IEEE P802.11
Wireless LANs

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| LB 203 Comment Resolution for 9.53, 8.4.2.170w, 9.12, and part of 9.49 |
| Date: 2014-08-01 |
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Abstract

This submission proposes resolutions for comments in clause 9.53, 8.4.2.170w, 9.12, and partially of 9.49 of TGah Draft 2.0 with the following CIDs (TOT 16 CIDs):

* 4170, 3973
* 3143, 3850, 4016, 4195
* 3734, 3735
* 3667, 3668, 3840, 3841, 4100
* 3375, 4152, 4153

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** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4170 | 247.51 | 9.12.1 | "The values of the Protocol Version field in the Frame Control field of the MPDUs contained in an A-MPDU shall be the same."The PV1 frame does not have the Duration field. If PV0 frame and PV1 frame are aggregated in the single A-MPDU, the STA can transmit the PV1 PPDU more effectively. Because the duration of the PV1 frame can be derived from the PV0 frame. | Allow to aggregate the MPDUs having the different Protocol Version into the single A-MPDU. | Rejected –The comment does not identify a technical issue. Mixing protocol versions in a single A-MPDU may complicate the implementation, for little perceived benefit. Setting a NAV through an A-MPDU is unreliable because an A-MPDU will typically be transmitted at a higher rate that is not a basic rate. |
| 3973 |  | 9.12.4 | It is necessary to specify a rule of A-MPDU aggregation of group addressed Data frames for an S1G STA. | 1) Insert a following note after NOTE 2 (P1241L8 of P802.11mc D2.5)---NOTE 3 -- An S1G AP can transmit an A-MPDU containing MPDUs with a group addressed RA.2) Insert following texts as new bullets at the end of the last paragraph.---- If the PPDU is an S1G PPDU, the value of maximum A-MPDU length exponent that applies is the minimum value in the Maximum A-MPDU Length Exponent subfields of the S1G Capabilities Info field of the S1G Capabilities elements across all S1G STAs associated with the transmitting AP.- If the PPDU is an S1G PPDU, the value of minimum MPDU start spacing that applies is the maximum value in the Minimum MPDU Start Spacing subfields of the S1G Capabilities Info field of the S1G Capabilities elements across all S1G STAs associated with the transmitting AP. | Accepted |

**Discussion:** *None.*

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3143 | 312.53 | 9.53 | The S1G STA does not have to postpone all transmissions to the recipient of the Header compression request. Rather it has to postpone the transmission of frames with a particular TID and that do not include A3 and/or A4. Also note that PV1 Data frames contain a PTID field of 3 bits. Make sure the singaling is consistent. | Insert " that do not include the fields requested to be stored for the indicated TID" immediately after "Short frames". | Revised –Agree in principle with the commenter. Proposed resolution accounts for the suggested change. Regarding the PTID note that this is the 3 LSBs of the TID so the signalling is consistent. In addition we also clarify that the TID field also contains the ACI value when the header compression is related to transmissions of PV1 QMF frames.TGah editor to make the changes shown in 11-14/1066r0 under all headings that include CID 3143. |
| 3850 | 312.22 | 9.5 | The header compression procedure can't be used for 4-address frame. | Update the header compression procedure. | Revised --The header compression procedure is used in general for any PV1 frame, including the 4-address frame which contains DA in Address 3 and SA in Address 4. Using the header compression procedure it is possible to indicate the receiver to store A3 and A4 so that the transmitter does not need to include A3 and A4 in the frames it transmits. So there is no inconsistency in this subclause. But there is some normative text missing in Subclause 9.49 (Relay operation) that would clarify this aspect. Proposed resolution adds the normative text in Subclause 9.49 (Relay operation).TGah editor to make the changes shown in 11-14/1066r0 under all headings that include CID 3850. |
| 4016 | 311.26 | 9.53 | dot11ShortMACHeaderImplemented should be dot11ShortMACHeaderOptionImplemented | Replace all instances of dot11ShortMACHeaderImplemented with dot11ShortMACHeaderOptionImplemented | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1066r0 under all headings that include CID 4016. |
| 4195 | 313.6 | 9.53 | It is mentioned that the CCMP Update present field is equal to 0 which means that the Header Compression Response frame does not carry the CCMP Update field. In fact CCMP Update present field is never present in Header Compression Response frame. How is the TID of the received Short frame indicated then? | Please clarify. | Revised –Agree with the comment. Proposed resolution clarifies that the CCMP Update field is present in the header compression response. TGah editor to make the changes shown in 11-14/1066r0 under all headings that include CID 4195. |

**Discussion:** *None.*

* **Header Compression procedure**

**TGah Editor: *Change the paragraph below as follows (#4016):***

The Header Compression procedure enables S1G STAs to store addresses and/or update security parameters at the receiver. An S1G STA with dot11ShortMACHeaderOptionImplemented equal to true may include a Header Compression element in (Re) Association Request frames, (Re) Association Response frames and in Header Compression frames. After association, an S1G STA with dot11ShortMACHeaderOptionImplemented equal to true may transmit Header Compression frames and Short frames. A non-S1G STA shall not transmit Header Compression frames or Short frames.

