LPWAN WG

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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/lpwan
** Recordings and Minutes are public and may be subject to discovery in the event of litigation.
*** From the Webex login
Agenda bashing

16:00> Opening, agenda bashing (Chairs) [2min]
   • Note-Well, Blue Sheets, Scribes, Agenda Bashing
   • Approval minutes from last meeting

16:02> LPWAN Overview Presentation and Discussion (Stephen Farrel) [5min]
   • https://datatracker.ietf.org/doc/draft-ietf-lpwan-overview/

16:07> Static Context Header Compression for IPv6 and UDP (Ana, Laurent, Carles) [40min]
   • https://datatracker.ietf.org/doc/draft-ietf-lpwan-ipv6-static-context-hc/

16:47> LPWAN Static Context Header Compression (SCHC) for CoAP (Laurent) [10min]

16:57> AOB [QS]
Status

WG formed October 14th

• Charter item #1 (Informational document)
  – Baseline technology description

• Charter item #2 (Standards track document)
  – Enable the compression and fragmentation of a CoAP/UDP/IPv6 packet over LPWA networks
# Charter - Milestones

## Milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 2017</td>
<td>Submit CoAP compression mechanism to the IESG for publication as a Proposed Standard</td>
</tr>
<tr>
<td>May 2017</td>
<td>Submit IP/UDP compression and fragmentation mechanism to the IESG for publication as a Proposed Standard</td>
</tr>
<tr>
<td>Apr 2017</td>
<td>Submit LPWAN specification to the IESG for publication as an Informational Document</td>
</tr>
<tr>
<td>✔️</td>
<td>Adopt CoAP compression mechanism as a WG item</td>
</tr>
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</tr>
<tr>
<td>✔️</td>
<td>Adopt LPWAN specifications as WG item</td>
</tr>
</tbody>
</table>
Last meeting Action items

• JCZ, DD: Review IP/UDP drafts
• CB, MV: Review CoAP draft
• Ana: Post to the mailing list with the terms that we want confirmed
• Overview and SCHC/IP: post refresher
Upcoming IETF in Prague

• Meeting? Hope so!
• 2H?
LPWAN Overview

Editor: Stephen Farrell
(many contributors)
Wi-Sun Contribution

• Status?
  – Inputs from Bob and Paul

• From Stephen:
  – Text from WI-SUN received
  – Next revision to be done and submitted by Friday (May, 12th)
  – As close as possible for WGLC
  – Minor changes may be necessary though

• Timeline
  – Submit version for Friday
  – Have detailed review from WG until May, 24th
  – Modify and submit WGLC-ready version by May, 30th
LPWAN SCHC Compression
draft-ietf-lpwан-ipv6-static-context-hc-03

Authors:
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Carles Gomez <carlesgo@entel.upc.edu>
Compression Part:

• Updates from last meeting:
  – Vocabulary modifications:
    • Things or End-System (ES) => Device (DEV) waiting consensus ML
    • LPWAN Application Server (LA) => Application (APP)
    • Network Gateway (NG) => (NGW)
    • LPWAN Compressor (LC) => SCHC C/D
  – Changing CDF to CDA
    • As the MO is a function, the idea to make another function for C/D is confusing, so the C/DA will be an action after the MO function application.
  – To be clear: Field 1, field 2, etc are the Field ID
LPWAN SCHC Fragmentation
draft-ietf-lpwan-ipv6-static-context-hc-03

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Carles Gomez <carlesgo@entel.upc.edu>
Status

• Updates since the last interim (26\textsuperscript{th} April)

• Included in draft-ietf-lpwan-ipv6-static-context-hc-03
  – Along with most of the updates presented in the last interim

• Thanks for the feedback!
Frag header (Window mode)

• W bit
  – Same value for fragments of the same window (first, W=1)
  – Complemented for the next window
  – Avoid ambiguity in certain conditions

```
+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
\ | Rule ID | DTag | W | CFN |
+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
<--T--> 1 <--N-->
```

