Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: PHY Header related comments
Date Submitted: 28th June, 2010
Source: Jaeseung Son
Company: Samsung Electronics Co.,LTD
Address: Dong Suwon P.O. Box 105, 416 Maetan-3dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742 Korea
Voice:[82-31-279-5285], FAX: [82-31-279-5130], E-Mail:[js1007.son@samsung.com]

Re: []

Abstract: Collect PHY Header related comment to resolve together

Purpose: Contribution to IEEE 802.15.7 TG-VLC

Please refer 15-10-0400-01-0007 first.

CID 236 (Subclause 6.1.3, page 23, line 18)

Comment

- There is no mapping from these tables to the value placed in t he PHY header.

Suggested Remedy

- Add a column to Tables 2, 3 and 4 that maps the operating m ode to an integer that is placed in the 5 bit Data Rate field.

Resolution/instruction to editor

- MCS ID is inserted in PHY header. Please refer document 15-10-0400-01-007
- So, my suggestion is Accept.

CID 321 (Subclause 6.4.2, page 39, line 11)

Comment

- Figure 21: Having 1 reserved bit is not a good option. It caused a lot of problems during the transition from 11g --> 11n

Suggested Remedy

- Add at least 1 more reserved bit

Resolution/instruction to editor

- 6 bits is used for reserved fields. Please refer document 15-10-0448-00-0007
- So, my suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 322 (Subclause 6.4.1, page 39, line 29)

Comment

- Figure 22: Having 1 reserved bit is not a good option. It cause d a lot of problems during the transition from 11g --> 11n

Suggested Remedy

- Add at least 1 more reserved bit

Resolution/instruction to editor

- We merged figure 21 and 22. and remedy is reflected in CID 321.
- My suggestion is Accept.
- Instruction to editor: Nothing to do

CID 325 (Subclause 6.4.1, page 39, line 7)

Comment

- Both PPDU format have a frame length that is 7 bits, which implies th at the PSDU can be no more than 127 bytes, but section 6.5 implies t hat the MAC payload could be 65535 bytes long

Suggested Remedy

- Fix inconsistency

Resolution/instruction to editor

- Frame length is fixed. 16 bit is used. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 329 (Subclause 6.4, page 39, line 7)

Comment

- The packet formats are different from the frame formats in section 5.6.4.x.

Suggested Remedy

- Harmonize the packet format.

Resolution/instruction to editor

- Packet format is changed. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 333 (Subclause 6.4, page 39, line 12)

Comment

- There is a conflict between this figure and Table 23 and the text in the draft. Apparently, the intent was to have more information than just the frame length. This will require some work.

Suggested Remedy

- For this location, change the figure to just show the structure for all PHY packets, i.e., boxes for SHR, PHR, PSDU (or PHY payload, pick one name and use it) and FCS. Don't put lengths in the figure, the length of the fields is defined in the subclauses that define those fields.

Resolution/instruction to editor

- Figure and table is changed. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 335 (Subclause 6.4, page 39, line 26)

Comment

- Normally, a channel estimation field is used to improve the demodulation of data. In this case, the channel estimation field needs to precede the PHR and not be part of the data that is checked by the FCS.

Suggested Remedy

- Move the channel estimation field (CES) to between the SHR and PHR an d have it as a new field for CSK modes.

Resolution/instruction to editor

- Please refer document 15-10-0448-00-0007
- PHR is sent in OOK modulation. And CES is used for PSDU. And there is “MCS ID" indication in the PHR to prepare CSK modulation. So CES should be after PHR..
- My suggestion is Reject.

CID 369 (Subclause 6.4, page 41, line 32)

Comment

- It writes that 'frame length field is 7 bits'. However, it takes values of more than 8 in Table 22.

Suggested Remedy

Resolution/instruction to editor

- Frame length is fixed. 16 bit is used. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- See CID 325

CID 372 (Subclause 6.4.1.3, page 41, line 33)

Comment

- The maximum packet size is 64 kB, which requires 16 bits for the length f ield. This is reflected in Table 23 for the PHY header and appears to be t he intention of the group. The 7 bit length is from 802.15.4, which is tryi ng to solve a much different problem.