NOTE- A Short frame is an MDPU with Protocol Version field in the Frame Control field equal to 1 (see 8.8 (MAC frame format for Short frames)).

The header compression procedure uses a Header Compression element, which is referred to as a Header Compression request or a Header Compression response, depending on the Request/Response subfield setting of the Header Compression element.

An S1G STA indicates a request to store address fields by sending a Header Compression request with the Store A3 and/or Store A4 subfields equal to 1. Upon receipt of such a request, the receiving STA shall respond with a Header Compression response indicating which of the optional fields it stores. Stored address fields can subsequently be omitted from the MAC header of Short frames transmitted by the STA that sent the Header Compression request.

An S1G STA indicates a request to update security parameters by sending a Header Compression request with the CCMP Update subfield equal to 1. The receiver STA shall respond with a Header Compression response acknowledging receipt of the updated security parameters.

**TGah Editor: *Change the paragraph below as follows (#3143):***

After sending a Header Compression request, an S1G STA shall postpone the transmission of Short frames that do not include the fields that were requested to be stored to the recipient of the Header Compression request until it receives the corresponding Header Compression response.

After receiving a Header Compression request, an S1G STA shall store and activate the included addresses it intends to store and/or the security information included in the Header Compression request before transmitting the corresponding Header Compression response.

When no Header Compression response has been received in response to a Header Compression request within dot11HeaderCompressionResponseTimeout, an S1G STA shall transmit another Header Compression request.

**TGah Editor: *Change the paragraphs below as follows (#4195, 3143):***

A STA that receives a Short frame with one or more compressed addresses that it has not stored or which causes a decryption error should transmit an unsolicited Header Compression response to the transmitter of the Short frames, in which the Store A3, and Store A4 fields are all equal to 0. The unsolicited Header Compression response shall include the TID/ACI of the received Short frame in the TID/ACI subfield of the CCMP Update field if the received frame caused a decryption error.

A STA that receives an unsolicited Header Compression response shall transmit a Header Compression request to the transmitter of the Header Compression response. The Header Compression request shall include all the addresses that the transmitting STA requests to be stored at the receiver and/or the security information that corresponds to the indicated TID/ACI.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3734 | 171.12 | 8.4.2.170w | A3 and A4 are not accurate: A3 being not in a frame, A4 being in the frame make no sense. Actually A3 should be DA and A4 should be SA. | Change A3 to DA and A4 to SA through the draft in this subclause and other places if necessary. | Rejected –The comment fails to identify an issue. The Header Compression element contains the A3 field and the A4 field, which presence is indicated by signalling that is self-contained within the element. Hence, there is no ambiguity in the signalling itself. Neither there is ambiguity in the terminology as the description of the content of the fields is already clear in this subclause and is inline with the normative behaviour that is defined in the Header compression procedure (where it is indicated that A3 and/or A4 fields on frames transmitted after setting up the procedure can be omitted because of storage at the receiver) and in the other respective subclauses corresponding to different procedures (for example in relay operation there are CIDs (e.g., 3735) asking to clarify this aspect.).  |
| 3735 | 171.4 | 8.4.2.170w | This definition is not enough for relay header compression. | Change this element or define another element for relay header compression. | Revised –This element is sufficient for header compression in relay operation. What is missing is the normative behaviour under the Relay operations subclause. Proposed resolution is to add the corresponding behaviour in Subclause (9.49 (Relay operation)).TGah editor to make the changes showin in 11-14/1066r0 under all headings that include CID 3735.  |

**Discussion:** *Note that there are no changes to subclause 8.4.2.170w (Header Compression element) because of these CIDs. Changes are made to subclause 9.49(Relay operation) to resolve CIDs therein which resolution also resolves CID 3735. See resolutions below.*

* Header Compression element

The Header Compression element is used by a STA to inform its intended receiver regarding information it needs to store. The format of the Header Compression element is illustrated in Figure 8-575a50 (Header Compression element format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | HeaderCompressionControl | A3 (optional) | A4 (optional) | CCMP Update (optional) |
| Octets: | 1 | 1 | 1 | 0 or 6 | 0 or 6 | 0 or 5 |

* Header Compression element format

The Element ID and Length fields are defined in 8.4.2.1 (General).

