



09 October 2015 Webex

IPv6 over the TSCCH
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.
- If you are aware that a contribution of yours (something you write, say, or discuss in any IETF context) is covered by patents or patent applications, you need to disclose that fact.
- 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

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** Recordings and Minutes are public and may be subject to discovery in the event of litigation.

*** From the Webex login

Agenda

- Administrivia [5min]
 - Agenda
 - Minutes Last meeting
- draft-wang-6tisch-6top-sublayer [30min]
- Status of security drafts [5min]
- Work needed on OTF [10min]
- Status Rechartering [5min]
- AOB [3min]

Administrivia

Admin is trivia

- Approval Agenda
- Approval minutes




draft-ietf-6tisch-minimal

- Submitted to IESG!
- Congrats Xavi 😊

IETF94 Yokohama

PRELIMINARY

15:20-17:20 Thursday Afternoon session II

Room 413	art	epext	Extensible Provisioning Protocol Extensions	  
Room 502	art	rtcweb	Real-Time Communication in WEB-browsers	
Room 303	int	6tisch	IPv6 over the TSCH mode of IEEE 802.15.4e	
Room 302	int	dhc	Dynamic Host Configuration	
Room 501	ops	opsarea	Operations & Management Area Open Meeting Combined with OPSAWG	
Rooms 411/ 412	rtg	pim	Protocols for IP Multicast	
Room 304	rtg	rtgwg	Routing Area Working Group	
Room 301	sec	oauth	Web Authorization Protocol	
17:20-17:40			Beverage Break	

- 2015-10-19 (Monday): Internet Draft submission cut-off (for all drafts, including -00) by UTC 23:59, upload using IETF ID Submission Tool.
- 2015-10-19 (Monday): Draft Working Group agendas due by UTC 23:59, upload using IETF Meeting Materials Management Tool.
- 2015-10-23 (Friday): Early Bird registration and payment cut-off at UTC 23:59.

IETF94 Yokohama slots Reqs so far

- 802.15.4 LLC (Charlie)
- Reactive routing over 6TiSCH (Charlie)
- Minimal status (Xavi, remote)
- Rechartering (Chairs)
- DetNet reqs (Pascal)

Second ETSI 6TiSCH Plugtest

- As previously announced, we are making arrangement to hold the 2nd ETSI 6TiSCH Plugtest 2-4 February 2015 in Paris
- Mark you calendar, more communication coming

draft-wang-6tisch-6top-sublayer

Qin Wang (*Ed.*)

