**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |  |
| --- | --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title |  | |
| Date Submitted | [13 Nov 2015] | |
| Source | [] [] [address] | Voice: [ ] Fax: [ ] E-mail: [ ] |
| Re: | [Interest Group 6tisch Plenary Meeting in Dallas] | |
| Abstract | [Interest Group 6tisch Minutes.] | |
| Purpose | [Official minutes of the Task Group Session | |
| Notice | This document has been prepared to assist the IEEE P802.15. 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. | |

**IEEE 802.15 Interim Meeting – Session #99**

**Hyatt Regency, Dallas**

**Nov 9-12, 2015**

Tuesday, 10 Nov 2015, 10:30 (AM2) 2

# Tuesday, 10 Nov 2015, 13:30 (PM1)

**13:35** IG 6tisch chair, Pat Kinney, called meeting to order.

Chair presented opening report 15-15-0856-03-ig6t:

Chair displayed administration slide showing the URL for the IEEE-SA slides #1 through #4 of the IEEE patent policy.

Chair asked if anyone in the meeting was personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance? There were no responses.

**Agenda for Dallas**

* + Review of IETF94, Yokohama; Nov 2015
  + 6tisch issues discussion
    - 6top IEs
    - Security
    - ReCharter
    - LLC impact
  + Approval of agenda (15-15-807-00)
  + Approval of minutes from Bangkok (15-15-0766-00)
* Review Summary of IETF94
  + New Charter
    - Status Document
    - New Charter
    - Milestones
    - Action Plan
  + Dynamic Scheduling
    - [draft-wang-6tisch-6top-sublayer-03](http://tools.ietf.org/html?draft=draft-wang-6tisch-6top-sublayer-03)
    - draft-dujovne-6tisch-6top-sf0-00
  + Tracks in 6TiSCH
    - [draft-thubert-6tisch-4detnet-01](http://tools.ietf.org/html?draft=draft-thubert-6tisch-4detnet-01)
  + Any Other Business
    - Announcement second ETSI 6TiSCH Plugtests
* 6top IEs
  + The 6P messages are carried in a payload IE, i.e. IETF Information Element:
  + Group ID: IANA\_IETF\_IE\_GROUP\_ID -Length: variable
  + Content: defined as follows
  + IEEE Liaison Considerations
  + If the specification described in this document is supported by the 6TiSCH WG, the authors of this document ask the 6TiSCH WG chairs to liaise with the IEEE to request a Payload Information Element Group ID to be assigned to the IETF (Group ID IANA\_IETF\_IE\_GROUP\_ID described in Appendix A).
  + Members of 6tisch also asked if IG 6tisch could assist in the use of the requested ID by proposing a detailed format consisting of elements such as sub-ids and other fields
  + Current 6tisch proposal
  + draft-wang-6tisch-6top-coapie-01
  + In response to a request from IETF 6tisch, IG 6T agreed to a recommended practice for external SDO Payload IE sub-types
    - As captured in doc 15-15-0939-02, the consensus was to limit nesting the sub-types to one, allowing concatenation of the Payload IEs rather than the method used in 802.15.4-2015 of nesting sub-types
    - The following figures illustrates an overview of this concept compared to the 802.15.4-2015 technique:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bits: 0-10** | **11-14** | **15** | **16-23** | **Octets: 0-2046** |
| Payload IE Content Length | Group ID | Type (0b1) | Sub-type ID | Sub-type Content |
| Payload IE | | | Payload IE Content | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Payload IE | Payload IE Content | Payload IE | Payload IE Content | … |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Octets: variable** | **Octets: variable** | **variable** | **...** | **variable** |
| Payload IE | Nested IE | Nested IE | ... | Nested IE |

Payload IE with concatenation of Nested IEs

|  |  |  |  |
| --- | --- | --- | --- |
| **Bits: 0-7** | **8-14** | **15** | **Octets: 0-255** |
| Length | Sub-ID | Type = 0 | Content |

Nested IE

**Security**

Join Process:

