IEEE P802.11
Wireless LANs

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| Maximum TRN field duration |
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Abstract

This document suggests text that defines a maximum duration for the TRN field of EDMG PPDUs.

**Discussion**

* In the current version of the draft (D0.2), the duration of the TRN field is limited only by:
	+ The maximum number of TRN-Units (8 bits, 255)
	+ The maximum values of EDMG TRN-Unit P and EDMG TRN-Unit M
	+ The total duration of the PPDU itself
* As a result,
	+ For the (EDMG TRN-Unit P = 2, EDMG TRN-Unit M = 6) configuration, the maximum TRN field duration is 8\*255 + 2 = 2042 TRN subfields (~891 us)
	+ For the (EDMG TRN-Unit P = 2, EDMG TRN-Unit M = 8) configuration, the maximum TRN field duration is 10\*255 + 2 = 2552 TRN subfields (~1.11 ms)
	+ For the (EDMG TRN-Unit P = 4, EDMG TRN-Unit M = 16) configuration, the maximum TRN field duration would be 20\*255 + 4 = 5104 TRN subfields (~2.22 ms), which is greater than the maximum PPDU duration.
* Going into more detail,
	+ Only necessary to limit EDMG BRP-TX.
	+ To enable practical implementations, instead of limiting the duration of the TRN field, it is actually only necessary to define a maximum number of possible AWVs trained in the EDMG BRP-TX packet, which is given by

$$\frac{EDMG TRN-Unit M ×EDMG TRN Length}{EDMG TRN-Unit N}$$

* + Observations
		- Number of TRN subfields used for channel estimation has no impact
		- Repetition factor does have an impact 🡪 only one measurement/feedback is made for each EDMG TRN-Unit N TRN subfields.
* Proposal:
	+ Limit:

$$\frac{EDMG TRN-Unit M ×EDMG TRN Length}{EDMG TRN-Unit N}\leq 8×255=2040$$

* + Allows both mandatory modes to be used with the maximum number of TRN-Units.
	+ The limit is always satisfied when $EDMG TRN-Unit N>1$.
		- Only necessary to define a limit for EDMG BRP-TX packets with $EDMG TRN-Unit N = 1$.
		- For similar reason, it is also not necessary to define limit for EDMG BRP-RX/TX packets.
* Example 1: For (EDMG TRN-Unit P = 2, EDMG TRN-Unit M = 8, EDMG TRN-Unit N = 1), the maximum number of TRN-Units is

$$8 ×EDMG TRN Length\leq 2040\rightarrow EDMG TRN Length\leq 255$$

* + Number of TRN-Units may be equal to its maximum.
* Example 2: And when (EDMG TRN-Unit P = 4, EDMG TRN-Unit M = 16, EDMG TRN-Unit N = 1), the maximum number of TRN-Units is

$$16 ×EDMG TRN Length\leq 2040\rightarrow EDMG TRN Length\leq 127.5$$

* + For “long” configurations, we wouldn’t be able to set the number of TRN-Units used to its maximum when EDMG TRN-Unit N = 1 🡪 In this case, more than one packet would have to be used.

30.9.2.2.5 TRN field definition

*Insert the following paragraph:*

For transmitted EDMG BRP-TX packets with the value of the EDMG TRN-Unit N field in the EDMG-Header-A equal to 1, the EDMG TRN Length field in the EDMG-Header-A shall be less than or equal to 2040/M, where M is the value of the EDMG TRN-Unit M field in the EDMG-Header-A.

**Straw Poll**

Do you agree that the text in contribution 17/0278r0 shall be incorporated into the next draft 11ay specification?

**References:**