IEEE P802.11  
Wireless LANs

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| 11ac PIFS separation for RTS | | | | |
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Abstract

This document provides resolution for the comments listed below.

Comments refer to the transmission of an RTS with multicast TA within a multiple frame transmission sequence. As pointed out by the comments, there is an issue in the current spec text that need be clarified.

RTS with multicast TA requires the receiver to estimate the state of the CCA on secondary channels for PIFS time before the reception of the RTS. In a multiple frame transmission sequence, frames are separated by SIFS (SIFS duration < PIFS duration); The RTS receiver estimating the channel for PIFS time may find that channel is busy just because of the presence of the immediately preceding frame; that is not the desired behaviour.

In order to enable the receiver to correctly estimate the CCA state on secondary channels, the proposed solution is to enforce a PIFS separation of the RTS with respect to a previous frame

Notes on this document:

* Comments are from: 11-11-0276-00-00ac-tgac-d0-1-comments.xls.
* Comments refer to: Draft P802.11ac\_D0.1.pdf.
* In providing instruction for spec editing, the following conventions are used.
  + Red text indicates changes to be applied to existing text in Draft P802.11ac\_D0.1.pdf.
  + Text in blue is text copied from the 802.11n-2009 baseline that was not shown in the 11ac draft and that need be added to the draft, with the modifications shown in green.
  + Text in black is unmodified text from Draft P802.11ac\_D0.1.pdf.
  + Italic light gray text indicates instruction to the editor.

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| 1484 | Lv, Kaiying | 9.2.0b.4.4 | 45 | 30 | TR | In the case of transmissions to multiple destinations within an TXOP, TXOP holder may use RTS/CTS to protect the data transmission for each destination. PIFS interval should be used before sending RTS. | Add one below the item"A VHT STA performing clear channel assessment (CCA) in the secondary 20/40/80 channels before transmitting a 40/80/160/80+80 MHz mask PPDU using EDCA channel access as described in 11.20.4 (STA CCA sensing in a VHT BSS)" A VHT TXOP holder performing clear channel assessment (CCA) in the secondary 20/40/80 channels before transmitting RTS to a responder other than the previous responder. | Modified. see discussion | COEX |
| 938 | Santosh Abraham, Simone Merlin | 9.2.0b.4.4 | 45 | 1 | TR | The RTS receiver need to have PIFS time to correctly assess the CCA state; When RTS is sent immediately following a previous frame (SIFS), the receiver might not be able to correctly estimate the CCA state on all channels; Need to define what to do when RTS is sent immediately following a previous frame; | Proposed solution: If NAV is set, RTS with broadcast address shall be sent with PIFS separation from an immediately preceding frame | Agree. Added in 9.9.1.4 “A STA shall not commence the transmission of an RTS with group TA until at least PIFS time after the immediately preceding frame exchange sequence” | COEX |

Discussion

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I agree that some text is needed, but proposed text seems inaccurate; the CCA is not performed by the TXOP holder, CCA is performed by the RTS receiver. Moreover, there is no need to specify “other than the previous responder”; previous responder is not well defined; also, referring to a previous responder implies that TXOP holder needs to store the address of the previous responder; if previous responder is allowed to use SIFS, then the CCA for the previous responder will not function properly (and that is what we are trying to solve)

The suggested text is:

A TXOP holder transmitting an RTS with multicast TA within a multiple frame transmission sequence, as specified in section 9.9.1.4 (Multiple frame transmission in an EDCA TXOP)

Proposed spec text changes

*Instructions for the Editor:*

*Red text indicates changes to be applied to existing text in Draft P802.11ac\_D0.1.pdf.*

*Text in blue is text copied from the 802.11n-2009 baseline that was not shown in the 11ac draft and that need be added to the draft, with the modifications shown in green.*

***Text in black is unmodified text from Draft P802.11ac\_D0.1.pdf***

***Italic light gray text indicates instruction to the editor***

*Change section 9.2.0b.4.4 as follows*

##### 9.2.0b.4.4 PIFS

***Change the second paragraph as follows:***

The PIFS may be used as described in the following list and shall not be used otherwise:

* A STA operating under the PCF as described in 9.3 (PCF)
* A STA transmitting a Channel Switch Announcement frame as described in 11.9 (DFS procedures)
* An HC starting a CFP or a TXOP as described in 9.9.2.1.2 (CAP generation)
* An HC or a non-AP QoS STA that is a polled TXOP holder recovering from the absence of an expected reception in a CAP as described in 9.9.2.1.3 (Recovery from the absence of an expected reception)
* An HT STA using dual CTS protection before transmission of the CTS2 as described in 9.2.0b.8 (Dual CTS protection)
* A TXOP holder continuing to transmit after a transmission failure as described in 9.9.1.4 (Multiple frame transmission in an EDCA TXOP)
* A TXOP holder transmitting an RTS with a group TA within a multiple frame transmission sequence, as specified in section 9.9.1.4 (Multiple frame transmission in an EDCA TXOP)
* An RD initiator continuing to transmit using error recovery as described in 9.15.3 (Rules for RD initiator)
* An HT AP during a PSMP sequence transmitting a PSMP recovery frame as described in 9.16.1.3 (PSMP uplink transmission (PSMP-UTT))
* An HT STA performing clear channel assessment (CCA) in the secondary channel before transmitting a 40 MHz mask PPDU using EDCA channel access as described in 11.14.9 (STA CCA sensing in a 20/40 MHz BSS)
* A VHT STA performing clear channel assessment (CCA) in the secondary 20/40/80 channels before transmitting a 40/80/160/80+80 MHz mask PPDU using EDCA channel access as described in 11.20.4 (STA CCA sensing in a VHT BSS)

*Replace first paragraph of section 9.9.1.4 with the following one*

**9.9.1.4 Multiple frame transmission in an EDCA TXOP**

Change the first paragraph of 9.9.1.4 as follows:

Multiple frames may be transmitted in an ~~acquired~~ EDCA TXOP that was acquired following the rules in

9.9.1.3 if there areis more than one frame pending in the AC for which the channel has been acquired.

However, those frames that are pending in other ACs shall not be transmitted in this EDCA TXOP. If a

TXOP holder~~STA~~ has in its transmit queue an additional frame of the same AC as the one just transmitted

and the duration of transmission of that frame plus any expected acknowledgment for that frame is less than the remaining TXNAV~~medium occupancy~~ timer value, then the STA may commence transmission of that frame ~~at~~ a SIFS (or RIFS, under the conditions defined in 9.2.3.0b) after the completion of the immediately preceding frame exchange sequence. A STA shall not commence the transmission of an RTS with a group TA until at least PIFS time after the immediately preceding frame exchange sequence . An HT STA that is a TXOP holder may transmit multiple MPDUs of the same AC within an A-MPDU as long as the duration of transmission of the A-MPDU plus any expected BlockAck response is less than the remaining TXNAV timer value.

Premotion

Do you accept the resolution for the CIDs on document 11/0348r0?