**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | TG 802.15.12 minutes for July, 2016 Plenary Meeting | |
| Date Submitted | [28 July, 2016] | |
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| Re: | [TG 802.15.12 (ULI) meeting minutes] | |
| Abstract | TG 802.15.12 minutes from the San Diego Plenary Meeting | |
| Purpose | [Record the transactions of the TG 802.15.12 plenary meeting during July, 2016] | |
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**Minutes for IEEE TG 802.15.12 San Diego Plenary Meeting**

**25-29 July, 2016**

**Chair – Pat Kinney**

**Vice Chair - Charlie Perkins**

**Monday PM1 (July 25) (Room Golden Hill B)**

Chair called the meeting to order at 1:30pm. Attendance: 15

**Opening / Closing Report (DCN: 15-16-0374-01-0000)**

**Meeting Objectives / Session Focus - TG12 -ULI**

* Monday 25 July, PM1: Opening report, Agenda, Schedule Review
* Tuesday 26 July, AM2: Joint meeting with 802.15.4s - discussion on common elements
* Tuesday 26 July, PM2: Discussion on how KMP should work within 15.12
* Wednesday 27 July, AM1: Continued discussion on how KMP should work within 15.12
* Wednesday 27 July, PM1: Discussion on how 6LoWPAN should work within 15.12
* Wednesday 27 July, PM2: Discussion on Generic PHY configuration using multiplexed MAC interface
* Thursday 28 July, AM1: Discuss Generic MAC Configuration using multiplexed MAC Interface
* Adjourn

**Call meeting to order**

* Opening Report
* Approve agenda (15-16-0456-01)
* Approve previous minutes (15-16-0403-00)
* Timeline Review
* Preparation for Tuesday's joint meeting with 802.1
* Recess

**Patent Policy and call for Essential Patents**

Chair presents IEEE slides #1 to #4 of the IEEE patent and meeting conduct slides. Chair provides an opportunity for disclosure. None was heard.

**Opening Report (DCN 15-16-0456-12)**

Chair leads discussion on TG objectives, schedule, deliverables and liaisons.  Results captured in document 15-16-0374-01.

**Approve agenda (15-16-0456-00)**

* Moved by Ben, seconded by Charlie
* No objections

**Approve previous minutes (15-16-0403-00)**

* Moved by Ben, seconded by Bob Heile
* No objections

**Strategy for Moving Forward**

* Discusses slides from 15-16-0479-01-0000
* Discussion about whether 6LoWPAN is always needed for IPv6 upper layer
* Diagrams are drawn to emphasize conformance with 802 architecture
* Discussion about proposed frame format
* Discussion about “802.15.12 Functional Description” and non-equivalence of horizontal elements
* Discussion about removing “Pass-thru” from the functional description.
* Replace “Other Function(s)” by “Other Protocol(s)”

**Joint Meeting with TG 802.15.4s**

* Dynamic 802.15.4 Management
  + Fits as part of “Management Protocols” in “802.15.12 Functional Description”
* MAC
* PHY
  + Transmit Power Level

Recess at 3:17pm

**Tuesday AM2 (July 26) (Room Gaslamp D) [Joint Meeting 15.4s]**

Chairs called the meeting to order at 10:35am.

**Agenda**

* Open
* Presentation/Discussion
* Recess

**Open**

**Presentation/Discussion**

* Discussion about Management Protocols

**Recess**

**Tuesday PM2 (July 26) (Room Gaslamp ABC)**

Chair called the meeting to order at 8:33am. Attendance: nn

**Agenda:**

* Call meeting to order
* Discussion on how KMP should work within 15.12
* What does Link SAP look like?
* Recess

**Call meeting to order at 4:11pm**

**Review of document 15-16-0479-03 following up from Monday’s discussion**

* Discussion about compressing the MAC frame format. Note this is not in the PAR
* Functional Decomposition diagram redrawn for new 6LoWPAN placement
* Need to be sure that the other side also understands 802.15.12

**Discussion on how KMP should work within 15.12**

* Showed new diagram including KMP modification

**What does Link SAP look like?**

* We need a method of indicating a way for the higher-layer SAP to say which protocol they are directed to. Maybe we need twice as many SAPs? It is the job of 802.15.12 to specify a uniform interface to all the intermediate functions like KMP and L2R.
* MultiplexID in 802.15.9 identifies the higher-level protocol using the (fragmentation) service. The mechanism for the MMI, i.e., the ability to send the data to the proper SAP, will be an extension of the mechanism defined in 802.15.9 for the multiplexed data service.
* For HLPDE, need to define a primitive mechanism to route data and management from the link SAPs or from the protocol SAPs to the appropriate SAP.

