**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **Proposed Resolutions for Metric Comments CID #373, 374, 375, 376, 377, 378, 379, 380, R195, R196** | |
| Date Submitted | 17 August 2015 | |
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| Re: | 802.15.10 Consolidated Comment Entry Form, CID #373, 374, 375, 376, 377, 378, 379, 380, R195, R196 | |
| Abstract | Provides a proposed resolution to CID #373, 374, 375, 376, 377, 378, 379, 380, R195, R196 | |
| Purpose | To be used by the technical editor to apply the necessary changes to the draft to resolve CID #373, 374, 375, 376, 377, 378, 379, 380, R195, R196 | |
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**Comments #373, 374, 375, 376, 377, 378, 379, 380, R195, R196**

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| CID | Name | Page | Sub-clause | Line # | Comment | Proposed Change |
| 373 | Noriyuki Sato | 58 | 6.2.2.10 | 32 | Using SINR as LQM is not good idea since PQM is calculated by adding LQMs. | Consider using dB and make it integer type and some normalize to represent SINR metric. |
| 374 | Tero Kivinen | 58 | 6.2.2.10 | 38 | This table has several items which says that the type of the Metric value and threshold is Float, but it does not specify how the Float is encoded in the 4-octet field. In 15.4 we do not specify the format for Float when sent over the air. As this sends them in the IE the format needs to be specified. | Specify format of the Floats. |
| 375 | Billy Verso | 58 | 6.2.2.10 | 38 | SINR is not defined anywhere | Define SINR, and describe what it is and how it is used. |
| 376 | Kiyoshi Fukui | 58 | 6.2.2.10 | 38 | Need a definition of an unit to be represented in. Maybe, dB is appropriate. If an unit is dB, the type of SINR metric should be Integer. | Refine the SINR definition. |
| 377 | Billy Verso | 58 | 6.2.2.10 | 40 | ETX Expected transmission count is not described anywhere. | Describe what it is and how it is used. |
| 378 | Kiyoshi Fukui | 58 | 6.2.2.10 | 40 | Precision of ETX value is not an integer. It should be represented in more precise unit. | Define the more precise unit. |
| 379 | Kiyoshi Fukui | 58 | 6.2.2.10 | 43 | Type of ETT value should be Integer. If more precise time than millisecond is needed, an unit to be represented in should be more precise. | Confirm the necessary precision of ETT value and correct it if necessary. |
| 380 | Noriyuki Sato | 58 | 6.2.2.10 | 43 | Better to define this metric as integer. | Consider |
| R195 | Charlie Perkins | 58 | 6.2.2.10 | 43 | Why "float"? | A 2 octet integer would likely be more than sufficient. |
| R196 | Charlie Perkins | 58 | 6.2.2.10 | 48 | A single vendor-specific extension may not be enough | Create 8-bit subtype as first field and a registry for vendor extensions. High-order bit of subtype == 1, means that subtype field is 16 bits long. |

**Resolution: AiP**

**CIDs 373, 375, and 376:** The utility of SINR as a metric is unclear, since it is not an additive metric on multi-link routes. The term should be deleted from the draft.

* ***Delete SINR from Table 11 and renumber the other Metric IDs***

**CID 374**: Floating point format is not defined in the document. Add a normative reference to IEEE 754.

* ***Add a new normative reference in Section 2 as follows:***

[IEEE 754] IEEE Standard for Floating-Point Arithmetic," *IEEE Std 754-2008* , vol., no., pp.1,70, Aug. 29

* ***Add citation in Table 11 wherever “Float” appears as a data type.***

**CID 377**: The definition for ETX is unclear.

* ***Add a new Section 5.2.2.1:***

**5.2.2.1 ETX link metric**

The ETX metric of a link is the estimated average number of transmissions required to successfully send a packet (each packet smaller than MTU) over that link, until an acknowledgement is received. The ETX metric is additive; in other words, the ETX metric of a path is the sum of the ETX metrics for each link on the path.

**CID 378**: The units of measurement for ETX should have much finer granularity.

* ***Insert the following text at the end of the description for ETX in Table 11:***

“, measured in units of .001”

**CIDs 379, 380, and R195.** The unit of measurement for ETT is milliseconds, and the numerical representation for the unit should be a 16 bit (unsigned) integer, allowing for ETT up to over a minute. Although the meaning of ETT might be more precisely conveyed by the name “Expected Delivery Time”, the acronym ETT is already well-known in the literature and so it should be kept.

* ***Modify the Type field for ETT in Table 11 to be Integer instead of Float. Modify the length field to be 2 instead of 4.***

**CID R196**: A single Metric ID allocation in Table 11 for Vendor-Specific may be insufficient. Utilize the next octet as a subtype field.

* ***Renumber the type of the Vendor specific Metric ID to be 15, so that it is preceded by all other allocated Metric IDs.***

As illustrated in Figure xxx,

* ***Insert the following text as the description for Vendor specific in Table 11:***

“The Subtype field identifies the exact subtype of vendor-specific Metric. If the most significant bit of the first octet of the subtype is ‘0’, then the subtype field is 7 bits long, otherwise the subtype field is 15 bits long. The length of the metric is determined by this 7 or 15 bit subtype field.”

* ***Insert the following figure to illustrate the description for Vendor specific subtype:***



Figure xxx – Format of the vendor specific PQM