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: https://etherpad.tools.ietf.org/p/lpwan
** Recordings and Minutes are public and may be subject to discovery in the event of litigation.
*** From the Webex login
Agenda bashing

17:00 Opening, agenda bashing (Chairs)  10mn
   • Note-Well, Scribes, Agenda Bashing, Approval minutes from last meeting
   • Review todo
   • Status of drafts

17:10 LPWAN Overview - WGLC status and updates  5mn

17:15 Fragmentation optimization       (Laurent/Ana)  10mn

17:25 Finite State Machine Discussion (Laurent)  20mn

17:45 Update on adding a length field for rules (Arun)  5mn

17:50 Update on SCHC fragmentation (Carles)  10mn

17:xx AOB

Interim, September 26th, 2017
Last meeting Action items

• Chairs to book the meeting for IETF 100, 80 people, 2:30 Hours
• Alper to send an email to the list with proposed editorials
• Chairs to Ask Stephen to publish the doc with Alper's comment
• Arun to resend his mail asking for the length indication in the rule
• Chairs to ask the group to review the FSM in today's material posted on the IETF
# IETF 100

## Sessions - View (meeting: 100)

**Working Group Name:** IPv6 over Low Power Wide-Area Networks (lpwan)

**Area Name:** Internet Area

**Number of Sessions Requested:** 1

**Length of Session 1:** 2.5 Hours

**Number of Attendees:** 80

**Conflicts to Avoid:**

Other WGs that included IPv6 over Low Power Wide-Area Networks in their conflict list:
- dmm, intarea, homenet, curdle, babel, roll, trill, 6lo, cbor

**Resources requested:** *None so far*

**People who must be present:** *None*

**Special Requests:**

### Activities Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Action</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 12, 2017</td>
<td>09:49:05</td>
<td>New session was requested</td>
<td>Pascal Thubert</td>
</tr>
</tbody>
</table>
LPWAN Overview

Editor: Stephen Farrell
(many contributors)
WGLC status and updates

• Doc passed WGLC
• Got Alper’s edits
• Stephen to push out a new rev now
• Then chairs to shoot in the pub-req
SCHC

Fragmentation optimization

Authors:
Ana Minaburo <ana@ackl.io>
Laurent Toutain <laurent.toutain@imt-atlantique.fr>
Carles Gomez <carlesgo@entel.upc.edu>
Padding issue

- LPWAN is aligned on bytes
- SCHC ruleid/Dtag/W/LCN may break this alignment.

Interim, September 26th, 2017
All-x frag optimization

• All-x frag are used to request ack from receiver
  – In normal fragmentation process All-x should contain:
    • 1 byte for All-0 frag
    • MIC-size + 1 byte for All-1 frag
  – Sending empty ack for bitmap transmission:
    • All-0 frag (SCHC+pad [no data]) or
    • All-1 frag (SCHC+MIC+pad [no data])
      – Empty All-1 frag (SCHC+pad) is abort message.
Ack Optimization

• Bitmap structure:

```
  2  2
^ ^
N N
- -
2 3
```

```
+------------------------ 2^N -1 bits ------------------------------->
```

• Bitmap optimization:

```
| Byte | Byte | Byte | Byte | Byte |
```

```
SCHC
```

```
Known length
```

```
known length
```

```
Any length
```

```
10 01111111 11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000000 00000000
```

Does not work if errors are on the left bitmap part, but full received window can be compressed.

Impose always 1 Byte of bitmap: 0 Byte of bitmap => abort?
SCHC

Finite State Machine Discussion

Authors:
Ana Minaburo <ana@ackl.io>
Laurent Toutain <laurent.toutain@imt-atlantique.fr>
Carles Gomez <carlesgo@entel.upc.edu>
• Notation:
  • All-0 frag: all the bits of FCN are set to 0
  • All-1 frag: all the bits of FCN are set to 1
  • All-x frag: either All-0 or All-1 frag
SCHC

Update on adding a length field for rules

Authors:
Ana Minaburo <ana@ackl.io>
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Carles Gomez <carlesgo@entel.upc.edu>
proposals

• indicate the way how the length shall be derived;
  – variable
    • refer section 4.5, pg 12 of the draft-06.
  – static
    • C/D learns the length by other means.
proposals

• adding length column separately might increase the memory consumption significantly if there are many rules.

• Re-use MO (matching operator) column to specify the length
proposals

- MO: check_length alias ck_ln

<table>
<thead>
<tr>
<th>Field</th>
<th>TV</th>
<th>MO</th>
<th>CDF</th>
<th>dir</th>
<th>Sent</th>
</tr>
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<tr>
<td>CoAP version</td>
<td>01</td>
<td>equal</td>
<td>not-sent</td>
<td>bi</td>
<td>TT</td>
</tr>
<tr>
<td>CoAP Type</td>
<td>0</td>
<td>ignore</td>
<td>value-sent</td>
<td>bi</td>
<td>TT</td>
</tr>
<tr>
<td>CoAP TKL</td>
<td>0</td>
<td>equal</td>
<td>not-sent</td>
<td>bi</td>
<td>TT</td>
</tr>
<tr>
<td>CoAP Code</td>
<td>ML1</td>
<td>match-map</td>
<td>matching-sent</td>
<td>bi</td>
<td>CC</td>
</tr>
<tr>
<td>CoAP MID</td>
<td>0000</td>
<td>MSB(7)</td>
<td>LSB(9)</td>
<td>bi</td>
<td>M-ID</td>
</tr>
<tr>
<td>CoAP Uri-Path</td>
<td>path</td>
<td>ck_ln(4)</td>
<td>value-sent</td>
<td>down</td>
<td>PATH</td>
</tr>
</tbody>
</table>
proposals

• MO: check_length alias ck Ln
• Some questions:
  – ref: section 4.5.4, one can avoid specifying length in LSB function. How to handle it?
    • overload MO ck_len(x,y) ?  x=msb_val, y=actual_len
  – any approximate #rules for a lpwa device ?
    • to see if adding additional column would have significant impact on memory
Thanks!

Comments?
SCHC

Update on SCHC fragmentation

Authors:
Ana Minaburo <ana@ackl.io>
Laurent Toutain <laurent.toutain@imt-atlantique.fr>
Carles Gomez <carlesgo@entel.upc.edu>
Status

• Last version published is -06

• Further updates already available on GitHub:
Technical updates

• Recommended ACK Always timer to be reasonably short

• Window mode – ACK on error
  – Added MAX_FRAG_RETRIES
  – Discussed also in the Security Considerations section
Editorial updates

• Abstract
  – Minor improvement (fragmentation part)

• Merged sections 5.2 and 5.3
  – 5.2. Reliability options: definition
  – 5.3. Reliability options: discussion

• Added examples (Appendix B)
  – Window mode – ACK “always”
    • Last window behavior
Thanks!

Comments?

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Carles Gomez <carlesgo@entel.upc.edu>
AOB ?