Suggested Remedy

- Make the Length field 16 bits. Create a figure that shows the PHR using the values in Table 23 and a 2 octet HCS.

Resolution/instruction to editor

- Frame length is fixed. 16 bit is used. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- See CID 325

CID 374 (Subclause 6.4.1.5, page 42, line 3)

Comment

- HCS says "The combination of PHY header and the MAC header shall be protected with a 2 octet CCITT CRC-16 header check sequence (HCS)". This does not agree with the picture Figure 22 (page 53(39)) where HCS seems to be for PHY header only?

Suggested Remedy

- It is not clear but I would expect this HCS to apply to PHY only and not MAC. If this is so then remove reference to MAC header from this clause.

Resolution/instruction to editor

- HCS is for PHY header only. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 375 (Subclause 6.4.1.6, page 42, line 9)

Comment

- Frame Check Sequence. Talks about HCS which should be in 6.4.1.5 only. Also it mentions CCITT which no longer exists, should say ITU-T.

Suggested Remedy

- Delete this and refer to section 7.2.1.9 where the FCS field is defined correctly.

Resolution/instruction to editor

- 7.2.1.9 is also FCS and 6.4.1 for PHY header. So FCS should be deleted in PHY header section. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 376 (Subclause 6.4.1.5, page 42, line 4)

Comment

- The statement about this CRC applying to PHY header and MAC head er is confusing. How can the MAC header be included if there are m ultiple MAC frames per PHY frame?

Suggested Remedy

- If the statement is supposed to be true, add text describing how this is done when creating for sending and decomposing when receiving.

Resolution/instruction to editor

- Text is wrong.
- My suggestion is Accept in principle.
- See CID 374

CID 379 (Subclause 6.4.1.5, page 42, line 7)

Comment

- Data scrambling is nor defined for HCS

Suggested Remedy

- Define data scrambling

Resolution/instruction to editor

- Data scramble is used in CSK modulation only. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 380 (Subclause 6.4.1.5, page 42, line 3)

Comment

- Assuming the HCS is intended to detect errors in the PHY header, the allocation of a 16-bit CRC to detect errors in t he remainder 8 bit of the PHR seems excessive.

Suggested Remedy

- Use a more economical error detection scheme

Resolution/instruction to editor

- PHR is longer(Frame length 7bits->32bits) than D1 version.
- So, current HCS is not excessive.
- My suggestion is Reject.

CID 381 (Subclause 6.4.1.6, page 42, line 9)

Comment

- FCS is generated in MAC

Suggested Remedy

- move FCS section to MAC

Resolution/instruction to editor

- There is two FCS subclause(6.4.1.6 and 7.2.1.9).
- So 6.4.1.6 is deleted.
- My suggestion is Reject.

CID 382 (Subclause 6.4.1.5, page 42, line 7)

Comment

- The entire section explain and showing the CRC sh ould be taken out of here and put into an appendix.

Suggested Remedy

- Put CRC explanation and example in appendix

Resolution/instruction to editor

- CRC is normative text.
- My suggestion is Reject.

CID 383 (Subclause 6.4.1.5, page 42, line 7)

Comment

- Where is data scrambling defined for the HCS?

Suggested Remedy

- Please define or remove data scrambling in this s ubclause.

Resolution/instruction to editor

- My suggestion is Accept.
- See CID 379.

CID 384 (Subclause 6.4.1.5, page 42, line 3)

Comment

- This paragraph is a mess. Plus, the MAC header isn't protected by the HCS.

