IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB 266 Resolution for CIDs related to  35.9.2.1 Latency sensitive traffic differentiation | | | | |
| Date: Nov 11, 2022 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Duncan Ho | Qualcomm Inc |  |  | dho@qti.qualcomm.com |
| Gaurang Naik |  |  |  |
| George Cherian |  |  |  |
| Alfred Asterjadhi |  |  |  |
| Abhishek Patil |  |  |  |
| Yanjun Sun |  |  |  |
| Abdel Karim |  |  |  |

Abstract

This submission proposes resolutions for following 26 CIDs received for TGbe LB266:

13224, 10681, 10856, 10873, 10891, 10901, 10909, 11161, 11617, 11781, 12275, 12285, 12293, 12396, 12459, 12525, 12708, 12709, 13019, 13104, 13639, 13709, 13828, 13829, 13947, 14072

**Revisions:**

* Rev 0: Initial version of the document.

***TGbe editor: The baseline for this document is 11be D2.1***

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 13224 | Binita Gupta | 35.9.2.1 | 511.14 | No consensus was reached on clause 35.9.2.1 in last round. Suggest to rename 35.9.2.1 clause to 'Latency sensitive traffic identification' and indicate that latency sensitive traffic carried over rTWT SPs are identified by TIDs negotiated as part of the rTWT setup. | As in comment | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 10681 | Liangxiao Xin | 35.9.2.1 | 511.14 | no content in this subclause. | Please explain how to differentate latency sensitive traffic in this subclause | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 10856 | Jinsoo Choi | 35.9.2.1 | 511.15 | There is just a place holder fot the way of latency sensitive traffic differentiation. It needs to define a mechanism of properly distinguishing from other types of traffic. TID based differentiation/mapping of the low latency traffic can be one of example for the purpose. | As in comment | **Rejected**  An r-TWT Request already carries the TID(s) (TID bitmap) of the low-latency traffic. Please see resolution of 13224. |
| 10873 | Yousi Lin | 35.9.2.1 | 511.14 | What is the latency sensitive traffic differentiation mechanism? | Please provide the details. | **Rejected**  Please see resolution of 13224. |
| 10891 | Charlie Pettersson | 35.9.2.1 | 511.14 | There is nothing in this subclause that differentiates latency sensitive traffic from other types of traffic. | Either remove the subclause or add a differentiation mechansim. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 10901 | Akira Kishida | 35.9.2.1 | 511.14 | Details of the definition latency sensitive traffic and the mechanism that differentiates latency sensitive traffic from other types of traffic remain blank. It should be clarified. | As in the comment. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 10909 | Akira Kishida | 35.9.2.1 | 511.14 | Priority in latency sensitive traffic or TID should be clarified when operating on restricted service periods. In other words, some prioritization between TIDs in restricted service periods should be clarified. | As in the comment. | **Rejected**  An r-TWT Request already carries the TID(s) (TID bitmap) for which the SP is for. There are already rules defined in 35.9.5 (traffic delivery) that clarifies the relative priority while servicing traffic from these TID(s). |
| 11161 | Boon Loong Ng | 35.9.2.1 | 511.12 | For r-TWT operation, it is not clear how the AP can determine whether a TID is latency sensitive. | A mechanism needs to be described to help differentiate latency sensitive traffic. | **Rejected**  The AP knows based on the TID(s) included in the r-TWT Request. |
| 11617 | Lei Wang | 35.9.2.1 | 511.12 | Where is the definition of a mechanism that differentiates latency sensitive traffic from other types of traffic in 35.9.2.1? Is this subclause incomplete? | Please actually define the mechanism as stated in the current sentence of this subclause. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 11781 | Osama Aboulmagd | 35.9.2.1 | 511.14 | The sentence "this subclause defines a mechanism that differentiate latency sensitive traffic from other types of traffic". It is not clear how this differentiation is achieved and why r-TWT can satisfy delay requirements of real-time application? | Add sone explanation of the merits of r-TWT to support delay-sensitive traffic | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 12275 | Rajat Pushkarna | 35.9.2.1 | 511.19 | rTWT mechanism does not propose in what scenario will the rTWT be terminated/ | Provide a procedure to perfrom rTWT setup termination. | **Rejected**  The r-TWT follows baseline broadcast TWT procedure to terminate an r-TWT SP (see section 26.8.3.1 in baseline spec). |
