27 November 2015 Webex

IPv6 over the TSCH mode of IEEE 802.15.4e

Chairs:
Pascal Thubert
Thomas Watteyne
Etherpad for minutes:
http://etherpad.tools.ietf.org:9000/p/6tisch?useMonospaceFont=true

Note Well

This summary is only meant to point you in the right direction, and doesn't have all the nuances. The IETF's IPR Policy is set forth in BCP 79; please read it carefully.

The brief summary:
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For further information, talk to a chair, ask an Area Director, or review the following:
- BCP 9 (on the Internet Standards Process)
- BCP 25 (on the Working Group processes)
- BCP 78 (on the IETF Trust)
- BCP 79 (on Intellectual Property Rights in the IETF)

Reminder:

Minutes are taken *
This meeting is recorded **
Presence is logged ***

* Scribe; please contribute online to the minutes at
http://etherpad.tools.ietf.org:9000/p/6tisch?useMonospaceFont=true
** Recordings and Minutes are public and may be subject to discovery in the event of litigation.
*** From the Webex login

Agenda

- Administrivia   [3min]
    - Agenda bashing
    - Approval minutes from last meeting
- Charter Update   [15min]
    - Last chance before sending to responsible A-D (Brian)
- Minimal Support: Status   [15min]
- Architecture: Status and Directions   [15min]
- 6lo drafts: 6TiSCH dependencies   [10min]
    - draft-thubert-6lo-backbone-router
    - draft-thubert-6lo-routing-dispatch
- AOB   [2min]

Administrivia

Admin is trivia

- Approval Agenda
- Approval minutes

Rechartering

Charter

- Latest text maintained at https://bitbucket.org/6tisch/meetings/wiki/charter2

- Request will be made to Brian Haberman (responsible A-D) after this meeting

The group will…

- Produce a specification of the 6top sublayer that describes the protocol for neighbor nodes to negotiate adding/removing cells. This work will leverage cross participation from IEEE members including the IEEE 6TiSCH Interest Group (IG 6T) to define protocol elements and associated frame formats.

    - Implicit: please Courtesy Copy the IG 6T on ML discussions about 6top protocol

    - Also we do our STD track RFC and validate it in parallel to IEEE effort to form LLC 802.15.12 TG

- Produce a specification for a default 6top Scheduling Function including the policy to enable distributed dynamic scheduling of timeslots for IP traffic. This may include the capability for nodes 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.

    - Implicit: the architecture view is that the SF control layer is above LLC and will be maintained at IETF

    - Also that if formed, LLC is expected to Provide services that SF Uses.

- 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.

- Produce a specification for a secure 6TiSCH network bootstrap, adapted to the constraints of 6TiSCH nodes and leveraging existing art when possible.

- Keep updating the "6TiSCH architecture" that describes the design of 6TiSCH networks. This document highlights the different architectural blocks, signaling and data 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 but will not be delivered within this round of chartering.

Minimal Support: Status
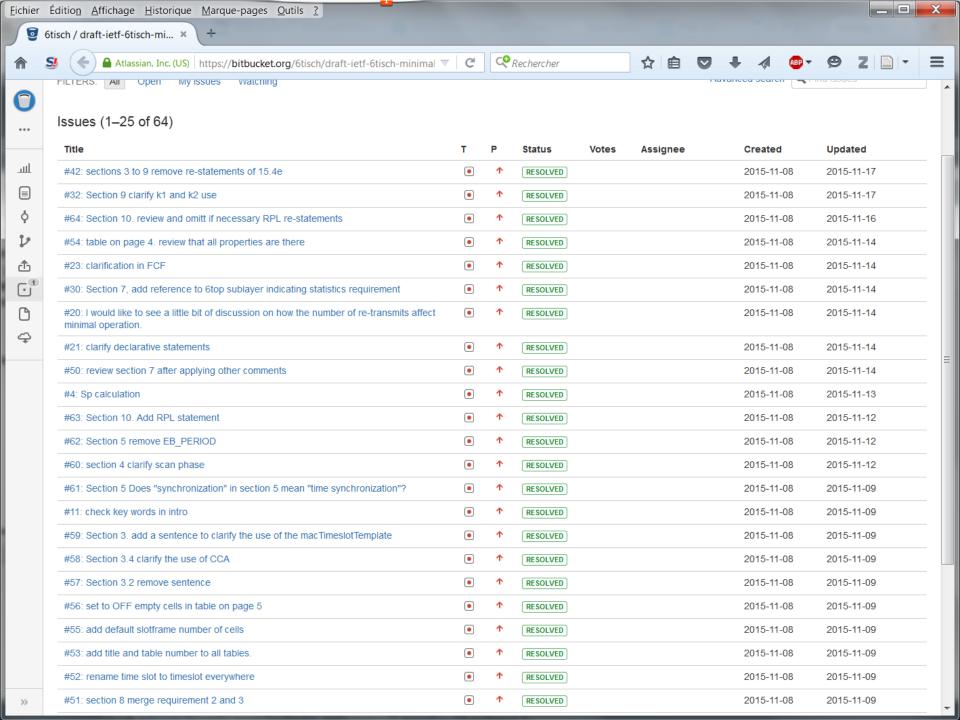
draft-ietf-6tisch-minimal-12