* PANA
  + More than just restricted forwarding rules and hooks for the upper layers, it also involves resource isolation at the lower layers to help ensure that unauthorized traffic cannot interfere with authorized traffic
* 802.15.9 KMP
  + The main use of PANA in 802.15.9 is for provisioning the link-layer credentials (LLCs) to the joining node, where the LLCs can be of any type including shared key and public key credentials
  + While PANA can be used for both bootstrapping and link-establishment, this document provides the guidelines for the use of PANA as a bootstrapping KMP
* Metrics to evaluate secure join mechanism
  + So IMO the key metric is the duration of the overall process, network-wise. Percentage of battery consumed was not the best metric to consider as it clearly depends on the capacity of your battery. The duty cycle with minimal schedule during joining will probably be on the order of 10-15% (1/11, 1/7 cells). That means that 10-15% of time you will be wasting energy listening to the transmissions of others, collisions, retransmissions, the duration of which depends on the number of nodes contending for the minimal cell and obviously the traffic load per node
  + It’s not that we do not care it, but as the joining process is done only once, it is so small amount of actual network lifetime. For example, if the joining process takes an hour for the 100 node network, and the network is then up and running for a year, before next maintenance cycle, that is 0.01% of the lifetime of the network.
* Use of well-known key for beacons

**LLC impact on 6tisch**

* Commentary
* IETF AD seemed irritated that advance notice of the LLC group formation had not been given to him
* Significant confusion as to the LLC’s impact on IETF efforts such as 6tisch and 6lo, i.e. will LLC define new and different versions of 6tisch and 6lo?
* Announcement of 802.15.12 (LLC) effort in the IEEE
* LLC Interest Group has progressed to a Study Group that had first meeting recently.
* general goal is to make 15.4 easier to use. Right now, a lot left to implementers
* on the todo list: dispatch code (a la Ethertype), 15.9 and 15.10 alignment with LLC, etc.
* interface for Key Management Protocol (KMP) and L2 routing.
* 802.15 has growing awareness of 6TiSCH thanks to 6TiSCH interest group at IEEE, that reports at every meeting about 6TiSCH progress
* provides link to presentation on LLC on IEEE side
* at January meeting: submit PAR and CSD
* how is it organized? 802.15.12 will not be merged into 802.15.4 release?
* 802.15.12 and 802.15.4 would have reasonably distinct content so they can be kept separated. LLC work would be delivered separately from 802.15.4 and not wrapped into 802.15.4 revisions.
* at 6TiSCH, we plan on just continuing our work at the current fast pace. Discussion and coordination with IEEE will happen in parallel.
* agreement that both groups want the same thing. Other "customers" also out there. 6TiSCH is a primary customer that LLC wants to keep satisfied

**ReCharter**

Three new work items: dynamic scheduling (6top, SF0), secure bootstrap, track definition and DetNet requirements

1. Produce "6TiSCH architecture" to describe the design of 6TiSCH networks. This document will highlight the different architectural blocks and signaling flows, including the operation of the network in the presence of multiple LBRs. The existing document will be augmented to cover dynamic scheduling and application of the DetNet work.
2. Describe the mechanisms offered by the 6top sublayer. This includes a protocol for neighbor nodes to negotiate adding/removing cells. The work on the protocol and associate packet formats could be continued at the IEEE.
3. Produce a specification for a default 6top Scheduling Function including the policy to enable distributed dynamic scheduling of time slots for IP traffic. This may include the capability for IoT routers to appropriate chunks of the matrix without starving, or interfering with other 6TiSCH nodes. This particular work will focus on IP traffic since the work on tracks is not yet advanced enough to specify their requirements for dynamic scheduling operations.
4. Produce a specification for a secure 6TiSCH network bootstrap, adapted to the constraints of 6TiSCH nodes and leveraging existing art when possible.
5. Produce requirements to the DetNet WG, detailing 6TiSCH chunks and tracks, and the data models to manipulate them from an external controller such as a PCE.

**15:30** Meeting adjourned