Xavi Vilajosana

Status

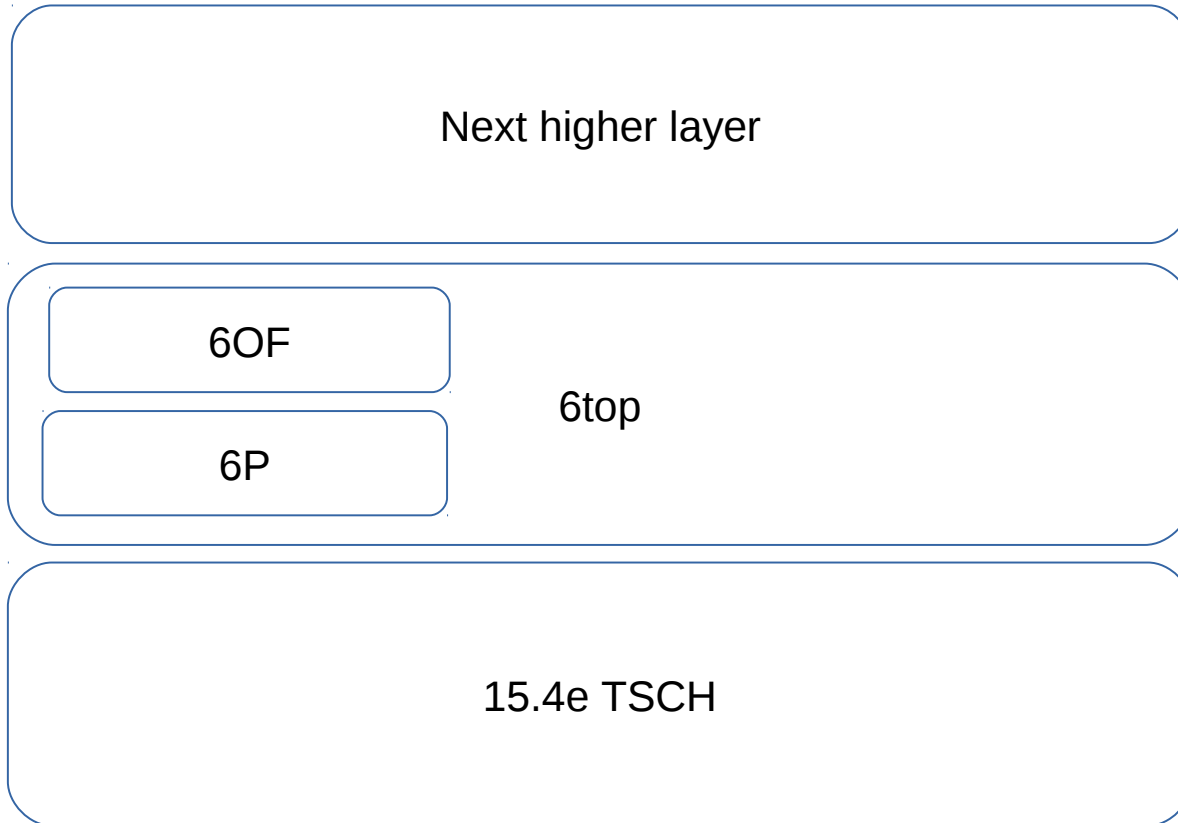
- Published -02 on 9 October:
<https://datatracker.ietf.org/doc/draft-wang-6tisch-6top-sublayer/>
- Re-focused text on the idea of:
 - Mechanisms defined in 6top sublayer
 - Policy defined in “6top Objective Function” (6OF)
- Introducing clear terms:
 - “6TiSCH Operation Sublayer“ (6top)
 - “6top Objective Function“ (6OF)
 - “6top Objective Function Identifier“ (6OFID)
 - “6top Protocol“ (6P)
 - 6top Atomic Transaction



