IEEE P802.11  
Wireless LANs

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| D3 Comment Resolution, brianh, part 2 | | | | |
| Date: 2012-07-15 | | | | |
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##### Baseline is 11ac D3.0. Changes indicated by a mixture of Word track-changes and instructions. For equation changes, Tex notation is sometimes used. E.g. a\_{xyz}^b denotes axyzb

MAC CIDs: 6713, 6743, 6744, 6266, 6802, 6764, 6765, 6766, 6777, 6300, 6778, 6060, 6062

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| 6713 | David Hunter | 3.2 | 4.23 | It is beyond the scope of 802.11ac to delete a definition that is used extensively in 802.11-2012. | Do NOT delete the definiton of "transmit power". If a modification of this definition is needed for VHT, then specify that the 802.11-2012 definition applies to all but VHT STAs and add an appropriate definition for VHT STAs. | Rejected. This definition was ambigiuous, no more than partial, not useful, widely ignored in the baseline and instead this draft clarifies any usage of transmit power that still needs something like this definition. See 12/0888<motioned-Rev#> for a full discussion of the problems with this definition and why we are all better off without it. |

***Context:***

“transmit power: The effective isotropic radiated power (EIRP) when referring to the operation of an

orthogonal frequency division multiplexing (OFDM) physical layer (PHY) in a country where so regulated.”

***Discussion:***

Definition is ambiguous: Does “where so regulated” bind to EIRP, “operation”, “OFDM PHY” or “Country”? Actually, *none* of these make sense as written. Talking with the original author, the intent was to bind with “country” as:

transmit power: The effective isotropic radiated power (EIRP) when referring to the operation of an

orthogonal frequency division multiplexing (OFDM) physical layer (PHY) in a country where transmit power is so regulated.

(But then this becomes a circular definition!)

Definition is partial: what is the definition of transmit power where transmit power is not regulated as EIRP? EIRP per MHz? Conducted? Conducted per MHz?

Definition is not useful: Consider the US. Is the US a country where transmit power is regulated as EIRP? Consider the FCC UNII-2 TX Power rules: which say (explicitly) conductedPower < min(24,11+10logB)dBm AND (implicitly) EIRP < min(30,17+10logB)dBm AND (explicitly) conductedPSD< 11dBm/MHz AND (implicitly) eirpPSD < 17dBm/MHz. And different bands have different rules – some are explicitly EIRP. That is, a single country has a mix of rules, and indeed a single band in that single country.

Definition is ignored: Consider the description of the TPC Response element

“The Transmit Power field is set to the transmit power used to transmit the frame containing the TPC Report

element. The field is coded as a 2’s complement signed integer in units of decibels relative to 1 mW. The

maximum tolerance for the transmit power value reported in the TPC Response element is ± 5 dB. This

tolerance is defined as the difference, in decibels, between the reported power value and the actual EIRP of

the STA (when transmitting 1500 octet frames or maximum MPDU sized-frames, whichever is smaller).”

Here it is clear that “transmit power” means “EIRP” and nothing but EIRP, even in a country regulated as conducted. See also Max Transmit Power field, Transmit Power Used field, etc

Then there is the Country element

“The Maximum Transmit Power Level field is a signed number and is 1 octet in length. It indicates the

maximum power, in dBm, allowed to be transmitted. As the method of measurement for maximum transmit

power level differs by regulatory domain, the value in this field is interpreted according to the regulations

applicable for the domain identified by the Country String.”

Here transmit power could be EIRP, or conducted, or EIRP per MHz, according to the regulations applicable for the domain (i.e. country and band). Certainly not “EIRP or undefined”

Definition is applied: We searched the baseline for instances of “transmit power” that did not clearly distinguish between EIRP and conducted (or other) and, in conjunction with broad industry collaboration and using the “EIRP” component of the baseline’s “transmit power” definitionas guidance, clarified what was meant. We see this in 11acD3.0 as clarifications of the Power Capability element, Peer-to-Peer Link Report element, diagnostic Information subelement, and Radio Information subelement.

