

IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)	
Title	TG3 Rolling Meadows Ad-Hoc Working Document	
Date Submitted	[9 October, 2001]	
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Re:	[]	
Abstract	[This document is contains the issues and resolutions developed by TG3 subcommittee at the Rolling Meadows ad-hoc meeting. It also contains a summary of the changes made to the draft due to the conference calls and other issues.]	
Purpose	[To provide a record of the resolutions of TG3.]	
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1. Goals

- 1) Power Management Proposal and suggested wording
Proposal by Jay Bain, 01/430r0, 01/429r1 - **Unused CTA bits - accept, need text. Null CTAs, accept in principle, but waiting for the details.**
- 2) Geographic coordinator selection and daughter network
proposal by B. Huang, 01/304r3, 01/305r3 - **Cleanup and modify GIP to do reconfiguration, due at Austin. Child network only requires 1 extra information element, agreed that this is a good idea.**
- 3) Resolve QoS Policy and QoS MLME-primitives
proposal by A. Heberling, 01/469r0, 01/470r0 - **Most of the text is complete, needs some work. Agree in principle to multiple possible convergence layers, the concept of a service flow and the commands at the MLME-SAP level.**
- 4) Security Proposal recommendation and wording
Proposal by G. Rasor (SEC, Auth, Assoc), 01/423r0 - **Still waiting for proposal.**
- 5) Management control outside of the CAP
Proposal by W. Shvodian, 01/xxxr0- **Direct approved, waiting text**
- 6) 11 Mb/s QPSK-TCM mode
Proposal by J. Karaoguz, 01/448r0 - **DONE**
- 7) The rest of the prioritized issues list. (perform triage prioritization on issues and resolve the most important ones first.)

2. Agenda

Tuesday October 9th:

8:00 am Call meeting to order
 8:01 am Approve/modify agenda
 8:05 am Begin work on goals* in the order listed
 10:00 am Recess for break
 10:20 am Meeting called to order
 10:21 am Continue work
 12:00 pm Recess for lunch
 1:00 pm Meeting called to order
 1:01 pm Continue work
 3:00 pm Recess for break
 3:20 pm Meeting called to order
 3:21 pm Continue work
 5:30 pm Recess for dinner

Wednesday, October 10th:

8:00 am Meeting called to order
 8:01 am Continue work on goals
 10:00 am Recess for break
 10:20 am Meeting called to order
 10:21 am Continue work
 12:00 pm Recess for lunch
 1:00 pm Meeting called to order
 1:01 pm Continue work
 3:00 pm Recess for break
 3:20 pm Meeting called to order
 3:21 pm Continue work
 6:00 pm Recess for dinner

Thursday, October 11th:

8:00 am Meeting called to order
 8:01 am Continue work on goals
 10:00 am Recess for break
 10:20 am Meeting called to order
 10:21 am Continue work
 12:00 pm Working lunch
 1:00 pm Adjourn

Items to communicate:

- 1) Describe Protocol Implementation Conformance Spec. (PICS) to authors
- 2) SDL Scope and Effort

3. Items to resolve

3.1 Power management/Wake on WPAN

Consensus is that we already have the mechanisms that allow the higher layers to perform Wake on WPAN. Suggestion is to provide text in an informative annex that describes how this feature can be used.

3.2 Additions to 7.5.11 EPS Configuration request

Suggest following definitions

EPSTime has a range of 0 to 65,535 ms. A value of zero has the interpretation of DEVs waking for each superframe. Depending on the value of superframe duration parameter, values of EPSTime that are a value that is less than the current value of superframe duration are interpreted as wake for each superframe. Since wake time is bounded by superframe beacon location, the beacon start point preceding the completion of EPSTime shall be the wake point.

EPSPHase is a value of beacon number as defined in Piconet synchronization parameters element. The value is determined by the EPSSync parameter in the MLME-POWERMGT.request primitive. The current beacon number when that primitive is received by the SME is used for EPSPHase in building the EPS configuration request command.

EPSTime is OK, EPSPHase definition needs some work, perhaps a new name, the EPSPHase. EPSSync needs a definitions and rename it to EPSPHase.

EPSPHase is a value of beacon number as defined in xref. The value may be determined by higher layers, but this is not specified in the standard.

3.3 MAX CTAs elements

The text says “maximum number of GTS slots that may be assigned to a DEV, where the DEV is either the source or destination, including group or multicast destinations.” However the elements does not have an AD-AD or device ID, so where is the DEV defined? Is it implicit, i.e. it is the DEV that is sending the element? If so, then the DEV cannot be a group or multicast destination.

3.4 Coordinator selection, 8.2.3

We need to add text that all ACs that hear the PNC selection frame and are not currently associated with piconet shall participate in the coordinator selection process. Also need to add that ACs that are currently associated with a piconet shall not participate.

3.5 11 Mb/s QPSK-TCM mode

Agree to change BPSK mode to QPSK-TCM. Agree to modify the the current TCM encoder for the extra feedback path.

