

IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)		
Title	JPKG proposed changes		
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Source	[James P. K. Gilb] [Apparent Technologies] [16990 Via Tazon, Suite #125 San Diego, CA 92127]	Voice: [858-485-6401] Fax: [858-485-6406] E-mail: [last name at ieee dot org]	
Re:	[802.15.3-2003.pdf]		
Abstract	[This document contains a list or proposed changes to IEEE Std 802.15.3.]		
Purpose	[The purpose of this document is to propose changes to IEEE Std 802.15.3 to improve compatibility, performance and clarity in the standard.]		
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Release	The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.		

1. Introduction

This document proposes various changes to IEEE Std 802.15.

2. Editorial changes

2.1. Pseudo-static misspelled

Problem: The word “pseudo-static” is misspelled “psuedo-static” in some places

Suggested remedy:

Clause 6:

Page 63, Table 22

Change the table entry as shown:

CTAType	Enumeration	DYNAMIC, PSUEDO_STATIC PSEUDO_STATIC	Indicates if the request is for a dynamic or pseudo-static CTA.
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Clause 8

8.4.3.1 Channel time allocations (CTA)

Change the text in this subclause as shown:

Page 172:

Pseudo-static CTAs shall be allocated only for isochronous streams and shall not be sub-rate allocations, as described in 7.5.6.1. If the PNC needs to change the duration or location of a pseudo-static CTA within the superframe, it shall change the corresponding CTA blocks in the beacon. The PNC shall not create any new CTAs for other stream indicies that overlap with the old time interval of the pseudo-static CTAs for mMaxLostBeacons number of superframes. However, the PNC may overlap the old and new time intervals of the same ~~pseudopseudo~~ pseudo-static CTA within a superframe as it does not create the possibility of frame collisions. If the PNC sees the transmission of a PDU during the new allocation by the source of the old allocation before the expiration of mMaxLostBeacons number of superframes, the PNC may reuse the old allocation for another pair of DEVs. When the source DEV of a pseudo-static CTA receives a beacon with the new CTA, it shall cease using the old CTA and begin using the new CTA. When the destination DEV of a pseudo-static CTA receives a beacon with the new CTA, it shall begin receiving during the new CTA and may also receive during the old CTA.

8.5.1.2 Isochronous stream modification

On page 186, replace Figure 119 on with the following figure:

Figure 119: Top left box, change psuedo-static to pseudo-static.

2.2. Wrong MAC parameter names

Name wrong (and broken cross-reference)

8.9.6 PNC channel scanning

Change the text in this subclause as shown:

Page 202:

If the PNC initiates a scan of one or more alternate channels, the PNC shall not transmit a beacon for one or more beacon intervals. The PNC shall not suspend beacon transmissions for more than twice ~~aMinChannelScan~~ mMinChannelScan. The PNC, upon returning to its current channel and resuming the transmission of its beacons, shall increment the Time Token field by the number of beacons not sent during the time the PNC was scanning one or more alternate channels.

9.3.6 Secure frame reception

Change the text in this subclause as shown:

Page 225:

When a DEV receives a secure beacon frame (a beacon with the SEC field in the Frame Control field set to one, the DEV shall determine if the received time token is greater than the CurrentTimeToken and less than the LastValidTimeToken + ~~aMaxTimeTokenChange~~ mMaxTimeTokenChange. If not, the MLME shall return an MLME-SECURITYERROR. indication to the DME with the ReasonCode set to BAD-TIME-TOKEN and shall not perform any additional operations on the received beacon. The DEV shall also determine if the SECID matches the SECID of the piconet group data key stored in the MAC/MLME, or the SECID of a valid old piconet group data key, as described in 9.2.5. If the SECID does not match, the DEV may set the CurrentTimeToken to the value in the beacon and request a new piconet group data key, as described in 9.3.2. If both of these checks succeed, the DEV shall check the integrity code on the beacon using the piconet group data key. If this succeeds, the DEV shall accept the beacon and set the LastValidTimeToken and CurrentTimeToken to be the time token in the beacon. If the DEV is able to determine that it missed a beacon or that the beacon was corrupted and if CurrentTimeToken is less than LastValidTimeToken + ~~aMaxTimeTokenChange~~ mMaxTimeTokenChange - 1, the DEV should increment the CurrentTimeToken to maintain synchronization with other DEVs in the piconet.

2.3. Extra entity in MSC

Problem: The PNC DME entity in figure 147 is unnecessary.

Suggested remedy: Delete the PNC DME line and box in Figure 147.

(withdrawn)

2.4. Broken cross references in PDF

Problem: The cross references in the PDF do not work if they cross clause boundaries.

Suggested remedy: Work with IEEE staff to determine the desired file names to avoid broken cross-references.

