**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | IEEE 802.15.4z MAC - CRG |
| Date Submitted |  |
| Source | Boris Danev (3db Access) |
| Re: | Letter Ballot Comments assigned to Boris Danev – P802.15.4z-D1 |
| Abstract | This contribution proposes updated text for the baseline draft P802.15.4z-D1 |
| Purpose | Provision of the text to facilitate its incorporation into the draft text of the IEEE 802.15.4z standard currently under development in TG4z. |
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| Patent Policy | The contributor is familiar with the IEEE-SA Patent Policy and Procedures:  <http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and  <http://standards.ieee.org/guides/opman/sect6.html#6.3>.  Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and  <http://standards.ieee.org/board/pat>. |

**Technical Comments Resolution**

* i-1183, i-1820, i-2836, i-1184, i-1821, i-2837

In current LRP UWB the LEIP sequence is delayed by a constant *aLeipDelayTime* from start of SFD. Therefore we need to provide a way to change this behavior for LRP ERDEV. Therefore the PIBs *phyLrpUwbLeipEnabled* and *phyLrpUwbLeipLength* were proposed to override the base LRP UWB.

* i-0520

“A LRP device shall support default value of 128“ replace with “LRP UWB PHY supports up to 128. LRP UWB ERDEV supports up to 256.

* i-0002, i-0539, i-0579, i-0538, i-1862, i-2443, i-0535, i-0578, i-0536, i-0532, i-0420,

Line 18-21 replace with new following modified definition:

“The LRP-ERDEV supports challenge-response authenticated ranging with distance commitment on secret data payload.

A set of authenticated ranging schemes is described in 6.9.9 using the security services (Clause 9). Annex G provides the requirements to support distance bounding by distance commitment on the data payload.”

* i-0593, i-0592, i-0591, i-0472, i-0590, i-0913, i-1550, i-2751, i-0912, i-1549, i-2750, i-0474,i-0473,i-0911,i-1548,i-2473,i-0910,i-1547,i-2450,i-0916,i-1553,i-2613, i-0595, i-0476, i-0477, i-0603

Replace with revised 6.9.9. Doc 15-19-0259-00-004z-lb-comment-resolution-6.9.9.docx.

* i-0915,i-1552,i-2595,i-0914,i-1551,i-2571

Proposal of introducing MLME-RAW-ENABLE request primitive available in Doc. 15-19-0251-01-004z-letter-ballot-comments-MAC-LRP.

* i-0918, i-1555,i-2845,i-0917,i-1554,i-2844

Table 2 was simplified and corrected to follow Clause 9. Replace with revised 6.9.9 in Doc. 15-19-0259-00-004z-lb-comment-resolution-6.9.9.docx.

* i-0920,i-1557,i-2124,i-0919,i-1556,i-2068

Introduced two Payload IEs (Challenge and Response IE) following recommendation from Tero. SR c-data concept was removed.

Doc. 15-19-0251-01-004z-letter-ballot-comments-MAC-LRP.docx

Doc. 15-19-0259-00-004z-lb-comment-resolution-6.9.9.docx.

* i-1561

Section 6.9.9.4 was revised.

Doc. 15-19-0259-00-004z-lb-comment-resolution-6.9.9.docx.

* i-2123,i-0603,i-0481,i-0480,i-0479,i-2311,i-0240,i-0927,i-0928,i-0929,i-0931,i-1564,i-1565,i-1566,i-1568,i-2752,i-2753,i-2754,i-2755,i-0926,i-1563,i-2861,i-0482,i-0483,i-2153,i-0242,i-0484,i-0932,i-0933,i-0934,i-0935,i-0936,i-1569,i-1570,i-1571,i-1572,i-1573,i-2756,i-2757,i-2758,i-2759,i-2760,i-0243,i-0485,i-0486,i-0937,i-1574,i-2761,i-0938,i-0939,i-0940,i-0941,i-0942,i-0943,i-0944,i-1575,i-1576,i-1577,i-1578,i-1579,i-1580,i-1581,i-2762,i-2763,i-2764,i-2765,i-2766,i-2767,i-2768,i-0244,i-0945,i-0946,i-0947,i-0948,i-0949,i-0950,i-0951,i-1582,i-1583,i-1584,i-1585,i-1586,i-1587,i-1588,i-2769,i-2770,i-2771,i-2772,i-2773,i-2774,i-2775,i-0246,i-0245,i-0952,i-0953,i-1589,i-1590,i-2776,i-2777, i-0930, i-1567, i-1562, i-0925

All comments on Figures 36-40 are addressed in modified figures and corresponding text in the revised section 6.9.9.

Doc. 15-19-0259-00-004z-lb-comment-resolution-6.9.9.docx.

* i-0003, i-0004, i-1863, i-2465, i-2888,i-2884,i-2885,i-2565,i-2442,i-0577,i-2029,i-1194,i-1831,i-2030,i-0607,i-0325

Replace with revised Annex G provided in 15-19-0260-00-004z-lb-comment-resolution-Annex-G.docx. I followed the guidelines for information in annexes and the base standard structure of the annex content (e.g., Annex B, Annex F).

* i-2029, i-2030, i-1194, i-183

Include the following references into Annex A.

[B24] Catherine Meadows, Paul Syverson, Range Authentication Protocols for Localization, 2007

[B25] David A. Basin, Srdjan Capkun, Patrick Schaller, Benedikt Schmidt, Formal Reasoning about Physical Properties of Security Protocols. ACM Trans. Inf. Syst. Secur. 14(2): 16:1-16:28 (2011)

[B26] Jolyon Clulow, Gerhard P. Hancke, Markus G.Kuhn, and Tyler Moore. So near and yet so far: Distance-bounding attacks in wireless networks. In Proceedings of the European Workshop on Security and Privacy in Ad-hoc and Sensor Networks (ESAS), 2006.

[B27] Nils Ole Tippenhauer, Heinrich Luecken, Marc Kuhn and Srdjan Capkun, UWB Rapid-Bit-Exchange System for Distance Bounding, In Proceedings of the ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), 2015

[B28] Marcin Poturalski, Secure Neighbor Discovery and Ranging in Wireless Networks, Ph.D. dissertation, EPFL\_TH5131 (2011), https://infoscience.epfl.ch/record/166938/files/EPFL\_TH5131.pdf