there is no SSID field in the S1G Beacon frame; 3) use of italics is frowned on. | Change to "calculated over the SSID" | Revised –  Agree in principle with the commenter. Proposed resolution accounts for the proposed changes. Regarding the italics, they are not changed to keep consistency with REVmc D4.0. Since the same terminology is used for Short Probe Response frames we propose the same resolution to that terminology used in 8.8.5.3 as well.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8073. |
| 8079 | Stephen Adrian | 106.46 | "In frames transmitted by an S1G STA, " -- this creates a conflict with unqualified statements in the baseline.  This issue occurs multiple times in this subclause. | Either:  1) show the baseline and qualify it "non-S1G"  2) insert before the baseline para, and insert "otherwise". Consider structuring the alternatives as a list. | Accept: Adding "non-SIG" in baseline.  Add the following text: Change to baseline.  In frames transmitted by an non-S1G STA, the MCS Selector field value 2 indicates the MCS Index field specifies an index value that is taken  In frames transmitted by an non-S1G STA, the MCS Selector field value 3 indicates that the MCS Index field specifies values that are taken from  Table 22-30 (VHT-MCSs for mandatory 20 MHz, NSS = 1) to Table 22-37 (VHT-MCSs for optional 20  MHz, NSS = 8), indicating a VHT-MCS for a 20 MHz channel width.  In frames transmitted by an non-S1G STA, the MCS Selector field value 4 indicates that the MCS Index field specifies values that are taken from  Table 22-38 (VHT-MCSs for mandatory 40 MHz, NSS = 1) to Table 22-45 (VHT-MCSs for optional 40  MHz, NSS = 8), indicating a VHT-MCS for a 40 MHz channel width.  In frames transmitted by an non-S1G STA, the MCS Selector field value 5 indicates that the MCS Index field specifies values that are taken from  Table 22-46 (VHT-MCSs for mandatory 80 MHz, NSS = 1) to Table 22-53 (VHT-MCSs for optional 80  MHz, NSS = 8), indicating a VHT-MCS for an 80 MHz channel width.  In frames transmitted by an non-S1G STA, the MCS Selector field value 6 indicates that the MCS Index field specifies values that are taken from  Table 22-54 (VHT-MCSs for optional 160 MHz and 80+80 MHz, NSS = 1) to Table 22-61 (VHT-MCSs for  optional 160 MHz and 80+80 MHz, NSS = 8), indicating a VHT-MCS for a 160 MHz or 80+80 MHz channel  width. |
| 8141 |  | 206.06 | "The general format of the Frame Control field of the PV1 MAC header is illustrated in Figure 8-728 (Frame Control field)except for the least significant octet of the Frame Control field of Short Probe Response frames" -- actual it is the most significant octet that differs. | At cited location, change "least" to "most". | Accepted |
| 8143 | Stephens, Adrian | 262.36 | "NOTE--Support for a <S1G-MCS, NSS> tuple at a given bandwidth implies support for long GI" -- this note has nothing to do with the receding para. | Move note to a subclause on support for different flavours of GI. | Rejected –  The receding paragraph states that a STA shal not use an <S1G-MCS, NSS> tuple and BW that is not supported by the receiving STA(s), quoting:  “An S1G STA shall not, unless explicitly stated otherwise, transmit an S1G PPDU unless the <S1G-MCS, NSS> tuple and bandwidth used are in the Rx Supported S1G-MCS and NSS Set of the receiving STA(s).”  While the note clarifies that the support for this tuple at a given BW implies support for long GI. Hence, it is related to the receding paragraph because of the <S1G-MCS, NSS> tuple and bandwidth. |
| 8181 | Stephens, Adrian | 377.55 | Frame formats go in clause 8. | Move Figure 9-105 and 9-106 into clause 8. | Revised –  Agree with the commenter. Actually the Figures can already be found in clause 8 as Figure 8-753 and 8-754. Hence, the proposed resolution is to remove these figures and place crossreferences to the existing figures in clause 8.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8181. |
| 8300 | Montemurro, Michael | 337.36 | What operations does a STA perform when it makes use of Bitmap Protection. What is it protecting against? | Add more descriptive text to describe how the transmitter uses the feature; how the receiver uses the feature; and once the feature is signaled, what happens? | Revised –  Agree in principle with the commenter that some descriptive text would be useful to help the reader. Note that the operation at the transmitter (i.e., the originator) and the receiver (recipient) are already described in the subclause.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8300. |
| 8183 | Stephens, Adrian | 343.34 | "may update the portion of its local TSF that corresponds to the received timestamp information by replacing those bits of its local TSF timer" -- this is a misleading statement, because it implies a simplistic implementation. An implementation would need to check for an update that caused a large delta in local TSF time to determine that a higher order bit had changed. | Reword thus: "may update the its local TSF using the received portions of the AP's TSF. " | Revised –  Agree in principle with the commenter. Proposed resolution accounts for the suggested changes.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8183. |
| 8283 | Fischer, Matthew | 352.61 | The paragraph beginning with "An S1G STA shall set the Poll Type subfield in the Frame Control field" does not belong here - it includes a definite reference to a PS-Poll frame and that discussion took place in the previous subclause. | Move the cited paragraph to the previous subclause 10.2.2.1 where discussion of PS-Poll transmission takes place. | Revised –  Agree with the commenter. Proposed resolution accounts with the suggested change, providing specific location where to move the paragraph.  TGah editor: Split the paragraph in P351L31 into two paragraphs, with the 2nd paragraph starting from the sentence “An S1G STA may transmit NDP PS-Poll frames…” Then move the paragraph cited by the commenter immediately at the start of the newly created 2nd paragraph. |