2.5. Definition for “device-host” is no longer needed

Problem: Page 3, 3.13: Device-host (or DEV-host) was introduced at one point in the development of the standard, but is not used in the standard now, except in B.14.1, where it can be removed.

Suggested remedy:

3. Definitions

Change the text in this subclause as shown:

~~3.13 device-host: The equipment that incorporates an 802.15.3" device. The device-host may have more than one device incorporated in it as well as other networking connections, both wired and wireless.~~

4. Acronyms

Change the text in this subclause as shown:

DEV	device
DEV-host	device-host
DEVID	device identifier

Annex B:

(informative)

Security considerations

Change the text in this subclause as shown:

B.1.4.1 Key lifecycle

In order to maintain security, care needs to be taken to protect keys from exposure for their entire lifetime. This standard provides ~~the DEV-host~~ the necessary methods for good key life cycle management. The requirements for key life cycle management depend on the type of application.

2.6. Definition for parent piconet uses “guaranteed time slot”

Problem: Page 4, 3.24: Guaranteed time slot was changed to channel time allocation but evidently did not get changed here.

Suggested remedy:

3. Definitions

Change the text in this subclause as shown:

3.24 parent piconet: A piconet which creates channel time allocations ~~allocates guaranteed time slots~~ for another piconet (child or neighbor types) operating in the same channel.

2.7. Incorrect field name

Problem: Page 168, 8.8.3, the text does not reference the field name correctly.

Suggested remedy:

8.8.3 Delayed acknowledgement

Change the text in this subclause as shown:

If the ~~max-burst~~ value of the Max Burst field is set to zero, the source DEV shall stop transmitting in the current CTA and reopen the Dly-ACK mechanism by sending a single frame with the ACK Policy field set to Dly-ACK Request in the next CTA for this stream. If the value is not zero the source DEV may continue transmission in the current CTA, if the time is available.

2.8. Wrong size of field in secure beacon frame

Problem: Page 108, 7.3.1.1, Figure 11

Suggested remedy:

7.3.1.1 Non-secure beacon frame

Change the text in this subclause as shown:

In Figure 11, change “L_m” to be “L₁”.

2.9. Wrong tense

Problem: Page 172, 8.4.3.1 - incorrect tense.

Solution:

8.4.3.1 Channel time allocations (CTA)

Change the text in this subclause as shown:

The PNC divides the CTAP into channel time allocations (CTAs). A DEV that is given a directed CTA is guaranteed that no other DEVs will compete for the channel during the indicated time duration of the CTA. A DEV with a CTA may or may not make use of all the allocated time duration within the CTA. The selection of a stream, command or asynchronous data for transmission during a CTA is determined locally by the DEV depending on the number of pending frames and their priorities. See A.1.2.1 for more information on priority management.

2.10. Extra word

Problem: Page 106, 7.2.6 – extra word.

Solution:

7.2.6 MAC header validation

Change the text in this subclause as shown:

When the PHY receives a frame it validates the received frame's MAC header before passing the MAC header and ~~and~~ its associated MAC frame body to the MAC. The protection mechanism used to validate the MAC header is PHY dependent. In addition, the bit order and the length of the protection mechanism, pLengthHCS, are also PHY dependent. For the 2.4 GHz PHY, the MAC header protection mechanism is defined in 11.2.9.

2.11. Change to singular

Problem: Page 163, 8.2.7.1 – Wrong number for verb

Solution:

8.2.7.1 Stopping an independent or parent piconet

Change the text in this subclause as shown:

If the PNC is going to remove itself from the piconet and no other DEVs are capable of taking over as the PNC, the PNC shall place the PNC shutdown IE, as described in 7.4.5, in the beacon. The PNC shall ensure that the shutdown announcement complies with the rules for beacon announcements in 8.6.4. The only exception to this requirement is if the PNC will be shutting down and does not have enough time to wait for the next system wake beacon to complete the handover process.

3. Clarifications

3.1. CTA Rate Factor field in CTA Status IE

Problem: The CTA Rate Factor field in the CTA Status IE has the same name as a similar field in the Channel Time Request command. However, these fields do not have exactly the same meaning (see 8.5.1.1).

Suggested Remedy:

7.4.10 CTA Status

Change the text in this subclause as shown:

In Figure 37, change “CTA rate factor” to be “CTA Sub-Rate”

The ~~CTA Rate Factor~~ CTA Sub-Rate field is set to the number of beacons between every CTA as described in 7.5.6.1. If one or more CTAs are allocated per superframe, this value shall be set to zero.

3.2. Responding to request for non-existing stream index

Problem: What does the PNC respond with when you ask for the CTA Status IE of a terminated stream?

Suggested remedy: The PNC should respond with a CTA Status IE that uses the UnassocID for SrcID and DestID with the requested stream index and the rest of the fields zero and ignored on reception.