Suggested Remedy

- Change "The CRC … shall be protected …" to be "The PHY header shall be protected "

Resolution/instruction to editor

- My suggestion is Accept.
- See CID 374

CID 385 (Subclause 6.4.1.6, page 42, line 11)

Comment

- "The CCITT CRC-16 HCS" -> "The FCS"

Suggested Remedy

- Change as indicated

Resolution/instruction to editor

- Subclause 6.4.1.6 is deleted.
- See CID 381
- My suggestion is Reject.

CID 386 (Subclause 6.4.1.5, page 42, line 3)

Comment

- Text says HCS should cover PHY and MAC headers, b ut figures for PPDU show that HCS only covers PHY h eader

Suggested Remedy

- Clarify and fix

Resolution/instruction to editor

- My suggestion is Accept.
- See CID 374

CID 386a (Subclause 6.4.1.5, page 42, line 3)

Comment

- The HCS subclause is confusing. On one hand, it states th e HCS field is computed over the PHY header. On the othe r hand, it states "the combination of PHY header and the M AC header shall be protected with … (HCS)".

Suggested Remedy

- Fix paragraph

Resolution/instruction to editor

- My suggestion is Accept.
- See CID 374

CID 386b (Subclause 6.4.1.5, page 42, line 3)

Comment

- A figure of CRC implementation for HCS would be very helpful to reader

Suggested Remedy

- Reference Figure 26 for the HCS sections as well

Resolution/instruction to editor

- There is not reference sentence about figure 26. If there is not any reference sentence then we have to delete figure 26.
- Insert following sentence at line 4 in page 42. "A schematic of the processing is shown in Figure 26. ".
- Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 389 (Subclause 6.4.2, page 44, line 42)

Comment

- Phy Header field is not defined in PPDU

Suggested Remedy

- Define Phy Header field position in the PPDU

Resolution/instruction to editor

- We already defined in figure 21 and 22.
- Please refer updated version in 15-10-0448-00-0007
- My suggestion is Reject.

CID 390 (Subclause 6.4.2, page 44, line 43)

Comment

- Text says that "all light sources shall transmit the same hea der contents simultaneously". What does simultaneously m eans? Can the preambles be offset? Do the first bits of pre amble have to be aligned?

Suggested Remedy

- Clarify

Resolution/instruction to editor

- My suggestion is Accept.
- See CID 355

CID 391 (Subclause 6.4.2, page 44, line 40)

Comment

- PHY Header is not defined in PPDU.

Suggested Remedy

- Please define PHY Header.

Resolution/instruction to editor

- See CID 389

CID 395 (Subclause 6.4.2, page 44, line 42)

Comment

- CRC is not defined for the PHY Header in Table 23

Suggested Remedy

- Need the PHY header to be protected by CRC for obustnes s. Define CRC for the PHY header.

Resolution/instruction to editor

- Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 397 (Subclause 6.4.2, page 45, line 1)

Comment

- Table 23 What is the meaning of the cloumn bit? Does it represent bi t position? Number of bits?

Suggested Remedy

- I have no clue, since there is no place for the PHY header shown in Figure 21 or Figure 22

Resolution/instruction to editor

- The number in table is number of bits.
- Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 399 (Subclause 6.4.2, page 45, line 22)

Comment

- It appears that multiple PHY headers are defined, e.g. in 6.4.2 as well as in Figures 21 and 22, presumably for the different modulation types. In th e case of the latter, a frame length of 64kB cannot be supported, since t he frame length field is 7 bits.

Suggested Remedy

- Clarify applicability of frame length constant and re-organize the section s on PHY header.

Resolution/instruction to editor

- The content is updated. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 401 (Subclause 6.5.1, page 45, line 2-15)

Comment

- Table 23 – PHY header, the PHY header fields are not specified anywher e in the PPDU figures. In fact the PHY header specified in this table is 32 bits, whereas the PHY header specified in Figures 21 is only 24 bits

Suggested Remedy

- PPDU format is not correct, please fix. In fact there needs to be a better description of how to construct the PPDU including how to assign the bit s in the PHY header (LSB to MSB or MSB to LSB)

Resolution/instruction to editor

- The content is updated. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 403 (Subclause 6.4.2, page 45, line 1)

Comment

- Table 23 (PHY Header) is not consistent with the previously defin ed packet format.