The Header Compression Control field is 1 octet and is illustrated in Figure 8-575a51 (Header Compression Control field(#3937, 3281, 3649)).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 B7 |
|  | Request/ Response | Store A3 | Store A4 | CCMP Update Present | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 4 |

* Header Compression Control field(#3937, 3281, 3649)

The Request/Response subfield is set to 0 to indicate a Header Compression request and set to 1 to indicate a Header Compression response.

The Store A3 subfield is set to 1 to request the intended receiver of the Header Compression request to store the A3 field. It is set to 1 in the Header Compression response to confirm storing of the A3 field. Otherwise, it is set to 0 to indicate either no storage request or unsuccessful storage response of the A3 field.

The Store A4 subfield is set to 1 to request the intended receiver of the Header Compression request to store the A4 field. It is set to 1 in the Header Compression response to confirm storing of the A4 field. Otherwise, it is set to 0 to indicate either no storage request or unsuccessful storage response of the A4 field.

**TGah Editor: *Change the paragraph below as follows (#4195, 3143):***

The CCMP Update Present subfield is 1 bit and is set to 1 to indicate the intended receiver of the Header Compression request to update the base packet number (BPN) and Key ID fields for the specified TID/ACI in the CCMP Update field. It is set to 1 in the Header Compression response to confirm update of the fields or to indicate decryption error for the specified TID/ACI. Otherwise, it is set to 0 to indicate either no CCMP update request or no CCMP update confirmation.

The A3 field in the Header Compression element is present if the Request/Response subfield is 0 and the Store A3 subfield is 1. Otherwise, it is not present.

The A4 field in the Header Compression element is present if the Request/Response subfield is 0 and the Store A4 subfield is 1. Otherwise, it is not present.

**TGah Editor: *Change the paragraphs below as follows (#4195, 3143):***

The CCMP Update field in the Header Compression element is present ifthe CCMP Update Present subfield is 1. Otherwise, it is not present.

The CCMP Update field is 5 octets and contains the BPN and Key ID for a given TID/ACI, as illustrated in Figure 8-575a52 (CCMP Update field).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B31 | B32 B33 | B34 B37 | B38 B39 |
|  | BPN | Key ID | TID/ACI | Reserved |
| Bits: | 32 | 2 | 4 | 2 |

* CCMP Update field

The BPN subfield contains the base packet number (BPN) for the TID/ACI in the CCMP Update field. The BPN subfield consists of the PN2, PN3, PN4, and PN5 octets, as illustrated in Figure 8-575a53 (BPN subfield).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B15 | B16 B23 | B24 B31 |
|  | PN2 | PN3 | PN4 | PN5 |
| Bits: | 8 | 8 | 8 | 8 |

* BPN subfield

The Key ID subfield contains the Key ID for the TID/ACI included in the CCMP Update field.

The TID/ACI subfield contains the TID/ACI for which the BPN and the Key ID subfields apply.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3667 | 306.40 | 9.49.3 | Address 2 should be the MAC address of the AP instead of Relay-AP. | as comment | Revised –Agree with the commenter. Proposed resolution accounts for the suggested change. TGah editor to make the changes showin in 11-14/1066r0 under all headings that include CID 3667. |
| 3668 | 306.48 | 9.49.3 | Address 2 should be the MAC address of the AP instead of Relay-AP. | as comment | Revised –Agree with the commenter. Proposed resolution accounts for the suggested change. TGah editor to make the changes showin in 11-14/1066r0 under all headings that include CID 3668. |
| 3840 | 306.5 | 9.49.3 | Short frame for relay operation is not complete | Add complete short frame here. | Revised –Agree in principle with the commenter. Proposed resolution clarifies the missing parts of the relay operation with Short frames.TGah editor to make the changes showin in 11-14/1066r0 under all headings that include CID 3840. |
| 3841 | 306.5 | 9.49.3 | The decision of RA for relay operation is missing. | add the related rules. | Rejected –The comment is very vague. It seems that the comment asks regarding the selection of the relay to which to forward the data for a given destination. Note that the relay learns the RA of the next hop using the Reachable Address element.  |
| 4100 | 306.26 | 9.49.3 | Even in case of short frame, A3 may exist. | Change "If the frame is Short frame then Address 3 is not present" to "If the frame is Short frame then Adress 3 may not be present". | Rejected –Address 3 is not present for Short frames because it is equal to the address identified by Address 1. This is inline with 8.8.3: *“The A3 field is present if A3 is not equal to the address identified by A1 and an A3 is not stored at the receiver, or when A3 is not equal to an A3 stored at the receiver (as described in 9.53 (Header Compression procedure)). When the A3 field is not present, A3 is either stored at the recipient of the frame or, if an A3 is not stored at the recipient of the frame then A3 is equal to the address identified by A1.”* |