Added
### W bit: examples

<table>
<thead>
<tr>
<th>Sender</th>
<th>Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>W=1, CFN=6</td>
<td>W=1, CFN=6</td>
</tr>
<tr>
<td>W=1, CFN=5</td>
<td>W=1, CFN=5</td>
</tr>
<tr>
<td>W=1, CFN=4</td>
<td>W=1, CFN=4</td>
</tr>
<tr>
<td>W=1, CFN=3</td>
<td>W=1, CFN=3</td>
</tr>
<tr>
<td>W=1, CFN=2</td>
<td>W=1, CFN=2</td>
</tr>
<tr>
<td>W=1, CFN=1</td>
<td>W=1, CFN=1</td>
</tr>
<tr>
<td>W=1, CFN=0</td>
<td>W=1, CFN=0</td>
</tr>
<tr>
<td>ACK</td>
<td>no bitmap</td>
</tr>
<tr>
<td>W=0, CFN=6</td>
<td>W=1, CFN=4</td>
</tr>
<tr>
<td>W=0, CFN=5</td>
<td>W=1, CFN=2</td>
</tr>
<tr>
<td>W=0, CFN=4</td>
<td>W=1, CFN=1</td>
</tr>
<tr>
<td>W=0, CFN=7</td>
<td>MIC checked =&gt;</td>
</tr>
<tr>
<td>ACK</td>
<td>no bitmap</td>
</tr>
</tbody>
</table>

(End)
Frag header for retries (Packet mode)

• First transmission attempt

```
<- -------------- R -------------->
  <- T ->    <- N ->

  +----- ... ----+ ...  +--- ... +---
         | Rule ID   | DTag  | CFN |
         +----- ... ----+ ...  +--- ...
```

- Absolute Fragment Number
- Starts from 0, seq. increasing
- Size A may be greater than N

• Retransmitted fragment

```
<- -------------- R -------------->
  <- T ->    <- A ---->

  +----- ... ----+ ...  +--- ...
         | Rule ID   | DTag  | AFN |
         +----- ... ----+ ...  +--- ...
```
Retries (Packet mode): example

- Avoid ambiguity about resent frags in Packet modes

```
Sender                    Receiver
(AFN=0)  |--------CFN=6--------->|
(AFN=1)  |--------CFN=5--------->|
(AFN=2)  |--------CFN=4--------X--|
(AFN=3)  |--------CFN=3--------->|
(AFN=4)  |--------CFN=2--------X--|
(AFN=5)  |--------CFN=1--------->|
(AFN=6)  |--------CFN=0--------->|
(AFN=7)  |--------CFN=6--------->|
(AFN=8)  |--------CFN=5--------->|
(AFN=9)  |--------CFN=4--------X--|
|--------CFN=7--------->| MIC checked |
|<--------ACK----------| bitmap:110101110100001 |
|--------AFN=2--------->|
|--------AFN=4--------->|
|--------AFN=9--------->| MIC checked = > |
|<--------ACK----------| no bitmap |
(End)
```
Other updates

• Downlink fragment transmission
  – Receiver MAY perform an uplink transmission ASAP after reception of a downlink fragment (not the last one)
  – L2 ACK or upper layer triggered data unit transmission

• Timer names added
  – ‘ACK on Error Timer’
  – ‘ACK Always Timer’
Thanks!
Comments?

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Carles Gomez <carlesgo@entel.upc.edu>
LPWAN CoAP SCHC

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CoAP

• No more normative
• Description of CoAP fields compression
  – Work in progress…
• Read it!
• Questions on
  – Block / fragmentation
• Analysis of common exchanges
  – CoMi, LWM2M, IoTivity?
  – URI-path/Query not flexible: is it a problem?
• Definition of timers:
  – Impact in MID and Token size.
AOB ?