IEEE P802.11  
Wireless LANs

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| “Obsolete Annex G?” | | | | |
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Abstract

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At first look, it may seem obvious that we must keep Annex G as it meticulously defines all the packet exchanges and is normative.

HOWEVER….

Arguments:

OK it’s nice and safe to be able to refer to Annex G every time we say “frame exchange” BUT there are 309 instances of “frame exchange” and only a handful of cases (14) does it refer to Annex G.

Nowhere is a reference made to a particular line or part of Annex G.

One could argue that we should be adding “(see Annex G)” in all these cases (or many of them) if Annex G was really required as the depository for how frame exchanges are carried out and which are valid.

If we look at each “frame exchange” reference, however, we see that there is no real need to reference Annex G, so no problem if Annex G was deleted. What is so difficult to understand by “frame sequence”?

Also:

How sure are we that Annex G is complete and there is a good deal of doubt that it is accurate, inclusive and up to date? **At the the least, if we retain it, we need to investigate if it is indeed accurate and up to date.**

**POINTS**

“**frame exchange sequence:** A sequence of frames specified by Annex G”

*If not in Annex G then by definition it is not a valid sequence? That’s dangerous*.

We may need a definition that explains that a “frame exchange sequence” is a finite set of frames. OR we accept that the words are self explanatory.

“sequence” - a particular order in which related events, movements, or things follow each other.

Maybe:

***“frame exchange sequence - the order in which particular frames are transmitted in order to complete an exchange.”***

A check through D0

“frame exchange” 309 instances, of which “frame exchange sequence” 128

“valid response” 4

“see Annex G” 5 instances

“in Annex G” 9 instances

**“See Annex G” (5 instances)**

In each of these ask yourself what happens if “see Annex G” is deleted?

9.2.4.1.7 P781.34

The Power Management subfield is used to indicate the power management mode of a STA. The subfield is either reserved (as defined below) or remains constant in each frame from a particular STA within a frame exchange sequence (see Annex G).

“See Annex G” is superfluous anyhow, already in definition. No new info at all.

P1716.11

The recognition of a valid CTS frame sent by the recipient of the RTS frame, corresponding to this PHY-RXEND.indication primitive, shall be interpreted as successful response, permitting the frame exchange sequence to continue (see Annex G). The recognition of anything else, including any other valid frame, shall be interpreted as failure of the RTS frame

transmission.

Here “valid frame” is referring to a valdi 802.11 frame, not a frame in a sequence.

P1720.31

After transmitting an MPDU that requires an Ack or BlockAck frame as a response (see Annex G), the STA

shall wait for an AckTimeout interval…

If we do not believe that the rules for Ack or BA are spelt out, then do we go rushing to Annex G to see? I argue nothing lost if deleted.

P1802.53

If a PHY-RXSTART.indication primitive does occur during the timeout interval, the STA shall

wait for the corresponding PHY-RXEND.indication primitive to recognize a valid response

MPDU (see Annex G) that either does not have a TA field or is sent by the recipient of the

MPDU requiring a response. If anything else, including any other valid frame, is recognized,

the transmission of the MPDU has failed.

*Actually I think this is possibly wrong.*

P1812.13

After a valid response (see Annex G) to the initial frame of a TXOP, if the Duration/ID field is set for multiple

frame transmission…

**“in Annex G” (9 Instances)**

***We also have “in Annex G”,, look at each and ask oneself what effect is of deleting. One question is “where in Annex G???***

P1733.19

A retry is defined as the entire sequence of frames sent, separated by SIFSs, in an attempt to deliver an MPDU, as described in Annex G

*Is “retry” described in Annex G? NO “retry”in Annex G*

P1737.47

Under DCF, error recovery is always the responsibility of the STA that initiates a frame exchange sequence (described in Annex G).

*Error recovery is not described in Annex G.*

P2048.7

For each frame received at the RDS during the SP, the RDS shall follow the same rules for frame exchange sequences as described in Annex G and 10.39 (DMG and CMMG(11aj) channel access).