**Discussion:** *None.*

* Addressing and forwarding of individually addressed relay frames

**TGah Editor: *Change the paragraph below as follows (#3850, 3735, 3375, 3840):***

MSDUs received from a local LLC sublayer at the MAC SAP of a relay-STA which are not destined for the relay-STA are forwarded via the WM to the AP to which it is associated, using either a 4-address frame format or an A-MSDU format except when the frame carrying the (A-)MSDUs is a Short Data frame for which header compression is used as described in 9.42l (Header Compression procedure).

The addressing of the 4-address frame shall be as follows in this case:

* Address 1 is the MAC address of the AP (the receiver of the MPDU)
* Address 2 is either the MAC address or the AID of the relay-STA (the transmitter of the MPDU)
* Address 3 is the DA of the MSDU (the destination address of the MSDU)
* Address 4 is the SA of the MSDU (the source address of the MSDU)

**TGah Editor: *Change the paragraph below as follows (#3850, 3735, 3375, 3840):***

If the 4-address frame is a Short Data frame that contains an A-MSDU then the DA and/or SA shall not be present in any of the A-MSDU subframe headers unless the DA and/or SA are not equal to the values contained in Address 3 and/or Address 4 of the frame.

Otherwise, the addressing of the frame containing an A-MSDU shall be as follows in this case:

* Address 1 is the MAC address of the AP (the receiver of the MPDU)
* Address 2 is either the MAC address or the AID of the relay-STA (the transmitter of the MPDU)
* Address 3 is the MAC address of the AP (the BSSID)
* If the frame is a Short Data frame then Address 3 is not present
* DA in A-MSDU subframe header is the DA of the MSDU (the destination address of the MSDU)
* SA in A-MSDU subframe header is the SA of the MSDU (the source address of the MSDU)

MSDUs received from a local LLC sublayer at the MAC SAP of an AP which are not destined for the AP or one of its associated non-AP STAs are forwarded via the WM to an appropriate relay-STA, using either a 4-address frame format or an A-MSDU format.

**TGah Editor: *Change the paragraph below as follows (#3667):***

The addressing of a 4-address frame shall be as follows in this case:

* Address 1 is either the MAC address or the AID of the relay-STA (the receiver of the MPDU)
* Address 2 is the MAC address of the AP (the transmitter of the MPDU)
* Address 3 is the DA of the MSDU (the destination address of the MSDU)
* Address 4 is the SA of the MSDU (the source address of the MSDU)

**TGah Editor: *Change the paragraph below as follows (#3850, 3735, 3375, 3668, 3840):***

If the 4-address frame is a Short Data frame that contains an A-MSDU then the DA and/or SA shall not be present in any of the A-MSDU subframe headers except when DA and/or SA for the MSDU are different from the values contained in Address 3 and/or Address 4 of the frame.

Otherwise, the addressing of a frame containing an A-MSDU shall be as follows in this case:

* Address 1 is either the MAC address or the AID of the relay-STA (the receiver of the MPDU)
* Address 2 is the MAC address of the AP (the transmitter of the MPDU)
* Address 3 is the MAC address of the AP (the BSSID)
* If the frame is a Short Data frame then Address 3 is not present
* DA in A-MSDU subframe header is the DA of the MSDU (the destination address of the MSDU)
* SA in A-MSDU subframe header is the SA of the MSDU (the source address of the MSDU)

**TGah Editor: *Change the paragraph below as follows (#3850, 3735, 3375, 3840):***

* When the frame is a Short Data frame and the intended receiver has confirmed storing A3 and/or A4 as described in 9.42l (Header Compression procedure) then the DA and/or SA should not be present in either the A3 and/or A4 fields of the frame or in the DA and/of SA of the A-MSDU subframe header contained in the frame except when the DA and/or SA for the MSDU are different from the stored values. Addressing and forwarding of group addressed relay frames

**TGah Editor: *Change the paragraphs below as follows (#3850, 3735, 3375, 3840):***

Group addressed MSDUs received from a local LLC sublayer at the MAC SAP of a relay-STA are forwarded via the WM to an AP to which it is associated, using either a 4-address frame format or an A-MSDU format except when the frame carrying the (A-)MSDUs is a Short Data frame for which header compression is used as described in 9.42l (Header Compression procedure).