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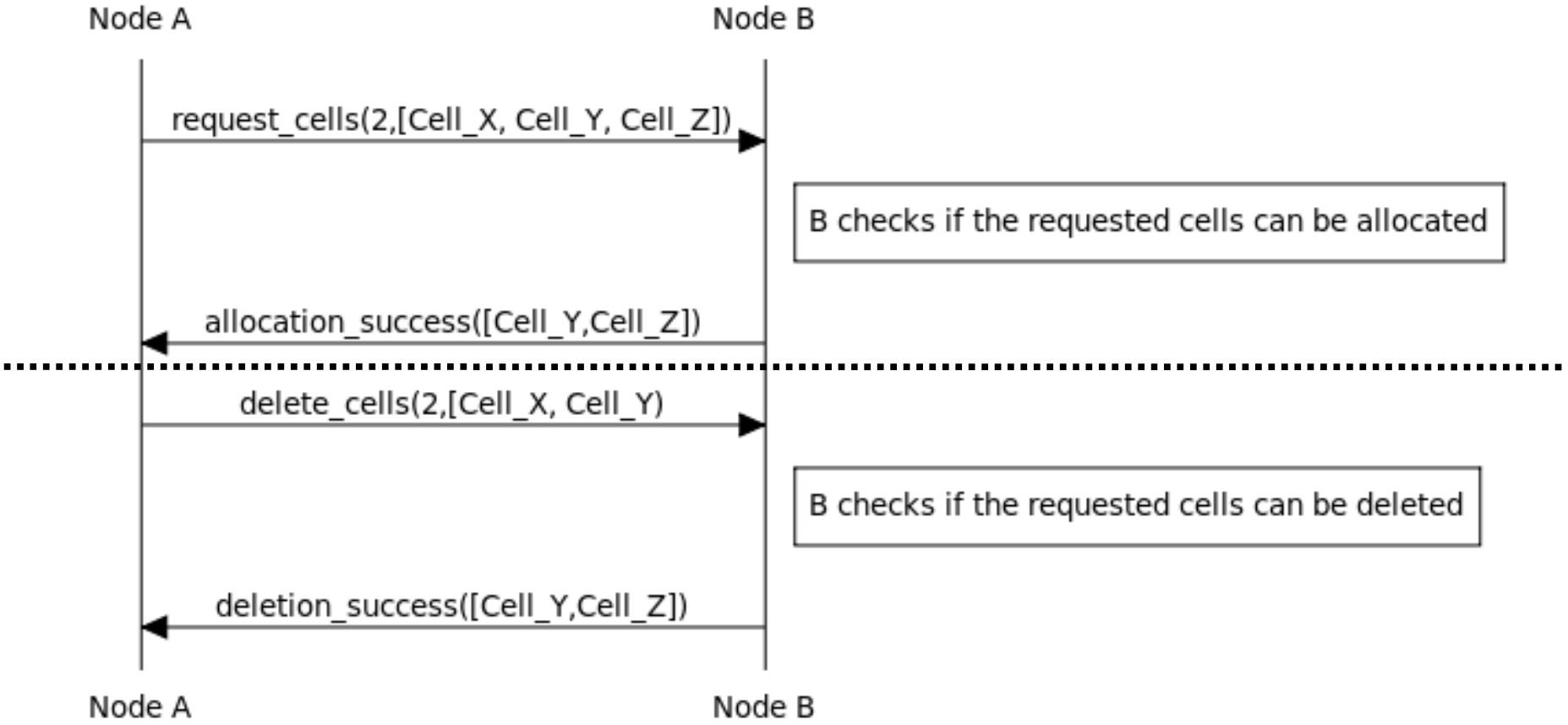


6top



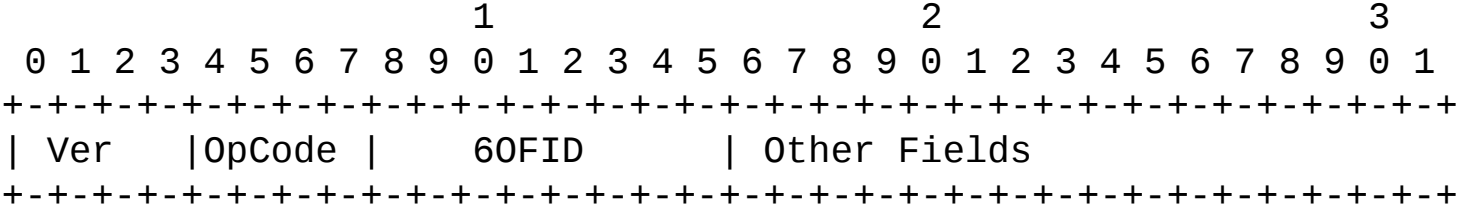


6P





6P - General Message Format



- Ver (6P Version): The version of the 6P protocol. Only version IANA_6P_VERSION is defined in this document. Future specification might define further version of the 6P protocol.
- OpCode (6P OpCode): Operation to carry out, or the response code. The list of OpCode values is defined only for version IANA_6P_VERSION in this document.
- 60FID (6top Objective Function Identifier): The identifier of the 60F to use to handle this message. The 60FID is defined in Section 4.1.
- Other Fields: The list of other fields depends on the value of the OpCode, as detailed below.

