IEEE P802.11
Wireless LANs

|  |
| --- |
|  CC36 Resolution for CIDs in Clause 35.7.4 (Random Backoff for EHT STAs before Restricted TWT Service Period) |
| Date: October 19, 2021 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Abdel Karim Ajami | Qualcomm Inc. |  |  | aajami@qti.qualcomm.com |
| Duncan Ho |  |  | dho@qti.qualcomm.com |
| Alfred Asterjadhi |  |  | aasterja@qti.qualcomm.com |
| George Cherian |  |  | gcherian@qti.qualcomm.com |
| Abhishek Patil |  |  | yanjuns@qti.qualcomm.com |
| Yanjun Sun |  |  | appatil@qti.qualcomm.com |
| Gaurang Naik |  |  | gnaik@qti.qualcomm.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 Abstract

This submission proposes resolutions for following 3 CIDs received for TGbe CC36:

6416, 6968, 5949

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Editorial fixes.
* Rev 2: Based on feedback received when the doc was presented in TGbe MAC call 11/29/21

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** |
| 6416 | Muhammad Kumail Haider | 35.6.4 | 298.37 | The text specifies that all EHT STAs supporting r-TWT operation shall end their TXOPs before the start of an r-SP. It creates a problem that if multiple such STAs complete their backoff at TXOP boundary and cannot start a TXOP due to r-SP boundary, they may synchronize in accessing the channel after r-SP start boundary. This can lead to an increase in probability of collisions. | Additional channel access rules should be defined to address the problem. | **Revised**Agree in principle.Quiet Element also presents a similar issue to the one raised by the commenter, and the baseline text resolves this by requiring the clients to restart the backoff counter from present CW.Reusing a similar solution for r-TWT, we add a paragraph similar to that in clause 11.8.3, at the end of Clause 35.7.4.1 to provide additional channel access mechanism for a STA whose backoff counter reaches zero before the start of the Restricted TWT SP and which cannot start a transmission because the remaining time till the start of the service period is too short. **Tgbe editor please implement changes as shown in doc 11-21/1699r2 tagged as 6416** |
| 6968 | Sanghyun Kim | 35.6.4.1 | 298.41 | It is required to provide additional channel access mechanism for a STA that its backoff counter is reached to zero right before the start of the R-TWT SP (The STA may defer its Tx initiation when the remaining time is too short). | As in the comment | **Revised**Agree in principle.Same resolution as that of CID 6416**Tgbe editor please implement changes as shown in doc 11-21/1699r2 tagged as 6416** |
| 5949 | Liuming Lu | 35.6.4.1 | 298.42 | The current specification of the rule is imprecise. The intention of the rule is to avoid the TXOP overlaping with the restricted TWT service periods to be ocuppied by other STAs. If the non-AP EHT STA as a TXOP holder ends the TXOP too early, the duration from the end time of TXOP to the start time of the restricted TWT service period is so long that another legacy STA may easily preempt the channel to obtain the TXOP again. | The restriction is suggested to be further specified on the operation that the TXOP ends before the start of any restricted TWT service periods, especially the duration from the end time of TXOP to the start time of the restricted TWT service period should be limited | **Revised**Agree in principle.Same resolution as that of CID 6416For legacy stations, they will follow the quiet element that starts at the same time as the r-TWT SP as per clause 35.7.4.2. Based on Quieting rules in clause 11.8.3, a legacy STA shall complete its transmission before the start of the quiet interval. Otherwise, if the frame exchange does not complete before the start of the quiet interval, then the legacy STA shall defer the transmission by selecting a random backoff count from the present CW.**Tgbe editor please implement changes as shown in doc 11-21/1699r2 tagged as 6416** |

**Discussion:**

CIDs 6416, 6968, and 5949 highlight an issue related to channel access rules for a non-AP EHT STA with dot11RestrictedTWTOptionImplemented set to true in Clause 35.7.4.1

A non-AP EHT STA with dot11RestrictedTWTOptionImplemented set to true may count down its RBO to zero but decide not to transmit because the remaining time till the start of the upcoming r-TWT service period is too short.

If multiple such STAs maintain zero RBO counter till the start of the r-TWT SP, transmissions will collide and hence the latency will increase. Especially that these STAs are expected to be awake during the r-TWT SP and go back to doze state after.

In baseline, the last paragraph of 11.8.3 address a similar issue. Thus, the highlighted text in green below was added based on received feedback and is technically similar to baseline 11.8.3.

**Proposed Text:**

***TGbe editor: Please note Baseline is 11be D1.31***

**35.7.4.1 General**

***TGbe editor: Please modify the following paragraph in Clause 35.7.4.1***

A non-AP EHT STA with dot11RestrictedTWTOptionImplemented set to true as a TXOP holder shall ensure the TXOP ends before the start of any restricted TWT service periods if the TXOP is obtained outside of a restricted TWT service period. Before starting transmission of an MPDU, a non-AP EHT STA with dot11RestrictedTWTOptionImplemented set to true shall check if there is enough time for the frame exchange to complete prior to the start of the restricted TWT service period and if there is not enough time then the STA shall defer transmission by selecting a random backoff count using the present CW (without advancing to the next value in the series). The short retry count and long retry count for the MSDU or A-MSDU are not affected. (#6416)

SP: Do you agree to the resolutions provided in doc 11-21/1699r2 for the following CIDs for inclusion in the latest 11be draft?

6416, 6968, 5949