**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |
| --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **TG8 MAC** **Work Items**  |
| Date Submitted | January 15, 2015 |
| Source | Qing Li (InterDigital)& TG8 working group  | E-Mail:[Qing.Li@InterDigital.com] |
| Re: |  |
| Abstract | This document contains the MAC work items discussed at the AM1 (Jan. 15). |
| Purpose | This document provides the MAC work items for the draft PAC specification. |
| Notice | This document does not represent the agreed views of the IEEE 802.15 Working Group or IEEE 802.15.8 Task Group. It represents only the views of the participants listed in the “Source(s)” field above. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15. |
| 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>. |

Red font: we don’t have any text yet.

Highlighted in yellow: we have some simple text there, like 1~3 lines.

Highlighted in green: we have reasonable text there, not to that level of detail yet but the best that we’ve done so far.

1. Overview.. 1

* 1. General (Yes, BJ)

1.2 Scope. (Yes, the Scope in the PAR will be copied here with more text. BJ)

1.3 Purpose (Yes, use PAR as the reference for the content here. BJ)

2. Normative references

. 1

3. Definitions. 2

[3.1 Definitions. 2](#_Toc396117130)

[3.2 Acronyms and abbreations. 2](#_Toc396117131)

4. General description. 3

4.1 General (Yes, TBD)

4.2 Components of the IEEE 802.15.4 WPAN (Yes, TBD)

4.3 Network topologies (Yes, use what’s in the PFD for now, BJ)

4.3.1 Star network formation (NO)

4.3.2 Peer-to-peer network formation (Yes, covered by 4.3 – only 4.3, BJ)

4.4 Architecture (Yes, copy the one in 802.15.4 Figure 3, Qing)

4.4.1 Physical layer (PHY) (Yes, Marco)

4.4.2 MAC sublayer. (Yes, BJ)

4.5 Functional overview **-- detailed in 15.4!** (Yes, wait till Clause 5&6 are done, TBD.)

4.5.1 Superframe structure (Yes, wait till Clause 5&6 are done, TBD.)

4.5.2 Data transfer model (Yes, wait till Clause 5&6 are done, TBD.)

4.5.3 Frame structure (Yes, wait till Clause 5&6 are done, TBD.)

4.5.4 Improving probability of successful delivery (Yes, wait till Clause5&6 are done, TBD.)

4.5.5 Power consumption considerations. (Yes, wait till Clause 5&6 are done, TBD.)

4.5.6 Security (Yes, wait till Clause 5&6 are done, TBD.)

4.6 Concept of primitives (Yes, wait till Clause 5&6 are done, TBD.)

5. MAC protocol 3

*5.1 MAC functional description* (Yes, top functions may copy from PFD,

the rest - wait till all the MAC functions are defined, TBD)

**5.1.1 Channel access** (Yes, TBD)

5.1.1.1 Superframe -detailed w. config. in 15.4 (Yes, , BJ?)

5.1.1.1.1 CAP (Yes, BJ)

5.1.1.1.2 CFP (Yes, Shannon/Marco)

5.1.1.2 Incoming and outgoing superframe timing (Yes, TBD)

5.1.1.3 Interframe spacing (IFS) (Yes, TBD)

5.1.1.4 CSMA-CA algorithm (Yes, BJ)

**5.1.2 Starting and maintaining PANs** **– Beacon!** (Yes, copy15.4??

It’s beacon based scheme

5.1.2.1 Scanning through channels (Yes, Huan-Bang)

5.1.2.1.1 ED channel scan (Yes, Huan-Bang)

5.1.2.1.2 Active and passive channel scan (Yes, Huan-Bang)

5.1.2.1.3 Orphan channel scan Yes, Huan-Bang)

5.1.2.2 PAN identifier conflict resolution (?? BJ will contact Dr. Joo)

5.1.2.2.1 Detection (?? BJ will contact Dr. Joo)

5.1.2.2.2 Resolution (?? BJ will contact Dr. Joo)

5.1.2.3 Starting and realigning a PAN (Yes, BJ)

5.1.2.3.1 Starting a PAN (Yes, BJ)

5.1.2.3.2 Realigning a PAN (Yes, BJ )

5.1.2.3.3 Realignment in a PAN (Yes, BJ)

5.1.2.3.4 Updating superframe configuration and channel PIB attributes (Yes, BJ)

5.1.2.4 Beacon generation ???

5.1.2.5 Device discovery (Yes, Shannon)

**5.1.3 Association and disassociation**  (Yes, Peering for PAC, TBD)

5.1.3.1 Association

5.1.3.2 Disassociation

**5.1.4 Synchronization**  (Yes, 5.1 Synchronization, BJ)

5.1.4.1 Synchronization with beacons ??

5.1.4.2 Synchronization without beacons (yes, BJ)

5.1.4.3 Orphaned device realignment ??

**~~5.1.5 Transaction handling (~~**~~indirect transmissions~~**~~) (??~~**

**5.1.6 Transmission, reception, and acknowledgment**

(Yes, 5.4 Communication, + Multicast/Broadcast, Qing/Shannon/BJ )

