13 May 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:

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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
- round-table draft status [10min]
  - update draft-ietf-6tisch-6top-protocol
  - update draft-dujovne-6tisch-6top-sf0
  - update draft-ietf-6tisch-minimal
- high-bandwidth forum for ML discussions [10min]
  - "Doubts in 3-step transactions mentioned in draft-wang-6tisch-6top-protocol-00“
  - "comments on latest terminology draft"
- outcome security DT meeting [20min]
- AOB [2min]

Administrivia

Admin is trivia

- Approval Agenda
- Approval minutes

round-table draft status

draft-ietf-6tisch-6top-protocol [1/3]

- v00 published after adoption
- Protocol defined. 3 way and 2 way transaction model.
- Typo to be corrected:

  “The SF running on node B selects 2 cells” ->

  “The SF running on node A selects 2 cells”.

draft-ietf-6tisch-6top-protocol [2/3]

- Discussion about 3 step transactions and possible concurrency problem (Seema Kumar):

  If 2 nodes use 3 step transaction concurrently (which is supported by 6top)

  A lock mechanism MAY be needed to prevent the same list to be sent to both requesters.

draft-ietf-6tisch-6top-protocol [3/3]

NumCells = 2,[]

B ----------> A

[(1,2),(2,2),(3,5),(4,6)]

B <---------- A

Concurrently

NumCells = 2, []

A <---------- C

draft-dujovne-6tisch-6top-sf0

- Changed name and submitted after adoption: draft-ietf-6tisch-6top-sf0
- Will address typos and layout problems pointed out by Pascal
- Rules for CellList and Node Behaviour at boot are recommended on Sec. 5.3 of draft-ietf-6tisch-6top-protocol-00
- As commented at IETF95, we will change the current Bandwidth Estimation Algorithm to add overprovisioning at the allocation policy, thus eliminating steps 5 and 6 (this addresses comments from Satish and Pascal)

draft-ietf-6tisch-minimal [1/4]

Comments from Charlie:
TBD:
•RPL not mandated but recommended, however:
- abstract
- Intro

•The rest of the draft indicates the use of RPL if multihop and implemented. -> (not mandatory)

DONE:
- Updated references from 15.4e to 15.4-2015
- Renamed Join Priority → Join Metric
- Clarification of 0F0 examples
- Indicate that 0F0 metric when no-acks is out of scope
- Clarification of MOP in RPL
- Minor glitches and typo corrections

draft-ietf-6tisch-minimal [2/4]

Abstract
This minimal mode uses a collection of protocols including the 6LoWPAN framework and RPL to enable interoperable IPv6 connectivity over IEEE 802.15.4 TSCH with minimal network configuration and infrastructure.

Could we say:
This minimal mode uses a collection of protocols including the 6LoWPAN framework and a routing protocol (e.g., RPL) to enable interoperable IPv6 connectivity over IEEE 802.15.4 TSCH with minimal network configuration and infrastructure.

draft-ietf-6tisch-minimal [3/4]

Intro:

This specification defines operational parameters and procedures for a minimal mode of operation to build a 6TiSCH Network. The 802.15.4 TSCH mode, the 6LoWPAN framework, RPL [RFC6550], and its Objective Function 0 (OF0) [RFC6552], are used unmodified, but parameters and particular operations of TSCH and RPL are specified to guarantee interoperability between nodes in a 6TiSCH Network.

Could we say:

This specification defines operational parameters and procedures for a minimal mode of operation to build a 6TiSCH Network. The 802.15.4 TSCH mode, the 6LoWPAN framework , a routing protocol such as RPL [RFC6550], and its Objective Function 0 (OF0) [RFC6552], are used unmodified, but parameters and particular operations of TSCH and RPL are specified to guarantee interoperability between nodes in a 6TiSCH Network.

