**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | Resolutions for selected SA ballot comments | |
| Date Submitted | 14 January 2020 | |
| Source | Billy Verso (Decawave),  Frank Leong (NXP Semiconductors) |  |
| Re: | Contribution to TG4z for IEEE 802.15.4z to address selected SA ballot comment | |
| Abstract | Contribution to TG4z amendment of IEEE Std 802.15.4-2015 | |
| Purpose | This submission is intended to address the indicated SA ballot comments. | |
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**Comment ID(s): 27629200023**

Resolution: change the text of subclause 6.9.6.8 *Other procedures for coordinating RDEV and ERDEV* as shown below:

For successful interworking of HRP-ERDEV when an STS is being employed, the transmitter and receiver need to be aligned with respect to the seed (i.e., key and data value V) used in the transmitter to generate the STS and used in the receiver to generate the sequence to correlate with the received STS. To coordinate these values, the secure private data communication capability of this standard may be used to transfer the seed between devices using the Ranging STS Key and Data IE (RSKD IE) as described in 7.4.4.39. ~~The RSKD IE may convey the full seed (128-bit key and 128-bit data value V) or a part consisting of the 32-bit counter and/or a subset of the upper 96 bits.~~ The counter value within the RSKD IE ~~may~~ can relate to the current packet or a future one, as is indicated by the CP field of the IE. The higher layer is responsible for using the received RSKD IE information to configure the STS seed, (via phyHrpUwbStsKey, phyHrpUwbStsVUpper96 and phyHrpUwbStsVCounter PIB attributes), appropriately for its future packet transmissions and receptions. A header IE version of the RSKD IE is also defined, in 7.4.2.19, to facilitate synchronization of STS generators using information sent in the clear while accompanied by secured payload IEs and data.

Similarly, when using DPS as described in 6.9.4, the RDEVs need to coordinate the preamble codes and channel selection they are going to employ and again the secure private data communication capability of this standard ~~may~~ can be used to transfer the selected preamble code indices and channel number values between devices using the RCPCS IE (as described in 7.4.4.45).

**Comment ID(s): 27632500023, 27632600023, 27632700023, and 27626900023.**

Discussion: Main change is to only say A0/A1 is for the optional gap specification or optional frame length extension and not mention other application specific optional use. We note also that (a) address mismatch detection and reception abortion can be done as soon as destination address field is available, long before CRC is reached for a long frame; (b) the intended use of gap specifier includes a destination address; (c) a receiver not configured to expect use of A0/A1 for frame length extension and not rejecting because of wrong address (i.e. if a broadcast address was used) will terminate reception of any such extended length, (which are not for it in any case), earlier than would be the case if it was using A0/A1 for the length. (d) where A0/A1 is being employed for optional gap specifier, the STS is after the data payload so will affect receivers expecting other STS packet formats.

Resolution: Delete p150 line 18 which reads: “Where this feature is not being employed, e.g., the application wishes to use A1 and A0 for some other signaling purpose, it may be disabled by setting all four of these PIB attributes to zero.”

**Comment ID(s): 27627000023 and 27627300023.**

Resolution: replace Figure 82—DRBG for STS with the figure below which shows the data and key together form the Seed.



**Comment ID(s): 27625200023**

Resolution:

1. Insert final paragraph in 16.8:

Reference vectors capturing the above mandatory sets along with a number of optional parameter selections are provided in [B20] with a description of these in [B21].

1. Add the following two references in the bibliography:

[B20] “15.4z HRP UWB PHY Test Vectors”, IEEE 802.15 document number 15-20-0002-00

[B21] “Description 15.4z HRP UWB PHY Test Vectors”, IEEE 802.15 document number 15-20-0003-01

**Comment ID(s): 27626600023 and 27626500023**

Resolution:

1. Change the clause “G.1 Introduction” paragraph as shown:

This Annex provides test vectors for use in ensuring that a HRP-ERDEV implementation is producing the correct STS. This is achieved ~~by way~~ of specifying for an example Seed (i.e., specific Key and Data values), the resultant first two blocks of bits that ~~are~~ shall be produced by the DRBG, and the BPSK modulation polarities that are shall be subsequently applied to the associated first 256 transmitted pulses of the STS.

1. Change the first paragraph clause “G.2 Test vectors for STS generation” as shown:

This example ~~illustrates~~ specifies the first two blocks generated by the DRBG described in 16.2.8 using following initialization:

1. Change the final paragraph clause “G.2 Test vectors for STS generation” as shown:

After the transmission of 4096 STS pulses, (a ~64 µs long BPRF mode STS or a ~32 µs long HPRF mode STS), the counter ~~will~~ shall have updated 32 times resulting in a *phyHrpUwbStsVCounter* value of 1F 9A 3E 04, and the associated value of data = *phyHrpUwbStsVUpper96* || *phyHrpUwbStsVCounter* ~~would~~ is then ~~be~~ 36 2E EB 34 C4 4F A8 FB D3 7E C3 CA 1F 9A 3E 04.

1. Change the first paragraph clause “G.3 Resulting STS modulation” as shown:

Bits ~~This example illustrates how bits~~ C(0:255) from G.2 ~~are~~ shall be mapped to BPSK modulation polarities of the first 256 pulses of the STS, as described in 16.2.8.2. Symbols A(i) ~~are~~ shall then be spread by dL = 8 chips in BPRF mode, or dL = 4 chips in HPRF mode. The resulting symbols A(i) for the example data are:

***[END]***