Xavi Vilajosana

Kris Pister

WG Doc Status

- Passed last call

- In INT AREA Directorate review

- Shepherd created Ticket #40 (minimal):

    - Ralph's INT AREA review

- Thomas and Xavi split that in 50-ish issues

    - Visible in BitBucket

    - https://bitbucket.org/6tisch/draft-ietf-6tisch-minimal/issues/

    - Completion tracked in IETF tools

FILTERS: All   Open   My Issues   Watching   Advanced Search   Find issues

Issues (1–25 of 64)

Title	T	P	Status	Votes	Assignee	Created	Updated
#42: sections 3 to 9 remove re-statements of 15.4e	●	↑	RESOLVED			2015-11-08	2015-11-17
#32: Section 9 clarify k1 and k2 use	●	↑	RESOLVED			2015-11-08	2015-11-17
#64: Section 10. review and omitt if necessary RPL re-statements	●	↑	RESOLVED			2015-11-08	2015-11-16
#54: table on page 4. review that all properties are there	●	↑	RESOLVED			2015-11-08	2015-11-14
#23: clarification in FCF	●	↑	RESOLVED			2015-11-08	2015-11-14
#30: Section 7, add reference to 6top sublayer indicating statistics requirement	●	↑	RESOLVED			2015-11-08	2015-11-14
#20: I would like to see a little bit of discussion on how the number of re-transmits affect minimal operation.	●	↑	RESOLVED			2015-11-08	2015-11-14
#21: clarify declarative statements	●	↑	RESOLVED			2015-11-08	2015-11-14
#50: review section 7 after applying other comments	●	↑	RESOLVED			2015-11-08	2015-11-14
#4: Sp calculation	●	↑	RESOLVED			2015-11-08	2015-11-13
#63: Section 10. Add RPL statement	●	↑	RESOLVED			2015-11-08	2015-11-12
#62: Section 5 remove EB_PERIOD	●	↑	RESOLVED			2015-11-08	2015-11-12
#60: section 4 clarify scan phase	●	↑	RESOLVED			2015-11-08	2015-11-12
#61: Section 5 Does "synchronization" in section 5 mean "time synchronization"?	●	↑	RESOLVED			2015-11-08	2015-11-09
#11: check key words in intro	●	↑	RESOLVED			2015-11-08	2015-11-09
#59: Section 3. add a sentence to clarify the use of the macTimeslotTemplate	●	↑	RESOLVED			2015-11-08	2015-11-09
#58: Section 3.4 clarify the use of CCA	●	↑	RESOLVED			2015-11-08	2015-11-09
#57: Section 3.2 remove sentence	●	↑	RESOLVED			2015-11-08	2015-11-09
#56: set to OFF empty cells in table on page 5	●	↑	RESOLVED			2015-11-08	2015-11-09
#55: add default slotframe number of cells	●	↑	RESOLVED			2015-11-08	2015-11-09
#53: add title and table number to all tables.	●	↑	RESOLVED			2015-11-08	2015-11-09
#52: rename time slot to timeslot everywhere	●	↑	RESOLVED			2015-11-08	2015-11-09
#51: section 8 merge requirement 2 and 3	●	↑	RESOLVED			2015-11-08	2015-11-09

draft-ietf-6tisch-architecture-09

All of us, Pascal editor

WG Doc Status

- WG decided to follow Ralph's recommendation and abandon the volume based publication

- The WG will withhold the document till is is complete or the WG aborts, whichever comes first.

- Ticket #38 (terminology): update links to documents

- Ticket #39 (architecture): Ralph's INT AREA review
  - Most comments addressed
  - Working text maintain in bitbucket
  - More in next slides

- Next steps
  - Publish 09 with just the correction for ticket 39 (like, today)
  - Discuss the missing corrections and update the draft (coming weeks)
  - Add text on tracks that echo text in

TOC revision

Need to discuss reactive routing for HbH scheduling

Will add Track related text there

Lack progress at 6lo

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#39 Summary

* misses the intent of an "architecture" document
> I read that the actionable is the below, for which the above is an
  introduction

* mixes high-level architecture with more complete design or specification
  content
> I separated them now as section 3 and 4 and moved some text to
  adapt.

*   misses some architecture components
> There is now a clearer section "3.8. Dependencies on Work In
  Progress". Text was added on the deterministic work.