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| 6743 | David Hunter | 8.5.2.6 | 88.47 | What is the unexplained "Zero or one" above some of the field blocks? This is a non-standard format whose contents need to be expressed in some other way -- such as normative text that expresses these are optional fields. | Delete these words and add a statement that these two fields are optional. | Revised. Replace “Zero or more” in conjunction with Wide Bandwidth  Channel Switch  Element as “Optional”. Replace incorrect “Zero or one” by “Zero or more”” |
| 6744 | David Hunter | 8.5.8.7 | 89.10 | What is the unexplained "Zero or one" above some of the field blocks? This is a non-standard format whose contents need to be expressed in some other way -- such as normative text that expresses these are optional fields. | Delete these words and add a statement that these three fields are optional. | Revised. Replace “Zero or more” with “Optional”. |

**8.5.2.6 Channel Switch Announcement frame format**

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|  |  |  |  |  |  | Optional | Zero or more |
|  | Category | Spectrum Management Action | Channel Switch Announcement element | Secondary Channel Offset element | Mesh Channel Switch Parameters element | Wide Bandwidth Channel Switch element | New VHT Transmit Power Envelope element |
| Octets: | 1 | 1 | 5 | 3 | 6 | 0 or 5 | Variable |

**8.5.8.7 Extended Channel Switch Announcement frame format**

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|  |  |  |  |  |  |  |  | Optional | Optional | Zero or more |
|  | Category | Public Action | Channel Switch Mode | New Operating Class | New Channel Number | Channel Switch Count | Mesh Channel Switch Parameters element | New Country element | Wide Bandwidth Channel Switch element | New VHT Transmit Power Envelope element |
| Octets: | 1 | 1 | 1 | 1 | 1 | 1 | 6 | Variable | Variable | Variable |

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| 6266 | Brian Hart | 8.5.13.7 | 92.43 | Only one VHT Transmit Power Envelope element is included | Make this one element per distinct value of units interpretation [assign to Brian Hart] | Revised. See changes under CID 6266 in 12/0888<motioned-Rev#> |

**Table 8-244—Information for TDLS Channel Switch Request frame**

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| 10 | VHT Transmit Power Envelope | VHT Transmit Power Envelope element (zero or more are present).  Each VHT Transmit Power Envelope element that is present includes  a distinct value of the Local Maximum Transmit Power Units Interpretation. If present, the New VHT  Transmit Power Envelope element indicates the maximum transmit powers for the direct link for the indicated  bandwidths with an indicated units interpretation after a switch to a direct link (see 10.22.6.4.1 (General)). |

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| 6802 | Matthew Fischer | 9.18.5 | 124.36 | When can a frame contain more than one of these elements? If it really can, then is there a second sort criterion which is used when the values are the same. | Please clarify. | Rejected. See the Note in Table 8-183y as a clarification (“NOTE—This table is only expected to be updated if regulatory  domains mandate the use of transmit power control with limits that cannot  be converted into an EIRP value per PPDU bandwidth”) in conjunction with the Note at the end of 9.18.5 (“NOTE—In the case of two VHT Transmit Power Envelope elements received in the same frame by a STA, each with a  known Local Maximum Transmit Power Units Interpretation subfield, then the expected possibilities are a) the STA  complies with either element (shared spectrum), b) the STA complies with both elements (tightened regulations) or c)  the STA complies with the second element (changed regulations).”)  The (units) values cannot be the same since the inclusion rules consistently refer to “distinct” values. See e.g. Table 8-20: (“One VHT Transmit Power Envelope element is present  for each distinct value of the Local Maximum Transmit  Power Units Interpretation subfield …”) |

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| 6764 | David Hunter | 9.18.5 | 124.37 | Ordering of elements needs to be done according to the values in their subfields, not the subfields themselves (which are all the same). | Replace "increasing Local" with "increasing values of their Local" and replace "subfield" with "subfields". | Accepted |

***Context***

A STA that sends two or more VHT Transmit Power Envelope elements in a frame shall order the elements

by increasing values of their Local Maximum Transmit Power Units Interpretation subfields

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| 6765 | David Hunter | 9.18.5 | 124.46 | Different elements are likely to have different values in their Local Maximum . . . Integration subfields. | Replace "value in the Local" with "values in their Local" and replace "subfield" with "subfields". | Accepted |

***Context:***

A STA that receives two or more VHT Transmit Power Envelope elements in the same frame with known

values in their Local Maximum Transmit Power Units Interpretation subfields shall process all the elements according

to the local regulations known at the STA.

