IEEE P802.11
Wireless LANs

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| CC36 CR for 35.6.2.1 Latency sensitive traffic differentiation |
| Date: 2021-08-05 |
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Abstract

This submission proposes resolutions for the following CIDs for TGbe CC36:

5951

Revisions:

* Rev 0: Initial version of the document
* Rev 1: Add a TSPEC variant element, which contains the relevant parameters for the proposed latency sensitive traffic criterion

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

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

***TGbe editor: The baseline for this document is 11be D1.1.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 5951 | 35.6.2.1 | 298.25 | There is no Latency Sensitive Traffic Criterion specified currently, therefore it is difficult to differentiate the latency sensitive traffic especilly for the traffic identified with TSPEC element. Because the latency Sensitive Traffic can be transferred with Restricted TWT periods for strict protection, if latency Sensitive Traffic criterion is still unspecified some non-latency-sensitive traffic identified with TSPEC element is mistakenly treated as latency-sensitive traffic and occupies the R-TWT periods, which is unfair for other EHT STAs which need to transfer the latency sensitive traffic | The Latency Sensitive Traffic Criterion is suggested to be specified by using some of the parameters of TSPEC element. And the operating mechanism needs to be specified. | RevisedAgreed it is necessary to specify how to differentiate the latency sensitive traffic.**Instruction to the editor**, ***please* insert the *paragraphs in 35.7.2.1 Latency sensitive traffic differentiation, and insert the new subclause at the end of subclause 9.4.2 Elements, as shown in this document (doc.: IEEE 802.11-21/1290r0).*** |
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**Discussion:**

This document proposes a latency sensitive traffic criterion required for differentiating latency sensitive traffic. Two optional formats are given for the specification of the relevant parameters for the proposed latency sensitive traffic criterion as follows.

Option 1: A Latency Sensitive Traffic Criterion element.

Option 2: A TSPEC variant element, which contains the relevant parameters for the proposed latency sensitive traffic criterion.

**Proposed Text Change:**

**1. Proposed Text Change for “35.7.2.1 Latency sensitive traffic differentiation”**

**TGbe editor**: ***at P319 of IEEE P802.11be™/D1.01,*** ***please*** insert the following ***paragraphs in 35.7.2.1 Latency sensitive traffic differentiation*** (CID 5951)

**Option 1 – for the Latency Sensitive Traffic Criterion element:**

An EHT AP that has dot11RestrictedTWTOptionImplemented equal to true may announce a criterion for differentiating latency sensitive traffic by containing a Latency Sensitive Traffic Criterion element in transmitted Beacon frames, Probe Response frames, and (Re)Association Response frames, and other management frames. A non-AP EHT STA identifies latency sensitive traffic according to the criterion indicated in the most recently received Latency Sensitive Traffic Criterion element. A traffic stream is identified as latency sensitive traffic if the following conditions are met:

* The delay bound for the traffic stream is less than or equal to the threshold for delay bound indicated in the Threshold for Delay Bound field of Latency Sensitive Traffic Criterion element.
* The MSDU delivery ratio for the traffic stream is larger than or equal to the threshold for MSDU delivery ratio indicated in the Threshold for MSDU Delivery Ratio field of Latency Sensitive Traffic Criterion element if present.
* The maximum jitter for the traffic streame is less than or equal to the threshold for maximum jitter indicated in the Threshold for Maximum Jitter field of Latency Sensitive Traffic Criterion element if present.

Otherwise it is not identified as latency sensitive traffic.

**Option 2 – for the TSPEC variant element:**

An EHT AP that has dot11RestrictedTWTOptionImplemented equal to true may announce a criterion for differentiating latency sensitive traffic by containing a TSPEC element with the Type subfield equal to the value of 2 in transmitted Beacon frames, Probe Response frames, and (Re)Association Response frames, and other management frames. A non-AP EHT STA identifies latency sensitive traffic according to the criterion indicated in the most recently received TSPEC element with the Type subfield equal to the value of 2. A traffic stream is identified as latency sensitive traffic if the following conditions are met:

* The delay bound for the traffic stream is less than or equal to the threshold for delay bound indicated in the Threshold for Delay Bound subfield of Latency Sensitive Traffic Attributes field of the TSPEC element.
* The MSDU delivery ratio for the traffic stream is larger than or equal to the threshold for MSDU delivery ratio indicated in the Threshold for MSDU Delivery Ratio subfield of Latency Sensitive Traffic Attributes field of the TSPEC element if present.
* The maximum jitter for the traffic streame is less than or equal to the threshold for maximum jitter indicated in the Threshold for Maximum Jitter subfield of Latency Sensitive Traffic Attributes field of the TSPEC element. if present.

