IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 802.11bc LB 252 resolution for CIDs assigned to Abhi (part 2) | | | | |
| Date: January 12, 2021 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |

Abstract

This submission proposes resolutions for the following 30 comments submitted during LB 252 for 11bc D1.0:

1571, 1519, 1351, 1523, 1637, 1567, 1163, 1113, 1162, 1606, 1627, 1383, 1384, 1261, 1385, 1608, 1346, 1034, 1352, 1357, 1474, 1517, 1486, 1271, 1110, 1144, 1440, 1045, 1388, 1100

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Live edits made when the document was presented during the TGbc sessions on 14th January 2021
* Rev 2:
  + Updated the baseline to D1.01 and doc [11-21/0064r4](https://mentor.ieee.org/802.11/dcn/21/11-21-0064-04-00bc-lb252-resolutions-for-cids-assigned-to-abhi-part-1.docx)
  + Document includes resolution to ten additional CIDs (highlighted in yellow in the table below):
    - 1474, 1517, 1486, 1271, 1110, 1144, 1440, 1045, 1388, 1100
  + Resolution for some comments discussed earlier was updated based on offline discussions and the impact of the changes from the addition comments resolved in rev2 (highlighted in green in the table below)
    - 1571, 1519, 1351, 1523, 1637, 1567, 1034
  + Incorporated feedback from Mark R. and Carol A.