**Recess:** The Study Group went into recess (at 5:20pm) until the Wednesday PM1 session

**Wednesday AM1 (July 27) (Room Gaslamp D)**

Chair called the meeting to order at 8:35pm. Attendance: 9

**Agenda - Discussion on the Multiplexed MAC interface leveraging 15.9:**

* Discussion on the Multiplexed MAC interface leveraging 15.9
* Recess

**Review of architectural discussion from Tuesday PM2 session.**

* Carry higher layer data in either Data Payload or 802.15.4 IEs; keep both options
* Question about whether to return data in MAC Enhanced ACK frame
* Discussion about Slide 20 of doc. 479-03; MAC parameters are not intended to be related to PHY parameters on the same row.
* Management Protocol needs to also be able to configure L2R and other non-MAC/PHY parameters
* Management Protocol configures the device and that determines which protocol entities to use

**Recess at 9:50am**

**Wednesday AM2 WG Midweek Plenary (July 27) (Room Harbor EF)**

Chair called the meeting to order at 10:33am. Attendance: about 40

* Affiliation, Warsaw, etc.
* 802.18 – open meeting yesterday
* TG status updates

**Wednesday AM2 WG Midweek WNG (July 27) (Room Harbor EF)**

Chair called the meeting to order at 11:25am. Attendance: about 40

* Interest group for LP-WAN will be formed.
* Award-winning student paper about IEEE 802 Wireless security efforts
* J-C. Zuniga presents about privacy - alarming
  + 11-16-1029-00-0000-802e-privacy-july-update.pdf

**Wednesday PM1 (July 27) (Room Gaslamp D)**

Chair called the meeting to order at 1:33pm. Attendance: 9

**Agenda - Discussion on the Multiplexed MAC interface:**

* Review recent progress in 802.15.12 Functional Decomposition
* Discussion on the Multiplexed MAC interface
* Recess

**Review recent progress in 802.15.12 - Functional Decomposition**

* Destination SAP is determined by the configuration (e.g., 6tisch module)
* For some dynamic configuration, 6LoWPAN needs to have access to Management Protocols (a mandatory component).
* Since the MAC may have to apply dynamic power regarding 802.15 frames not related to 802.15.12, it needs a neighbor table in the MAC layer.
* Yesterday, it was agreed to replace 6tisch by 6top
* Payload IE can be encrypted. And can also be very long if needed. This means that carrying higher level data in IEs may be better than as Data Payload.

**Discussion on the Multiplexed MAC interface**

* Management Protocols, HLPDE, and MMI are mandatory. Everything else is optional.
* Need volunteers to write descriptions for HLPDE and MMI. No one volunteered.
* Can use 802.15.9 for inspiration to design MMI.
* Discussion about 802.15.9 data flow
* Charlie volunteers for 802.15.10

**Recess at 2:35pm until Thursday AM1 session, which starts at 8:30am.**

**Wednesday PM2 (July 27) (Room Gaslamp D)**

Meeting was canceled.

**Thursday AM1 (July 28) (Room La Jolla B)**

Chair called the meeting to order at 8:31am. Attendance: 11

**Agenda -- Discuss Discussion on how 6LoWPAN should work within 15.12:**

* Review Architectural decisions
* Discussion on how 6LoWPAN should work within 15.12
* Plan for next session
* Adjourn

**Review Architectural decisions and modifications**

* Mention that 802.15.10 has now included a functional diagram
* Funtional Decomposition diagram redrawn to rename SAPs, identify mandatory-to-implement, distribute management protocols
* Review HLPDE (mandatory to implement).
  + TODO: RAC assignment request
* Review MMI (Multiplexed MAC Interface) (mandatory to implement)
* Frame Composition diagrams redrawn for accuracy. Two candidate frames, keep both for now.
  + Might identify the IE frame as the preferred format
  + Some devices do not support IEs (e.g., 2006)
  + Discussion about using MIC to avoid doing harm to legacy devices
  + May need discovery to avoid doing harm
  + Only need to require integrity check for the discovery, use preconfigured key
  + Ben did do one thing right (IE concatenation) in the 802.15.4 design of IEs.
* Review meeting with 802.15.4s
  + 802.15.12 can populate the tables, not modify them on dynamic basis
* Desired signal strength versus “undesired signal strength” (i.e., interference)
* Item X

**Strategy for Moving Forward**

* See DCN 15-16-0479-04
* Within the Management Protocols block which is mandatory to implement, there will be many optional “parts” that depend upon which functional blocks are present
* Discussion about ranging (or location accuracy) from Billy Verso. Need to look at 802.15.8.

**Future Efforts**

* HLPDE – P. Kinney
* MMI – P. Kinney
* 6LoWPAN
* KMP – P. Yee?
* 802.1X – P. Yee?
* Management Protocol – H. Yokota
* L2R – C. Perkins
* 6TiSCH - ?
* 6top - ?
* Ranging – B. Verso

**Schedule** (See DCN 15-16-0479-04)

* Instead of RFP, consider indicating that TG12 is marshaling volunteers
* Baseline Definition will slip until November
* Ranging – B. Verso
* Mandatory sections are covered to be ready by November

**Action Items**

* Chair to make RAC assignment request
* Volunteers to produce the functional blocks as assigned
* Need to define precedence about which IEs have precedence to be passed to upper layer

**Adjourn at 10:04am**