IEEE P802.11
Wireless LANs

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| LB 200 Comment Resolution for MAC Header Compression |
| Date: 2014-01-01 |
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Abstract

This submission proposes resolutions for comments related to Header Compression feature of TGah Draft 1.0 with the following CIDs:

2316, 1451, 2429, 1566, 1462, 2822

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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2316 | 137.34 | 8.7 | The SA/DA negotiation is missing for short frame/A-MSDU. Add the negotiation frame procedure in related subclause. | As in Comment | Agree with the commenter. Proposed resolution is to add the negotiation procedure for storing information at the receiver. Revised – TGah editor to make changes shown in 11-14-0079r0 under the heading for CIDs from 2316 to 2822. |
| 1451 | 142.05 | 8.7.3.2 | It is not clear when the recipient has stored the A3 field and/or A4 field. Clarify or add a reference to a subclause where storing of these fields is described. The concept of storing constant MAC header information at the transmitter/receiver is included in R.4.4.4.A of the Tgah SFD but is missing in the draft. | As in comment. | Agree with the commenter. Proposed resolution is to add the negotiation procedure for storing information at the receiver.Revised – TGah editor to make changes shown in 11-14-0079r0 under the heading for CIDs from 2316 to 1462. |
| 2429 | 142.05 | 8.7.3.2 | What does "stored at the recipient of the frame" mean? Also in 8.7.6 | Clarify | Agree with the commenter. Proposed resolution is to add the negotiation procedure for storing information at the receiver that clarifies the concept.Revised – TGah editor to make changes shown in 11-14-0079r0 under the heading for CIDs from 2316 to 1462. |
| 1566 | 142.05 | 8.7.3.2 | Text states, "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". However, it is not clear how A3 is "stored" at the recipient | None yet. Clarify how A3 is "stored" | Agree with the commenter. Proposed resolution is to add the negotiation procedure for storing information at the receiver that clarifies the concept.Revised – TGah editor to make changes shown in 11-14-0079r0 under the heading for CIDs from 2316 to 1462. |
| 1462 | 148.48 | 8.7.6 | The presence/absence of DA field (para starting in line 48) and SA field (para starting in line 57) in the Dynamic A-MSDU subframe is not clear. Similar observation for the case when they are stored at the recipient. The concept of storing constant MAC header information at the transmitter/receiver is included in R.4.4.4.A of the Tgah SFD but is missing in the draft. | Clearly describe mapping of the SA and DA fields with/without storing at the receiver and required signaling. | Agree with the commenter. Proposed resolution is to add the negotiation procedure for storing information at the receiver that clarifies the concept.Revised – TGah editor to make changes shown in 11-14-0079r0 under the heading for CIDs from 2316 to 1462. |
| 2822 | 142.05 | 8.7.3.2 | There is only some text on the case when A3/A4 is not present. But there is no text on the case when A3/A4 is present. | Please add the text on the case when A3/A4 is present. | Agree with the commenter. Proposed resolution is to add the text for the case of A3/A4 presence in the header.Revised – TGah editor to make changes shown in 14/0079r0 under the heading for CIDs from 1448 to 2822. |

**Discussion:** *None.*

**Proposed changes:**

* **Address fields**

**Instruction to TGah Editor: *Change the two paragraphs below in this subclause as follows:***

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 9.40a (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.

The A4 field is present if A4 is not equal the address identified by A2 and an A4 is not stored at the receiver, or when A4 is not equal to an A4 stored at the receiver (as described in 9.40a (Header Compression procedure)). When the A4 field is not present, A4 is either stored at the recipient of the frame or, if an A4 is not stored at the recipient of the frame then A4 is equal to the address identified by A2.

* **Dynamic A-MSDU format**

**Instruction to TGah Editor: *Change the two paragraphs below in this subclause as follows:***

If present, the DA field of the Dynamic A-MSDU subframe header contains the destination address of the MSDU. When the DA field is not present, the DA of the MSDU is equal to the A3 stored at the recipient of the frame (as described in 9.40a (Header Compression procedure)) or, if an A3 is not stored at the recipient of the frame then the DA is equal to the A3 field (if present in the header of the MPDU that carries the Dynamic A-MSDU subframe), or, if also an A3 field is not present in the short MAC header of the MPDU that carries the Dynamic A-MSDU subframe thenthe DA is equal to the address identified by the A1 field of the short MAC header of the MPDU that carries the Dynamic A-MSDU subframe.

If present, the SA field of the Dynamic A-MSDU subframe header contains the source address of the MSDU. When the SA field is not present in a Dynamic A-MSDU subframe, the SA is equal to the A4 stored at the recipient of the frame as described in 9.40a (Header Compression procedure)) or, if anA4 is not stored at the recipient of the frame then the SA is equal to the A4 field (if present in the short MAC header of the MPDU that carries the Dynamic A-MSDU subframe), or, if also an A4 field is not present in the short MAC header of the MPDU that carries the Dynamic A-MSDU subframe then the SA is equal to the address identified by the A2 field of the short MAC header of the MPDU that carries the Dynamic A-MSDU subframe.