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

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1474 | Stephen McCann | 24.00 | 2 | 9.4.2.300 | The title of this clause is "E-BCS Parameters element". The term E-BSC is not defined. | Change all occurances of "E-BCS" to "eBCS", unless it is within a MLME definition. | **Revised**  All references to the term ‘E-BCS’ or ‘eBCS’ have been fixed in D1.01 to ‘EBCS’. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1486 | Stephen McCann | 24.00 | 18 | 9.4.2.300.2 | It would be more efficient if the "E-BCS Parameters field for an AP" and the "E-BCS Parameters field for a non-AP STA" be merged into a single frame entitled "eBCS Parameters". There are enough reserved bits in both the current UL and DL frames, so that within a new common frame a leading bit could be assigned to Uplink or Downlink (if really required). The other subfields could be renamed to be more common. | Change the frames in clauses 9.4.2.300.2 and 9.4.2.300.3 to a single eBCS parameters field. This field then contains the following sub-fields: Control, eBCS Info frame interval (optional). The Control sub-field comprises: B0: uplink/downlink indicator, B1-B2: Authentication Mode: B3-B4: Limiting Mode, B5: Metadata Embedding, B6: No forwarding, B7: Reserved. | **Revised**  The spec text has been updated such that the EBCS element provides parameters for an EBCS AP only. The text related to the two bits advertised for an EBCS non-AP STA is moved out of this subclause to the EBCS UL frame. The subclause titles under 9.4.2.300 are deleted. The field name ‘AP Control’ is updated to say ‘Control’.  The subclause on EBCS UL frame is updated to match the change. The bits ordering in EBCS UL Control field of the frame is updated to include the two bits moved from the EBCS Parameters element. The bit used to signal presence of EBCS Parameters element in the EBCS UL frame is removed. The EBCS Parameter field (which carries the EBCS Parameters element) is deleted from the frame. Corresponding description text is removed. Text in clause 11 is updated to make correct references.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1486 |
| 1517 | Stephen McCann | 24.00 | 9 | 9.4.2.300.1 | What is an "eBCS UL frame", as it's not defined anywhere? | Change to "UL eBCS frame" as defined in 9.6.7.100? Otherwise add a definition of an eBCS UL frame. | **Revised**  Agree with the comment. The text cited by the comment was deleted as a resolution to another comment. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1440 | Osama Aboulmagd | 25.00 | 13 | 9.4.2.300.2 | What is "Throttling Scheme"? | As in comment | **Revised**  The text cited by the comment was replace with the terms ‘Uniform’ and ‘Per Destination’ as a resolution to another comment. The new terms capture the intention of the field. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1045 | Albert Petrick | 25.00 | 14 | 9.4.2.300.2 | In Table 9-bc2 for Subfield value equal to 1 the Encoding column reads "with whom.... ". The relationship is between an AP and a non-AP STA. The 'whom" is the non-AP STA or some device. | Remove the ambiguity and replace "whom" with the intended device e.g., non-AP-STA | **Revised**  Agree with the comment. The text cited by the comment was deleted as a resolution to another comment. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1271 | Mark RISON | 25.00 | 20 | 9.4.2.300.2 | "If the STA does not transmit eBCS Info frames, this subfield is not used. " is confusing because this subclause is about APs | Change to "If the AP does not transmit eBCS Info frames, this subfield is not used. " | **Revised**  Agree with the comment. The text cited by the comment was deleted as a resolution to another comment. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1110 | Erik Lindskog | 25.00 | 20 | 9.4.2.300.2 | Change 'If the STA does not transmit eBCS Info frames, this subfield is not used.' to 'If the AP STA does not transmit eBCS Info frames, this subfield is not used.' to clarify that we are talking about the AP STA. | As described in the comment. | **Revised**  Agree with the comment. The text cited by the comment was deleted as a resolution to another comment. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1571 | Tomoko Adachi | 36.00 | 4 | 9.6.7.100 | Change "E-BCS Parameters" in Figure 9-bc24 to "E-BCS Parameters element". | As in comment. | **Revised**  The ‘EBCS Parameters’ field was removed from the frame as a resolution to another comments. The description for the ‘Destination URI’ field was updated to clarify that this field is an element (Destination URI element).  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1571 |
| 1519 | Stephen McCann | 36.00 | 5 | 9.6.7.100 | Regarding Figure 9-bc24, the terminology should be "Public Action frames". | Rename Figure 9-bc24 to "eBCS UL Action frame field format" | **Revised**  All references to the term ‘E-BCS’ or ‘eBCS’ have been fixed in D1.01 to ‘EBCS’. Therefore, no further changes are needed.  TGbc editor: No changes are needed to resolve this comment |
