IEEE P802.11  
Wireless LANs

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| LB257 Resolution for CID 2178 | | | | |
| Date: November 5, 2021 | | | | |
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Abstract

This submission proposes resolution for CID 2178 received from LB257: P802.11bc D2.0 Working Group Recirculation Ballot.

Note: The changes shown are based on 802.11bc draft 2.0.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revise some figure numbers.

|  |  |  |  |  |  |  |  |
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| **CID** | **Commenter** | **Clause Number(C)** | **Page(C)** | **Line(C)** | **Comment** | **Proposed Change** | **Resolution** |
| 2178 | Lei Huang | 9.4 | 24 | 60 | 11bc provides Enhanced Broadcast Request/Response ANQP-element and EBCS Content Request/Response frame for fast acquisition of EBCS service. However, if the EBCS data are authenticated by the PKFA or HCFA algorithm, the EBCS non-AP STA still cannot authenticate the EBCS data before receiving the EBCS Info frame. | Add authentication algorithm related information to the Enhanced Broadcast Request/Response ANQP-element and EBCS Content Request/Response frame. | **Revised.**  Agree with the commenter. The corresponding signaling and descriptions are added.  TGbc editor to make the changes shown in 11-21/1787r1. |

*Editor: Please modify the Figure 9-144d as follows and insert the following content:*

**9.4.1 Fields that are not elements**

**9.4.1.68 EBCS Request field**

The EBCS Request field is included in an EBCS Content Request frame used by an EBCS non-AP STA to request one or more EBCS traffic streams from its associated AP. The format of the EBCS Request field is shown in Figure 9-144b (EBCS Request field format).

EBCS Request Information List

Octets: variable

**Figure 9-144b—EBCS Request field format**

The EBCS Request Information List field contains one or more EBCS Request Info subfields.

The format of the EBCS Request Info subfield is shown in Figure 9-144c (EBCS Request Info subfield format).

|  |  |  |  |
| --- | --- | --- | --- |
| EBCS  Request Info Control | Content ID | Broadcaster MAC Address | Requested Time To Termination |

Octets: 1 1 0 or 6 0 or 3

**Figure 9-144c—EBCS Request Info subfield format**

The format of the EBCS Request Info Control subfield is shown in Figure 9-144d (EBCS Request Info Control subfield).

B0 B1 B2 B3 B7

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Requested Time To  Termination Present | Broadcaster MAC Address Present | (#2178) Request Authentication Info | Reserved |
| Bits: | 1 | 1 | 1 | 5 |

**Figure 9-144d—EBCS Request Info Control subfield**

A value of 1 in the Requested Time To Termination Present subfield indicates that a Requested Time To Termination subfield is present in the same EBCS Request Info subfield. A value of 0 in the Requested Time To Termination Present subfield indicates that a Requested Time To Termination subfield is not present in the same EBCS Request Info subfield.

A value of 1 in the Broadcaster MAC Address Present subfield indicates that a Broadcaster MAC Address subfield is present in the same EBCS Request Info subfield. A value of 0 in the Broadcaster MAC Address Present subfield indicates that a Broadcaster MAC Address subfield is not present in the same EBCS Request Info subfield.

(#2178) A value of 1 in the Request Authentication Info subfield indicates that STA requests the authentication information of the EBCS traffic streams identified by the Content ID included in the same EBCS Request Info subfield. A value of 0 in the Request Authentication Info subfield indicates that there is no request for the authentication information of the EBCS traffic streams identified by the Content ID included in the same EBCS Request Info subfield.

*Editor: Please modify Figure 9-144f and Figure 9-144g as follows and insert the following content:*

**9.4.1.69 EBCS Response field**

The EBCS Response field is included in an EBCS Content Response frame used by an EBCS AP to respond to a request for one or more EBCS traffic streams from an associated STA. The format of the EBCS Response field is shown in Figure 9-144e (EBCS Response field format).

EBCS Response Information List

Octets: Variable

**Figure 9-144e—EBCS Response field format**

The EBCS Response Information List field contains one or more EBCS Response Info subfields. The format of the EBCS Response Info subfield is shown in Figure 9-144f (EBCS Response Info subfield format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| EBCS  Response Info Control | Content ID | EBCS  Request Failure Code | Time To Termination | EBCS SP  Duration | EBCS SP  Interval | (#2178) Authentication Info |

Octets: 1 1 0 or 1 0 or 3 0 or 2 0 or 2 Variable

**Figure 9-144f—EBCS Response Info subfield format**

The format of the EBCS Response Info Control subfield is shown in Figure 9-144g (EBCS Response Info Control subfield).