The addressing of the 4-address frame shall be as follows in this case:

* Address 1 is the MAC address of its associated AP (the receiver of the MPDU)
* Address 2 is either the MAC address or the AID of the relay-STA (the transmitter of the MPDU)
* Address 3 is the DA of the MSDU (the group address).
* Address 4 is the SA of the MSDU (the source address of the group addressed MSDU)

If the 4-address frame is a Short Data frame that contains an A-MSDU then the DA and/or SA shall not be present in any of the A-MSDU subframe headers unless the DA and/or SA are not equal to the values contained in Address 3 and/or Address 4 of the frame.

Otherwise, the addressing of the frame containing an A-MSDU shall be as follows in this case:

* Address 1 is the MAC address of its associated AP (the receiver of the MPDU)
* Address 2 is either the MAC address or the AID of the relay-STA (the transmitter of the MPDU)
* Address 3 is the MAC address of its associated AP (the BSSID)
* If the frame is a Short Data frame then Address 3 is not present
* DA in A-MSDU subframe header is the DA of the MSDU (the group address)
* SA in A-MSDU subframe header is the SA of the MSDU (the source address of the group addressed MSDU)

When the frame is a Short Data frame and the intended receiver has confirmed storing A3 and/or A4 as described in 9.42l (Header Compression procedure) then DA and/or SA should not be present in either the A3 and/or A4 fields of the frame or in the DA and/of SA of the A-MSDU subframe header contained in the frame except when the DA and/or SA for the MSDU are different from the stored values.Group addressed MSDUs received from a local LLC sublayer at the MAC SAP of an AP (including a Root AP and a relay-AP) are forwarded via the WM to an appropriate relay-STA and its associated non-AP STAs, using a 3-address frame format.

The addressing of a 3-address frame shall be as follows in this case:

* Address 1 is the DA of the MSDU (the group address)
* Address 2 is the MAC address of the AP (the BSSID)
* Address 3 is the SA of the MSDU (the source address of the group addressed MSDU)

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3375 | 308.59 | 9.49.5.2 | please add reference 8.8 for "Short Data frame". Also do we need a reference to the Header Compression procedure and clarify how it works? | As in comment | Revised –Agree in principle with the comment. Proposed resolution is to add in 9.49 (Procedures of TXOP sharing for relay operation) a reference to subclause 8.8 (MAC frame format for Short frames). In addition we clarify that if the two STAs have negotiated SA/DA storage via header compression procedure then the transmitter does not need to add A3/A4 or SA/DA fields in the transmitted Short frame. This is clarified in 9.49.3 (Addressing and forwarding of individually addressed relay frames) and in 9.49.4 (Addressing and forwarding of group addressed relay frames).TGah editor to make the changes showin in 11-14/1066r0 under all headings that include CID 3375. |
| 4152 | 307.34 | 9.49.5 | P307L34: ...field of Short Data... there should be missing a definition of <Short Data>. Is that a variant of Short frame?? | Define Short Data or add description of Short data in the draft text. | Revised –Agree in principle with the comment. Proposed resolution is to add a reference to the subclause where Short Data frames are defined. TGah editor to make the changes showin in 11-14/1066r0 under all headings that include CID 4152. |
| 4153 | 307.34 | 9.49.5 | P307L34: Need to change the sentence of "... may set the Relayed Frame <field> in the Frame Control field of Short data <>, the Relayed Frame field in NDP Ack <frames>, and ..." into "...may set the Relayed Frame <subfield> in the Frame Control field of Short data <frame>, the Relayed Frame <subfield in NDP Ack <frame>, and ...". | change <field> into <subfield> in the Frame control field. | Rejected –The current terminology is inline with REVmc D3.0 where the subfields of the Frame Control field are still called “fields”. For example refer to the use of "Protocol Version field" in 8.2.4.1.2 and so on. |

**Discussions:** *None.*

* Procedures of TXOP sharing for relay operation

**TGah Editor: *Change the paragraph below as follows (#3375, 4152):***

An S1G STA that supports TXOP sharing procedure may set the Relayed Frame field in the Frame Control field of Short Data frames (defined in 8.8 (MAC frame format for Short frames), the Relayed Frame field in NDP Ack frames, and the Order field in the Frame Control field of an S1G RTS frame to 1. Otherwise, it shall set the Relayed Frame field or Order field in any frame to 0 unless the frame is an NDP Ack frame used for flow control as described in 9.42o (Flow control). The S1G STA may use TXOP sharing to transmit to the relay(#3434) (relay AP or relay STA) either one Short Data frame or the last Short Data frame of the TXOP.(#3846)