**Instruction to TGah Editor: *Add the following subclause (@REVmc D2.0):***

**9.40a Header Compression procedure**

The Header Compression procedure enables S1G STAs to store addresses and/or update security parameters at the receiver. An S1G STA with dot11ShortMACHeaderImplemented 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 dot11ShortMACHeaderImplemented 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 set to 1 (see 8.7 (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 set to 1. The receiver STA shall respond with a Header Compression response acknowledging receipt of the updated security parameters.

After sending a Header Compression request, an S1G STA shall postpone the transmission of Short frames 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.

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 a Header Compression response to the transmitter of the Short frames, in which the Store A3, Store A4, and CCMP Update present fields are all equal to 0, while indicating the TID of the received Short frame in the TID subfield.

A STA that receives a Header Compression response with the Store A3, Store A4, and the CCMP Update present fields all equal to 0 shall transmit a Header Compression request to the transmitter of the Header Compression response. The Header Compression request shall include all the addresses and security information that the transmitting STA requests to be stored at the receiver for the indicated TID.

**Instruction to TGah Editor: *Add the following element:***

**8.4.2.170z 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 element is illustrated in Figure 8-xy1 (Header Compression element format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Header Compression Control | A3(Optional) | A4(Optional) | CCMP Update(Optional) |
| Octets: | 1 | 1 | 1 | 0 or 6 | 0 or 6 | 0 or 5 |

**Figure 8-xy1 – Header Compression element format**

The Element ID field is 1 octet in length and is set to the Header Compression element value in Table 8-55 (Element IDs).

The Length field is 1 octet in length and is set to 2 plus the sum of the lengths of each optional field present in the element.

The Header Compression Control field is 1 octet in length and is illustrated in Figure 8-xy2 (Compresssion Control field).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 B7 |
|  | Request/Response | Store A3 | Store A4 | CCMP Update Present | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 3 |

**Figure 8-xy2 – Header Compression Control field**

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 unsuccessfull 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 unsuccessfull storage response of the A4 field.

The CCMP Update Present subfield is 1 bit in length and is set to 1 to indicate the intended receiver of the Header Compression request to update the BPN and Key ID fields for the specified TID in the CCMP Update field. It is set to 1 in the Header Compression response to confirm update of the fields. 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.

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

The CCMP Update field is 5 octets in length and contains the BPN and Key ID for a given TID, as illustrated in Figure 8-xy2 (CCMP Update field).

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

Figure 8-xy2 – CCMP Update field

The BPN subfield contains the base packet number (BPN) for the TID in the CCMP Update field. The BPN subfield consists of the PN2, PN3, PN4, and PN5 octets, as illustrated in Figure 8-xy3 (BPN subfield).

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

Figure 8-xy3 – BPN subfield

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

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

**8.4.2 Elements**

**8.4.2.1 General**

**Instruction to TGah Editor: *Insert the following row into Table 8-55:***

|  |
| --- |
| * **Element IDs**
 |
| Element | Element ID | Length of indicated element (in octets) | Extensible |
| … |  |  |  |
| Header Compression | <ANA> | 2 to 19 | Yes |

**Instruction to TGah Editor: *Please add the following row in: Table 8-23(Association Request frame body) in Clause 8.3.3.5 (Association Request frame format), Table 8-24(Association Response frame body) in Clause 8.3.3.6(Association Response frame format), Table 8-25(Reassociation Request frame body) in Clause 8.3.3.7 (Reassociation Request frame format), Table 8-26(Reassociation Response frame body) in Clause 8.3.3.8 (Reassociation Response frame format) (@REVmcD2.0) as follows:***

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes**  |
| … |  |  |
| TBD | Header Compression  | Header Compression is present if dot11ShortMACHeaderOptionImplemented is true. |

**Instruction to TGah Editor: *Change Table 8-363a as follows:***

|  |
| --- |
| * **S1G Action field values**
 |
| **Value** | **Meaning** | **Time Priority** |
| … |  |  |
| 9 | Sector ID Feedback |  |
| 10 | Header Compression | Yes |
| 11 – 255  | Reserved |  |

**Instruction to TGah Editor: *Add the following action frame:***

**8.6.24.11a Header Compression frame format**

The Header Compression frame is used to update information at the recipient STA, as defined in 9.40a (Header Compression procedure). The Header Compression frame contains the information shown in Table 8-363x (Header Compression action field format).

|  |
| --- |
| **Table 8-363x - Header Compression action field format** |
| **Order** | **Information** |
| 1 | Category  |
| 2 | S1G Action |
| 3 | Dialog Token |
| 3 | Header Compression element (#485)( see 8.4.2.170z) |

The Category field is set to the value for S1G, specified in Table 8-38 (Category values).

The S1G Action field is set to the value for Header Compression, specified in Table 8-363a (S1G Action field values).

The Dialog Token field is a value chosen by the STA sending the Header Compression frame to identify the request/response transaction.

The Header Compression element field contains a Header Compression element as specified in 8.4.2.170d (Header Compression element).