B0 B1 B2 B3 B4 B5 B7

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | EBCS Request Status | Time to Termination Present | EBCS SP Duration Present | EBCS SP Interval Present | (#2178) Authentication Info Present | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 1 | 3 |

**Figure 9-144g—EBCS Response Info Control subfield**

A value of 0 in the EBCS Request Status subfield indicates that the request for the EBCS traffic stream identified by the Content ID subfield included in the same EBCS Response Info subfield is successful and an EBCS Request Failure Code subfield is not included in the same EBCS Response Info subfield. A value of 1 in the EBCS Request Status subfield indicates that the request for the EBCS traffic stream identified by the Content ID subfield included in the same EBCS Response Info subfield is refused and an EBCS Request Failure Code subfield is included in the same EBCS Response Info subfield.

A value 1 in the Time To Termination Present subfield indicates that a Time To Termination subfield is included in the same EBCS Response Info subfield. A value 0 indicates that the same EBCS Response Info subfield does not contain a Time To Termination subfield.

A value 1 in the EBCS SP Duration Present subfield indicates that an EBCS SP Duration subfield is included in the same EBCS Response Info subfield. A value 0 indicates that the same EBCS Response Info subfield does not contain an EBCS SP Duration subfield.

A value 1 in the EBCS SP Interval Present subfield indicates that an EBCS SP Interval subfield is included in the same EBCS Response Info subfield. A value 0 indicates that the same EBCS Response Info subfield does not contain an EBCS SP Interval subfield.

(#2178) A value 1 in the Authentication Info Present subfield indicates that an Authentication Info subfield is included in the same EBCS Response Info subfield. A value 0 indicates that the same EBCS Response Info subfield does not contain an Authentication Info subfield.

The Content ID subfield indicates the ID of the EBCS content stream.

If the request for the EBCS traffic stream identified by the Content ID subfield in the same EBCS Response Info subfield is refused, the value of the EBCS Request Status Code subfield indicates one of the failure codes defined in Table 9-91i (EBCS Request Failure Code).

**Table 9-91i—EBCS Request Failure Code**

|  |  |  |
| --- | --- | --- |
| **Failure Code** | **Name** | **Meaning** |
| 0 | REFUSED\_REASON\_UN- SPECIFIED | Unspecified failure |
| 1 | REFUSED\_ASSOCIA- TION\_REQUIRED | Request for the EBCS traffic stream is refused since the traffic stream requires the requesting STA to be associated. |
| 2-255 |  | Reserved |

The Time To Termination subfield indicates the requested period in number of TBTTs after which the EBCS traffic stream identified by the Content ID subfield included in the same EBCS Response Info subfield is terminated. The value 0 is reserved. An EBCS traffic stream identified by the Content ID subfield contained in an EBCS Response Info subfield has no specific termination time if the EBCS Response Info subfield contains no Time To Termination subfield.

The EBCS SP Duration subfield indicates the nominal duration of each EBCS service period in TUs.

The EBCS SP Interval subfield indicates the target interval between consecutive EBCS service periods for the EBCS traffic stream identified by the Content ID subfield in the same EBCS Response Info subfield in TUs.

*Editor: Please insert the following* *paragraphs after P27L11:*

(#2178) The Authentication Info subfield is used by STA to authenticate the EBCS traffic streams and shown in Figure 9-144h (Authentication Info subfield format).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Content Authentication Algorithm | Content Information Control | Content Address Type | Content Address | Title Length | Title | Negotiation Info | Time Of Termination (optional) | Next TX Schedule (optional) |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Allowable Time Difference (optional) | HCFA Base Key (optional) | Previous Period HCFA Base Key 0 Sequence (optional) | Previous Period HCFA Base Key 0 (optional) | Previous Period HCFA Base Key 1 Sequence (optional) | Previous Period HCFA Base Key 1 (optional) |

Octets: 0 or 2 0 or 32 0 or 1 0 or 32 0 or 1 0 or 32

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HCFA Key  Change Interval (optional) | Number Of Instant Authenticat ors (optional) | Instant Authenticat or List (optional) | Service URL Length (optional) | Service URL  (optional) |

Octets: 0 or 1 0 or 1 *n* x 33 0 or 1 variable

(#2178) **Figure 9-144h Authentication Info subfield format**

(#2178) The Content Authentication Algorithm subfield is defined in Table 9-397c (Content Authentication Algorithm field).

