LPWAN WG

WG Chairs:
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Pascal Thubert <pthubert@cisco.com>

AD: Eric Vyncke
<evyncke@cisco.com>
Note Well

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Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- BCP 9 (Internet Standards Process)
- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)

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Reminder:

Minutes are taken *
This meeting might be 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

[16:05] Administrivia [5min]
  o Note-Well, Scribes, Agenda Bashing
  o WG Status
[16:10] SCHC-over-LoRaWAN Update [30min]
[16:40] SCHC-over-Sigfox Update [10min]
[16:50] AOB [QS]
## WG Status

### Milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
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<tbody>
<tr>
<td>Jul 2021</td>
<td>Produce a Standards Track document to enable operations, administration and maintenance (OAM) to the LPWAN device, including support for delayed or proxied liveness verification (Ping)</td>
</tr>
<tr>
<td>Feb 2021</td>
<td>Produce a Standards Track document to define the generic data models to formalize the compression and fragmentation contexts for LPWANs</td>
</tr>
<tr>
<td>Dec 2020</td>
<td>Produce Standard Track documents to apply SCHC IPv6/UDP over the baseline technologies</td>
</tr>
<tr>
<td>May 2020</td>
<td>Perform SCHC Maintenance, including enabling SCHC mechanisms for Upper layer Protocols</td>
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Interims

Every two weeks, starting May 19th
16h-17h CEST

IETF 108 will be online

> Interims and online meetings will be the way ahead for the foreseeable future (IETF109…)

Interim Meeting, May 19th, 2020
# Documents advancement

<table>
<thead>
<tr>
<th>Active Internet-Drafts (5 hits)</th>
</tr>
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<tbody>
<tr>
<td><strong>draft-ietf-lpwan-coap-static-context-hc-13</strong></td>
</tr>
<tr>
<td><strong>LPWAN Static Context Header Compression (SCHC) for CoAP</strong></td>
</tr>
<tr>
<td><strong>draft-ietf-lpwan-schc-over-lorawan-07</strong></td>
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<tr>
<td><strong>Static Context Header Compression (SCHC) over LoRaWAN</strong></td>
</tr>
<tr>
<td><strong>draft-ietf-lpwan-schc-over-nbiot-02</strong></td>
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<tr>
<td><strong>SCHC over NB-IoT</strong></td>
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<tr>
<td><strong>draft-ietf-lpwan-schc-over-sigfox-02</strong></td>
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<tr>
<td><strong>SCHC over Sigfox LPWAN</strong></td>
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<tr>
<td><strong>draft-ietf-lpwan-schc-yang-data-model-02</strong></td>
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<tr>
<td><strong>Data Model for Static Context Header Compression (SCHC)</strong></td>
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<tr>
<th>Related Internet-Drafts (3 hits)</th>
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<tr>
<td><strong>draft-barthel-lpwan-oam-schc-01</strong></td>
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<tr>
<td><strong>OAM for LPWAN using Static Context Header Compression (SCHC)</strong></td>
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<tr>
<td><strong>draft-thubert-lpwan-command-reg-01</strong></td>
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<tr>
<td><strong>Command and Control Registry for SCHC</strong></td>
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<tr>
<td><strong>draft-thubert-lpwan-schc-over-ppp-00</strong></td>
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<td><strong>SCHC over PPP</strong></td>
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### Documents advancement

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<tr>
<th>Draft ID</th>
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<th>Pages</th>
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<td>draft-ietf-lpwan-coap-static-context-hc-13</td>
<td>LPWAN Static Context Header Compression (SCHC) for CoAP</td>
<td>2020-03-05</td>
<td>29</td>
<td>IESG Evaluation: Revised I-D Needed for 68 days</td>
<td>Pascal Thubert</td>
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<td>draft-ietf-lpwan-schc-over-lorawan-07</td>
<td>Static Context Header Compression (SCHC) over LoRaWAN</td>
<td>2020-04-17</td>
<td>25</td>
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<td>2020-05-17</td>
<td>25</td>
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<td>draft-ietf-lpwan-schc-over-sigfox-02</td>
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<td>Data Model for Static Context Header Compression (SCHC)</td>
<td>2020-02-28</td>
<td>34</td>
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<td>Suresh Krishnan</td>
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<td>draft-bartel-lpwan-oam-schc-01</td>
<td>OAM for LPWAN using Static Context Header Compression (SCHC)</td>
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<td>draft-thieme-schc-over-ethernet</td>
<td>Command Channel over Ethernet</td>
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</tbody>
</table>

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**Charter item:**

Produce a Standards Track document to enable operations, administration and maintenance (OAM) to the LPWAN device, including support for delayed or proxied liveness verification (Ping).
draft-ietf-lpwan-schc-over-lorawan

Editors:
Ivaylo Petrov (ivaylo@ackl.io)
Olivier Gimenez (ogimenez@semtech.com)

Interim meeting, May 19th, 2020
Upcoming changes in draft-008

- Add uplink All-1 example with last tile
- Fixed IID example
- Use RFC8376 terminology
- List all bitmap possibilities in SCHC ACK example
- Add payload to downlink All-1
- Fixed some nits
Use RFC8376 generic terminology or LoRaWAN?

