IEEE P802.11  
Wireless LANs

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| 802.11bc LB255 – Discussion on 9.4.5.100 | | | | |
| Date: March 10, 2021 | | | | |
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Abstract: This submission presents discussion material to address comments from the LB252 on section 9.4.5.100.

1. **9.4.5.100 Enhanced Broadcast Service~~s~~ ANQP-element**
2. The Enhanced Broadcast Service~~s~~ ANQP-element provides a list of one or more enhanced broadcast
3. services that are available from the STA transmitting this element. The format of the Enhanced Broadcast
4. Service~~s~~ ANQP-element is defined in Figure 9-bc12.

***TGbc editor: Modify Figure 9-bc12 as shown below [CID 1011, 1012,1046, 1047, 1069]***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Info ID | Length | ~~Broadcast Control~~ | Next EBCS Info Frame Tx Time | Enhanced Broadcast Service~~s~~ Tuples |
| Octet | 2 | 2 | ~~1~~ | 2 | Variable |

**Figure 9-bc12 - ~~EBCS Response Info Control subfield format~~ Enhanced Broadcast Service ANQP-element**

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

***TGbc editor: Remove lines below [CID 1011, 1012,1046, 1047, 1069]***

1. ~~The Broadcast Control field is defined in Figure 9-bc13~~

~~B0 B1 B2 B3 B7~~

|  |  |  |  |
| --- | --- | --- | --- |
| ~~Transmit Capability~~ | ~~Receive Capability~~ | ~~Service Advertisement~~ | ~~Reserved~~ |

~~Bits: 1 1 1 5~~

**~~Figure 9-bc13 Enhanced Broadcast field format~~**

### 16

1. ~~The Transmit Capability subfield is set to 1 by a STA to indicate that it supports the transmission of EBCS.~~
2. ~~This subfield is set to 0 to indicate that there is no support for the transmission of EBCS.~~
3. ~~The Receive Capability subfield is set to 1 by a STA to indicate that it supports the reception of EBCS.~~
4. ~~This subfield is set to 0 to indicate that there is no support for the reception of EBCS. When the Enhanced~~
5. ~~Broadcast Services ANQP-element is transmitted by a non-AP STA, this bit set to 1 indicates that the~~
6. ~~information in the Enhanced Broadcast Services Tuples refers to EBCS being received by the non-AP STA.~~
7. ~~The Service Advertisement subfield is set to 1 by a STA to indicate that the Enhanced Broadcast Services~~
8. ~~Tuples subfield contains information about the EBCS(s) transmitted by the STA. This subfield is set to 0 to~~
9. ~~indicate that there are no Enhanced Broadcast Services Tuples subfields at the time of transmission from~~
10. ~~the STA.~~

***TGbc editor: Add the following line before the explanation of the Enhanced Broadcast Service Tuples field [CID 1011, 1012,1046, 1047, 1069]***

1. The Next EBCS Info Frame Tx Time field indicates the number of TBTTs until the beacon interval in which the next Info frame is transmitted.
2. The Enhanced Broadcast Service~~s~~ Tuples field contains one or more Enhanced Broadcast Service~~s~~ Tuple
3. fields as shown in Figure 9-bc14.

***TGbc Editor: Use this version of the Figure 9-bc14, which solves some formatting issues [CID 1495]***

***[CID 1011, 1012,1046, 1047, 1069]***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Control | Content ID | Negotiation  ~~Request~~  Method | Next Tx Schedule (Optional) [CID1612] | Time To Termination (Optional) [CID 1215] | Authentication Algorithm |
| Octets | 1 | 1 | 1 | 0 or 8 | 0 or 2 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Content ~~Destination~~ Address Type (Optional) | Content ~~Destination~~Address (Optional) | Title Length (Optional) | Title (Optional) |

Octets: 0 or 1 variable 0 or 1 variable

17 **Figure 9-bc14 - Enhanced Broadcast Service~~s~~ Tuple field format**

1. The Control field defines which of the optional fields are present in the Enhanced Broadcast Services Tuple
2. field and is defined in Figure 9-bc15~~a:~~[CID 1562]

***TGbc Editor: Makes sure Figure 9-bc15 fits completely in a single page and does not have a first empty column. [CID 1532, 1602] [CID 1046/1047/1011]***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 | B5-B7 |
|  | Next Tx Schedule Present [CID1612] | Time To Termination Present [CID1215] | Content Address  Present | Title Present | Association Required | Reserved |
| Bits | 1 | 1 | 1 | 1 | 1 | 3 |