(#2178) The Content Information Control subfield is shown in Figure 9-909ao (Content Information Control subfield format).

(#2178) The Content Address Type subfield and the Content Address subfield are defined in Figure 9.4.5.30 (Enhanced Broadcast Services ANQP-element).

(#2178) The Title Length subfield indicates the length of the following Title subfield in octets. The Title subfield is a human readable title of the content as a UTF-8 string.

(#2178) The Negotiation Info subfield indicates the negotiation method. The format of the Negotiation Info subfield is shown in Figure 9-909ap (Negotiation Info subfield format).

(#2178) The Time Of Termination Present subfield indicates whether the Time Of Termination field is present.

(#2178) The Next Schedule Present subfield indicates whether the Next Schedule field is present.

(#2178) The Allowable Time Difference subfield is present if the Content Authentication Algorithm indicates PKFA or HCFA and is not present otherwise. The value indicates the allowable time difference between the clock of the EBCS transmitter and the clock of the EBCS receivers in milliseconds.

(#2178) The HCFA Base Key subfield, the Previous Period HCFA Base Key 0 Sequence subfield, the Previous Period HCFA Base Key 0 subfield, the Previous Period HCFA Base Key 1 Sequence subfield, the Previous Period HCFA Base Key 1 subfield and the HCFA Key Change Interval subfield are present if the Content Authentication Algorithm field indicates HCFA and are not present otherwise.

(#2178) The HCFA Base Key subfield contains the first HCFA base key of the HCFA period that starts from this EBCS Info frame.

(#2178) The Previous Period HCFA Base Key 0 Sequence subfield and the Previous Period HCFA Base Key 1 Sequence subfield indicate the key sequence number of the Previous Period HCFA Base Key 0 subfield and the Previous Period HCFA Base Key 1 subfield respectively. The Previous Period HCFA Base Key 0 subfield and the Previous Period HCFA Base Key 1 subfield contain the HCFA base key to be disclosed for the previous HCFA period.

(#2178) If the previous HCFA period does not exist, e.g. at the start of the EBCS transmission, the Previous Period HCFA Base Key 0 Sequence subfield, the Previous Period HCFA Base Key 0 subfield, the Previous Period HCFA Base Key 1 Sequence subfield and the Previous Period HCFA Base Key 1 subfield are set to 0.

(#2178) The HCFA Key Change Interval subfield indicates the EBCS HCFA key change interval in units of 10 milliseconds (see dot11eBCSHCFAKeyChangeInterval).

The Number Of Instant Authenticators subfield and the Instant Authenticators subfield are present if the Content Authentication Algorithm field indicates HCFA with instant authentication, and are not present otherwise.

(#2178) The Number Of Instant Authenticators subfield, if present, indicates the number of the Instant Authenticators contained in the Instant Authenticator List.

(#2178) The Instant Authenticator List subfield, if present, contains one or more Instant Authenticators.

(#2178) The format of each Instant Authenticator is shown in Figure 9-909ar (Instant Authenticator format).

(#2178) The Service URL Length subfield indicates the number of octets in the Service URL subfield.

(#2178) The Service URL subfield indicates the URL at which information relevant to the corresponding EBCS traffic stream might be retrieved, including negotiation or registration for the service, formatted in accordance with IETF RFC 3986.

*Editor: Please modify Figure 9-839aa as follows and insert the following content:*

**9.4.5 Access network query protocol (ANQP) elements**

**9.4.5.31 Enhanced Broadcast Services Request ANQP-element**

The Enhanced Broadcast Services Request ANQP-element transmits a register (or unregister) request from a STA to a peer STA to receive (or stop receiving) enhanced broadcast services that are available from the peer STA. The format of the Enhanced Broadcast Services Request ANQP-element is defined in Figure 9-839y (Enhanced Broadcast Services Request ANQP-element format).

|  |  |  |
| --- | --- | --- |
| Info ID | Length | Enhanced Broadcast Services Request Tuples |

Octets: 2 2 variable

**Figure 9-839y—Enhanced Broadcast Services Request ANQP-element format**

The Info ID and Length fields are defined in 9.4.5.1 (General).