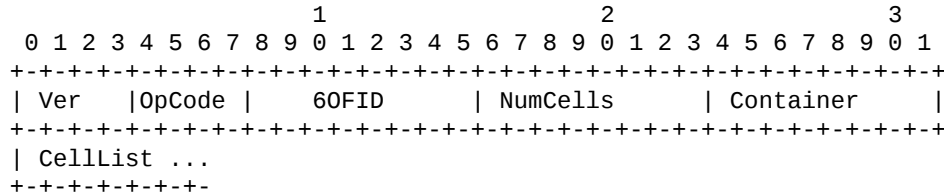
6P - OpCodes

Value	OpCode	RC	Description
IANA_ADD	ADD	N	add one or more cells
IANA_DELETE	DELETE	N	delete one or more cells
IANA_RC_SUCCESS	RC_SUCCESS	Y	operation succeeded
IANA_RC_ERR_VER	RC_ERR_VER	Y	unsupported 6P version
IANA_RC_ERR_60FID	RC_ERR_60FID	Y	unsupported 60FID
IANA_RC_ERR_BUSY	RC_ERR_BUSY	Y	the node is busy
IANA_RC_ERR	RC_ERR	Y	operation failed
TODO-0xf	reserved		



6P ADD/DELETE Request

ADD



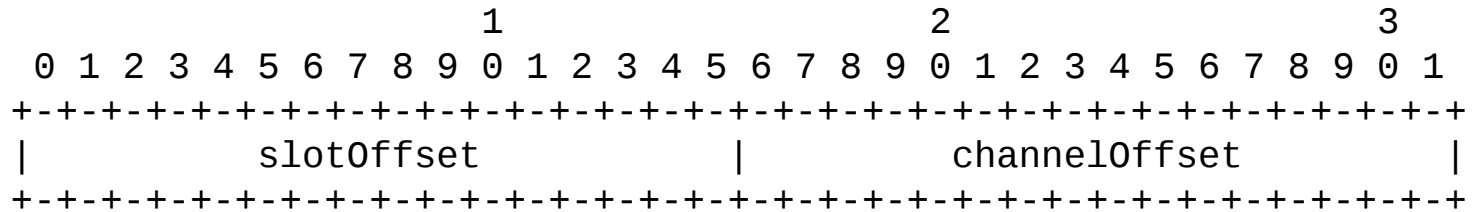
- Ver: Set to IANA_6P_VERSION.
- OpCode: Set to IANA_ADD for a 6P ADD Request.
- 6OFID: Identifier of the 6OF to be used by the receiver to handle the message.
- NumCells: The number of additional TX cells the sender wants to schedule to the receiver.
- Container: An indication of where in the schedule to take the cells from (which slotframe, which chunk, etc.). This value is an indication to the 6OF. The meaning of this field depends on the 6OF, and is hence out of scope of this document.
- CellList: A list of 0, 1 of multiple 6P Cells. The format of a 6P Cell is defined in Section 3.1.4

DELETE

The 6P DELETE Request has the exact same format as the 6P ADD Request, except for the OpCode which is set to IANA_DELETE.



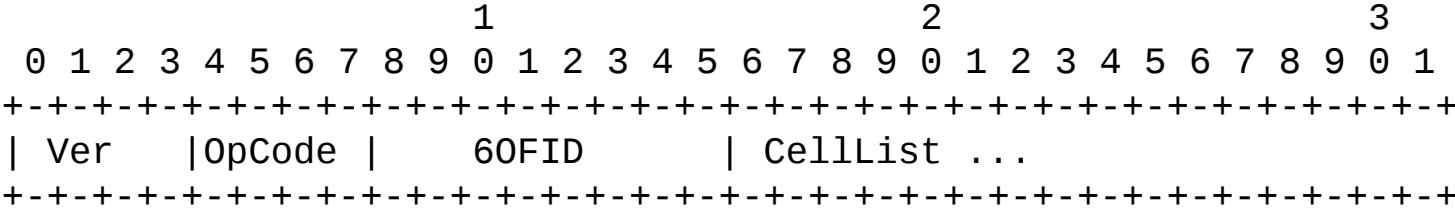
6P Cell Format



slotOffset: The slot offset of the cell.
channelOffset: The channel offset of the cell.