**Figure 9-bc15 Control field format**

1. ~~The Broadcaster MAC Address Present subfield is set to 1 by a STA to indicate that the Enhanced~~
2. ~~Broadcast Services Tuple field contains a Broadcaster MAC Address field. This subfield is set to 0 to~~
3. ~~indicate that there is no Broadcaster MAC Address field.~~ ***[CID 1046/1047/1011]***
4. The Next Tx Schedule Present subfield is set to 1 by a STA to indicate that the Enhanced Broadcast
5. Service~~s~~ Tuple field contains a Next Tx Schedule field. This subfield is set to 0 to indicate that there is no
6. Next Tx Schedule field. [CID 1612]
7. The Time To Termination subfield is set to 1 by a STA to indicate that the Enhanced Broadcast Service~~s~~
8. Tuple field contains a Time To Termination field. This subfield is set to 0 to indicate that there is no Time
9. to Termination field.[CID1215]
10. The Content ~~Destination~~ Address Present subfield is set to 1 by a STA to indicate that the Enhanced
11. Broadcast Service~~s~~ Tuple field contains Content ~~Destination~~  Address Type and Content ~~Destination~~
12. Address fields. This subfield is set to 0 to indicate that there are no Content ~~Destination~~ Address Type and
13. Content ~~Destination~~ Address fields.
14. The Title Present subfield is set to 1 by a STA to indicate that the Enhanced Broadcast Service~~s~~ Tuple field
15. contains a Title Length field and a Title field. This subfield is set to 0 to indicate that there are no Title
16. Length and Title fields.
17. ~~The EBCS TxRx field indicates if the service identified in this Enhanced Broadcast Services Tuple field is being transmitted (when set to 0) or received (when set to 1) by the STA sending this Enhanced Broadcast Service ANQP-element.~~ [CID 1046/1047/1011]
18. A value of 1 in the Association Required subfield indicates that association is required to consume the
19. eBCS identified by the content ID contained in the Content ID subfield. A value of 0 indicates that
20. association is not required to consume the eBCS identified by the content ID contained in the Content ID
21. subfield.
22. The Content ID subfield indicates the identifier of the content.
23. The Request Method subfield indicates the request method to solicit the transmission of an EBCS identified
24. by the content ID contained in the Content ID subfield. The encoding of the Request Method subfield is
25. defined in Table 9-bc3 (Request Method subfield encoding).
26. **Table 9-bc3—Request Method subfield encoding**

|  |  |  |
| --- | --- | --- |
| **Negotiation Method subfield value** | **Meaning** | **Notes** |
| 0 | No negotiation |  |
| 1 | Request using eBCS Request frames | eBCS request by STAs that are associated with the broadcaster |
| 2 | Request using eBCS Request ANQP-elements | eBCS request by STAs that are not associated with the broadcaster |
| 3 | Request as defined in EBCS Info frame | Out of band ~~IP~~ request. The mechanism and address is indicated in the EBCS Info frame. |
| 4-255 | Reserved [CID 1451] |  |

1. ~~The Broadcaster MAC Address field indicates the MAC Address of the AP broadcasting this channel, in~~
2. ~~the case of a setup with multiple APs.~~ ***[CID 1011, 1012,1046, 1047, 1069]***
3. The Time Of Termination subfield indicates the number of TBTTs until the content identified by the
4. content ID contained in the Content ID subfield is terminated. A value of 0 indicates that the content
5. identified by the content ID in the Content ID subfield ~~will be~~ is terminated at the following TBTT. A value
6. of 65535 indicates that the content identified by the content ID in the Content ID subfield has no specific
7. termination time.
8. The Next Tx Schedule subfield indicates the number of TBTTs until the beacon interval in which the next frame
9. belonging to the EBCS traffic stream, identified by the Content ID subfield, is transmitted. A value of 0
10. indicates that this transmission occurs in the beacon interval that starts at the next TBTT. A value of 1 indicates
11. that it occurs in the beacon interval that follows that beacon interval. A value of 65535 indicates that there is no
12. specific transmission time. [CID1612]
13. The Authentication Algorithm field indicates the authentication algorithm used for this EBCS traffic stream.
14. The Authentication Algorithm subfield is defined in Table 9-bcX (Authentication Algorithms).