Suggested Remedy

- Please define PHY Header.

Resolution/instruction to editor

- The content is updated. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 405 (Subclause 6.5.1, page 45, line 2-15)

Comment

- The PHY header fields in Table 23 are not specified in the PPDU strut ure figures (Figure 21, 22).

Suggested Remedy

- PHY Header should be clearly specified in figures as well as in the te xt

Resolution/instruction to editor

- The content is updated. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 409 (Subclause 6.5.1, page 45, line 1)

Comment

- This table is not referenced in the text. It seems to be the PHY header, but it is missing the HCS. Also, this conflicts with the other 8 locations where the PHY header is illustrated. However, I think this is actually supposed to be the PHY header and all the other locations are wrong. This is why important normative information needs to be defined in one location only and cross referenced as necessary.

Suggested Remedy

- Convert this into a figure for the PHY header, adding the 2 octet HCS. Define each of the fields in the text, saying what the values mean (e.g., Burst Mode bit shall be set to one if Burst Mode is being used.")

Resolution/instruction to editor

- The content is updated. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 722 (Subclause 7.4.2, page 163)

Comment

- (TR) §7.4.2, p. 163, l. 40–44: The phrase “where 6 represents …” seems to be a remnant of the corresponding clause of the IEEE 802.15.4–2006 specification (where the PPDU has size 6 octets, viz. preamble: 4 octets; SHR: 1 octet; length: 1 octet). With 802.15vlc, the PHY header has variable size and contains more octets than with 802.15.4–2006. Suggested remedy: Correct the formula accordingly.

Suggested Remedy

- Correct the formula accordingly.

Resolution/instruction to editor

- The content is updated. Please refer document 15-10-0448-00-0007
- My suggestion is Accept.
- Instruction to editor: Please replace 6.4 PPDU with document 15-10-0448-00-0007

CID 314 (Subclause 6.4.1.1, page 39, line 49)

Comment

- Need to mention about default preamble transmission illustrated in Figure 23 in the section.

Suggested Remedy

- Put an explanation about default preamble transmissio n illustrated in Figure 23 in this section.

Resolution/instruction to editor

- Sridhar will help me to add explanation.
- So, my suggestion is Accept.

CID 317 (Subclause 6.4.1, page 39, line 7)

Comment

- rate for PHR transmission is not mentioned

Suggested Remedy

- Lowest mandatory data rate should be used for PHR

Resolution/instruction to editor

- The comment should be Accepted but the suggested remedy should be Rejected.
- The PHR is sent using the lowest mandatory data rate “for the agreed optical clock rate” by the MAC clock rate negotiation process defined in Section 7.8.
- If there is no MAC clock rate negotiation and the RX does not support automatic detection of the clock rate, then the lowest mandatory data rate at the lowest mandatory clock rate shall be used for the PHR.

CID 346 (Subclause 6.4.1.1, page 39, line 38)

Comment

- rate for preamble transmission is not mentioned

Suggested Remedy

- Lowest mandatory data rate should be used for PHR

Resolution/instruction to editor

- The comment should be Accepted but the suggested remedy should be Rejected.
- See CID 317

CID 367b (Subclause 6.4.1.1, page 40, line 34)

Comment

- Come up with a different name for the field Preamble patter n as you are re-using the term preamble for both the comb ination of the fast locking pattern and the preamble pattern

Suggested Remedy

- Perhaps "data recovery pattern" or similar?

Resolution/instruction to editor

- My suggestion is Accept.
- See CID 298~301

CID 368 (Subclause 6.4.1.2, page 40, line 52)

Comment

- rate for burst preamble transmission is not mentioned

Suggested Remedy

- Lowest mandatory data rate should be used for PHR

Resolution/instruction to editor

- The comment should be Accepted but the suggested remedy should be Rejected.
- See CID 317