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| 6766 | David Hunter | 9.18.5 | 124.50 | It is likely that the relevant factor that needs to be known is the value of a subfield, rather than the subfield itself. | Replace "known Local" with "know value in its Local". | Revised – “replace with “known value in the Local” instead |

***Context***

NOTE—In the case of two VHT Transmit Power Envelope elements received in the same frame by a STA, each with a

known value in the Local Maximum Transmit Power Units Interpretation subfield, then the expected possibilities are a) the STA complies with either element (shared spectrum), b) the STA complies with both elements (tightened regulations) or c)

the STA complies with the second element (changed regulations).

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| 6777 | David Hunter | 10.8.4 | 153.26 | Something is missing / broken in the sentence that spans lines 26 and 27. | Perhaps replace the end of the sentence with:  "in a VHT Transmit Power Envelope element in Beacon and Probe Response frames." | Revised. See changes under the CID (6777,6300)-tuple in 12/0888<motioned-Rev#> which largely accord with the commenter’s proposed resolution. |
| 6300 | Brian Hart | 10.8.4 | 153.28 | Need one VHT Transmit Power Envelope element per units interpretation | Add (assign to Brian Hart) | Revised. See changes under the CID (6777,6300)-tuple in 12/0888<motioned-Rev#> which largely accord with the commenter’s proposed resolution. |

A VHT AP in a BSS, a VHT STA in an IBSS, and a VHT mesh STA in a MBSS shall advertise the local

maximum transmit power for that STA's operating channel in Beacon frames and Probe Response frames using one

VHT Transmit Power Envelope element for each distinct value of the Local Maximum Transmit Power Units Interpretation subfield that is supported by the BSS, IBSS or MBSS respectively. Each VHT Transmit Power Envelope element shall include a local power constraint for all channel widths supported by the BSS.

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| 6778 | David Hunter | 10.8.4 | 153.31 | This requirement states that these VHT STAs \_should\_ be able to reduce their EIRP to 0. But the note below says, if they can't, then they won't be able to associate. So shouldn't the requirement be "shall"? | Replace "should" with "shall". | Rejected. A STA implementer may elect not to support 0 dBm, albeit at the risk of reduced likelihood of association. This “should” is here to identify the risk and to steer the implementer away from choices that degrade the likelihood of widespread interoperability. However, ultimately the implementer has the knowledge and responsibility here. For instance, a long-range point-to-point bridge product using 11ac would be unlikely to be concerned about lost association opportunities. |

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| 6060 | Adrian Stephens | 10.8.2 | 152.31 | "If the Beacon or Probe Response frame most recently received by a VHT STA"    Just how dynamic is this information. Can an AP change the contents of its VHT Transmit Power element without a channel switch operation? | Delete "most recently"    Consider somewhere adding a statement that the contents of the VHT Transmit Power element does not change except through the operation of a channel switch. | Rejected. Transmit power control has always been allowed to be dynamic, and on-channel transmit power changes have never previously been associated with a channel switch. See for instance “The regulatory and local maximum transmit powers may change in a STA during the life of an infrastructture BSS and an MBSS” in 10.8.4.  VHT introduces TPC within the channel switch framework solely so that the STAs are able to operate at the correct power on the new channel. |

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| 6062 | Adrian Stephens | 10.22.6.4.1 | 157.04 | "When announcing new TPC parameters for an off-channel direct link, that come into effect at the same time as the switch to the direct link"    ", that" is ungrammatical. It should be either "that" or ", which". In this case it should be "that" because the second clause is part of the condition that applies to the "shall" statement. | Replace ", that" with "that" | Accepted |

***Context***:

When announcing new TPC parameters for an off-channel direct link that come into effect at the same time

as the switch to the direct link, the TDLS peer VHT STA initiating the switch shall include at least one VHT

Transmit Power Envelope element in a transmitted TDLS Channel Switch Request frame. The recipient

TDLS peer VHT STA that has dot11SpectrumManagementRequired or dot11RadioMeasurementActivated

equal to true shall use the parameters in these received element(s) in the recipient STA's TPC calculations for

the off-channel.