*   is incomplete and/or has been submitted for publication prior to
  completion of the architecture design
> I removed all references to volumes. The WG will withhold the
  document till it is complete or the WG aborts, whichever comes first.
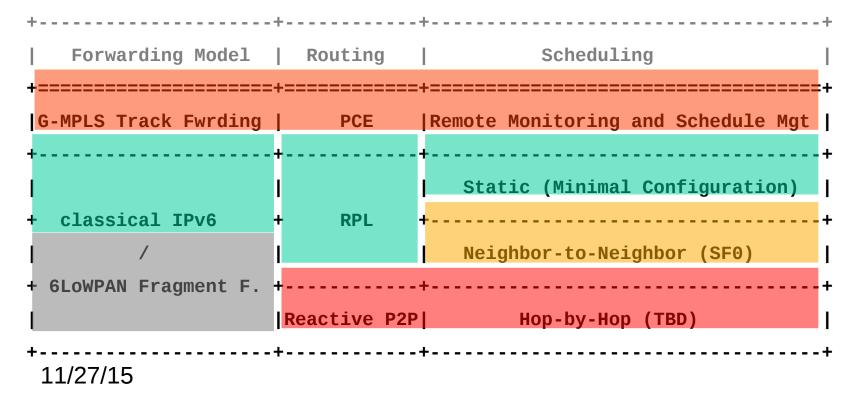
#39 Substantive/technical issues

- In my opinion, this document contains aspects of an architecture document, a requirements document and a design specification. However, it is missing some key aspect of each kind of document. For example, section 8 gives what I consider to be a description of the communication paradigms that are part of the architecture. The communication paradigms are described (for the most part) in the abstract, without specifying the design of how those paradigms are implemented.

> That text was expanded

11/27/15

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In my opinion, this document contains aspects of an architecture document, a requirements document and a design specification. However, it is missing some key aspect of each kind of document. For example, section 8 gives what I consider to be a description of the communication paradigms that are part of the architecture. The communication paradigms are described (for the most part) in the abstract, without specifying the design of how those paradigms are implemented.

> That text was expanded

> The following table was added to clarify what works with what that was also a comment by Kris about the apparent combinatory expansion which is fact is not there):

```
+----------------------+------------+--------------------------------------+
|   Forwarding Model   |  Routing   |              Scheduling              |
+======================+============+======================================+
|G-MPLS Track Fwrding  |    PCE     |Remote Monitoring and Schedule Mgt    |
+----------------------+------------+--------------------------------------+
|                      |            |      Static (Minimal Configuration)  |
+   classical IPv6     +    RPL     +--------------------------------------+
|         /            |            |      Neighbor-to-Neighbor (SF0)       |
+  6LoWPAN Fragment F. +------------+--------------------------------------+
|                      |Reactive P2P|          Hop-by-Hop (TBD)            |
+----------------------+------------+--------------------------------------+
```

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#39 Substantive/technical issues

*   Section 6, on the other hand, gives specific design details that would be better expressed in a design or specification document.

> I removed the text that looked like requirement or design (regarding 6lo which is now handling it) and pointed at the 6BBR draft that is pending adoption.

*   Similarly, section 10 specifies the current, preliminary design for the join process, rather than an architecture for security that describes all of the required security functions and how they relate to each other.

> That we still have to work out as a WG but we are chartering for it.

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#39 Substantive/technical issues

* How do applications interact with the network to request deterministic behavior of a datagram, a flow, a bundle of flows?

* How does the network report back to an application in the case where the deterministic behavior can't be met, or in the case where the network status has changed and an existing reservation can no longer be met?

* How is centralized track computation performed?

* How will the PCE/NME interact with other, autonomous functions such as the routing protocol? Or, will the PCE/NME control all forwarding?

> Clarified relation with the detnet work and provided details in "4.4.3. Remote Monitoring and Schedule Management". Note that there are indeterminations so I can only state expectations or goals.

    With respect to Centralized routing and scheduling, the 6TiSCH

    Architecture is (expected to be) be an extension of the detnet work

    Deterministic Networking Architecture [I-D.finn-detnet-architecture],

> Also added a general architecture picture inherited from RFC 7426

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#39 Substantive/technical issues

*   Rather than go into detail, for example, about using routing protocols to distribute ND registrations, explain that the multi-link subnet architecture requires extensions to NDP because not all hosts in a subnet can communicate with each other directly.

> added:

   6TiSCH nodes are not necessarily reachable from one another at Layer-2 and an LLN may span over multiple links. This effectively forms an homogeneous non-broadcast multi-access (NBMA) subnet, which is beyond the scope of existing IPv6 ND methods. Extensions to IPv6 ND have to be introduced.

*   The overview in section 4 is helpful but provides some redundant details and leaves out some others. In particular, what are the roles of the PCE and NME, and what communication is required among them and the various forwarding nodes to complete the schedule computation and distribute the schedules? What are the architectural components of route computation and update?

> This is being refined. The abstract components are now presented in more details in section "4.4.3. Remote Monitoring and Schedule Management"
   11/27/15

6lo drafts
6TiSCH dependencies

2 docs in adoption call a 6lo

- ## draft-thubert-6lo-backbone-router

  Enables Archie's 3.6. A Multi-Link Subnet Model

  Proxy 6LoWPAN ND by the 6LBTR to 6BBR

  For classical ND proxy over the backbone

  PlugTest at IETF 96 in Berlin

- ## draft-thubert-6lo-routing-dispatch

  Needed to Compress RPL artifacts in 6TiSCH packets

  Initially presented in Hawaii, long negotiations

  Now ready

  PlugTest?

- # PLEASE contribute at 6lo. It's now. It's late.

  11/27/15

AOB ?

Thank you!