*If it is 10.39, why look in Annex G. Are they different?*

Note: All the following are Power Control related. BUT “power” is not mentioned in Annex G.

P2169.19

The STA shall remain in its current power management mode until it informs the AP of a power management mode change via a frame exchange that includes an acknowledgment from the AP. Power management mode shall not change during any single frame exchange sequence, as described in Annex G.

*What if frame exchange is not in Annex G?*

P2151.50

To change power management modes a STA shall inform the AP by completing a successful frame exchange

(as described in Annex G) that is initiated by the STA. This frame exchange shall include a Management

frame, Extension frame or Data frame from the STA, and an Ack or a BlockAck frame from the AP.

***There is no “power” in Annex G,*** *so what frame exchange is this referring to? Confusing wording at the least. This is the problem of tying everything to Annex G.*

P2185.51

If the MM-SME Power Mode field within the MMS element sent by an MM-SME coordinated STA is 1, all STAs advertised in the MMS element shall switch to the doze state when the wakeup schedule of any one STA or a successful frame exchange as described in Annex G brings the STA to the doze state.

P2185.56

If the MM-SME Power Mode field within the MMS element sent by an MM-SME coordinated STA is 0, all STAs advertised in the MMS element shall switch to the awake state when the wakeup schedule of any one STA or a successful frame exchange as described in Annex G brings the STA to the awake state.

(where in Annex G????)

P2186.56

To change its power state without a wakeup schedule, a non-AP and non-PCP STA shall inform the AP or PCP by completing a successful frame exchange (as described in Annex G) that is initiated by the STA and that includes a Management frame, Extension frame or Data frame, and also an Ack or a BlockAck frame from the AP or PCP.

P2190.37

Alternatively, to change its power state without a wakeup schedule, the PCP shall inform all associated STAs by completing a successful frame exchange (as described in Annex G) that is initiated by the PCP and that includes a Management frame, Extension frame or Data frame, and also an Ack or a BlockAck frame from the associated STA.

**Now let’s look at some examples of “frame exchange sequence”**

**Maybe a good definition is all that is required to cover all of these?**

P2087.23

The frame exchange sequence for sector training is shown in Figure 10-111 (Sector training(11ah)), where the AP transmits training NDP CTS frames, and the STA provides Sector ID feedback. The frame exchange comprises the following steps:

*No need for Annex G, the sequence is completely defined, but maybe should check if Annex G has this exchange?*

P2183.6

In dynamic SM power save mode, the STA enables its multiple receive chains when it receives the start of a frame exchange sequence addressed to it. Such a frame exchange sequence shall start with a single-spatial stream individually addressed frame that requires an immediate response and that is addressed to the STA in dynamic SM power save mode.

*Again no need for Annex G.*

Easier to show interactive Search and display.

**I cannot find a place where not having Annex G causes a problem.**

**Examples where Annex G may present a problem**

**P 1917.30**

**P1804.11 Interesting**

**P1909.13 PPDU exchange, needs to be in Annex G?**

**P2033.40 (and 37) drawings so much better. Sure this is not in Annex G**

**P2083 FIGS 10-106 and 10-107 and 10-108 and 10-109** *True ACK and CTS are in Annex G but do they tell the whole story? This may prove challenging to get into Annex G, and if not there, these cannot be “valid” exchanges.*

**Conclusions**

1. **If not in Annex G then not a valid exchange** 
   1. Sounds dangerous to me.
2. What is actually missed if no Annex G?
   1. How much confusion will actually be introduced?
   2. Is there an exchange that is not clear in the main text but only appears in Annex G?
   3. Need to check so many cases I think it can never be 100 % compliant between text and Annex G.
3. Changing definition of “frame exchange sequence” is needed, it appears directly 128 times, but what about “frame exchange” is that the same thing? We see them being mixed already so does that need to be sorted out?