IEEE P802.11  
Wireless LANs

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| Comment Resolution for Subclauses 9.3.2 | | | | |
| Date: 2013-07-01 | | | | |
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Abstract

This document provides comment resolution for TGah Draft 0.1 Comment Collection 9 with these CIDs: 15, 59, and 168.

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

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

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

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| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **SC** | **Comment** | **Proposed Change** | **Resolution** |
| 15 | 133.8 | 9.19.4a.4 | Rules for NAV protection of PS-Polls are related to a more generic scheme (not related to presence of RPS IE in the beacon) according to the SFD: R.4.2.2.A: 1. AP may indicate to a paged STA a channel access slot after which the STA is allowed to contend (Preferred an implicit indication, based on TIM, so that the Beacon is not overloaded) ... 4. 4. AP may protect the PS-Poll/Trigger frames by setting the NAV | Describe PS-Poll protection with NAV setting from the beacon. Will submit a document with the resolution. | Revised –  TGah editor to make changes shown in 11-13-0815-00-00ah under the heading for CIDs 15, 59, and 168. |
| 59 | 133.9 | 9.19.4a.4 | It is not clear which RAW can be protected by NAV | Add text specifying that it is not allowed to protect with NAV a RAW other than a PS-Poll RAW; for RAWs intended for data tansmission STAs can anyway slectively request UL Synch frame for protection. | Revised –  TGah editor to make changes shown in 11-13-0815-00-00ah under the heading for CIDs 15, 59, and 168. |
| 168 | 122.44 | 9.3.2.4 | RAW shall set the NAV for all STAs not in current RAW Group indicated in RPS IE; rules for NAV settings using information indicated in RPS IE is absent in the current draft | NAV setting based on information in RPS IE need to be specified | Revised –  TGah editor to make changes shown in 11-13-0815-00-00ah under the heading for CIDs 15, 59, and 168. |

## Discussion

*According to the SFD only the first RAW may be protected by setting the NAV. The first RAW may or may not be indicated in an RPS IE, i.e., it can be implicitly, e.g., indicated by the TIM Element presence of BUs for TIM STAs.*

1. *AP may indicate to a paged STA a channel access slot after which the STA is allowed to contend*
   1. *Preferred an implicit indication, based on TIM, so that the Beacon is not overloaded*
      1. *Paged STA starts the contention at slot boundary defined as a function of STA position in the TIM IE and additional info determined by Association or Beacon frame. [July 2012 meeting minutes, 11-12/860r0]*
2. *After receiving TIM, STA transmits the PS-Poll/Trigger frames to a AP not earlier than the slot boundary of its channel access slot based on EDCA*
3. *AP may protect the PS-Poll/Trigger frames by setting the NAV*
   1. *The paged STAs can ignore the NAV set by the AP. If NAV is set, then only paged STAs can send PS-Poll/Trigger frames during the RAW*

* **Short Beacon frame format**

**Instruction to Editor: *Please modify subclause 8.3.4.1a as follows:***

The format of the Short Beacon is shown in Figure 8-34e (Short Beacon frame format).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |  |  |
|  | | FC | Duration | SA | Timestamp | Change  Sequence | Next  TBTT | Compressed  SSID | Access  Network  Options | Optional  elements | FCS |
| Octets: | | 2 | 2 | 6 | 4 | 1 | 3 | 4 | 1 | variable | 4 |
|  | * **Short Beacon frame format** | | | | | | | | | | |

The duration field is 2 bytes in length and is set to the duration in microseconds of the NAV set by this frame.

* **Setting for single and multiple protection under enhanced distributed channel access (EDCA)**

**Instruction to Editor: *Please modify subclause 8.2.5.2 as follows:***

Within a frame (excluding data frames containing QoS CF-Poll, PSMP frames, and frames that have the RDG/More PPDU subfield equal to 1, and (Short) Beacon frames) transmitted under EDCA by a STA that initiates a TXOP, there are two classes of duration settings: single protection and multiple protection. In single protection, the value of the Duration/ID field of the frame can set a NAV value at receiving STAs that protects up to the end of any following data, management, or response frame plus any additional overhead frames as described below. In multiple protection, the value of the Duration/ID field of the frame can set a NAV that protects up to the estimated end of a sequence of multiple frames. Frames that have the RDG/More PPDU subfield equal to 1 always use multiple protection. PSMP frames always use multiple protection. (Short) Beacon frames in S1G always use multiple protection. The STA selects between single and multiple protection when it transmits the first frame of a TXOP. All subsequent frames transmitted by the STA in the same TXOP use the same class of duration settings.

