IEEE P802.11  
Wireless LANs

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| RESOLUTION OF CID 4444 | | | | |
| Date: 2020-03-03 | | | | |
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Abstract

This submission proposes resolution for CID 4444.

Green indicates material agreed to in the group,

yellow material to be discussed, red material rejected by the group and

cyan material not to be overlooked.

The “Final” view should be selected in Word.

R1 – After changes suggested by Mark R. CAP discussion.

R2 – Forgot to change heading Rev. Tidied up a bit

CID 4444

4444 RISON, Mark 1001 3 10.23.3.2.2

Comment

"When the HC needs access to the WM to start a (#65)TXOP, the HC shall sense the WM. When the WM is determined to be idle at the TxPIFS slot boundary as defined in 10.3.7 (DCF timing relations), the HC shall transmit the first frame of any permitted frame exchange sequence, with the duration value set to cover the TXOP(#65)."" –

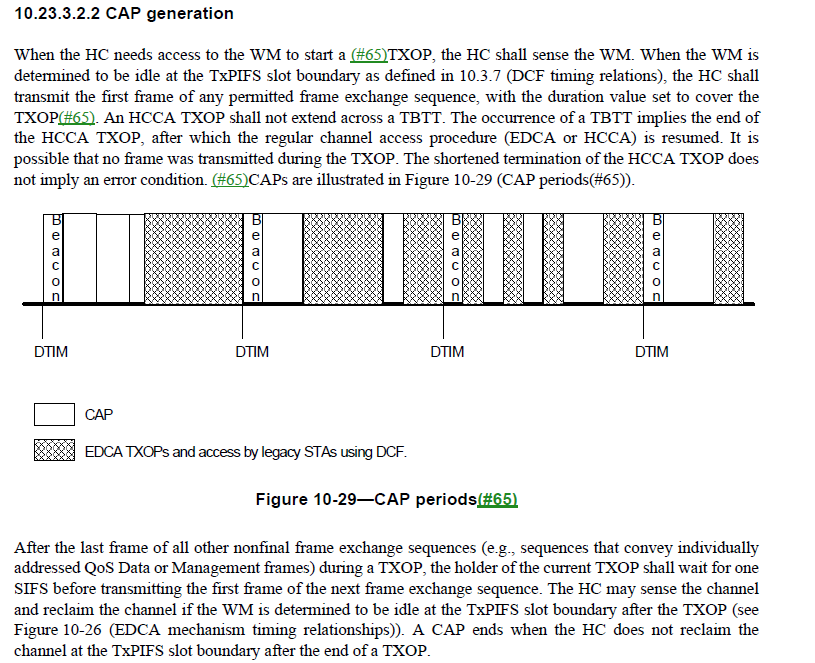
This seems to allow any AP that claims to support HCCA to always transmit after PIFS, even if the access is not for HCCA. The permission to use PIFS should be constrained to HCCA contexts"

Proposed

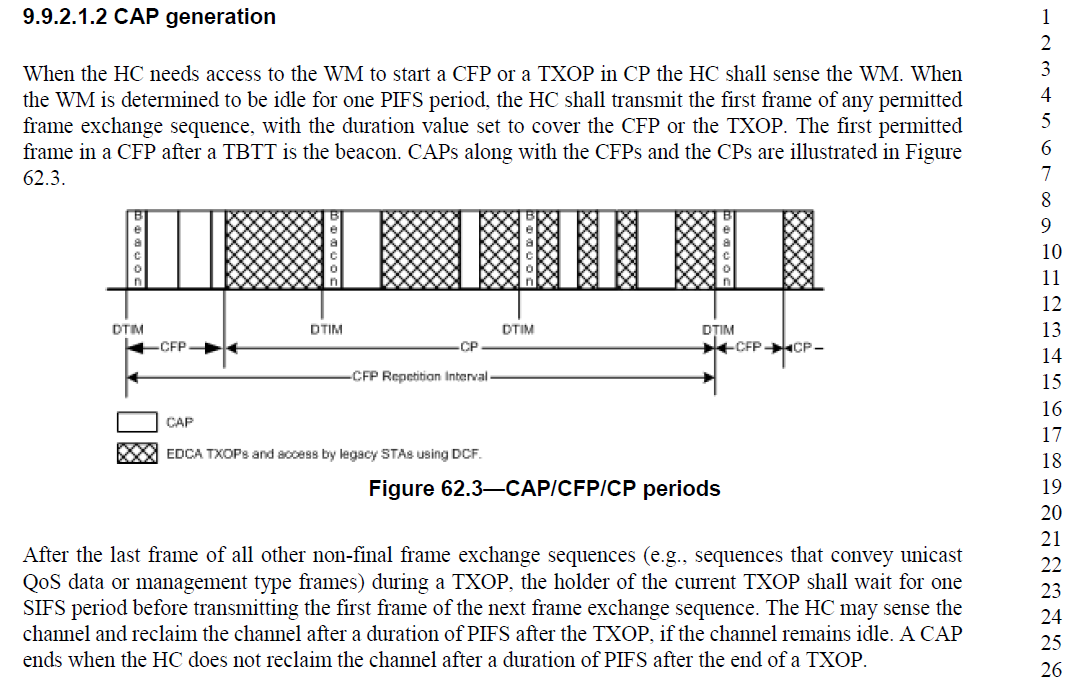
As it says in the comment

Discussion

Here is the referenced text in the Standard



Here is original 802.11e D13.0 relevant clause. That used CFP and CP but we go rid of that, and hence left with simply “TXOP”



Clearly, the HC reclaims the channel at PIFS for HCCA

Note that in 10.23.3.1

“The HCCA mechanism manages access to the WM using an HC that has higher medium access priority than non-AP STAs. This allows it to transfer MSDUs to STAs and to allocate TXOPs to STAs.”