| 12285 | KENGO NAGATA | 35.9.2.1 | 511.14 | Details of the definition latency sensitive traffic and the mechanism that differentiates latency sensitive traffic from other types of traffic remain blank. It should be clarified. | As in the comment. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 12293 | KENGO NAGATA | 35.9.2.1 | 511.14 | Priority in latency sensitive traffic or TID should be clarified when operating on restricted service periods. In other words, some prioritization between TIDs in restricted service periods should be clarified. | As in the comment. | **Rejected**  An r-TWT Request already carries the TID(s) (TID bitmap) for which the SP is for. There are already rules defined in 35.9.5 (traffic delivery) that clarifies the relative priority while servicing traffic from these TID(s). |
| 12396 | Rojan Chitrakar | 35.9.2.1 | 511.12 | This is probably added as a placeholder subclause. Either details should be added, else the subclause should be deleted. | Add details of how latency sensitive traffics are differentiated from other types of traffic, else the subclause should be deleted. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 12459 | Daniel Verenzuela | 35.9.2.1 | 511.14 | The sentence "This subclause defines a mechanism that differentiates latency sensitive traffic from other types of traffic." is misleading because the section just covers the set-up and some aspects of the R-TWT SP operation. The closes point is the definition of r-TWT TID(s) but there is not mechanism to connect these TIDs with latency sensitive traffic. | Define a concrete mechanism where the characteristics of latency sensitive traffic are defined and linked to the r-TWT TIDs. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 12525 | Yusuke Tanaka | 35.9.2.1 | 511.12 | The contents of this subclause are insufficient. | Please define specs for latency sensitive traffic differentiation | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 12708 | Pascal VIGER | 35.9.2.1 | 511.12 | "Latency sensitive traffic differentiation" is not clear enough. As nowadays an end-device is multiple content producer, there shall exist a differentiation of latency sensitive and not-latency-sensitive traffics (e.g. from local application) belonging to a same TID. There is a need to explicitly separate those traffic over TIDs. | The non-AP STA shall inform the AP of which TID it intends to use as isolating latency sensitive traffic.The STA locally updates its QoS mapping, and must inform the AP so that AP can well schedule resources corresponding to a latency sensitive traffic. Please refer to 11-22-0509r0 for such a scheme. | **Rejected**  It was decided before in the group that the mapping of the TIDs (0-7) to AC/User priority will remain the same as baseline. Therefore, the expectation is “low-latency” traffic should use TIDs that are for AC\_VO and AC\_VI.  Further, r-TWT can be used to protect the medium for these ‘low-latency” TIDs. |
| 12709 | Pascal VIGER | 35.9.2.1 | 511.15 | "Latency sensitive traffic differentiation" is not clear enough. As nowadays an end-device is multiple content producer, there shall exist a differentiation of latency sensitive and not-latency-sensitive traffics (e.g. from local application) belonging to a same TID. Otherwise, considering all traffics belonging TID as identical transportation is unfair ! | as in comment. Please consider fairness by differenciating transportation of LS and non-LS traffic of a same TID | **Rejected**  If more than one flow is mapped to the same TID, the flows should have similar QoS requirement so they should be treated equally (and they will be per the baseline spec due to EDCA parameters and per-TID BSR and scheduling and rTWT). If the flows do not have similar QoS, they should be carried using different TID values to obtain different level of QoS. |