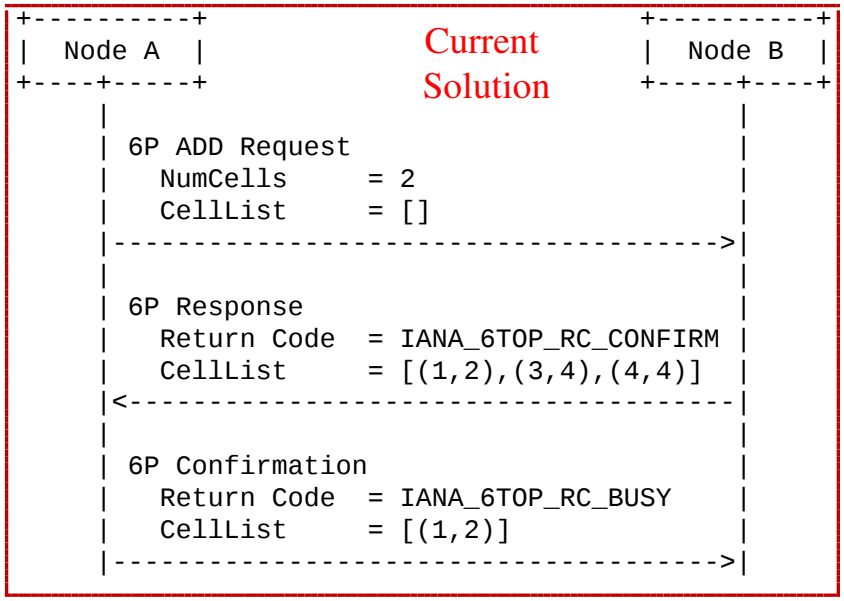
draft-ietf-6tisch-minimal [4/4]

Status:

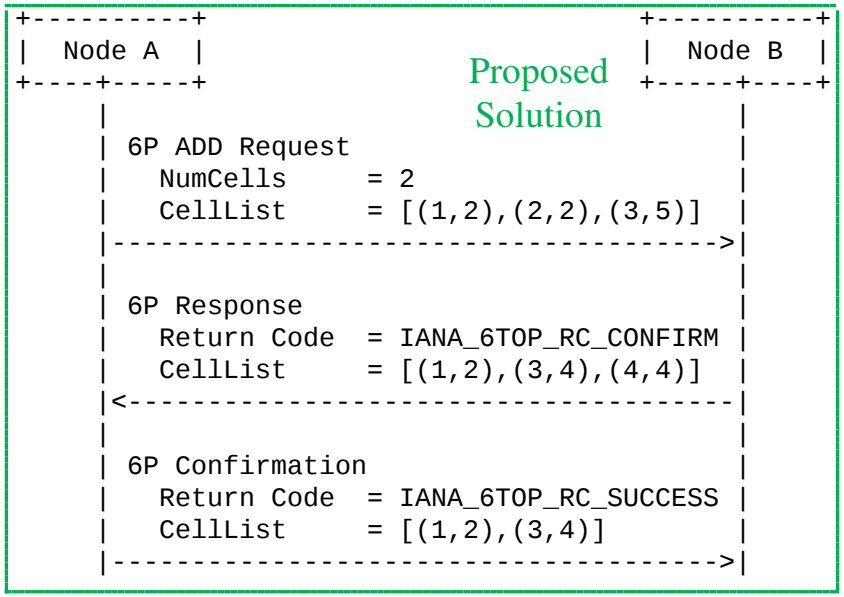
All changes in bitbucket
https://bitbucket.org/6tisch/draft-ietf-6tisch-minimal/wiki/Home