So a quick refresher on “What is an **HC?”**

**P186.39**

**hybrid coordinator (HC):** A type of coordinator, defined as part of the quality-of-service (QoS) facility, that implements the frame exchange sequences and medium access control (MAC) service data unit(MSDU) handling rules defined by the hybrid coordination function (HCF).

Note, however, that HCF includes EDCA and HCCA as per Clause 10.23.3.

So, when the HC is acting as an **HCCA HC, the HC does use PIFS to grab the WM**. The commenter is correct, we need to be clear that an HC is acting as the “HCCA” HC and not just an AP that may support HCCA (as noted by the comment).

The question is, if the AP /HC simply claims to support HCCA, can it grab the WM using PIFS, or, must the AP be acting in the “HCCA” HC role in order to do so?

Obviously the latter is the answer.

Hence, we do need to edit the sentence “When the HC needs access to the WM to start a (#65)TXOP, the HC shall sense the WM” so as to be clear that the AP is an “HCCA HC” in this case.

Question? - What distinguishes the HC when used for HCCA? Let’s go looking for clues

P1844.36 10.23.3.1. we read

“The HC is a type of centralized coordinator that grants a STA **a polled TXOP** with duration specified in a QoS (+)CF-Poll frame.”

Maybe the term “polled TXOP” may be the distinction plus that the HC transmits “a QoS (+)CF-Poll frame in order to start the TXOP.”

The HCCA HC starts a non-contention period using the QoS (+)CF-Poll.

Hence, as to the comment, I suggest two possible answers:

OPTION A

When the HC needs access to the WM to start a polled TXOP, the HC shall first sense the WM…

OR, to be double clear,

OPTION B

When the HC needs access to the WM to transmit a QoS (+)CF-Poll frame and start a polled TXOP,

Suggest, as does Mark, we go with Option A.

BUT WAIT, THERE’S MORE

As Mark R pointed out to me, we also have CAP “controlled access phase” –

***controlled access phase (CAP):*** *A time period during which the hybrid coordinator (HC) maintains control of the medium. It might span multiple consecutive transmission opportunities (TXOPs) and can contain polled TXOPs.*

Why the mix between TXOPs and polled TXOPs? If an HC is an HCCA AP it is polled TXOPs, if an EDCA HC, then TXOPs? I would have thought that the CAP would be specific for an HCCA HC, and a check through D3.0 seems to support this. Also Figure 10-29 supports this as the EDCA TXOPs are clearly shown separately (cross hatched areas).

**Having looked at all the references to CAP, I am convinced that CAP is for HCCA only.**

I think that Figure 10-29 is not correct. It appears to show 3 CAPs in the first CFP when the HC maintains control of the WM. These may well be different TXOPs but they are clearly the same CAP and hence are polled TXOPs. Also note that “CAP Generation” and this figure are in the “HCCA procedure” clause.

Hence, we could consider editing Figure 10-29 as follows:



OR



I seek consensus for this. I do not suggest editing the text surrounding the Figure at this time, but might entertain this if others felt that it may be necessary. Having said that we have lived for many years with this (since 11e).

Hence I propose that the definition be modified

***controlled access phase (CAP):*** *A time period during which the hybrid coordinator (HC) maintains control of the medium using HCCA procedures. It consists of one or more consecutive polled transmission opportunities (TXOPs)~~.It might span multiple consecutive transmission opportunities (TXOPs) and can contain polled TXOPs~~*

Checking each CAP reference, I think just one clarification is needed in a PIF rule, so as to support the change proposed to satisfy the comment.

10.3.2.3.4 P1729.46 “An HC starting (M53)a polled TXOP, as described in 10.23.3.2.2 (CAP generation)”

**Proposed Resolution:**

Revised

At 10.23.3.2.2. P1845.13,

Change,

“When the HC needs access to the WM to start a TXOP,”

To

“When the HC needs access to the WM to start a polled TXOP,”

At P179.49

Edit as follows:

***controlled access phase (CAP):*** *A time period during which the hybrid coordinator (HC) maintains control of the medium using HCCA procedures. It consists of one or more consecutive polled transmission opportunities (TXOPs). ~~It might span multiple consecutive transmission opportunities (TXOPs) and can contain polled TXOPs~~*

10.3.2.3.4 P1729.46, edit as follows:

“An HC starting (M53)a polled TXOP, as described in 10.23.3.2.2 (CAP generation)”

At P1845.22

Edit Figure 10-29 as follows to show polled TXOPs