The Duration/ID field is determined as follows:

* Multiple protection settings. The Duration/ID field is set to a value D as follows:
* If *TTXOP* = 0 and *TEND\_NAV* = 0, then *D = TSINGLE-MSDU – T*PPDU
* Else if *TTXOP = 0* and *TEND\_NAV* > 0, then *D = TEND-NAV –TPPDU*
* Else if *TEND-NAV = 0*, then 
* Else 

where

*TSINGLE-MSDU* is the estimated time required for the transmission of the allowed frame exchange sequence defined in 8.4.2.31 (EDCA Parameter Set element) (for a TXOP limit value of 0), including applicable IFS durations

*TPENDING* is the estimated time required for the transmission of

* Pending MPDUs of the same AC
* Any associated immediate response frames
* Any NDP transmissions and explicit feedback response frames
* Applicable IFS durations
* Any RDG
* Any pending QoS Null frame exchanges by paged STAs
* Any pending PS-Poll frame exchanges by paged STAs

*TTXOP* is the value of dot11EDCATable-TXOPLimit (dot11EDCAQAP-TableTXOPLimit for the AP) for that AC

*TTXOP-REMAINING* is *TTXOP* less the time already used time within the TXOP

*TEND-NAV* is the remaining duration of any NAV set by the TXOP holder, or 0 if no NAV has been established

*TPPDU* is the time required for transmission of the current PPDU

* **Setting and resetting the NAV**

**Instruction to Editor: *Please modify the first paragraph of subclause 9.3.2.4 as follows:***

A STA that receives at least one valid frame within a received PSDU shall update its NAV with the information received in any valid Duration field from within that PSDU for all frames where the new NAV value is greater than the current NAV value, except for those where the RA is equal to the MAC address of the STA. In addition, if the received PSDU is a (Short) Beacon frame that includes TIM elements in which there is an indication of available BUs for a STA in at least one of the TIM elements, then an STA may disregard the Duration field of the (Short) Beacon, not updating its NAV. In addition, if the received PSDU is a (Short) Beacon frame that includes at least one TIM element and at least one RPS element, an S1G STA that is allowed to access the first RAW immediately following the (Short) Beacon frame as specified in at least one of the RPS elements, may disregard the Duration field of the (Short) Beacon, not updating their NAV. Upon receipt of a PS-Poll frame with its Duration/ID field set to AID, a STA shall update its NAV settings as appropriate under the data rate selection rules using a duration value equal to the time, in micro-seconds, required to transmit one ACK frame plus one SIFS interval, but only when the new NAV value is greater than the current NAV value. If the calculated duration includes a fractional microsecond, that value is rounded up to the next higher integer. Various additional conditions may set or reset the NAV, as described in 9.4.3.3. When the NAV is reset, a PHY-CCARESET.request primitive shall be issued. This NAV update operation is performed when the PHYRXEND.indication primitive is received.

* **AP operation during the CP**

**Instruction to Editor: *Please modify subclause 10.2.1.6 as follows:***

* At every beacon interval, the AP shall assemble the partial virtual bitmap containing the buffer status per destination for STAs in the PS mode and shall send this out in the TIM field of the Beacon frame. At every beacon interval, the APSD-capable AP shall assemble the partial virtual bitmap containing the buffer status of nondelivery-enabled ACs (if there exists at least one nondelivery-enabled AC) per destination for STAs in PS mode and shall send this out in the TIM field of the Beacon frame. When all ACs are delivery-enabled, the APSD-capable AP shall assemble the partial virtual bitmap containing the buffer status for all ACs per destination. If FMS is enabled, the AP shall include the FMS Descriptor element in every Beacon frame. The FMS Descriptor element shall indicate all FMS group addressed frames that the AP buffers. An S1G AP should set the value of the Duration field in the (Short) Beacon frame to the estimated time required for all the S1G STAs that are indicated in the TIM elements and/or are allowed to access the first RAW immediately following the (Short) beacon, as specified by the RPS elements, to send the trigger frame or PS-Poll and receive an acknowledgement from the AP.