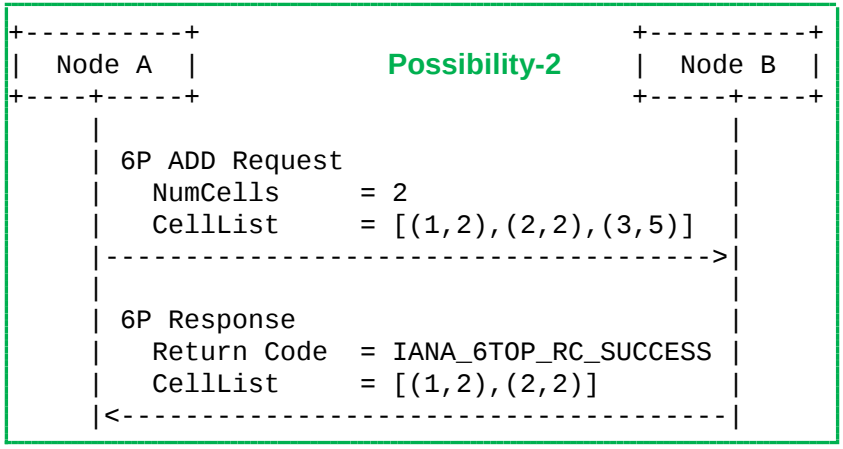
high-bandwidth forum for ML discussions

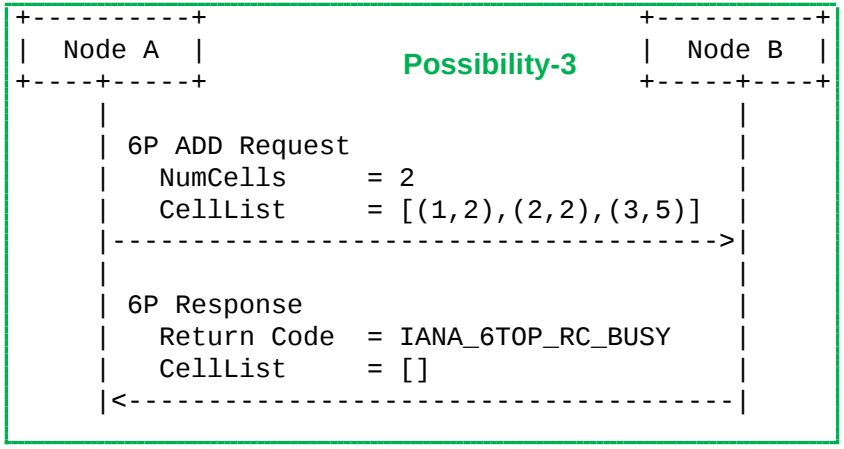
"Doubts in 3-step transactions mentioned in draft-wang-6tisch-6top-protocol-00"



Possibility-1







BUSY code will be returned in possibility-1 if node-A doesn't have cell list of node-B. But, the probability of success is higher than current solution.

"comments on latest terminology draft“ [1/2]

Link: *A communication facility or medium over which nodes can communicate at the link layer, i.e., the layer immediately below IP. Thus, the IETF parlance for the term "Link" is adopted, as opposed to the IEEE802.15.4e terminology. In the context of the 6TiSCH architecture, which applies to Low Power Lossy Networks (LLNs), an IPv6 subnet is usually not congruent to a single link and techniques such as IPv6 Neighbor Discovery Proxying are used to achieve reachability within the multilink subnet. A link is distinct from a track. In fact, link local addresses are not expected to be used over a track for end to end communication. Finally, from the Layer 3 perspective (where the inner complexities of TSCH operations are hidden to enable classical IP routing and forwarding), a single radio interface may be seen as a number of Links with different capabilities for unicast or multicast services.*

"comments on latest terminology draft“ [2/2]

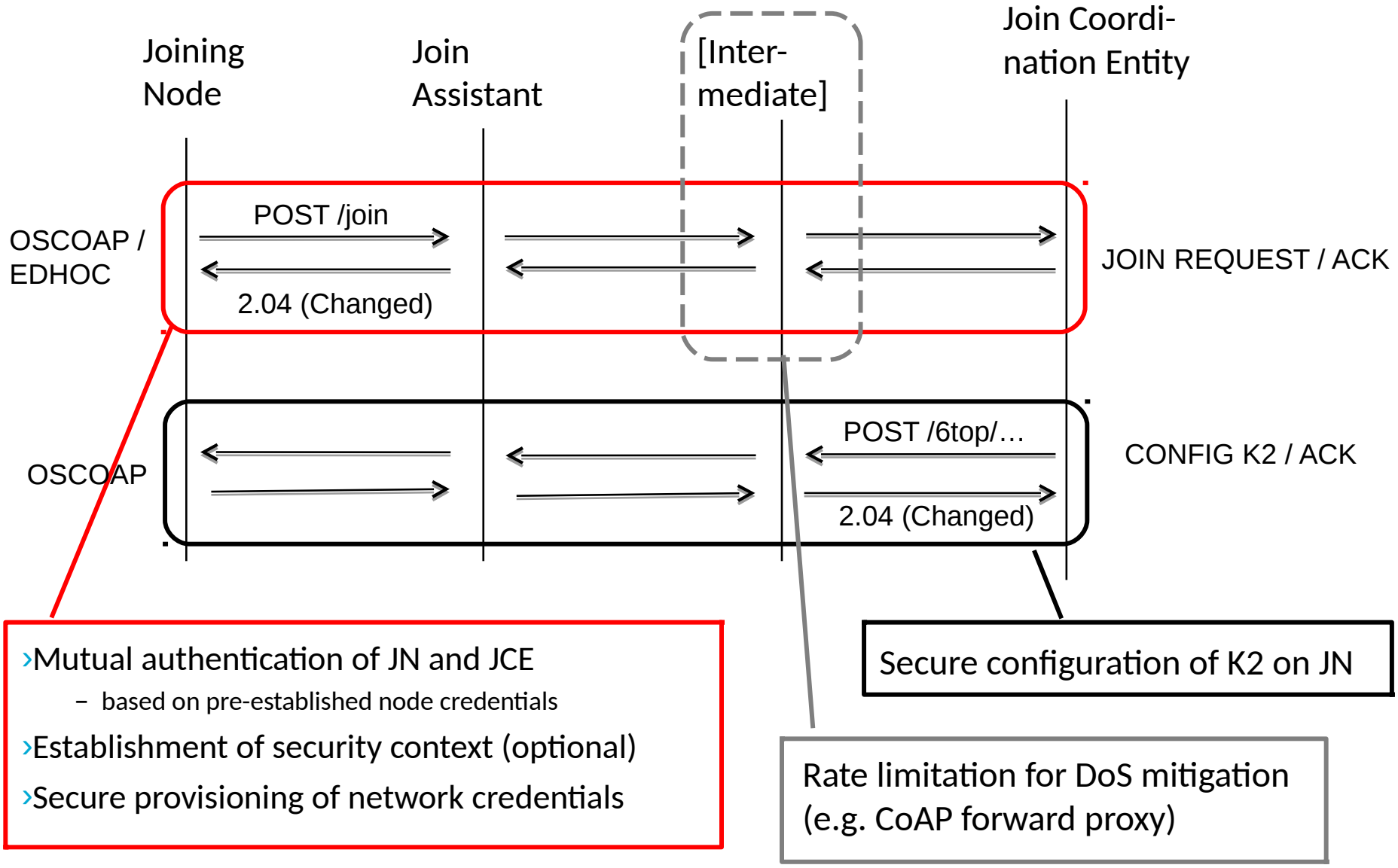
- *Confusing definition*
- Introduced to make the difference from the IEEE802.15.4 link definition
- The IEEE802.15.4 link correspond to the 6TiSCH cell
- A 6TiSCH link is a IP link
- Practically a link exists between two nodes when at least one cell is schedule between them
- A link is not simply a bundle
- A link is given by the union of 2 bundles, one in each direction, between two neighbor nodes
- Currently the same bundle pair are used for exchanging L3 traffic, regardless the RPL instance (which defines a topology)
- Should we have different bundles for each instance?