Table 9-bcX Authentication Algorithms

|  |  |
| --- | --- |
| Value | Authenticated Algorithm |
| 0 | HLSA (see 12.100.4 No frame authentication with mandatory higher layer source authentication (HLSA)) |
| 1 | PKFA (see 12.100.2 eBCS public key frame authentication (PKFA)) |
| 2 | HCFA without instant authentication (see 12.100.3 eBCS Hash chain frame authentication (HCFA)) |
| 3 | HCFA with instant authentication (see 12.100.3 eBCS Hash chain frame authentication) |
| 4-255 | Reserved |

1. The Content ~~Destination~~ Address Type subfield is defined in Table 9-bc4 (Content ~~Destination~~ Address
2. Type subfield). ~~The value of 2, indicating a UDP or hostname, shall only be used for EBCS UL frames.~~
3. ~~The other values are used for both EBCS DL and UL frames.~~ [CID 1022]
4. **Table 9-bc4 Content ~~Destination~~ Address Type subfield**

|  |  |
| --- | --- |
| **Value** | **Address Type** |
| 0 | UDP/IPv4 |
| 1 | UDP/IPv6 |
| ~~2~~ | ~~UDP/hostname (UL only)~~  [CID1022] |
| 2~~3~~ | MAC Address |
| 3-255 [CID1452] | Reserved |

1. The Content Address subfield contains the addresses and the port to select the content, encoded as follows.
2. If the Content ~~Destination~~ Address Type subfield is UDP/IPv4, the format of the Content ~~Destination~~
3. Address subfield is shown in Figure 9-bc16 (Content ~~Destination~~ Address subfield format for UDP/IPv4).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Source IPv4 Address | Destination IPv4 Address | Destination  UDP Port |
| Octets | 4 | 4 | 2 |

1. **Figure 9-bc16 Content ~~Destination~~ Address subfield format for UDP/IPv4**
2. The Source IPv4 Address subfield contains the source IPv4 address of the content. If the value of the Source IPv4 Address subfield is 0, the source address of the content is not specified.
3. The Destination IPv4 Address subfield indicates the IPv4 address used as destination (typically a
4. multicast IPv4 address) in the broadcast frames for the EBCS identified by the Content ID field. The
5. Destination Port subfield indicates the UDP port associated with the IPv4 address indicated in the
6. Destination IPv4 Address subfield.[CID 1501/1500/1499]
7. NOTE---The UDP port and IP address are encoded per the conventions defined in 9.2.2.
8. If the Content ~~Destination~~ Address Type subfield is UDP/IPv6, the format of the Content ~~Destination~~
9. Address subfield is shown in Figure 9-bc17 (Content ~~Destination~~ Address subfield format for UDP/IPv6).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Source IPv6 Address | Destination IPv6 Address | Destination  UDP Port |
| Octets | 16 | 16 | 2 |

1. **Figure 9-bc17 Content ~~Destination~~ Address subfield format for UDP/IPv6**
2. The Source IPv6 Address subfield contains the source IPv6 address of the content. If the value of the Source IPv6 Address subfield is 0, the source address of the content is not specified.
3. The Destination IPv6 Address subfield indicates the IPv6 address used as destination (typically a
4. multicast IPv6 address) in the broadcast frames for the EBCS identified by the Content ID field. The
5. Destination Port subfield indicates the UDP port associated with the IPv6 address indicated in the
6. Destination IPv6 Address subfield. [CID 1501/1500/1499]
7. NOTE---The UDP port and IP address are encoded per the conventions defined in 9.2.2.

**TGbc Editor: Remove the following lines [CID 1022, 1512, 1453]**

1. ~~If the Content Destination Address Type subfield is UDP/hostname, the format of the Content Destination~~
2. ~~Address subfield is shown in Figure 9-bc18 (Content Destination Address subfield format for~~
3. ~~UDP/hostname). The Hostname Length subfield indicates the length of the Hostname subfield. The~~
4. ~~Hostname subfield is the hostname as a UTF-8 string.~~

|  |  |  |
| --- | --- | --- |
| ~~Hostname Length~~ | ~~Hostname~~ | ~~Destination UDP Port~~ |