Otherwise it is not identified as latency sensitive traffic.

**2. Proposed Text Change for “9.4.2 Elements” (for Option 1)**

**TGbe editor**: ***at P163 of IEEE P802.11be™/D1.01, please insert the following new subclause at the end of subclause 9.4.2 Elements*** (CID 5951)***:***

The format of the Latency Sensitive Traffic Criterion element is defined in [Figure 9-xxx (Latency Sensitive Traffic Criterion element format)](#bookmark93). The frames carrying this element and usage of this element are described in 35.7.2.1 Latency sensitive traffic differentiation.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element ID Extension | Latency Sensitive Traffic Criterion Control | Threshold for Delay Bound | Threshold for MSDU Delivery Ratio | Threshold for Maximum Jitter |

Octets: 1 1 1 1 4 0 or 1 0 or 4

**Figure 9-xxx—Latency Sensitive Traffic Criterion element format**

The Element ID, Length, and Element ID Extension fields are defined in [9.4.2.1 (General)](#bookmark71).

The format of the Latency Sensitive Traffic Criterion Control field is defined in [Figure 9-xxx (Latency Sensitive Traffic Criterion Control field format )](#bookmark131).

B0 B1 B2 B7

|  |  |  |
| --- | --- | --- |
| Threshold for MSDU Delivery Ratio Presence Indicator | Threshold for Maximum Jitter Presence Indicator | Reserved |

Bits: 1 1 6

**Figure 9-xxx—Latency Sensitive Traffic Criterion Control field format**

The Threshold for MSDU Delivery Ratio Presence Indicator subfield indicates whether the Threshold for MSDU Delivery Ratio field is present in the Latency Sensitive Traffic Criterion element. A value of 1 in the Threshold for MSDU Delivery Ratio Presence Indicator subfield indicates that the Threshold for MSDU Delivery Ratio field is present in the Latency Sensitive Traffic Criterion element. Otherwise, the Threshold for MSDU Delivery Ratio field is not present in the Latency Sensitive Traffic Criterion element.

The Threshold for Maximum Jitter Presence Indicator subfield indicates whether the Threshold for Maximum Jitter field is present in the Latency Sensitive Traffic Criterion element. A value of 1 in the Threshold for Maximum Jitter Presence Indicator subfield indicates that the Threshold for Maximum Jitter field is present in the Latency Sensitive Traffic Criterion element. Otherwise, the Threshold for Maximum Jitter field is not present in the Latency Sensitive Traffic Criterion element.

The Threshold for Delay Bound field is 4 octets long and contains an unsigned integer that specifies the threshold for delay bound. The meaning of delay bound is the same as the definition of the Delay Bound field specified in the TSPEC element.

The Threshold for MSDU Delivery Ratio field indicates the threshold for the percentage of packets that are expected to be delivered within the threshold for delay bound specified in the Threshold for Delay Bound field and its encoding is defined in Table 9-xxx. The Threshold for MSDU Delivery Ratio field is optional.

|  |
| --- |
| Table 9-xxx: Threshold for MSDU Delivery Ratio field values |
| Value | Packet delivery ratio |
| 0 | Not specified |
| 1 | 99% |
| 2 | 99.9% |
| 3 | 99.99% |
| 4 | 99.999% |
| 5 | 99.9999% |
| 6 - 255 | Reserved |

The Threshold for Maximum Jitter field contains an unsigned integer that specifies the threshold for the maximum amount of time, in microseconds, allowed for delay variation to transport two sequential MSDUs or A-MSDUs belonging to the traffic stream. The Threshold for Maximum Jitter field is optional.

2. Proposed Text Change for “9.4.29 TSPEC element” (for Option 2)

**2.1 Addition of the Latency Sensitive Traffic Attributes field in the TSPEC element**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|    | Element ID | Length | TS info | NominalMSDUSize | MaximumMSDUSize | Minimum Service Interval | Maximum Service Interval | Inactivity Interval | Suspension Interval | Service Start Time |
| Octets: | 1 | 1 | 3 | 0 or 2 | 0 or 2 | 0 or 4 | 0 or 4 | 0 or 4 | 0 or 4 | 0 or 4 |
|  | Minimum Data Rate | Mean Data Rate | Peak Data Rate | Burst Size | Delay Bound | Minimum PHY Rate | Surplus Bandwidth Allowance | Medium Time | DMG Attributes | EHT Attributes |
| Octets: | 0 or 4 | 0 or 4 | 0 or 4 | 0 or 4 | 0 or 4 | 0 or 4 | 0 or 2 | 0 or 2 | 0 or 2 | 0 or 6 |
|  | **Latency Sensitive Traffic Attributes** |  |  |  |  |  |  |  |  |  |
| Octets: | 0 or 5 or 6 or 9 or 10 |  |  |  |  |  |  |  |  |  |
|  |  | TSPEC element format |