6P Response Format



- Ver: Set to IANA_6P_VERSION.
- 60FID: Identifier of the 60F to be used by the receiver to handle the message.
- OpCode: One of the "return code" OpCodes listed in Section 3.1.3.
- CellList: A list of 0, 1 of multiple 6P Cells. The format of a 6P Cell is defined in Section 3.1.4.

6OF Identifier (6OFID)

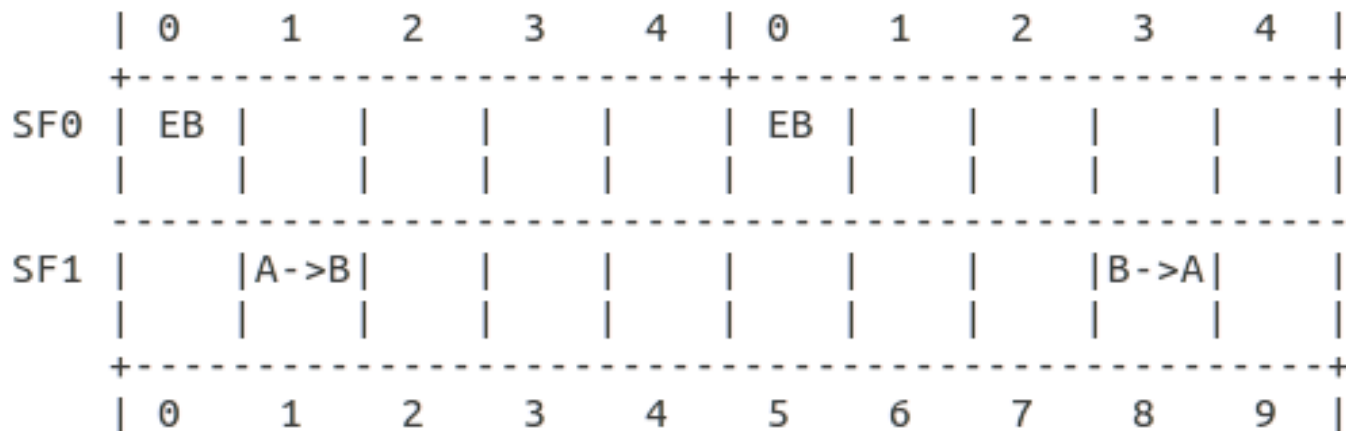
Range	Meaning
0x00	reserved
0x01-0x7f	managed
0x80-0xfe	unmanaged
0xff	reserved

Requirements for a 6OF

- o MUST specify an identifier for that 6OF.
- o MUST specify a set of rules for a node to decide when to add one or more cells to a neighbor.
- o MUST specify a set of rules for a node to decide when to delete one or more cells to a neighbor.
- o MUST specify a value for the timeout, or a rule to calculate it.
- o MUST specify a meaning for the "Container" field in the 6P ADD Request.
- o MUST specify the rule for selecting the cells (including their number) to add to the CellList field in the 6P ADD Request.
- o MUST specify the rule for verifying which cells from the CellList it can add to its schedule.
- o MUST specify what to do after an error has occurred (either the node sent a 6P Response with an error code, or received one).
- o SHOULD clearly state the application domain the 6OF is created for.
- o SHOULD contain examples which highlight normal and error scenarios.
- o SHOULD contain a performance evaluation of the scheme, possibly through references to external documents.