5.1.6.1 Transmission (yes,

5.1.6.2 Reception and rejection (yes,

~~5.1.6.3 Extracting pending data from a coordinator (??~~

5.1.6.4 Use of acknowledgments and retransmissions (yes,

5.1.6.4.1 No acknowledgment (yes,

5.1.6.4.2 Acknowledgment (yes,

5.1.6.4.3 Retransmissions (yes,

5.1.6.5 ~~Promiscuous~~ (a new term???) mode (yes

5.1.6.6 Transmission scenarios (yes,

**5.1.7 ~~GTS allocation and management~~** CFP Scheduling

(yes, , refer to 802.15.4e, Marco/Qing)

5.1.7.1 CAP maintenance

5.1.7.2 GTS allocation

5.1.7.3 GTS usage

5.1.7.4 GTS deallocation

5.1.7.5 GTS reallocation

5.1.7.6 GTS expiration

**5.1.8 Ranging** (Yes, Igor/Billy)

5.1.8.1 Set-up activities before a ranging exchange

5.1.8.2 Finish-up activities after a ranging exchange

5.1.8.3 Managing DPS

5.1.8.4 The ranging exchange

*5.2 MAC frame formats*

**5.2.1 General MAC frame format** (Yes, **BJ-initiator**,Huan-Bang,Shannon, Qing, Joo)

5.2.1.1 Frame Control field

5.2.1.1.1 Frame Type field

5.2.1.1.2 Security Enabled field

5.2.1.1.3 Frame Pending field

5.2.1.1.4 Acknowledgment Request (AR) field

5.2.1.1.5 PAN ID Compression field

5.2.1.1.8 Source Addressing Mode field

5.2.1.2 Sequence Number field

5.2.1.3 Destination PAN Identifier field

5.2.1.4 Destination Address field

5.2.1.5 Source PAN Identifier field

5.2.1.6 Source Address field

5.2.1.1.6 Destination Addressing Mode field

5.2.1.1.7 Frame Version field

5.2.1.7 Auxiliary Security Header field

5.2.1.8 Frame Payload field

5.2.1.9 FCS field

**5.2.2 Format of individual frame types** (Yes, + Sync frame, Discovery frame,

Peering, Scheduling frame, **Qing-initiator**,

BJ, Huan-Bang, Shannon, Joo)

*5.2.2.1 Beacon frame format ??*

5.2.2.1.1 Beacon frame MHR fields

5.2.2.1.2 Superframe Specification field

5.2.2.1.3 GTS Specification field

5.2.2.1.4 GTS Directions field

5.2.2.1.5 GTS List field

5.2.2.1.6 Pending Address Specification field

5.2.2.1.7 Address List field

5.2.2.1.8 Beacon Payload field

**5.2.2.2 Data frame format**

5.2.2.2.1 Data frame MHR fields

5.2.2.2.2 Data Payload field

**5.2.2.3 Acknowledgment frame format**

**5.2.2.4 MAC command frame format**

5.2.2.4.1 MAC command frame MHR fields

5.2.2.4.2 Command Frame Identifier field

5.2.2.4.3 Command Payload field

**5.2.3 Frame compatibility**. (??,

*5.3 MAC command frames* (Yes, +Discovery.

**Shannon-initiator**,BJ, Huan-Bang, Joo, Qing)

**5.3.1 Association request command** (Yes,

5.3.1.1 MHR fields

5.3.1.2 Capability Information field

**5.3.2 Association response command**

5.3.2.1 MHR fields

5.3.2.2 Short Address field

5.3.2.3 Association Status field

**5.3.3 Disassociation notification command**

5.3.3.1 MHR fields

5.3.3.2 Disassociation Reason field

**5.3.4 Data request command**

**5.3.5 PAN ID conflict notification command**

**5.3.6 Orphan notification command**

**5.3.7 Beacon request command**

**5.3.8 Coordinator realignment command**

5.3.8.1 MHR fields

5.3.8.2 PAN Identifier field

5.3.8.3 Coordinator Short Address field

5.3.8.4 Channel Number field

5.3.8.4 Channel Number field

5.3.8.5 Short Address field

5.3.8.6 Channel Page field

**5.3.9 GTS request command**

5.3.9.1 MHR fields

5.3.9.2 GTS Characteristics field

------------------------------------------------------------------------------------

The following items are from the **TG8 PFD Doc: 15-14-0085-01-0008**

1. QoS
2. Interference management
3. Multi-hop operation
4. Power management
5. Security
6. Coexistence (is this the Co-existence Doc?)