IEEE P802.11
Wireless LANs

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| PDT MAC and CC50 CR for TWT SP Management |
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Abstract

This document contains Proposed Draft Text (PDT) for the TWT SP management feature of the proposed TGbn (UHR, Ultra High Reliability) amendment to the 802.11 standard.

The PDT incorporates the latest passing motions in TGbn and resolution for the following CIDs:

174, 3667

***TGbn editor: Baselines for this document are 11bn D0.2, 11be D7.0, REVme D7.0].***

# Revision information

The following is a summary of the important changes that occurred within each revision of this document:

|  |  |
| --- | --- |
| **Revision** | **Major changes** |
| 0 | Initial revision |
|  |  |
|  |  |
|  |  |
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# Introduction

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 TGbn Draft. The abstract, revision information, introduction, explanation of the proposed changes and references sections are not part of the adopted material.

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

## Explanation of the proposed changes:

The proposed changes to the 802.11 TGbn draft within this document are based on the following motions adopted by the TGbn task group:

### Relevant passed motions:

[Motion #31, [1]]

* **11bn defines a mechanism that enables a non-AP STA to indicate that it does not have pending traffic to deliver during the current ongoing TWT SP.**
	+ NOTE 1 – The exact signaling mechanism is TBD
	+ NOTE 2 – This does not propose changing the SP termination mechanism/signaling itself. As per current spec, a TWT SP may be terminated by an AP as specified in 26.8.5
	+ NOTE 3 – It is optional for the non-AP STA to provide such an indication

### Comments (CIDs) resolved:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 174 | Muhammad Kumail Haider | 37.12.1 | 84.54 | The TBD signaling should be defined to enable STA to indicate end of traffic to AP for SP termination. | As in comment | RevisedAgree in principle.TGbn editor: please implement changes as shown in this document tagged CID174. |
| 3667 | Alfred Asterjadhi | 37.12.1 | 21.61 | This behavior is very similar to early TWT SP termination. Perhaps call this subclause as such or just add it as another bullet under early TWT SP termination events. Also define the signaling. | As in comment. | RevisedAgree in principle. TGbn editor: please implement changes as shown in this document tagged CID3667 |

# Text to be adopted begins here:

3.4 Acronyms and abbreviations

***TGbn editor: Please add the following entry to subclause 3.4:***

EOTSP end of traffic for service period

**9.2.4.5 QoS Control field**

**9.2.4.5.1 QoS Control field structure**

***TGbn editor: Please modify row 6 of Table 9-10 (QoS Control field) as follows:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Applicable frame (sub)types** | **Bits 0-3** | **Bit 4** | **Bits 5-6** | **Bit 7** | **Bits 8** | **Bit 9** | **Bit 10** | **Bit 11-15** |
| … | … | … | … | … | … |
| QoS Data and QoS Data+CF-Ack frames sent in a nonmesh BSS by non-AP STAs that are not a TPU buffer STA or a TPU sleep STA | TID | 0 | Ack Policy Indicator | AMSDU Present | TXOP Duration Requested |
| TID | 1 | Ack Policy Indicator | AMSDU Present | Queue Size |
| QoS Null frames sent in a nonmesh BSS by non-AP STAs that are not a TPU buffer STA or a TPU sleep STA | TID | 0 | Ack Policy Indicator | Reserved | TXOP Duration Requested |
| TID | 1 | Ack Policy Indicator | ~~Reserved~~EOTSP if sent by a STA with dot11UHREOTSPImplemented equal to true, otherwise reserved | Queue Size |
| … | … | … | … | … | … | … | … | … |

***TGbn editor: Please add a new subclause in 9.2.4.5 as follows:***

**9.2.4.5.xxx EOTSP subfield**

﻿The End of Traffic for SP (EOTSP) subfield indicates if there is no further pending traffic from the transmitting non-AP STA during the current TWT service period. The EOTSP subfield is set to 1 if the transmitting non-AP STA does not have any more pending traffic to be delivered during the current TWT service period, and it is set to 0 if the transmitting non-AP STA either has more pending traffic to be delivered or does not know whether there is more pending traffic during the current TWT service period.

***TGbn editor: Please change the following subclause by adding 1 bit EOTSP Support subfield at next available position :***

* UHR MAC Capabilities Information field

The format of the UHR MAC Capabilities Information field is defined in Figure9-aa5 (UHR MAC Capabilities Information field format). [TBD]

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B4 | B5 |  B6  |   |  Bx |  | By Bz |
|  | DPS Support | DPS Assisting Support | Multi-Link Power Management | NPCA Supported | BSR Enhancement Support | Additional Mapped TID Support | ... | EOTSP Support | ... | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 1 |  |  | 1 |  |  |
|  |  | * UHR MAC Capabilities Information field format
 |

The subfields of the EHT MAC Capabilities Information field are defined in Table9-130a (Subfields of the UHR MAC Capabilities Information field).

|  |
| --- |
| * Subfields of the UHR MAC Capabilities Information field (continued)
 |
| Subfield | Definition | Encoding |
| … | … | … |
| EOTSP Support | Indicates whether EOTSP indication is supported. | Set to 1 to indicate EOTSP indication during TWT SP is supported.Set to 0 to indicate EOTSP indication during TWT SP is not supported. |

***TGbn editor: Please modify subclause 37.13 UHR TWT operation in P802.11bnD0.2 as follows:***

**37.13 UHR TWT operation**

**37.13.1 TWT SP (#3667)~~Management~~ early termination**

(#174)A UHR STA shall set the EOTSP Support field in the UHR MAC Capabilities Information field of the UHR Capabilities element to 1 if dot11UHREOTSPImplemented is true; otherwise, the UHR STA shall set the EOTSP Support field to 0.

A UHR STA (#174)with dot11UHREOTSPImplemented equal to true that is a TWT requesting STA or a TWT scheduled STA may (#174)~~use TBD signaling~~ set the EOTSP subfield to 1 in a QoS Null frame it transmits during an on-going TWT SP to indicate that the STA does not have any pending traffic for the remainder of the current TWT SP.

(#174)A UHR STA with dot11UHREOTSPImplemented equal to true that is a TWT responding STA or a TWT scheduling AP, and that receives a QoS Null frame with the EOTSP subfield equal to 1 during a TWT SP, may terminate the TWT SP for the STA that sent the QoS Null frame as described in 26.8.5 (Power save operation during TWT SPs).

**Annex C**

*(normative)*

***ASN.1 encoding of the MAC and PHY MIB***

# C.3 MIB Detail

***TGbn editor: Please add the following new MIB variable***

dot11UHREOTSPImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the STA implementation supports EOTSP indication during TWT SPs. If the attribute is false, it indicates that the STA implementation does not support EOTSP indication during TWT SPs”

::= { dot11UHRStationConfigEntry <ana> }

# Text to be adopted ends here.

**References:**

1. [11-24-0171r21](https://mentor.ieee.org/802.11/dcn/24/11-24-0171-21-00bn-tgbn-motions-list-part-1.pptx): 11-24-0171-21-00bn-tgbn-motions-list-part-1, Alfred Asterjadhi (Qualcomm Inc.)