3.6 Max Burst Size definition

Sub-clause 7.5.20, figure 51. Proposed definition: Max Burst Size is the maximum number of octets that can be sent by a stream in any one superframe.

The max burst size is the maximum number of octets sent at the maximum data rate that can be received by the DEV. (This definition leaves out the duty cycle length which is required).

Upon further review, perhaps this should be deleted. Keep this as an issue. Review all of the parameters, which are really necessary without overly complicating the MAC.

4. Editorial changes

- 7.4.12 MAX CTAs element, reformat to match the previous sub-clauses in 7.4 and move the functional description to clause 8.
- Check the PNC handover process to make sure that we state that the current PNC checks the DEV-info table to find the most qualified AC to become the new PNC.
- 7.3.1 Add xref to the channel change element and the CTA element in table 58 verify the use of the correct terminology. Also, change the Device ID entry to be device identifier element with description “IEEE 802 address of the PNC, xref 7.4.1” Change to piconet synchronization element and xref in notes.
- 7.3.1 Add text that says that the beacon elements can occur in any order and that DEVs shall ignore information elements other than the ones defined.
- 7.4.6 Add pad byte for word alignment and text for how to handle the pad byte.
- 7.4.3 Fix the TBD in the PHY table mapping by adding the appropriate section to the PHY and the xref to it in 7.4.3.
- 7.4.2 Fix length parameter for piconet sychronization parameter.
- 7.3.3 and 7.3.4, define the SA and DA for the command and data frames.
- 7.5.1, 7.5.2, 7.5.3, Make notes that the PNC selection commands, and the association commands are never sent with other commands. Or perhaps better is to say that a command can only be piggy-backed with commands that are sent with the same SA and DA pair.
- 7.2.1.9 Note that the beacon shall not have the SEC bit set (perhaps this is true of the command frames?).
- 7.5.2 ATP definitions disagrees with 8.2.5 definition of ATP. Did we fix this since Schaumburg.
- 7.5.17 (D06) add xref to stream identifier element to the appropriate information element (stream ID)
- Page 97, change aa to a
- 7.5.21 Fix QoS paramters length in table 49, fix table sizing for table 51
- 7.5.21 Need to get a good definition for Max Burst Size
- Figure 27, change length of the individual elements to be 7 instead of 6.

- 8.8 The acronyms TPC and DCS are mentioned, but are not defined. It should be DFS rather than DCS. Perhaps delete this sentence.

5. Changes from conference calls

5.1 September 20, 2001

5.1.1 Usage of RTC

Shvodian suggested that RTC in Section 7.4.3, and the acronyms section be deleted because it is not currently used. Gilb agreed that we could delete it. There was consensus agreement to remove it and its references.

Deleted in D08.

6. Corrections suggested by Wim VanHouton

(all references to D07)

o) On page 133 line 7 you wrote: ".....the first symbol of the PHY header....." but it should be at my opinion ".....the first symbol of the PHY preamble....."

Changed as indicated in D08.

oa) On Page 133 line 24 you use the word MPDU, this is not by my opinion, the commonly used terminology within the 15.3 standard.

Changed to "The maximum frame length allowed" in D08.

ob) On page 133 line 25 you wrote MAC Header or HCS, but Figure 3 on page 66 shows that HCS is part of the MAC header.

"or HCS" deleted in D08, text now says "... not the PHY preamble, PHY header or MAC header."

i) On page 135 line 49above is given... should be at my opinion.....above are given.....

Changed to "... above are given ..." in D08.

ii) On page 137 line 10 till 12: The higher.....to right. This sentence is in my opinion not adding a lot, I have to be honest. I actually do not understand the meaning of this statement. Should it be possible to leave this out and only writing: The decimal representations of the bitmapping..... (line 13 and further)

This is an informative comment to explain why we chose this mapping. However, we will try to improve the explanation in D09.

iii) On page 140 line 45 Section 11.3.4 is called QPSK modulation but if I read further it is actually Differential QPSK (DQPSK), is it not sensible to talk about DQPSK instead of QPSK also for BPSK in the whole document? I can not clearly distinguish what is differential modulated and what is not.....

Change QPSK to DQPSK in PHY, BPSK will be changed to QPSK-TCM in either D08 or D09.

iv) On page 140 line 48 regarding differential encoding What is the starting dibit for the DQPSK modulation (the reference dibit for the first phase change....)

Added sentence in D08 to clarify the issue: "The phase change of the first symbol is determined relative to the phase of the last symbol in the CAZAC sequence, 11.4.6."

iva) On page 140 line 53 you stated that differential encoding gives you the possibility for non coherent reception, but the CAZAC sequence (PHY preamble) is not differential encoded so you need a coherent "like" reception anyway (carrier offset compensation, equalization), don't you agree.....?

To get the most information out of the CAZAC sequence, you would do soft decisions with a coherent receiver. However, you can still get useful information (particularly AGC and packet timing) with differential detection. We discussed this particular issue before adopting the differential encoding. No change made, request the commenter withdrawn his objection.

v) In Table 74 on page 141 there is written pi in stead of π .