<table>
<thead>
<tr>
<th>Function/Technology</th>
<th>LoRaWAN</th>
<th>NB-IoT</th>
<th>Sigfox</th>
<th>Wi-SUN</th>
<th>IETF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor, Actuator, device, object</td>
<td>End Device</td>
<td>User Equipment</td>
<td>End Point</td>
<td>Leaf Node</td>
<td>Device (DEV)</td>
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<td>Transceiver, Antenna</td>
<td>Gateway</td>
<td>Evolved Node B</td>
<td>Base Station</td>
<td>Router Node</td>
<td>Radio Gateway</td>
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<tr>
<td>Server</td>
<td>Network Server</td>
<td>PDN GW/ SCEF*</td>
<td>Service Center</td>
<td>Border Router</td>
<td>Network Gateway (NGW)</td>
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<td>Security Server</td>
<td>Join Server</td>
<td>Home Subscriber Server</td>
<td>Registration Authority Server</td>
<td>Authentic. Server</td>
<td>LoWAN-AAA Server</td>
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<tr>
<td>Application Server</td>
<td>Application Server</td>
<td>Network Application Server</td>
<td>Application Application (App)</td>
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</table>
DTAG

A LoRaWAN device cannot interleave several fragmented SCHC datagrams on the same FPort. This field is not used and its size is 0.

Note: The device can still have several parallel fragmentation sessions with one or more SCHC gateway(s) thanks to distinct sets of FPorts, cf Section 5.2

• **Question**: Should we write that there is implicit DTAG?
Retransmission timer

Retransmission timer: LoRaWAN end-devices MUST NOT implement a "retransmission timer", this changes the specification of [RFC8724], see Section 5.6.3.5. It must transmit MAX_ACK_REQUESTS time the SCHC ACK REQ at it own timing; i.e. the periodicity between retransmission of SCHC ACK REQs is device specific and can vary depending on other application uplinks and regulations.

Ack-on-Error (uplink): Conflicts with duty cycle, especially if it implements non SCHC traffic.

Ack-Always (downlink): Retransmission timer cannot be used with LoRaWAN class A device as the RX window is opened by the device
All-1 SCHC Fragment and SCHC Sender-Abort
ALL-0 SCHC Fragment and SCHC ACK REQ

RFC8724 All-1:  *This condition is also met if the SCHC Fragment Header is a multiple of L2 Words*

RFC8724 All-0:  *This condition is met if the RCS is present and is at least the size of an L2 Word*

**Question:** Those conditions are met in LoRaWAN profile. Should we explicitly write it?
RFC8724 – Appendix D

RFC8724 The profile may define a delay to be added after each SCHC message transmission for compliance with local regulations or other constraints imposed by the applications.

Question: Not used in LoRaWAN profile. Should we explicitly say it?
Thank you for your attention
draft-ietf-lpwan-schc-over-sigfox-02

&

PySCHC Implementation

Juan Carlos Zúñiga (Sigfox), Carles Gómez (U Catalunya), Laurent Toutain (IMT-Atlantique),

Diego Wistuba, Sandra Céspedes, Rodrigo Muñoz (U Chile)
Draft Status

• Last draft updates (rev 02)
  • SCHC parameters
  • Enhanced text descriptions
  • UL callback/API details
  • Structure of document
  • Terminology
  • References
UL Callback/API

• Draft now includes availability and SCHC usage of data and metadata from UL Device transmissions:
  • Device ID
  • Message Sequence Number
  • Message Payload
  • Message Timestamp
  • Device Geolocation
  • RSSI
  • Device Temperature
  • Device Battery Voltage
All-1 + Message Sequence usage

• SCHC receiver relying on Sigfox Sequence Number to detect potential missing fragments before receiving the All-1 fragment

• SCHC ACK Bitmap constructed based on information from received fragments + Sequence Number
PySCHC Network Architecture

• PySCHC SW
• Pycom
• Sigfox Network
• Google Cloud *

* [https://cloud.google.com/community/tutorials/sigfox-gw](https://cloud.google.com/community/tutorials/sigfox-gw)
PySCHC SW Architecture

• SCHC Fragmenter: **ACK-on-Error**

• SCHC Profile: **Sigfox**

• Dev platform: **Pycom (LoPy4)**

• App platform: **Google Cloud**
Next Steps

• Keep advancing on PySCHC implementation to fine-tune parameters:
  • Timers
  • Rules
  • DTag

• Interoperability tests between PySCHC and other implementations should also help fine-tuning protocol parameters
  • Planned for upcoming IETF Hackathons:
    • IETF Vancouver,
    • IETF Madrid
    • IETF Bangkok?
AOB ?