IEEE P802.11 Wireless LANs

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| LB 266 Resolution for misc CIDs related to R-TWT |
| Date: Dec. 2022 |
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 Abstract

This submission proposes resolutions for following **14** CIDs received for TGbe LB266:

13211, 13213, 10712, 10913, 13239,

13636, 13014, 10696, 10697, 12403,

13033, 12894, 12490, 10698

Revisions:

* Rev 0: Initial version of the document.

***TGbe editor: The baseline for this document is 11be D2.3 and REVme2.0***

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.

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| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 13211 | Evgeny Khorov | 4.3.16a | 55.59 | Although the support of RTA is one of the targets of 802.11be, the current list of new features is not enough to guarantee low-latency low-jitter operation in the lagacy environment or in the presence of 11be devices that do not support RTA features. | Design some features that will provide guaranteed low jitter and delay | **Rejected.**The comment failed to identify a technical issue and didn’t observe a relevant proposal. |
| 13213 | Evgeny Khorov | 4.3.16a | 55.59 | The spec has extremely high overhead for industrial automation (RTA with periodic short packets) | I have a corresponding proposal | **Rejected.**The comment failed to identify a specific technical issue on what/where these overheads are; and how to avoid them w/o impairing the functionality. |
| 10712 | Liangxiao Xin | 10.25 | 300.08 | When a STA receives the frames of latency sensitive traffic, it stores the frames in receive reordering buffer. In the current rule, the STA will not pass the frame to the upper layer if it is not in the first one in the buffer. It is possible that the STA stores the frame in the buffer but cannot pass it the upper layer before it is expires | The STA should pass the frame of frames of latency sensitive traffic in its receive reordering buffer before the frame expires even if it is not the first one in the buffer. The STA needs to know the remaining lifetime of the frames after it stores it in the receiver reordering buffer. Commenter will bring a contribution. | **Rejected.**Alternatively to “the STA needs to know the remaining lifetime …”, the transmitter that has complete info (tx time and required lifetime) can use BAR to push forward the BA window\_L and subsequently the receiver side can flush its buffer.  |
| 10913 | Kiseon Ryu | 35.3.12.6 | 447.10 | In case latency sensitive traffic arrives at an AP MLD right after a STA affiliated with a non-AP MLD in PS mode enters a doze state, the traffic may not be delivered to the non-AP MLD in a timely manner. Not knowing each STA power state, the AP MLD may schedule for the non-AP MLD a trigger-enbaled TWT SP. If the STA is in doze state, the scheduled resources may be wasted. STAs affiliated with the non-AP MLD may need to listen for Beacon frames at each TBTT on any enabled link for a certain time duration right after receiving DL BUs. | As in the comment. | **Rejected.** The TWT is scheduled with the non-AP STA’s awareness and hence the AP won’t schedule a trigger-enabled TWT SP w/o the non-AP’s agreement usually with the only exception that AP sends an unsolicited TWT response frame that has an SP scheduled immediately before the non-AP STA is able to send a TWT setup frame to reject/tear-down this schedule. This exception should be able to be avoided by AP per its choice/need. Nevertheless, the idea mentioned in the last sentence can be done already. |
| 13239 | Binita Gupta | 35.9 | 510.51 | For rTWT to remain effective in providing predictable latency for LS traffic, it is desirable that there are tools defined which can be used to enable BSS(s)/link deployment where most/all EHT STAs will respect rTWT TxOP rules. Consider solutions where AP can indicate that for certain BSS(s) it prefers or requires non-AP STAs to support rTWT full operation and/or rTWT TxOP protection. | As in comments | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-22/538. But the group couldn’t reach an agreement. |
| 13636 | Rubayet Shafin | 35.9 | 510.51 | Restricted TWT would be an important feature for TDLS communication. However, the use of Broadcast TWT schedule, which is the basis of restricted TWT operation, by two TDLS peers STAs for communication over the TDLS direct link is not defined for TDLS operation (though individual TWT agreement can be established for the TDLS direct link by the amendmends made in 11ax). | Please provide text to enable the utilization of broadcast/restricted TWT schedule by two TDLS peer STAs. | **Rejected.**The group discussed this topic and options, e.g. 11-22/1463, but the group couldn’t reach an agreement. |
| 13014 | Chunyu Hu | 35.9 | 511.51 | The power saving rule as defined in 26.8.5 may require r-TWT STAs to stay awake for some bTWT SPs that r-TWT STAs are not interersted in. Need either necessary clarification or new rules for r-TWT STAs to save power. | As in comment | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-22/538. But the group couldn’t reach an agreement. |