| 1351 | Mark RISON | 36.00 | 5 | 9.6.7.100 | Figure 9-bc24 - UL eBCS frame Action field format shows the E-BCS Parameters field (which contains the eponymous element) as being 4 octets, but it's actually a variable-length field | Change 4 to Variable | **Revised**  The EBCS Parameters field was removed from the EBCS UL frame and hence Figure 9-bc24. However, the comment is applicable to other fields shown in the figure. The figure is updated to indicate that these fields are optionally carried in the frame and are of variable size. The term ‘(optional)’ is added within the field name and ‘0 or xxx’ is replaced with ‘xxx’ (e.g., ‘0 or variable’ is replaced as ‘variable’). The description text for each field is updated accordingly.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1351 |
| 1144 | Hitoshi Morioka | 37.00 | 3 | 9.6.7.100 | Certificate format should be specified. | Replace the line with "The STA Certificate field carries the X.509 certificate of the transmitting STA in DER (Distinguished Encoding Rules) format." | **Revised**  Based on offline discussion with the commenter, the field description is updated to says that the field carries X.509v3 certificate of the transmitting STA encoded according to RFC 5280.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1144 |
| 1523 | Stephen McCann | 37.00 | 17 | 9.6.7.100 | The "E-BCS Parameters element" is defined in clause 9.4.2.300 and does not appear to fit into a 4 octet subfield. I'm really not sure what this is supposed to mean. | Delete the cited sentence. | **Revised**  The EBCS Parameters field was removed from the EBCS UL frame and hence Figure 9-bc24. However, the comment is applicable to other variable length optional fields shown in the figure. The figure is updated to include the term ‘(optional)’ in the field name and replace ‘0 or variable’ as ‘variable’ since variable covers 0 length. The description text for each field is updated accordingly.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1523 |
| 1637 | Yunsong Yang | 36.00 | 9 | 9.6.7.100 | The E-BCS Parameters Present and Timestamp Present bits in the eBCS UL Control field appear in an opposite order of the E-BCS Parameters and Timestamp subfields in the UL eBCS frame Action field. If there is no particular reason for reversing the order, we should keep the order of the subfields and the order of their corresponding Present bits the same, e.g., by swapping the E-BCS Parameters Present bit and the Timestamp Present bit in the eBCS UL Control field. And for the same reason, the Frame Signature Type subfield should take B3 and B4 in the eBCS UL Control field, and B5-B7 should be the Reserved bits, so that in the future, if new parameters are added in the UL eBCS frame Action field after the Frame Signature subfield and B5-B7 are used for indicating their presence, a consistence order can be maintained. | In the eBCS UL Control field format, swap the E-BCS Parameters Present bit and the Timestamp Present bit, and change the Frame Signature Type subfield to B3 and B4 so that B5-B7 become the Reserved bits. And change the order of the related paragraphs accordingly. | **Revised**  Agree with the comment. The EBCS Parameters Present subfield was removed as a resolution to another comment.  The field order for other subfields within the EBCS UL Control field is updated as suggested by the comment with additional changes resulting from resolution for other comments.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1637 |
| 1567 | Tomoko Adachi | 36.00 | 10 | 9.6.7.100 | We can still fix the ordering to align with the ordering of the original fields in Figure 9-bc24. | Switch the bit ordering of the E-BCS Parameters Present subfield and Timestamp Present subfield in Figure 9-bc25. Switch the order of paragraphs starting from pp.ll 36.16 and 36.18. Or, switch the ordering of the Timestamp subfield and E-BCS Parameters subfield in Figure 9-bc24. | **Revised**  Agree with the comment. The EBCS Parameters Present subfield was removed as a resolution to another comment.  The field order for other subfields within the EBCS UL Control field is updated as suggested by the comment with additional changes resulting from resolution for other comments.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1567 |
| 1163 | James Yee | 36.00 | 24 | 9.6.7.100 | Reference to 12.bc.2.5 should be 12.100.2.5. Similar error of referencing "bc" occurs elsewhere in this draft too. | As noted | **Revised**  The section references are fixed in Table 9-bc6  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1163 |
| 1113 | Fumihide Goto | 36.00 | 20 | 9.6.7.100 | The number of Encoding of Frame Signature Type is only 4. Why don't you care about future update? | adding version filed in order to prepare updating | **Revised**  Agree with the comment. The size of the field is increased to 3 bits and a new row is added for values 4-7. The new values are marked as reserved for future expansion.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1113 |
| 1162 | James Yee | 36.00 | 23 | 9.6.7.100 | The Frame Signature Type field has no reserved values. Does this mean no new signature types are anticipated? Yes, the HLSA provides expansion and there are 2 reserved bits in the eBCS UL Control field, but the particular signature types and key lengths chosen may not meet the security requirements different applications. | Expand the field to allow more types or justify why the types chosen are adequate for the lifetime of the amendment. | **Revised**  Agree with the comment. The size of the field is increased to 3 bits and a new row is added for values 4-7. The new values are marked as reserved for future expansion.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1162 |