8.9.2 Probe request and response

Add text to this subclause as shown:

A DEV may request information about an isochronous stream by sending a Probe Request command requesting the CTA Status IE, as described in 7.4.10, with the Request Index field set to the stream index of the stream for which CTA information is requested. If the Request Index field is set to zero, the DEV is requesting information about all isochronous streams directed to the requesting DEV and to the BcstId and McstId. The PNC shall respond to a Probe Request command containing a request for the CTA Status IE by sending Probe Response command(s) containing the appropriate CTA Status IE(s).

If a DEV requests the CTA Status IE for a stream index that is not currently allocated by the PNC, the PNC shall respond with a Probe Response command containing a CTA Status IE with the following information:

- The SrcID and DestID fields both set to the UnassocID.
- The Stream Index field set to the requested stream index.
- All other fields set to zero.

3.3. Change beacon number

Problem: Page 209, line: 35-38: The sentence "If a child or 802.15.3 neighbor piconet has the same superframe duration as the parent, then it shall use the value of the Change Beacon Number field in the Piconet Parameter Change IE from the parent's beacon in the Piconet Parameter Change IE in its own beacon." has a problems. The child or 802.15.3 piconet does not necessarily use the same beacon number as the parent piconet.

Suggested Remedy:

8.10 Changing piconet parameters

Change the text in this subclause as shown:

This subclause describes the methods used to change certain key characteristics of the piconet. A PNC shall not change either the pseudo-static CTAs or the pseudo-static CTA blocks during a piconet parameter change. If the parent needs to move a pseudo-static CTA because the superframe duration is being reduced, it shall do so prior to using the superframe duration change process, as described in 8.10.2. ~~If a child or 802.15.3 neighbor piconet has the same superframe duration as the parent, then it shall use the value of the Change Beacon Number field in the Piconet Parameter Change IE from the parent's beacon in the Piconet Parameter Change IE in its own beacon.~~ A child or 802.15.3 neighbor piconet shall use the value of the Change Beacon Number field in the Piconet Parameter Change IE from the parent's beacon to calculate the Change Beacon Number field in the Piconet Parameter Change IE in its own beacon. The exceptions to this are:

(note: We need to add information on the requirements for this calculation).

3.4. Miscellaneous

Problem: Page 127, lines 13-14: The phrase "A value of vendor OUI not understood by a receiving DEV causes the remainder of this IE to be ignored." is not well written.

Suggested Remedy:

7.4.7 Application specific

Change the text in this subclause as shown:

The Vendor OUI field is the OUI assigned by the IEEE standards association registration authority committee (RAC), which shall be the sole registration authority. ~~A value of vendor OUI not understood by a receiving DEV causes the remainder of this IE to be ignored.~~ If a value of vendor OUI is not understood by a receiving DEV, that DEV shall ignore the remainder of this IE.

4. Ammendment/Revison

4.1. Channel change time

Problem: The MAC clause doesn't explicitly reference the channel change time.

8.11.1 Dynamic channel selection

Change the text in this subclause as shown:

The PNC is not required to wait until all of the DEVs in power save modes are in ACTIVE mode before changing channels. A power save DEV is not required to switch to ACTIVE mode when there is a channel change in progress. However, the power save DEV should change channels at the time indicated in the Piconet Parameter Change IE.

If possible, in beacon that is sent just prior to the channel change, the PNC should allow time at the end of the superframe for the DEVs in the piconet to change channel. The time required for a DEV to change channels is pPHYChannelSwitchTime.

8.15 MAC sublayer parameters

Add to the bottom of Table 61:

<i>Parameter</i>	<i>Subclause</i>
...	...
pPHYChannelSwitchTime	11.2.7.5

4.2. Decreasing the number of SPS sets

If a DEV takes over as PNC of a piconet, but does not support as many SPS sets as were supported by the previous PNC, how does this PNC reduce the number of SPS sets:

Suggested remedy: Use the PCTM IE to wake up DEVs in that set and send the SPS Set Configuration response command to the DEV with error code 5: Set deleted by PNC.

(OK so far, come back with more text).

4.3. Allow PNC to terminate Neighbor CTA if it has more than one.

Problem: The standard currently indicates that the PNC will use the disassociation process to stop a neighbor PNC. However, it is possible that a neighbor will have more than one CTA (it isn't expressly forbidden in the standard). The PNC may want to terminate only one of the allocations and not both.

Suggested remedy: Give the PNC the option to terminate the CTA without disassociating the neighbor.

(May be an informative clarification, the PNC can terminate neighbor CTAs without disassociating.)

5. New MLME Architecture

Figure 1 is an illustration of a proposed MAC architecture. This architecture is intended solely for the development of the SAPs in the 802.15.3 standard and does not necessarily represent a specific implementation. Implementers are allowed use any architecture for the MAC as long as it complies with the normative requirements in the IEEE Std 802.15.3-2003.

Figure 1: Conceptual MAC architecture for writing SAPs