| 13019 | Chunyu Hu | 35.9.2.1 | 511.12 | This subsection (35.9.2.1) is still empty as a placeholder. Develop normative text here. Note that subsection (9.4.2.199) P207L55/L60 already defined the LST associated with the corresponding r-TWT schedule is idenfied by the r-TWT TIDs. Add corresponding normative text. | Add main text. See comment. | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 13104 | Chittabrata Ghosh | 35.9.2.1 | 511.12 | This subclause is still a placeholder. R-TWT operation as specified identifies latency sensitive traffic based on UL/DL TIDs indicated in TWT element during setup. This subcaulse should be developed based on this specification | Add text to subcaulse as suggested in comment | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 13639 | Rubayet Shafin | 35.9.2.1 | 511.12 | Restricted TWT schedule is negotiated for low-latency traffic. However, how to identify a traffic stream as low-latency is not clear. According to current specification, a non-AP EHT STA can list any TID as low latency TID during its restricted TWT schedule negotiation with the AP. On the other hand, the r-TWT scheduling AP does not have a mechanism to check whether the TID requested by the non-AP STA for restricted TWT operation is indeed latency-sensitive TID or not. | Mechanisms and necessary rules for identifying latency-sensitive traffic stream need to be defined in 802.11be standards. | **Rejected**  When the STA has low latency traffic, the STA should use the TIDs corresponding to AC\_VI and AC\_VO (currently the two ACs that received the highest QoS priorities). Even in baseline, it’s left to STA implementation what TID to use for a traffic flow so we keep that aspect in 11be. |
| 13709 | Yunbo Li | 35.9.2.1 | 511.14 | the detail of the mechanism is missing | please complete the mechanism | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 13828 | Yuchen Guo | 35.9.2.1 | 511.14 | This subclause does not have effective text to differentiate latency sensitive traffic from normal traffic | Please add corresponding text | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 13829 | Yuchen Guo | 35.9.2.1 | 511.37 | According to the description in this paragraph, the rTWT element carried in the Beacon will not carry the Restricted TWT Traffic Info field. However, there will be some benefit if the rTWT element can carry the Restricted TWT Traffic Info. From AP's perspective, different TIDs mean different latency requirement. Hence, the AP can indicate some of the TIDs to be latency sensitive TID for each rTWT agreement. STAs can only select from the announced set of TIDs when requesting to join an rTWT agreement. This will prevent STAs from abusing the rTWT SP to transmit the traffic that is not latency sensitive. | Change the rules to allow the rTWT element in the Beacon to carry the Restricted TWT Traffic Info field. | **Rejected**  It was decided before that TID 0-7 are used for r-TWT and the baseline TID/AC/user priority mapping is not changed. This keeps the flexibility of STAs to choose TID like in baseline.  An AP can always reject an rTWT Request if it does not want to accept it. |
| 13947 | Rakesh Taori | 35.9.2.1 | 511.14 | Mechanisms that differentiate latency sensitive traffic from other types of traffic needs are missing and need to be defined. | Define the mechanisms that differentiate latency sensitive traffic from other types of traffic | **Revised**  Added clarification in the section. Please see the resolution of 13224.  **TGbe editor: Same resolution as CID 13224** |
| 14072 | Liuming Lu | 35.9.2.1 Latency sensitive traffic differentiation | 511.12 | According to current specification it is difficult to differentiate the latency sensitive traffic especilly for the traffic identified with QoS Characteristics element. Because the latency Sensitive Traffic can be transferred during Restricted TWT periods for strict protection, some traffic with less-stringent requirements in terms of latency is treated as latency-sensitive traffic in advance and occupies the R-TWT periods, which is unfair for other EHT STAs which need to deliver the latency sensitive traffic latter. | The Latency Sensitive Traffic Criterion or differentiation is suggested to be specified. | **Rejected**  The AP treats the TID requested by the STA per the baseline TID/AC/User priority mapping. The AP schedules the TID(s) accordingly. It is up to the STA implementation what TID to use for a traffic flow so we keep that aspect in 11be. |

**35.9.2.1 Latency sensitive traffic** (#13224)**identification**

(#13224)During an R-TWT membership setup, an R-TWT scheduled STA indicates the TID(s) that are used for low latency sensitive traffic in the Restricted TWT DL TID Bitmap subfield or Restricted TWT UL TID Bitmap subfield (see 35.9.2.2 (The setup procedure) and 9.4.2.199 (TWT element))(#13224).

Do you agree to the resolution provided in doc 11-22/1435r0 for the following CIDs?

13224, 10681, 10856, 10873, 10891, 10901, 10909, 11161, 11617, 11781, 12275, 12285, 12293, 12396, 12459, 12525, 12708, 12709, 13019, 13104, 13639, 13709, 13828, 13829, 13947, 14072