**Discussion: *None.***

**TGah Editor: *Change the second row of Table 8-9 as follows (#8064) (Note the change in the editing instruction):***

|  |  |  |
| --- | --- | --- |
| * Ack Policy subfield in QoS Control field of QoS Data frames | | |
| Bits in QoS Control field | | Meaning |
| Bit 5 | Bit 6 |
| 0 | 0 | Normal Ack or Implicit Block Ack Request.  In a frame that is a non-A-MPDU frame or VHT single MPDU where either the originator or the addressed recipient does not support fragment(#MDR) BA procedure:  The addressed recipient returns an Ack or QoS +CF-Ack frame after a short interframe space (SIFS) period, according to the procedures defined in 9.3.2.9 (Ack procedure) and 9.22.3.5 (HCCA transfer rules). A non-DMG STA sets the Ack Policy subfield for individually addressed QoS Null (no data) frames to this value.  In a non-A-MPDU frame or VHT single MPDU containing a fragment where both the originator and the addressed recipient support the fragment BA procedure:  The addressed recipient returns an NDP BlockAck frame after a SIFS, according to the procedure defined in 9.3.2.10a (Fragment BA procedure).  Otherwise:  The addressed recipient returns a BlockAck frame, either individually or as part of an A-MPDU starting a SIFS after the PPDU carrying the frame, according to the procedures defined in 9.3.2.10 (Block ack procedure), 9.24.7.5 (Generation and transmission of BlockAck frames by an HT STA, or DMG STA or S1G STA), 9.24.8.3 (Operation of HT-delayed block ack), 9.28.3 (Rules for RD initiator), 9.28.4 (Rules for RD responder), and 9.32.3 (Explicit feedback beamforming). |

* S1G Beacon frame format

**TGah Editor: *Change the paragraph below as follows (#8073):***

The Compressed SSID field is present if the Compressed SSID Present field in the Frame Control is 1 and indicates a 32-bit CRC calculated over the SSID contained in the S1G Beacon frame (calculation is performed as defined in 8.2.4.8 (FCS field) where the SSID is the *calculation fields*). Otherwise, it is not present.

* Short Probe Response frame format

**TGah Editor: *Change the paragraph below as follows (#8073):***

The Compressed SSID field is present if the Full SSID Present field in the Frame Control field is 0 and it contains a 32-bit CRC calculated over the SSID contained in the Probe Response frame or S1G Beacon frame (calculation is performed as defined in 8.2.4.8 (FCS field) where the SSID is the *calculation fields*). An SSID element is not present if the Full SSID Present field in the Frame Control field is 0.

* Bitmap Protection for NDP BlockAck frames

**TGah Editor: *Insert the paragraph below as follows (#8300):***

NDP BlockAck frames are protected by the 4 bit CRC of the S1G SIG-A field, which might not be enough to protect the BlockAck Bitmap field contained in the frame. This subclause describes a mechanisn that offers increased protection for the BlockAck Bitmap field of NDP BlockAck frames.

**TGah Editor: *Change the paragraph below as follows (#8181):***

The originator of an NDP BlockAck (NDP\_1M BlockAck or NDP\_2M BlockAck) frame (see 8.9.2.6 (NDP BlockAck)) shall protect the BlockAck Bitmap field of the NDP BlockAck frame (shown in Figure 8-753 (NDP CMAC frame body field of the NDP\_1M BlockAck frame) ) and Figure 8-754 (NDP CMAC frame body field of the NDP\_2M BlockAck frame)) by using the encoding procedure defined in this subclause.

**TGah Editor: *Remove Figure 9-105 and 9-106 (#8181).***

**TGah Editor: *Change the paragraphs below as follows (#8300):***

Initially the bit sequences [B3: B10] for NDP\_1M BlockAck and [B3:B18] for NDP\_2M BlockAck frames are set as described in 9.24.7.5 (Generation and transmission of BlockAck frames by an HT STA, or DMG STA or S1G STA) or 9.3.2.10a (Fragment BA procedure). Then, prior to transmission, the originator encodes the bit sequences following the procedure below.