Changed to π in D08, thanks.

va) On page 141 line 23 you wrote PHY header , MAC header and HCS but in Figure 3 on page 66, the HCS is shown as part of the MAC header. Do you mean FCS or uses this field the same modulation as the Frame body?

Changed to "PHY header and MAC header" in D08.

vb) On page 141 line36 you also talk about MAC header and HCS.....

The text ", HCS" deleted in D08.

vi) The header of Table 75-Scramber seed selection should be Table 75-Scrambler seed selection.

"Scrambler" spelled correctly in D08.

vii) On page 143 line 3 you use octets in stead of bytes, why?

Octets is a carry over from 802.11 where they may have picked it up from someone else. The rest of the draft uses octets instead of bytes, so I have changed all occurrences of bytes to octets in the PHY clause as well. Change completed in D08.

viii) In Table 76 you miss the reference Table 75 for the dibits b0-b1.

Cross reference to the scrambler seed selection table added to D08 (xref is to table 75)

ix) The content field of Table 76 for b5-b15 there is written Freme body length and this should be Frame body length

"Frame" correctly spelled in D08

x) In Table 77 is not clear if b2 is the most right bit or the one just to the right of the x.

The table now has 5 columns, the last three are for b2, b3 and b4, to clarify the mapping.

xi) On page 143 line 44 you talk about the end of the message payload, but I did not saw the definition in the frame format. In my opinion you should use something like the end of a packet after the FCS.

Text is changed to "... added to the end of frame body, i.e. after the FCS, ..." in D08.

xii) On page 144 line 48 and further, you talk about tail symbols for QPSK and BPSK, but in this mode no-trellis encoder is used, why do you need tail symbols then?

The reason is that it allows soft symbol detection of DQPSK modulation in a clean manner with a very tiny impact on the overhead. While this is not required, an implementer could use this technique to improve performance of the modem. Do you think a description of why it was chosen will be useful?

xiii) On page 145 line 22 you use: "...added before the message payload" but, by using the same terminology as in Chapter 7 and section 11.4.2 of the standard, it should be in my opinion something like: "A PHY preamble shall be added before the PHY Header, MAC header....."

Good catch, the preamble goes in front of the PHY header, not the message payload. The text reads "... shall be added prior to the PHY header ..." in D08 now.

xiv) On page 148 Table 80 there is no EVM for BPSK

With the change of BPSK to QPSK-TCM, the EVM for DQPSK will apply to QPSK-TCM and BPSK EVM will not be necessary.

xv) On page 148 line 17 you wrote 6 MHz of the center frequency, is this -3 MHz and +3 MHz or -6 MHz and +6 MHz or only + 6 MHz?

Changed text to read "... measured within +/- 6 MHz of ..." in D08

xvi) On page 148 line 12 the transmit mask is specified, why is the transmit mask specified and not the the type of filtering at the transmitter and receiver i.e. raised cosine with a certain roll-off.....?

We discussed this at various meetings. The reason is that the filter is an implementation detail whereas the spectral mask directly affects the adjacent channel performance (regardless of the type of the filtering). There was a proposal to provide a recommended filter, but that text has not yet been approved. Note that it is not sufficient to specify a raised cosine filter with excess bandwidth parameter since an implementation must use an approximation to the filter. The recommended filter should specify what approximation is sufficient.

xvii) On page 149 line17 you wrote: "...the emissions conform with...." it should be at my opinion "...the emissions are conform with...."

Changed "... the emissions should also conform with the ..." to "... the emissions should also conform to the ..." in D08.

xix) On page 150 line 5 till 9 you use MPDU and MAC Header and the HCS, same remarks as above...

Changed "... only the MPDU of 1024 bytes, but also the PHY preamble, PHY header, MAC header and the HCS." to "... only the frame body of 1024 octets, but also the PHY preamble, PHY header, MAC header and FCS." in D08.

Also changed "... with an MPDU length of 1024 bytes ..." to "... with an frame body length of 1024 octets ..." in the prior paragraph in D08.

xx) On page 150 line 16 you wrote: "sensitivity in listed in Table 83" it should be at my opinion "sensitivity listed in Table 83"

Extra "in" removed, now reads "... reference sensitivity listed in Table 83 ..." in D08.

xxi) On page 150 line 47 you wrote: ".....is the alternate channels Channel....." it should be at my opinion ".....is the alternate channel. Channel....."

Changed as indicated in D08.

xxii) On page 150 line 53 you wrote ".....one of the four modulation....." it should be at my opinion ".....one of the five modulation....."

Changed as indicated in D08.

xxiii) On page 151 the field in the right lower corner of Table 84 should be 16 dB i.s.o. 16 db.

Capitalization of dB fixed in D08.

xxiv) On page 151 line 29 and line 38 interferring should be at my opinion interfering.

Spelling on line 29 corrected (it was spelled correctly on line 38) in D08.