**2.2 Text Change for the definition of the Type subfield of the TS Info field**

The subfields of the TS Info field are defined as follows:

* **…**
* The TSID subfield contains a value that is a TSID. If the Type subfield is 0, then the MSB (bit 4 in TS Info field) of the TSID subfield is always set to 1 when the TSPEC element is included within an ADDTS Response frame. If the Type subfield is 1, the TSID subfield is set to the User Priority subfield (0~7) of the TSPEC element is set to the same UP value in the TSPEC element or TCLAS (if UP in TSPEC is reserved) or Intra-Access Category Priority Element (if included). The Type subfield is set to 2 to indicate the thresholds for relevant parameters for differentiating latency sensitive traffic if the TSPEC element is included in the Beacon frames, Probe Response frames, and (Re)Association Response frames, and other management frames.
* **…**

**2.3 Addition of the definition of the Latency Sensitive Traffic Attributes field**

The Latency Sensitive Traffic Attributes field is defined in Figure 9-xxx—Latency Sensitive Traffic Attributes field format. The Latency Sensitive Traffic Attributes field is present in a TSPEC element when the Type subfield is 2; otherwise absent.

|  |  |  |  |
| --- | --- | --- | --- |
| Latency Sensitive Traffic Criterion Control | Threshold for Delay Bound | Threshold for MSDU Delivery Ratio | Threshold for Maximum Jitter |

Octets: 1 4 0 or 1 0 or 4

**Figure 9- xxx—Latency Sensitive Traffic Attributes field format**

The format of the Latency Sensitive Traffic Criterion Control field is defined in [Figure 9-xxx (Latency Sensitive Traffic Criterion Control field format )](#bookmark131).

B0 B1 B2 B7

|  |  |  |
| --- | --- | --- |
| Threshold for MSDU Delivery Ratio Presence Indicator | Threshold for Maximum Jitter Presence Indicator | Reserved |

Bits: 1 1 6

**Figure 9-xxx—Latency Sensitive Traffic Criterion Control field format**

The Threshold for MSDU Delivery Ratio Presence Indicator subfield indicates whether the Threshold for MSDU Delivery Ratio field is present in the Latency Sensitive Traffic Attributes field. A value of 1 in the Threshold for MSDU Delivery Ratio Presence Indicator subfield indicates that the Threshold for MSDU Delivery Ratio field is present in the Latency Sensitive Traffic Attributes field. Otherwise, the Threshold for MSDU Delivery Ratio field is not present in the Latency Sensitive Traffic Attributes field.

The Threshold for Maximum Jitter Presence Indicator subfield indicates whether the Threshold for Maximum Jitter field is present in the Latency Sensitive Traffic Attributes field. A value of 1 in the Threshold for Maximum Jitter Presence Indicator subfield indicates that the Threshold for Maximum Jitter field is present in the Latency Sensitive Traffic Attributes field. Otherwise, the Threshold for Maximum Jitter field is not present in the Latency Sensitive Traffic Attributes field.

The Threshold for Delay Bound subfield is 4 octets long and contains an unsigned integer that specifies the threshold for delay bound. The meaning of delay bound is the same as the definition of the Delay Bound field specified in the TSPEC element.

The Threshold for MSDU Delivery Ratio subfield indicates the threshold for the percentage of packets that are expected to be delivered within the threshold for delay bound specified in the Threshold for Delay Bound field and its encoding is defined in Table 9-xxx. The Threshold for MSDU Delivery Ratio field is optional.

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| Table 9-xxx: Threshold for MSDU Delivery Ratio field values |
| Value | Packet delivery ratio |
| 0 | Not specified |
| 1 | 99% |
| 2 | 99.9% |
| 3 | 99.99% |
| 4 | 99.999% |
| 5 | 99.9999% |
| 6 - 255 | Reserved |

The Threshold for Maximum Jitter subfield contains an unsigned integer that specifies the threshold for the maximum amount of time, in microseconds, allowed for delay variation to transport two sequential MSDUs or A-MSDUs belonging to the traffic stream. The Threshold for Maximum Jitter field is optional.

**References:**

[1] CR TSPEC, 11-21-0619-02-00be-cr-tspec