The Enhanced Broadcast Services Request Tuples field contains one or more Enhanced Broadcast Services Request Tuple fields as shown in Figure 9-839z (Enhanced Broadcast Services Request Tuple field format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Enhanced Broadcast Services Request Control | Broadcast Action | Content ID | Broadcaster MAC Address (optional) | Requested Time To Termination (optional) |

Octets: 1 1 1 0 or 6 0 or 3

**Figure 9-839z—Enhanced Broadcast Services Request Tuple field format**

The format of the Enhanced Broadcast Services Request Control subfield is defined in Figure 9-839aa (Enhanced Broadcast Services Request Control format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 |  | B7 |
| Broadcaster MAC Address Present | Requested Time To Termination Present | (#2178) Request Authentication Info | Reserved | | |
| Bits: | 1 | 1 | 1 |  | 5 |  |

**Figure 9-839aa—Enhanced Broadcast Services Request Control format**

A value of 1 in the Broadcaster MAC Address Present subfield indicates that a Broadcaster MAC Address subfield is present in the Enhanced Broadcast Services Request Tuple field; otherwise, the Broadcaster MAC Address subfield is not present.

A value of 1 in the Requested Time To Termination Present subfield indicates that a Requested Time To Termination subfield is present in the Enhanced Broadcast Services Request Tuple field; otherwise the Requested Time To Termination subfield is not present.

(#2178) A value of 1 in the Authentication Info Present subfield indicates that an Authentication Info subfield is present in the Enhanced Broadcast Services Request Tuple field; otherwise, the Authentication Info subfield is not present.

*Editor: Please modify Figure 9-839ac as follows and insert the following content:*

**9.4.5.32 Enhanced Broadcast Services Response ANQP-element**

The Enhanced Broadcast Services Response ANQP-element provides a list of zero or more enhanced broadcast services that are available from a peer STA. The format of the Enhanced Broadcast Services Response ANQP-element is defined in Figure 9-839ab (Enhanced Broadcast Services Response ANQP-element format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | Octets: | 2 | 2 | variable |

|  |  |  |
| --- | --- | --- |
| Info ID | Length | Enhanced Broadcast Services Response Tuples  (Optional) |

**Figure 9-839ab—Enhanced Broadcast Services Response ANQP-element format**

The Info ID and Length fields are defined in 9.4.5.1 (General). The Enhanced Broadcast Services Response Tuples field, if present, contains one or more Enhanced Broadcast Services Response Tuple fields. The Enhanced Broadcast Services Response Tuple field is defined in Figure 9-839ac (Enhanced Broadcast Services Response Tuple format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (#2178) Enhanced Broadcast Services Response Control | Content ID | Broadcast Service Transmitting | | (#2178) Authentication Info  (optional) |
| Octets: | 1 | 1 | | 1 | variable |

**Figure 9-839ac—Enhanced Broadcast Services Response Tuple format**

(#2178) The Enhanced Broadcast Services Response Control subfield defines which of the optional fields are present in the Enhanced Broadcast Response Services Tuple field and is defined in Figure 9-839ad (Enhanced Broadcast Services Response Control field format):

B0 B1 B7

|  |  |  |
| --- | --- | --- |
|  | Authentication Info Present | Reserved |
| Bits: | 1 | 7 |

(#2178) **Figure 9-839ad - Enhanced Broadcast Services Response Control field format**

(#2178) A value of 1 in the Authentication Info Present subfield indicates that the Enhanced Broadcast Services Response Tuple field contains an Authentication Info field. A value of 0 indicates that the Enhanced Broadcast Services Response Tuple field does not contain an Authentication Info field.

The Broadcast Service Transmitting field indicates whether the EBCS traffic stream referenced by the Content ID field is being transmitted. A value of 1 indicates that the traffic stream is being transmitted and a value of 0 indicates that the traffic stream is not being transmitted. All other values are reserved.

The Broadcast Service Transmitting field values are defined in Table 9-340k (Broadcast Service Transmitting field values).