| 1606 | Xiaofei Wang | 37.00 | 4 | 9.6.7.100 | The purpose of Timestamp field should not be a part of the spec text in clause 9. | The purpose is useful and should be in a note. | **Revised**  The cited text is moved to clause 11. Further, it is changed to a recommendation to prevent replay attacks.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1606 |
| 1627 | Yasuhiko Inoue | 37.00 | 5 | 9.6.7.100 | Timestamp field has already defined in 9.4.1.10 | Use a different name. | **Revised**  The field name is changed to ‘Replay Protection’ and the ‘Counter’ subfield within this field is renamed to ‘Frame Count’  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1627 |
| 1383 | Mark RISON | 37.00 | 10 | 9.6.7.100 | "clause 11.bc.1.3" -- no such (sub)clause and it's a subclause and it should be Subclause (but normally just say nothing) | Change to "11.100.3.3" | **Revised**  The paragraph was modified as a result of resolution for another comment and the reference to clause 11 is removed. Therefore, not further changes are needed  TGbc editor: No changes are needed to resolve this comment |
| 1384 | Mark RISON | 37.00 | 10 | 9.6.7.100 | The encoding should be in Clause 9 not Clause 11 | Move the "number of seconds since 2020-01-01 00:00:00 UTC" to 9.6.7.100 | **Revised**  Clause 9 and 11 are updated as suggested by the commenter.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1384 |
| 1261 | Mark RISON | 37.00 | 13 | 9.6.7.100 | A URI is a URI, not an address | Change "The Destination URI element is defined in 9.4.2.89 (Destination URI element) and carries the address of 13 the remote destination where the packet needs to be forwarded to. " to "The Destination URI element is defined in 9.4.2.89 (Destination URI element) and indicates the remote destination to which the packet needs to be forwarded. " | **Revised**  Agree with the comment. The sentence was modified as suggested with changes in-line with those discussed during 11bc sessions on January 11th and 12th 2021  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1261 |
| 1385 | Mark RISON | 37.00 | 15 | 9.6.7.100 | “Note that the length of the Destination URI element is computed based on the value carried in the Length 15 field in the element (value in Length field + 2 octets). “ – this is true of all elements, including the EBCS Params element that is also in this frame | Delete the cited text | **Accept** |
| 1608 | Xiaofei Wang | 37.00 | 15 | 9.6.7.100 | is this sentence a note or spec text? If it is a note, needs to format it in Note format, otherwise, remove the word note and rephrase the text. | As in comment | **Revised**  The cited paragraph is deleted  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1608 |
| 1388 | Mark RISON | 37.00 | 20 | 9.6.7.100 | "The Frame Signature field, if present, carries a signature for the contents of the UL eBCS frame Action 20 field except the Frame Signature field. " is both too specific (which fields are covered) and not specific enough (how the signature is computed) | As it says in the comment | **Revised**  The description is updated to clarify that the Frame Signature field is present if the Frame Signature Type subfield has a value greater than zero.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1388 |
| 1100 | Carl Kain | 55.00 | 26 | 11.100.3.2 | there is an extra ")" | remove the extra ")" | **Reject**  There isn’t an extra ‘)’ at the cited line. |
| 1346 | Mark RISON | 56.00 | 6 | 11.100.3.3 | I think American or at least IEEE prefers "that" | Change "which" to "that" | **Revised**  Agree with the comment. The sentence describing this subfield in clause 9 and 11 and was updated to replace ‘which’ with ‘that’.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1346 |
| 1034 | Abhishek Patil | 56.00 | 6 | 11.100.3.3 | The Counter subfield is 4-bits long and can carry up to 16 values. Therefore the calculation should be 2^16 | replace 2^32 with 2^16 | **Rejected**  The cited subfield is 4 octets in length and hence would represent 2^32 frame transmissions. |
| 1352 | Mark RISON | 56.00 | 6 | 11.100.3.3 | Should specify whether the Counter subfield is initialised to any value, and if so to what value and when | As it says in the comment | **Revised**  The cited paragraph in clause 11 was updated as suggested by the comment. The field description in clause 9 was updated to remove the term ‘numeric’  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1352 |
| 1357 | Mark RISON | 56.00 | 6 | 11.100.3.3 | "a numeric value which is incremented for each 6 packet transmission. When the STA has transmitted 2 32 - 1 frames" is imprecise. What is a "packet"? What kind of "frames"? | Change to "a numeric value which is incremented for each UL eBCS frametransmission. When the STA has transmitted 2 32 - 1 UL eBCS frames" | **Revised**  The cited paragraph is updated as suggested by the comment with a typo fixed. The changes were also made in paragraph in clause 9 that describes the field.  TGbc Editor: please make changes as shown in doc: <https://mentor.ieee.org/802.11/dcn/21/11-21-0090-02-00bc-lb252-resolutions-for-cids-assigned-to-abhi-(part-2).doc> tag 1357 |