1. ~~Octets 1 variable 2~~
2. **~~Figure 9-bc18 Content Destination Address subfield format for UDP/hostname (CID 53)~~**

|  |  |  |
| --- | --- | --- |
|  | Source MAC Address | Destination MAC Address |
| Octets | 6 | 6 |

1. Figure 9-bc19 Content ~~Destination~~ Address subfield format for MAC Address
2. [CID 1513]
3. If the Content ~~Destination~~ Address Type subfield is MAC Address, the Content ~~Destination~~ Address
4. subfield contains a MAC address. [CID 1514].
5. The Source MAC Address subfield contains the source MAC address of the content. If the value of the Source MAC Address subfield is 0, the source MAC address of the content is not specified.
6. The Destination MAC Address subfield contains the destination MAC address of the content that is a group address.
7. The Title Length field indicates the length of the following Title field in octets.
8. The Title field is a human readable title of the content as a UTF-8 string.
9. If the Content Destination Address Type subfield is MAC Address, the Content Destination Address
10. subfield contains a MAC address. [CID 1514].

***TGbc Editor: remove Fig 9-bc19 [CID 1514]***

~~MAC Address~~

~~Octets 6~~

1. **~~Figure 9-bc19 Content Destination Address subfield format for MAC Address~~**

***TGbc Editor: Replace Time to Termination to Time To Termination as in the following for clause 9.4.2.301 [CID1215]***

|  |  |  |
| --- | --- | --- |
| EBCS  Request Info Control | Content ID | Requested Time T~~t~~o Termination |

Octets: 1 1 0 or 4

**Figure 9-bc7 - EBCS Request Info subfield format**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4-B7 |
|  | EBCS Request Status | Time T~~t~~o Termination Present | EBCS SP Duration Present | EBCS SP Interval Present | Reserved |
| Bits | 1 | 1 | 1 | 1 | 4 |

**Figure 9-bc11 - EBCS Response Info Control subfield format**

***TGbc Editor: Change Time to Termination to Time To Termination in clause 11.100.5 EBCS Termination Notice Procedure as follows [CID1215]***

1. NOTE—Which values of a received Time T~~t~~o Termination subfield are considered acceptable is
2. determined by the receiving STA and is beyond the scope of this standard.

***TGbc Editor: Modify Clause 11.22.3.3.100 as follows. [CID 1011, 1012,1046, 1047, 1069]***

1. **11.22.3.3.100 Enhanced Broadcast Service procedures**
2. Enhanced Broadcast Services may be advertised using the Enhanced Broadcast Service~~s~~ ANQP-
3. element (see 9.4.5.100). The element provides a list of zero or more enhanced broadcast services that
4. are available from a peer STA. Each broadcast service advertisement may contain ~~the time and duration of~~
5. ~~transmission, together with an identifier of the broadcast service, a content ID, and other information relevant to~~
6. ~~the broadcast service.~~ the request method used to negotiate the starting to the service (Request Method field),
7. the scheduled next transmission (Next Tx Schedule field), the time until the service will end its current
8. transmission (Time To Termination field), the authentication algorithm the service uses (Authentication
9. Algorithm field), the destination address (and port for UDP over IP transport) used by the higher layer protocol
10. of the EBCS traffic stream and the title (Title field) of the service in a human readable form.
11. STAs consuming directly the EBCS through the content address signaled in an Enhanced Broadcast Service
12. ANQP-element may consider that the ANQP frame can be unsecured or unauthenticated and its contents may
13. be provided by a malicious user.
14. If the service is authenticated (values 1, 2 or 3 of the Authentication Algorithm field as defined in Table 9-bcX)
15. or requires negotiation (values 1, 2 or 3 of the Request Method field as defined in Table 9-bc3), the information
16. provided by the Enhanced Broadcast Service ANQP-element is not enough to consume the service. The
17. information on the authentication and negotiation method may be obtained in the next EBCS Info frame.
18. This is indicated by the Authentication Algorithm field and in the Request Method field included in the EBCS
19. Broadcast Service ANQP-element.
20. If the content follows the authentication scheme as defined in 12.100.4 (No frame authentication with mandatory
21. higher layer source authentication (HLSA)) as indicated by the Authentication Algorithm subfield equal to 0 as
22. defined in Table 9-bcX.
23. A STA may use the Enhanced Broadcast Request ANQP-element to register (or de-register) from a
24. peer STA transmitting an enhanced broadcast service.