draft-toutain-6lo-6lo-and-SCHC-00

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<table>
<thead>
<tr>
<th><strong>LPWAN technologies</strong></th>
<th><strong>6LoWPAN/6Lo wireless technologies</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LoRaWAN</strong></td>
<td><strong>IEEE 802.15.4</strong></td>
</tr>
<tr>
<td><strong>Sigfox</strong></td>
<td><strong>Various:</strong></td>
</tr>
<tr>
<td><strong>NB-IoT</strong></td>
<td><strong>416 (min), 2200 (max)</strong></td>
</tr>
<tr>
<td><strong>Type of band</strong></td>
<td><strong>Unlicensed</strong></td>
</tr>
<tr>
<td><strong>Modulation</strong></td>
<td><strong>CSS</strong></td>
</tr>
<tr>
<td><strong>Frequency band(s) (MHz)</strong></td>
<td><strong>868 (EU), 915 (US), 783 (China)</strong></td>
</tr>
<tr>
<td><strong>Receiver sensitivity (dBm)</strong></td>
<td><strong>-137 (typical)</strong></td>
</tr>
<tr>
<td><strong>PHY layer data rate (kbit/s)</strong></td>
<td><strong>0.25 – 5.47 (EU), 50 (optional)</strong></td>
</tr>
<tr>
<td><strong>Message rate constraints</strong></td>
<td><strong>Duty cycle &lt; 1% (EU, China)</strong></td>
</tr>
<tr>
<td><strong>Capacity per device (order of magnitude, in bit/s)</strong></td>
<td><strong>10^7 (DR0, EU), 10^8 (DR5, EU)</strong></td>
</tr>
<tr>
<td><strong>MAC mechanism</strong></td>
<td><strong>Aloha-based (optional ACKs + retries)</strong></td>
</tr>
<tr>
<td><strong>Maximum frame payload size (bytes)</strong></td>
<td><strong>11 (DR0, USA) = 242 (worldwide)</strong></td>
</tr>
<tr>
<td><strong>Fragmentation and reassembly</strong></td>
<td><strong>No</strong></td>
</tr>
<tr>
<td><strong>Network topology</strong></td>
<td><strong>Star</strong></td>
</tr>
<tr>
<td><strong>Standards Development, Organization</strong></td>
<td><strong>LoRa Alliance (company)</strong></td>
</tr>
</tbody>
</table>

SCHC C/D & F/R
3 deliverables in one draft

- Spec. of a Header Compression engine (**Section 7**)
  - Generic engine, uses Static Context (→ SCHC)

- Specification of a fragmentation protocol (**Section 8**)
  - Has 3 different “modes” described in this draft
  - The different modes address different requirements

- Spec. of simple UDP/IPv6 compression (**Section 10**)
  - Using this SCHC engine
Other related drafts

• Canonical representation of context
• Apply SCHC compression to upper-layer protocols
  – For example, CoAP/UDP/IPv6
• Apply SCHC fragmentation to underlying networks
  – For example, Sigfox, LoRaWAN®
Uncompressed header

Card 1
Header
description

rule

context

Rule id

Card 12 [compressed header]

Residue

Card 1
Header
description

+ remaining data

Uncompressed header
6lo and SCHC

• Context
  – 6lo: no state for C/D, rules are known by construction
  – SCHC: no state for C/D, rules must be known by both ends (called context)
6lo and SCHC

• Bitmap and Rule ID:
  – 6lo: A fixed size bitmap gives the compression behavior and residues
  – SCHC: The rule ID has no semantic, its size is variable
    • more frequent compression schemes may have smaller sizes
6lo and SCHC

- Compression / Decompression functions:
  - Both: Send/Elided/Mapping/Compute
  - SCHC: MSB/LSB, (+extensible)

- C/D Behavior:
  - 6lo: fixed in the RFC
  - SCHC: Rules define the behavior.
SCHC in meshed 6lo?

• SCHC offers a generic field description tool:
  – Size, position, direction,
  – An extendable compression/decompression mechanism.

• 6lo and SCHC are complementary solutions
  – It is time to look at them together.