#1 – Text updated to be in line with discussion that took place during TGbc session on January 11th and 12th 2021

* Replace the term ‘forward’ with ‘relay’
* Replace the term ‘remote’ with ‘specified’
* Replace ‘contents of uplink frame’ with ‘HLP payload carried in EBCS UL frame’
* As in “… an EBCS AP relays the HLP payload carried in the EBCS UL frame to the specified destination …”

***TGbc Editor: The baseline for the proposed changes is 802.11bc D1.0 and document*** [***11-21/0064r4***](https://mentor.ieee.org/802.11/dcn/21/11-21-0064-04-00bc-lb252-resolutions-for-cids-assigned-to-abhi-part-1.docx)

**9.4.2.300 EBCS Parameters element**

***TGbc Editor: please make changes to this clause as shown below:***

[1486]An EBCS AP advertises its EBCS capabilities and operational parameters by including the EBCS Parameters element in Beacon and Probe Response frames that it transmits.

[1486]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID  Extension | EBCS Parameters Advertisement |

Octets: 1 1 1 variable

**Figure 9-bc1 - EBCS Parameters element format**

The format of the EBCS Parameters element is shown in Figure 9-bc1 (EBCS Parameters element format).

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

[1486]

[1486]The format of an EBCS Parameters Advertisement field is defined in Figure 9-bc2 (Format of EBCS Parameters Advertisement field).[1486]

|  |  |  |
| --- | --- | --- |
|  | Control[1486] | EBCS Info Frame Tx Countdown (optional) |

Octet: 1 0 or 2

**Figure 9-bc2 - Format of EBCS Parameters Advertisement field** [1486]

The format of the Control field is defined in Figure 9-bc3 (Control field format).[1486]

B0 B1 B2 B3 B4 B5 B6 B7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | UL  Authentication Mode | UL  Limiting Mode | Metadata Embedding Supported | EBCS Info Frame Tx Countdown Present | Reserved |

Bits: 2 2 1 1 2

**Figure 9-bc3 - Control field format**[1486]

The encoding of the UL Authentication Mode subfield is shown in Table 9-bc1 (Encoding of UL Authentication Mode subfield).

**Table 9-bc1 - Encoding of UL Authentication Mode subfield**

|  |  |  |
| --- | --- | --- |
| **Subfield value** | **Definition** | **Encoding** |
| 0 | No Authentication | AP relays the HLP payload carried in an EBCS UL frame to the destination specified in the frame without authenticating the transmitter of the frame. |
| 1 | Per Destination | AP relays the HLP payload carried in an EBCS UL frame only if it is able to authenticate the transmitter of the frame based on an established relationship with the destination specified in the frame. |
| 2 – 3 | Reserved |  |

The encoding of the UL Limiting Mode subfield is shown in Table 9-bc2 (Encoding of UL Limiting Mode subfield).

**Table 9-bc2 - Encoding of UL Limiting Mode subfield**[1476]

|  |  |  |
| --- | --- | --- |
| **Subfield value** | **Definition** | **Encoding** |
| 0 | Uniform | AP applies no restrictions or allows a fixed amount or frequency of HLP payload from a non-AP STA to be relayed to a specified destination, independent of the destination. |
| 1 | Per destination | AP applies limits to the amount or frequency of HLP payload from a non-AP STA to be relayed to a specified destination, based on a relationship established with the destination. |
| 2 – 3 | Reserved |  |

The Metadata Embedding Supported subfield is set to 1 if the AP supports embedding of metadata (such as location, date/time, etc. based on the relationship with the destination), when a non-AP STA requests embedding, before relaying the HLP payload carried in an EBCS UL frame to the specified destination. Otherwise, the subfield is set to 0.

NOTE – An EBCS non-AP STA that transmits an EBCS UL frame is not required to first discover APs that provide the relaying service, or whether they support metadata embedding (see 11.100.3.3).

[1486]If the AP transmits EBCS Info frames (see 9.6.7.101 (EBCS Info frame format)) at fixed intervals, the EBCS Info Frame Tx Countdown Present subfield of the Control field is set to 1 and the EBCS Info Frame Tx Countdown subfield in the element indicates the number of TBTTs until the transmission of the next EBCS Info frame. The value 1 indicates that the frame is transmitted following the next TBTT (see 11.100.2.2). The value 0 is reserved. Otherwise the EBCS Info Frame Tx Countdown Present subfield of the Control field is set to 0 and the EBCS Info Frame Tx Countdown subfield is not included in the element.

[1486]

**9.6.7.100 EBCS UL frame format**

***TGbc Editor: please make changes to this clause as shown below:***

***TGbc Editor: please note, changes proposed by CID 1637 and 1567 are not reflected in this document***

[#1]The EBCS UL frame is transmitted by an EBCS non-AP STA and carries higher layer payload intended for a destination identified within the frame.

The format of EBCS UL frame Action field is defined in Figure 9-bc24 (EBCS UL frame Action field format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Category | Public Action | EBCS UL  Control | Destination URI | HLP  Payload Length | HLP  Payload | STA  Certificate Length (optional) | STA  Certificate (optional) |

Octets: 1 1 1 variable 2 variable 0 or 2 variable

|  |  |  |
| --- | --- | --- |
| Replay Protection (optional) |  | Frame  Signature (optional) |

Octets: 0 or 8 variable

**Figure 9-bc24 - EBCS UL frame Action field format**[1486, 1351, 1523, 1627]

The Category field is defined in 9.4.1.11 (Action field).