Encoding Procedure:

For an NDP\_1M BlockAck frame:

• [B3: B10] = XOR([B3: B10], [B17: B24]);

For an NDP\_2M BlockAck frame

* [B3: B18] = XOR([B3: B18], [B21: B36]);

The intended recipient shall perform the same procedure to decode the bit sequences [B3: B10] for NDP\_1M BlockAck and [B3:B18] for NDP\_2M BlockAck frames.

**10.1.2.1 TSF for infrastructure and PBSS networks**

**TGah Editor: *Change the paragraph below as follows (#8183):***

A STA that receives a frame from its currently associated AP containing a Tetrapartial Timestamp or a Pentapartial Timestamp field may update its local TSF using the received portions of the AP’s TSF timer contained in the received field, following the procedure described in 10.1.3.10.3 (TSF timer accuracy with S1G Beacon).

# PARS II

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 8324 | Wang, Xiaofei | 235.08 | The language in "An S1G STA that receives an EDCA Parameter Set element shall update its MIB values of the EDCA parameters if the value of the element's STA Type subfield includes the STA's type (see 10.50.7 (S1G BSS type and STA type))." is rather akward. In addition, this sentence should be moved to after the next sentence since the next sentence is on the general case. | Change "An S1G STA that receives an EDCA Parameter Set element shall update its MIB values of the EDCA parameters if the value of the element's STA Type subfield includes the STA's type (see 10.50.7 (S1G BSS type and STA type)). QoS STAs update the MIB attributes and store the EDCA Parameter Set update count value in the QoS Info field." into " QoS STAs update the MIB attributes and store the EDCA Parameter Set update count value in the QoS Info field. An S1G STA shall update its MIB values of the EDCA parameters if its STA type is indicated by the STA Type subfield contained in the received EDCA Parameter Set element (see 10.50.7 (S1G BSS type and STA type))." | Accepted |
| 8326 | Wang, Xiaofei | 235.34 | Since it is defined in 9.22 that a S1G STA is a QoS STA, there is no need to use the term S1G QoS AP. | Remove "QoS" from "S1G QoS AP" | Accepted |
| 8479 | Asterjadhi, Alfred | 354.53 | "Upon receiving a PS-Poll+BDT frame with the More Data field equal to 0, the S1G AP that intends to respond with immediate Data frames may use the RTS/CTS scheme to send buffered data until it transmits a frame with MORE DATA equal to 0 or until the duration of the exchange, including the initial PS-Poll+BDT frame reaches the TXOP limit whichever comes first."  PS Poll+BDT is transmitted within BDT context. As such this sentence need to be moved to 9.47 | Move the cited text to subclause 9.47 (Bidirectional TXOP). | Revised –  Agree in principle and proposing specific instructions to the editor.  TGah editor:  Delete the cited text on Page 354 and add the following text to  Page 310 at line 6:  "Upon receiving a PS-Poll+BDT frame with the More Data field equal to 0, the S1G AP that intends to respond with immediate Data frames may use the RTS/CTS scheme to send buffered data until it transmits a frame with MORE DATA equal to 0 or until the duration of the exchange, including the initial PS-Poll+BDT frame reaches the TXOP limit whichever comes first." |
| 8029 | Stephens, Adrian | 3.10 | Having a VHT single MPDU apply also to S1G is a poor idea, because an S1G STA is not a VHT STA. | Either define an S1G single MPDU and use it whenever VHT single MPDU occurs in the standard, or create a new neutral term for a single MPDU transported using the A-MPDU mechanism and use throughout 802.11. | Revised –  Agree in principle with the commenter. Proposed resolution accounts for the suggested changes (the second option).  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8029. |
| 8487 | Levy, Joseph | 3.9 | While it is probably expedient to use the existing VHT Single MPDU definition as an S1G definition. This is a very confusing thing to do. It would be much simpler in my view to simply define a S1G Single MPTDU. This would also clarify much of the text describing S1G operation, without confusing the reader with VHT references. | Remove the insertion of sub 1 GHz (S1G) from the existing VHT single MPDU definition and add the following definition: sub 1 GHz (S1G) single medium access control (MAC) protocol data unit (S1G single MPDU): An MPDU that is the only MPDU in an aggregate MPDU (A-MPDU) carried in an sub 1 GHz (S1G) physical layer (PHY) protocol data unit (PPDU) and that is carried in an A-MPDU subframe with the EOF subfield of the MPDU delimiter field equal to 1. | Revised –  Agree in principle with the commenter. Proposed resolution is the same as for CID 8029 which suggests as an option for resolution to define a neutral term for this construct.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8487. |
| 8166 | Stephens, Adrian | 266.36 | "S1G PPDU isgreater than 511 octets." -- I dislike magic numbers because they provide no insight as to the reason behind them. | Create a named PHY attribute for this number and reference it by name here. | Revised –  Agree in principle with the commenter. Proposed resolution accounts for the suggested changes.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8166. |
| 8206 | Lepp, James | 5.62 | Why does a sensor STA have to meet a certain profile? | Remove the profile from the description. Describe those properties as being optimized by the protocol. | Revised –  Agree in principle with the commenter that the term “profile is ambiguous. Proposed resolution is to clarify such aspect by specifying that it has certain traffic and device characteristics.  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8206. |
| 8281 | Fischer, Matthew | 80.10 | Undefined term: Where is S1G RTS defined? Is this an RTS with TX VECTOR FORMAT parameter value S1G\*? The draft does not say this anywhere. | Include a blanket statement that says that any PPDU or maybe any BLAH frame transmitted with TX VECTOR parameter FORMAT equal to S1G\* is an S1G BLAH | Revised –  Proposed change is to keep consistent the terminology of this item with the previous ones (i.e., using TXVECTOR parameter in the description. However, note that the blanket statement is already present in 8.2.4.1.1:  “The Control frames carried by S1G PPDUs are called S1G Control frames.”  TGah editor to make the changes shown in 11-15/1531r0 under all headings that include CID 8281. |