**Table 9-340k—Broadcast Service Transmitting field values**

|  |  |
| --- | --- |
| **Value** | **Description** |
| 0 | A broadcast service is not being transmitted |
| 1 | A broadcast service is being transmitted |
| 2-255 | Reserved |

*Editor: Please insert the following* *paragraphs after P43L42:*

(#2178) The Authentication Info subfield is used by STA to authenticate the EBCS traffic streams and shown in Figure 9-144h (Authentication Info subfield format).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Content Authentication Algorithm | Content Information Control | Content Address Type | Content Address | Title Length | Title | Negotiation Info | Time Of Termination (optional) | Next TX Schedule (optional) |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Allowable Time Difference (optional) | HCFA Base Key (optional) | Previous Period HCFA Base Key 0 Sequence (optional) | Previous Period HCFA Base Key 0 (optional) | Previous Period HCFA Base Key 1 Sequence (optional) | Previous Period HCFA Base Key 1 (optional) |

Octets: 0 or 2 0 or 32 0 or 1 0 or 32 0 or 1 0 or 32

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HCFA Key  Change Interval (optional) | Number Of Instant Authenticat ors (optional) | Instant Authenticat or List (optional) | Service URL Length (optional) | Service URL  (optional) |

Octets: 0 or 1 0 or 1 *n* x 33 0 or 1 variable

(#2178) **Figure 9-144h Authentication Info subfield format**

(#2178) The Content Authentication Algorithm subfield is defined in Table 9-397c (Content Authentication Algorithm field).

(#2178) The Content Information Control subfield is shown in Figure 9-909ao (Content Information Control subfield format).

(#2178) The Content Address Type subfield and the Content Address subfield are defined in Figure 9.4.5.30 (Enhanced Broadcast Services ANQP-element).

(#2178) The Title Length subfield indicates the length of the following Title subfield in octets. The Title subfield is a human readable title of the content as a UTF-8 string.

(#2178) The Negotiation Info subfield indicates the negotiation method. The format of the Negotiation Info subfield is shown in Figure 9-909ap (Negotiation Info subfield format).

(#2178) The Time Of Termination Present subfield indicates whether the Time Of Termination field is present.

(#2178) The Next Schedule Present subfield indicates whether the Next Schedule field is present.

(#2178) The Allowable Time Difference subfield is present if the Content Authentication Algorithm indicates PKFA or HCFA and is not present otherwise. The value indicates the allowable time difference between the clock of the EBCS transmitter and the clock of the EBCS receivers in milliseconds.

(#2178) The HCFA Base Key subfield, the Previous Period HCFA Base Key 0 Sequence subfield, the Previous Period HCFA Base Key 0 subfield, the Previous Period HCFA Base Key 1 Sequence subfield, the Previous Period HCFA Base Key 1 subfield and the HCFA Key Change Interval subfield are present if the Content Authentication Algorithm field indicates HCFA and are not present otherwise.

(#2178) The HCFA Base Key subfield contains the first HCFA base key of the HCFA period that starts from this EBCS Info frame.

(#2178) The Previous Period HCFA Base Key 0 Sequence subfield and the Previous Period HCFA Base Key 1 Sequence subfield indicate the key sequence number of the Previous Period HCFA Base Key 0 subfield and the Previous Period HCFA Base Key 1 subfield respectively. The Previous Period HCFA Base Key 0 subfield and the Previous Period HCFA Base Key 1 subfield contain the HCFA base key to be disclosed for the previous HCFA period.

(#2178) If the previous HCFA period does not exist, e.g. at the start of the EBCS transmission, the Previous Period HCFA Base Key 0 Sequence subfield, the Previous Period HCFA Base Key 0 subfield, the Previous Period HCFA Base Key 1 Sequence subfield and the Previous Period HCFA Base Key 1 subfield are set to 0.

(#2178) The HCFA Key Change Interval subfield indicates the EBCS HCFA key change interval in units of 10 milliseconds (see dot11eBCSHCFAKeyChangeInterval).

(#2178) The Number Of Instant Authenticators subfield and the Instant Authenticators subfield are present if the Content Authentication Algorithm field indicates HCFA with instant authentication, and are not present otherwise.

(#2178) The Number Of Instant Authenticators subfield, if present, indicates the number of the Instant Authenticators contained in the Instant Authenticator List.

(#2178) The Instant Authenticator List subfield, if present, contains one or more Instant Authenticators.

(#2178) The format of each Instant Authenticator is shown in Figure 9-909ar (Instant Authenticator format).

(#2178) The Service URL Length subfield indicates the number of octets in the Service URL subfield.

(#2178) The Service URL subfield indicates the URL at which information relevant to the corresponding EBCS traffic stream might be retrieved, including negotiation or registration for the service, formatted in accordance with IETF RFC 3986.