The Public Action field is defined in 9.6.7.1 (Public Action frames).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 | B5 B7 |
|  | Metadata Embedding Requested | Do Not Relay Without Metadata Embedding | STA  Certificate Present | Replay Protection Present | Reserved | Frame Signature Type |
| Bits: | 1 | 1 | 1 | 1 | 1 | 3 |

**Figure 9-bc25 - EBCS UL Control field format**[1637, 1567, 1486, 1627]

The format of EBCS UL Control field is shown in Figure 9-bc25 (EBCS UL Control field format).

[1486]frameEmetadata

[#1, 1486]without relaying it HLP payloadspecified

The STA Certificate Present subfield is set to 1 when the STA Certificate Length and STA Certificate fields are carried in the frame. Otherwise, the subfield is set to 0.

[1486][1627]The Replay Protection Present subfield is set to 1 when the Replay Protection field is carried in the frame. Otherwise, the subfield is set to 0.

The encoding of the Frame Signature Type subfield is shown in Table 9-bc6 (Encoding of Frame Signature Type subfield).

**Table 9-bc6 - Encoding of Frame Signature Type subfield**

|  |  |  |
| --- | --- | --- |
| **Subfield value** | **Algorithm** | **Encoding** |
| 0 | HLSA | [#1]The authentication of HLP payload is provided by higher layer and is included in the HLP Payload field and the Frame Signature field is not present |
| 1 | RSA-2048 | See [1163, 1388]12.100.2.5 (Signature of the EBCS UL frame) and 12.100.2.6 (Authentication of an EBCS UL frame) |
| 2 | ECDSA-P256 |
| 3 | Ed25519 |
| 4-7 | Reserved | [1113, 1162] |

The HLP Payload Length field indicates the length of the HLP Payload field in octets.

The HLP Payload field carries the higher layer protocol (HLP) payload.

[1351, 1523]The STA Certificate Length field, if present, carries a non-zero value that indicates the length of the STA Certificate field in octets.

[1351, 1523, 1144]The STA Certificate field, if present, carries the X.509v3 certificate of the transmitting STA encoded according to IETF RFC 5280.

[1606]

[1627, 1351, 1523]The format of the Replay Protection field, if present, is shown in Figure 9-bc26 (Replay Protection field format).

|  |  |  |
| --- | --- | --- |
|  | Time | Frame Count |

Octets: 4 4

**Figure 9-bc26 - Replay Protection** **field format**[1627]

[1384]The Time subfield is either set to 0 or carries time, expressed as number of seconds since 2020-01-01 00:00:00 UTC, when the frame is queued for transmission.

[1627, 1346, 1352]The Frame Count subfield carries a value that is incremented for each EBCS UL frame transmission.

[#1, 1571, 1261]The Destination URI field contains a Destination URI element as defined in 9.4.2.89 (Destination URI element) that indicates the destination to which the HLP payload needs to be relayed.

[1608, 1385][1486]

[1388]The Frame Signature field is present if the value carried in the Frame Signature Type subfield is greater than zero. The Frame Signature field when present carries a signature for the contents of the EBCS UL frame Action field, except the Frame Signature field, by following the procedure in 12.100.2.5 (Signature of the EBCS UL frame).

* + - 1. **EBCS UL operation at an EBCS non-AP STA**

***TGbc Editor: please make changes to the 3rd, 4th & 5th paragraph in this clause as shown below:***

[1606, 1627, 1384]An EBCS non-AP STA should include tReplay Protection in the EBCS UL frame that it transmits to s

When the STA has time information, the Time subfield of the Replay Protection field shall indicate the time when the frame is queued for transmission; otherwise the subfield shall be set to 0.

NOTE—How a STA obtains time information is out of scope of this standard.

[1627, 1346, 1357]The Frame Count subfield of the Replay Protection field shall be initialized to 0. It shall be incremented for each EBCS UL frame transmission. When the STA has transmitted 232 – 1 EBCS UL frames, the value in the field shall wrap around and start from 0.