| 10696 | Liangxiao Xin | 35.9.4 | 512.07 | The current R-TWT design does not consider the interference from OBSS. Need a mechanism to give the R-TWT scheduling AP or member STA higher priority to acces channel compared with OBSS STAs. | Mulitple STAs can contend the channel together and share the obtained TXOP with the AP. Commenter will bring a contribution for the resolution of this CID. | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-21/1913 and 11-22/1574. But the group couldn’t reach an agreement. |
| 10697 | Liangxiao Xin | 35.9.4 | 512.07 | Should give higher priority of member STAs and scheduling AP to gain the channel access during R-TWT SP compared with OBSS STAs. | A backoff procedure with higher priority needs to be added. Commenter will bring a contribution for the resolution of this CID | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-21/1913 and 11-22/1574. But the group couldn’t reach an agreement. |
| 12403 | Rojan Chitrakar | 35.9.4.1 | 511.12 | This should apply to all STAs that are members of the BSS and not just STAs that support rTWT, else the reliability of rTWT SPs cannot be guaranteed. | Change as "A non-AP EHT STA as a TXOP holder shall ensure the TXOP ends before the start time of any r-TWT SPs advertised by the associated AP." | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-22/538. But the group couldn’t reach an agreement. |
| 13033 | Chunyu Hu | 35.9.4.1 | 512.12 | To support r-TWT operation, the STAs in the BSS may not all required to participate the r-TWT schedule, and the minimum requirement would be supporting the TXOP rules. It might be worthy to define this capability explicitly to gain more network support for r-TWT effectiveness. | As in comment | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-22/538. But the group couldn’t reach an agreement. |
| 12490 | Jeongki Kim | 35.9.4.2 | 512.42 | In a r-TWT SP, non-member STA may transmit a frame using EDCA to AP although AP allocates a quiet interval overlapping with the r-TWT SP, especially when AP does not allocate the overlapped quiet interval at the start of the r-TWT SP. This may degrade the performance of the latency sensitive traffic. In a r-TWT SP, if the AP wants to further protect/support the latency sensitive traffic related to TIDs of the r-TWT SP, the AP can be able to control a transmission of non-member STA (legacy STA as well as EHT STA) with minimizing the impact of the non-member STA. The group need to discuss this issue and provide a good solution for supporting a latency sensitive traffic in a r-TWT SP. | Define a mechanism for AP to be able to control a transmission of a non-member STA in a r-TWT SP | **Rejected.**The group discussed this topic: possible options and their cons/pros in the past, e.g. 11-21/1913, 11-22/1574 and the idea in CID #12894. But the group couldn’t reach an agreement. |
| 10698 | Liangxiao Xin | 35.9.5 | 512.53 | The R-TWT can be destroyed easily by the STAs not supporting R-TWT. It is important to have as many STAs supporting R-TWT as possible in the BSS to have better performance of R-TWT. However, it is not easy to convince a STA to support R-TWT feature if it does not have latency sensitive traffic to transmit. | Add a note that if R-TWT scheduling AP schedule the transmissions of the traffic that is not from R-TWT TIDs during a R-TWT SP, then it should first schedule for the STAs supporting R-TWT then the STAs not supporting R-TWT. | **Rejected.**The group discussed on possible ways to address the comments and improve the effectiveness of R-TWT SP further however couldn’t reach an agreement. |
| 12894 | Dmitry Bankov | 35.9.4.1 | 512.18 | A non-AP EHT STA that supports r-TWT is required to finish its TXOP before the start of any r-TWT SPs. However, it is not forbidden to start a TXOP 1us after the start of the r-TWT SP. For example, a non-AP EHT STA can start backoff countdown before the start of r-TWT SP and finish it right after it. A short guard interval at the beginning of the r-TWT SP should be introduced to make sure that the r-TWT members or the AP can access the channel at the start of r-TWT SP. | as in comment | **Rejected.**The group discussed the proposed idea in the mtg and raised a few comments e.g. 1) the guard time may give chance for legacy STA to win the medium; 2) it’s not necessary as the AP should try its best to grab the medium. The group couldn’t converge on an agreement. |

**Discussion on CID #12894**:

**Problem statement**: when a R-TWT SP starts, R-TWT supporting STAs may immediately start contend or resume the backoff procedure and grab the medium, leaving less chance for the R-TWT member STA including AP to gain the access.

**Proposed solution**: Introduce text to require non-member STAs resume their boff counting down dot11RTWTSPSTartGuardTime after the SP start time.

Q/A discussion didn’t lead to a solution as noted in the resolution.

**SP**: do you support the direction of solving CID #12894 by introducing text that requires non-member R-TWT supporting STAs resume their backoff counting down dot11RTWTSPStartGuardTime after the R-TWT SP start time?

Y

N

Abs