outcome security DT meeting

Security DT meeting

- 12 May 2016, 1-2pm Paris time
- Present:
  - Michael Richardson
  - Tero Kivinen
  - Giuseppe Piro
  - Tengfei Chang
  - Malisa Vucinic
  - Thomas Watteyne
  - Goran Selander
  - Francisca Palombini
  - Ludwig Seitz
  - Savio Sciancalepore
- Partial minutes at https://bitbucket.org/6tisch/meetings/wiki/

OSCOAP for 6tisch (naïvely)



- Mutual authentication of JN and JCE
  - based on pre-established node credentials
- Establishment of security context (optional)
- Secure provisioning of network credentials

Secure configuration of K2 on JN

Rate limitation for DoS mitigation (e.g. CoAP forward proxy)

start/end states (and costs) of 3 options

PSK

start state:

- each mote is pre-configured with a key, the same key is written in the JCE together with its MAC address

end state:

- the JCE has authenticated the mote; the mote has authenticated the JCE
- the JCE has installed (through secure session with the JN) key K2. This key is then used for link-layer AUTH+ENV CCM*
- the PSK enables a session between the node and the JCE. The JCE uses that session to send commands to the mote to (1) rotate K2, (2) change PSK

Cost:

- 4 packets
- Memory: don’t know

Protocols:

- OSCOAP, EDHOC

RPK

start state:

- ???

end state:

- ???

Cost:

- ???

Protocols:

- ???

certs

start state:

- ???

end state:

- ???

Cost:

- ???

Protocols:

- ???

AOB ?

6TiSCH Talks and Tutorials

talk

Overview (Industrial) IoT Standardization Efforts at IETF

Thomas Watteyne

ITU Meeting

Geneva, Switzerland

10 May 2016

tutorial

Introduction to the IETF 6TiSCH stack with OpenWSN & OpenMote

Thomas Watteyne, Xavier Vilajosana, Pere Tuset-Peiro

IEEE International Conference on Telecommunications (ICT)

Thessaloniki, Greece

16 May 2016

tutorial

Standards for the Industrial IoT: a Hands-on Tutorial with OpenWSN and OpenMote

Xavier Vilajosana, Pere Tuset-Peiro, Tengfei Chang, Thomas Watteyne

IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)

Valencia, Spain

8 September 2016

Plugtests Update

- TODO Miguel

Thank you!

Next interim:
Friday 27 May 2016