**3.1 Definitions**

**TGah Editor: *Change the paragraph below as follows (#8029, 8487):***

**Single medium access control (MAC) protocol data unit (S-MPDU):** An MPDU that is the only MPDU in an aggregate MPDU (A-MPDU) carried in an A-MPDU subframe with the EOF subfield of the MPDU delimiter field equal to 1.

***Replace “[a] VHT Single MPDU” with “[an] S-MPDU” throughout the draft (#8029, 8487).***

**3.4 Abbreviations and acronyms**

**TGah Editor: *Insert the acronym below (#8029, 8487):***

S-MPDU single MAC protocol data unit

**TGah Editor: *Change the last 3 rows of Table 24-37 as follows (#8166):***

Table 24-37—S1G PHY characteristics

|  |  |
| --- | --- |
| aPPDUMaxTime | 27,920 s (see NOTE 1) |
| aPSDUMaxLengthWithNoAggregation | 511 octets (see NOTE 2) |
| aPSDUMaxLength | 797159 octets (see NOTE 3) |
| NOTE 1—This is the maximum PPDU duration in s for an S1G\_1M PPDU with a bandwidth of 1 MHz, S1G-MCS10 and 1 spatial stream, limited by PSDU length of 511 octets.  NOTE 2—This is the maximum PSDU length in octets for an S1G PPDU supported by the Length field in the S1G SIG field when the Aggregation field is 0.  NOTE 3—This is the maximum length in octets for an S1G SU PPDU with a bandwidth of 16 MHz, S1G-MCS9 and 4 spatial streams, limited by 511 data symbols supported by the Length field in the S1G SIG field, excluding the SERVICE field and tail bits. | |

**9.13.5 Transport of A-MPDU by the PHY data service**

**TGah Editor: *Change the paragraph below as follows (#8166):***

An S1G STA shall set the TXVECTOR parameter AGGREGATION to 1 when the length of the PSDU to be carried in the S1G PPDU is greater than aPSDUMaxLengthWithNoAggregation.

**TGah Editor: *Change the paragraph below as follows (#8206):***

**sensor station (STA):** A sensor STA is a sub 1 GHz (S1G) non-access point (AP) STA that has certain traffic and device characteristics (e.g., limited payload size, limited traffic volume, battery operated device, etc.) and is allowed to associate with an AP that transmits a Beacon or a (Short) Probe Response frame containing the S1G Capabilities element with the STA Type Support subfield equal to 0 or 1.

**TGah Editor: *Change the paragraph below as follows (#8281):***

The Order field is 1 bit in length. ~~It is used for two purposes~~ The setting of the Order field is as follows:

* It is set to 1 in a non-QoS Data frame transmitted by a non-QoS STA to indicate that the frame contains an MSDU, or fragment thereof, that is being transferred using the StrictlyOrdered service class.
* It is set to 1 in a QoS Data or Management frame transmitted with a value of HT\_GF, HT\_MF, ~~or~~ VHT, or S1G for the FORMAT parameter of the TXVECTOR to indicate that the frame contains an HT Control field.
* It is set to 1 in an RTS frame transmitted with a value of S1G for the FORMAT parameter of the TXVECTOR to indicate that the intended recipient of the frame has permission to extend the TXOP as described in 9.51.5.4 (Relay-shared TXOP protection mechanisms).

Otherwise, the Order field is set to 0.