Slotframes

- 2 Slotframes
 - Minimal with Prio 0 (SF0)
 - Soft cell – 6top managed with Prio 1 (SF1)
- MAY have more.
 - Its role is out of scope



Admin Stuff

terminology draft

- 6top
- 6OF
- 6OFID
- 6P
- 6top Atomic Transaction

IANA

- o TODO: IANA_6TOP_IE_GROUP_ID
- o TODO: IANA_6P_VERSION
- o TODO: IANA_ADD
- o TODO: IANA_DELETE
- o TODO: IANA_RC_SUCCESS
- o TODO: IANA_RC_ERR_VER
- o TODO: IANA_RC_ERR_BUSY
- o TODO: IANA_RC_ERR

IEEE

The 6P messages are carried into a single IEEE802.15.4 Payload Information Element. We need a mechanism to discriminate 6P messages from other IEs. In the text, we assume a Payload IE Group ID (IANA_6TOP_IE_GROUP_ID) assigned. Another option would be for the IEEE to assign a Payload IE Group ID to the IETF, and for 6TiSCH to coordinate the creation of a IANA entry for subIEs.

Next Steps and Discussion

- OF draft
 - draft-dujovne-6tisch-on-the-fly contains exactly what an OF is
 - Rename to OF0?
 - Simplify text to purely technical?
- Proposed charter rewording proposal to match new terminology
 - [WP2] 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.
 - [WP3] Produce a specification for a default 6top Objective 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.
- Timeline:
 - 6top-sublayer and OF0 drafts presented in Yokohama
 - Drafts stabilized by end 2015
 - Interop in Feb 2016
 - Push drafts to IESG after plugtest (for Buenos Aires)

Status security drafts

work needed on OTF

Status Rechartering

New charter

- Proposed on the ML
- Still questions on limiting OTF to IP
- 3 new W-I:
 - OTF
 - secure bootstrap
 - Track definition and detnet requirements
- Non-milestone Interop sustaining guides

<https://bitbucket.org/6tisch/meetings/wiki/charter2>

Current Charter Work Items

The group will:

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. **Initially, the document will focus on distributed routing operation over a static TSCH schedule.**
2. Produce an Information Model containing the management requirements of a 6TiSCH node. This includes describing how an entity can manage the TSCH schedule on a 6TiSCH node, and query timeslot information from that node. A data model mapping for an existing protocol (such as Concise Binary Object Representation (CBOR) over the Constrained Application Protocol (CoAP)) will be provided.
3. **Produce "Minimal 6TiSCH Configuration" defining how to build a 6TiSCH network using the Routing Protocol for LLNs (RPL) and a static TSCH schedule. It is expected that RPL and the Objective Function 0 (OF0) will be reused as-is.**

The work will include a best practice configuration for RPL and OF0 operation over the static schedule. Based on that experience the group may produce a requirements draft for OF0 extensions, to be studied in ROLL.

Proposed Charter Update

The group will:

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 applicability of DetNet work.*
2. Produce an Information Model containing the management requirements of a 6TiSCH node. This includes describing how an entity can manage the TSCH schedule on a 6TiSCH node, and query timeslot information from that node. *A data model mapping for an existing protocol (such as Concise Binary Object Representation (CBOR) over the Constrained Application Protocol (CoAP)) will be provided. MAC-layer interactions to negotiate Time Slots between peers will be proposed, to be eventually continued at IEEE.*
3. Produce an "On-the-fly" specification to enable a distributed dynamic scheduling of time slots *for IP traffic*, with the capability for IoT routers to appropriate chunks of the matrix without starving, or interfering with, other 6TiSCH nodes.
4. Produce a specification for a secure 6TiSCH network bootstrap, adapted to the constraints of 6TiSCH nodes and leveraging existing art when possible.

Current non milestone Work Items

The Working Group may maintain a number of running, often-respun documents, that evolve as the technology is refined for work items that do not affect the milestone work items:

- implementers guide: this document will collect clarifying information based on input from implementers, in particular as it becomes available from interoperability events. This guide will contain information about test harnesses used for interoperability testing.
- coexistence guide: this document will provide information on how 6TiSCH can be operated in an environment shared with other protocols that use the same or a similar TSCH MAC, and/or operate on the same frequency band.
- [Text on Interop test ?](#)

The WG will welcome requirements for dynamic timeslot operation, for example for centralized schedule computation.

AOB ?

Thank you!