26 February 2016 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:

- By participating with the IETF, you agree to follow IETF processes.
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- You understand that meetings might be recorded, broadcast, and publicly archived.

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 [2min]
  - https://datatracker.ietf.org/doc/charter-ietf-6tisch/
  - Posted for external review
- Next steps for 6P and SF0 [40min]
  - draft-wang-6tisch-6top-sublayer
  - draft-dujovne-6tisch-6top-sf0
  - Updating 6LoWPAN [10min]
  - draft-thubert-6lo-inner-compression
- 6LoRH to last call? [5min]
  - draft-ietf-6lo-routing-dispatch
- AOB [2min]

Administrivia

Admin is trivia

- Approval Agenda
- Approval minutes

draft-munoz-6tisch-examples-00

- Example Packets for 6TiSCH Configuration, J. Munoz, E. Riou, G. Gaillard, D. Barthel
- Published 23 Feb 2016
- Already presented at last telco

IETF95

- We requested a 90min session
- Important dates:
  - 2016-03-04 (Friday): Preliminary agenda published for comment.
  - 2016-03-09 (Wednesday): Cut-off date for requests to reschedule Working Group and BOF meetings UTC 23:59.
  - 2016-03-11 (Friday): Final agenda to be published.
  - 2016-03-21 (Monday): Internet Draft submission cut-off (for all drafts, including -00) by UTC 23:59, upload using IETF ID Submission Tool.
  - 2016-03-21 (Monday): Draft Working Group agendas due by UTC 23:59, upload using IETF Meeting Materials Management Tool.
  - 2016-03-25 (Friday): Early Bird registration and payment cut-off at UTC 23:59.
  - 2016-03-28 (Monday): Revised Working Group agendas due by UTC 23:59, upload using IETF Meeting Materials Management Tool.
  - 2016-03-28 (Monday): Registration cancellation cut-off at UTC 23:59.
  - 2016-04-01 (Friday): Final Pre-Registration and Pre-Payment cut-off at 17:00 local meeting time.

Charter Update

Recharter update

- https://datatracker.ietf.org/doc/charter-ietf-6tisch/
- Posted for external review

Recharter milestones

Goals and Milestones:

- Done - WG to adopt IEEE802.15.4e TSCH overview
- Done - WG to adopt 6TiSCH architecture
- Done - WG to adopt 6TiSCH minimal configuration
- Done - WG to adopt 6top draft(s)
- Done - WG to adopt 6TiSCH data model for CoAP
- Done - WG to adopt 6TiSCH terminology
- Done - Submit YANG data model in 6top draft for preliminary OPSDIR review
- Done - Initial submission of 6TiSCH minimal configuration to the IESG
- Done - Initial submission of 6TiSCH TSCH to the IESG
- Done - Evaluate WG progress, propose new charter to the IESG
- Done - ETSI 6TiSCH #1 plugtests
- Done - ETSI 6TiSCH #2 plugtests
- Apr 2016 - Second submission of draft-ietf-6tisch-minimal to the IESG
- Apr 2016 - WG call to adopt draft-ietf-6tisch-6top-sf0
- Apr 2016 - WG call to adopt draft-ietf-6tisch-6top-sublayer
- Jul 2016 - ETSI 6TiSCH #3 plugtests
- Jul 2016 - Initial submission of draft-ietf-6tisch-6top-sublayer to the IESG
- Oct 2016 - Initial submission of draft-ietf-6tisch-6top-sf0 to the IESG
- Dec 2016 - Evaluate WG progress, propose new charter to the IESG
- Apr 2017 - Initial submission of 6TiSCH terminology to the IESG
- Apr 2017 - Initial submission of 6TiSCH architecture to the IESG
- Dec 2017 - 6TiSCH architecture and terminology in RFC publication queue

Next steps

draft-wang-6tisch-6top-sublayer

draft-dujovne-6tisch-6top-sf0

OTF and 6top Sublayer

- Evolution from:
  - On-The-Fly draft
  - 6top sublayer draft
- To:
  - SF0 (Scheduling Function)
  - 6top sublayer based on 6P protocol

Recap: OTF and 6top Sublayer

- Similar model to Objective Functions: Scheduling Function (SF)
- One protocol, multiple ways to enable distributed resource allocation
- Cell relocation is part of the SF
- SF0 is based on On-The-Fly scheduling
- More SFs to come (hopefully!).

Items under discussion

About 6P

- Parent preference: RPL Parent is the owner of the cells.
- Always selects the ones to be allocated.
- Solution:
  - Child-Initiated (three-step): First message: Child sends blacklist of Slotoffsets. Agree? Use CellList for this? New command?

About 6P

- CellList: (SlotOffset,ChannelOffset)
- What if we only provide the SlotOffset and leave ChannelOffset to the neighbor?
- Is there a non-valid identifier available to signal this case? (example:0?)
- This would leave for example (SlotOffset, ANY)

About 6P

- Transaction sequence number
  - Current 6P version does no allow concurrent transactions for the same pair of neighbors
  - Even without concurrency, difficult to track if a request (or response) is a retry
  - Add sequence number? Where?
  - Xavi proposed to use a token.

About 6P

- Define container: Bundle / Chunks
- Bundles group the number of cells between two neighbors
- Chunk assignment is the decision of the chunk owner
- Bundle must be identified by 6P ID (link,direction)
- We may have bundles with different priorities: More than one bundle between pairs of neighbours?

About 6P

- 6top Protocol at Boot:
  - Commands are transmitted on minimal cells and after bandwidth is available, on dedicated cells. When to switch? Out of scope?