An EBCS non-AP STA may request an EBCS AP that provides relaying service to embed metadata (such as location, date and time, etc.) by setting the Metadata Embedding Requested subfield of the EBCS UL Control field of in the EBCS UL frame to 1.[1486]

##### 11.100.3.2 EBCS UL operation at an EBCS AP

***TGbc Editor: please make changes to the 5th and 6th paragraph in this clause as shown below:***

[#1, 1627]In order to prevent denial-of-service attacks, replay attacks or injection attacks directed towards the specified destination, an EBCS AP that supports a relaying service should perform source authentication, perform replay check and validate the frame signature based on the fields carried in the EBCS UL frame by following the procedure defined in 12.100.2.6 (Authentication of an EBCS UL frame). Furthermore, an EBCS AP should limit the amount or the rate of HLP payload data it relays to a specified destination to defend against such attacks.

[#1, 1627]Eeor does not performs replay check relays EBCS specified,Replay Protection

[#1]An EBCS AP that authenticates the transmitter of the EBCS UL frame before relaying the HLP payload to a specified destination shall provide an indication of the authentication scheme in the EBCS Parameters element that it transmits (see Table 9-bc1 (Encoding of UL Authentication Mode subfield)).

[1627]

[#1]An EBCS AP that limits the number or frequency of HLP payload it relays to a specified destination shall provide an indication of the throttling scheme in the EBCS Parameters element that it transmits (see Table 9-bc2 (Encoding of UL Limiting Mode subfield)).

**6.3.201.2.2 Semantics of the service primitive**[1627]

***TGbc Editor: please make changes to this clause as shown below:***

The primitive parameters are as follows:

MLME-EBCSUL.request(

DestinationURI,

HLPPayload,

STACertificate,

ReplayProtection,

EBCSParameters,

PrivateKey

)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| DestinationURI | Destination URI element | As defined in 9.4.2.89  (Destination URI element). | The Destination URI element as defined in  9.4.2.89 (Destination URI element). |
| HLPPayload | Sequence of octets | N/A | Specifies the contents from the higher layer to be included in EBCS UL frame. |
| STACertificate | Sequence of octets | N/A | Specifies the certificate for the transmitting STA. |
| ReplayProtection | Sequence of octets | N/A | Specifies the time when an EBCS UL frame is queued for transmission and a count of the number of EBCS UL frame transmissions. |
| EBCSParameters | EBCS Parameters element | As defined in  9.4.2.300 (EBCS Parameters element). | The EBCS Parameters element as defined in  9.4.2.300 (EBCS Parameters element). |
| PrivateKey | Sequence of octets | N/A | Specifies the private key for signature generation. |

**6.3.201.3.2 Semantics of the service primitive**[1627]

***TGbc Editor: please make changes to this clause as shown below:***

The primitive parameters are as follows:

MLME-EBCSUL.indication(

DestinationURI,

HLPPayload,

ReplayProtection,

EBCSParameters

)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| DestinationURI | Destination URI element | As defined in  9.4.2.89 (Destination URI element). | The Destination URI element as defined in  9.4.2.89 (Destination URI element). |
| HLPPayload | Sequence of octets | N/A | Specifies the contents from the higher layer to be included in an EBCS UL frame. |
| ReplayProtection | Sequence of octets | N/A | Specifies the time when an EBCS UL frame is queued for transmission and a count of the number of EBCS UL frame transmissions. |
| EBCSParameters | EBCS Parameters element | As defined in  9.4.2.300 (EBCS Parameters element). | The EBCS Parameters element as defined in  9.4.2.300 (EBCS Parameters element). |

**12.100.2.6 Authentication of an EBCS UL frame**[1627]

When an EBCS receiver receives an EBCS UL frame, the EBCS receiver shall authenticate it as follows:

1. If the Replay Protection field is present, and
   1. The Time subfield set to a non-zero value then, discard the EBCS UL frame if the value in the Time subfield is greater than the time at the EBCS receiver, expressed as the number of seconds since 2020-01-01 00:00:00 UTC.
   2. The value carried in the Frame Count subfield is less than the value received in a previously received EBCS UL frame (if any), then discard the EBCS UL frame.
2. Verify the certificate of the STA in the EBCS UL frame using the installed certificate of the CA. If the verification fails or the certificate of the CA that signed the certificate of the STA in the EBCS UL frame is not installed, the EBCS frame UL shall be discarded.
3. Verify the signature in the EBCS UL frame using the certificate of the STA in the EBCS UL frame. If the verification fails, the EBCS UL frame shall be discarded.

If the authentication succeeds, the EBCS receiver processes the HLP Payload as described in 11.bc.3.2 (EBCS UL operation at an EBCS AP).