IEEE P802.11
Wireless LANs

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|  “Obsolete Annex G”  |
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Abstract

R0 – original

R1 – added more references, first attempt at definition.

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

HOWEVER….

There are 295 instances of “frame exchange” and in only 14 cases does it actually 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 (including “frame exchange sequence”), however, we see that there is no reference to Annex G, so no problem if Annex G was deleted.

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.**

 “**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.

Could work on a definition:

“Sequence” – particular order of related events that follow each other

“Exchange” – giving one thing and receiving another in return.

Maybe along lines of “An allowed order of exchanged frames”

A check through 802.11-2020 (ignoring index)

“frame exchange” 295 instances,

Includes “frame exchange sequence” 120

“valid response” 4

“Annex G” 18 instances

Includes “see Annex G” 5 instances

And “in Annex G” 9 instances

**“See Annex G”**

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

If we had a definition for “frame exchange sequence”, does it help?

9.2.4.1.7 P791.49

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).

P1732.16

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.

P1736.42

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…

P1819.62

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.

P1829.36

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…

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

***One question is “where in Annex G???***

P1750.11

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.

P1754.36

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

P2066.43

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).

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.

P2171.33

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.

P2205.46

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.

P2205.50

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????)

P2206.52

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.

P2210.33

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.

**Then there are 3 other “Annex G” references**

P237.17

The features and behaviors of VHT STAs specified in

Clause 6 (Layer management), Clause 8 (PHY service specification), Clause 9 (Frame formats), Clause 10

(MAC sublayer functional description), Clause 11 (MLME), Clause 14 (MLME mesh procedures),

and Annex G apply to TVHT STAs as well, unless stated otherwise

P238.17

For Annex G, the following replacements are applied for TVHT STAs:

— “TVHT” replaces “VHT”.

— “tvht” replaces “vht”.

P1833.3

In this example, the STA accesses the medium using EDCA channel access and then transmits a nav-set sequence (e.g., RTS/CTS for non-DMG STAs or RTS/DMG CTS for DMG STAs) (using the terminology of Annex G).

**“Valid Response” only 2 independent (**i.e. 2 are “valid response (see Annex G)”**)**

P2227.10

If the ResultCode in the MLME-ASSOCIATE.response primitive is SUCCESS, the SME has an existing SA with the STA, and an SA Query procedure with that STA has failed to receive a valid response (i.e., has not received an MLME-SAQUERY. confirm primitive within the dot11AssociationSAQueryMaximumTimeout period), the SME shall issue an MLME-DISASSOCIATE.request primitive addressed to the STA with ReasonCode INVALID\_AUTHENTICATION.

*Valid response is specified.*

P2231.53

If the ResultCode in the MLME-REASSOCIATE.response primitive is SUCCESS, the SME has an

existing SA with the STA, and an SA Query procedure with that STA has failed to receive a valid

response (i.e., has not received an MLME-SA-QUERY.confirm primitive within the

dot11AssociationSAQueryMaximumTimeout period), the SME shall issue an MLMEDISASSOCIATE.

request primitive addressed to the STA with ReasonCode

INVALID\_AUTHENTICATION.

*Same, valid response is completely specified.*

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

P2106.17

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:

Hmm…no need for Annex G, the sequence is compoletely defined, but maybe should check if Annex G has this exchange?

P2202.58

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.