About 6P

- What is the status of the IANA IDs in 6P?
- IANA_IETF_IE_GROUP_ID
- IANA_6TOP_SUBIE_ID
- IANA_6TOP_6P_VERSION
- 6P command identifiers
- 6P Return Codes
- IANA_SFID_SF0?

SF0 next steps

SF0 next steps

- Statistics for SFs and Relocation: Are they out of scope?
- We defined PDR as a general element, but no measurement specification
- We defined less than average, but did not define how to calculate average.

SF0 next steps

- 6P Behavior at Boot:
  - Assign by default at least one cell for each neighbor?
  - Define a pre-allocation configuration with the parent?
  - (Current) Issue a CLEAR command so the allocation algorithm starts with zero allocated cells. Keep this?

SF0 next steps

- Examples of error handling:
  - What happens on Timeout?
  - Number of retries until transaction is considered unsuccessful? (issue a CLEAR command and wait?)
  - What if an unresponsive node is erased from the neighbor list during a transaction?
  - From the 6P specification, a node can abort a transaction, but the node may not respond at all.

SF0 next steps

- Security considerations section
- Adjust error IDs
- Review relocation criteria (currently PDR lower than the average)
- Review Cell List rules (to add parent preference)

6P and SF0

- Are there any other items missing?

Updating 6LoWPAN

6LoRH status

- draft-thubert-6lo-inner-compression
- Created February 12, 2016
- Gap found during ETSI plugtest

- Solves RFC 6282 limitation:
- (SAC / DAC == 0) => prefix is Link local FE80::
- (SAC / DAC == 1) => Prefix from context

=> No way to use outer IP header as reference

UDP packet forwarded by the root (slide from 1/22)

```
+-+-+-+-+-+-+- ... +-+-+- ... -+-+-- ... -+-+- ... -+-+-+-+-+-+-+ ... -+-+-+-+...
|11110001 |RH3-6LoRH | RPI-6LoRH | IP-in-IP | NH=1 |11110CPP| Compressed | UDP
|Page 1   |Type1 S=2 |           |  6LoRH   | IPHC | UDP    | UDP header | Payload
+-+-+-+-+-+-+- ... +-+-+- ... -+-+-- ... -+-+- ... -+-+-+-+-+-+-+ ... -+-+-+-+...
           <-8bytes->                          <-         RFC 6282       ->
                                                No RPL artifact
```

One may note that the RPI is provided. This is because the address of the root that is the source of the IP-in-IP header is elided and inferred from the InstanceID in the RPI. Once found from a local context, that address is used as Compression Reference to expand addresses in the RH3-6LoRH.

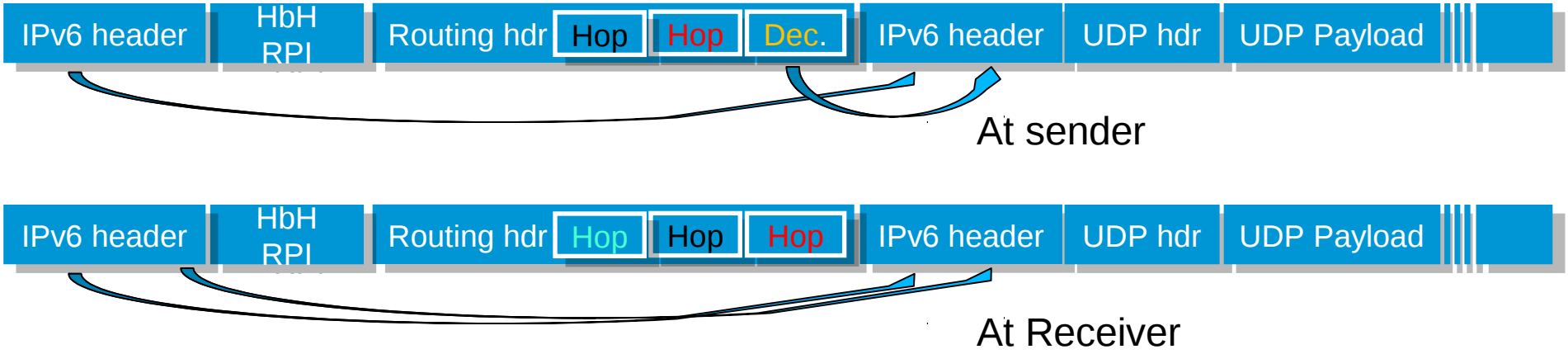
<=>

Should we propose a way to elide the root in IPHC?

With 6lo-inner-compression

(SAC / DAC == 0) =>

- if outer then prefix from outer
- else prefix is Link local FE80::



6LoRH to last call?

6LoRH status

- draft-ietf-6lo-routing-dispatch
- Updated February 12, 2016
- Clarifications after successful ETSI plugtest
- All tickets resolved: Ready for Last Call?

#17	Format inside of an RPL domain	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-02-12
#14	More optimal compression of 6LoRH	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-02-12
#16	Behaviour with encapsulated LOWPAN_IPHC	routing-dispatch	closed	fixed	enhancement	major	pthubert@cisco.com	2016-02-07
#11	RH3 6LoRH not recoverable	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-02-04
#15	current entry as reference for next entry compression in RH	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-02-04
#10	Lacking description when no IP-in-IP is present	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-26
#13	Root as reference for compression	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-23
#12	Relative Order of 6LoRH headers	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-23
#8	Tom Phinney's review on 6LoRH	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-15
#9	Tom Phinney's review on Paging Dispatch	paging-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-15
#7	Split 6LoRH Document	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-14
#5	Leftover table for RPI types	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-14
#6	Thomas Watteyne review December 14th	routing-dispatch	closed	fixed	defect	major	pthubert@cisco.com	2016-01-14

AOB ?

Thank you!