draft-ietf-lpwan-ipv6-static-context-hc-22

Authors:
Laurent Toutain <Laurent.Toutain@imt-atlantique.fr>
Carles Gomez <carlesgo@entel.upc.edu>
Ana Minaburo <ana@ackl.io>
Dominique Barthel <dominique.barthel@orange.com>
Juan Carlos Zuniga <JuanCarlos.Zuniga@sigfox.com>
Presentation agenda

• What is this draft about?
• What has happened since IETF105?
• What is coming up next?
• Changes since -21
What is this draft about?
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 exemple, CoAP/UDP/IPv6
- Apply SCHC fragmentation to underlying networks
  - For exemple, Sigfox, LoRaWAN
What has happened since IETF105?
What has happened since IETF105?

- On IESG telechat agenda Aug 22\textsuperscript{nd}
- Many IESG reviews received right before Aug 22\textsuperscript{nd}
  - 3 DISCUSSes, now all cleared
- Thanks to all the reviewers
  Deborah Brungard, Brian Carpenter, Alissa Cooper,
  Roman Danyliw, Benjamin Kaduk, Mirja Kühlewind,
  Barry Leiba, Alexey Melnikov, Alvaro Retana,
  Adam Roach, Joseph Salowey, Éric Vyncke
- Text rework Aug 20\textsuperscript{th} – Nov 2\textsuperscript{nd}
  - 36 commits, 354 lines added and 176 deleted (out of ~3000 lines)
  - Got approval of most reviewers, DISCUSSes cleared
What is coming up next?
What is coming up next?

• Push into RFC Editor queue today
• Communicate/educate about SCHC
• Continue the OpenSCHC development
• Evaluate performance, applicability
Current uses of SCHC (1/2)

- IETF drafts
  - OSCORE/CoAP/UDP/IPv6 compression with SCHC,
  - SCHC-over-Sigfox, SCHC-over-LoRaWAN, SCHC-over-NB-IoT
- Demos
  - DLMS/UDP/IPv6 over LoRaWAN
  - CoAP/UDP/IPv6 compression over LoRaWAN
  - CoAP header compression over LTE-m
  - SSH over LoRaWAN
- Under evaluation
  - IPSec ESP header compression
Current uses of SCHC (2/2)

- **Implementations**
  - OpenSCHC (Python3), [https://github.com/openschc/openschc](https://github.com/openschc/openschc)
  - Acklio (3),
  - Universidad de Chile (pycom),
  - RIOT (tentative)

- **Scientific papers**
  - C. Gomez et al., *IPv6 over LPWANs: connecting Low Power Wide Area Networks to the Internet (of Things)*, IEEE Wireless Communications Magazine, 17 pages, 2019. ([accepted for publication](https://ieeexplore.ieee.org/document/9000000))
  - …
Changes since -21

https://github.com/lp-wan/ip-compression/compare/draft-21...draft-22
Functional

• Fixed mistake in description of Ack-Always algorithm
  – Thanks Benjamin Kaduk for spotting this!

• Rewrote Appendix F to say that ACK-Always and ACK-on-Error require bidirectional links
  – Left it to schc-over-foo drafts to say how bidirectionality is achieved on quasi-bidirectional links
Security Considerations

• Major rewrite (again)
• Added more cases
  – Compressed packet size leaking secret information in packet
  – Decompressed packet different from original packet
  – Fragmentation as a way to bypass firewalls
  – Potential privacy issue with DTag
• Thanks to Roman Danyliw, Benjamin Kaduk, Joseph Salowey
Editorial (1/2)

• Ref to RFC 8376 made normative
• Fixed use of RFC 2119 language
  – mostly OPTIONAL
• Fixed reference to CRC32
• Referenced all Appendices from the text
Editorial (2/2)

- Improved definition of scope for RuleID
- Improved description of compression and decompression algorithms
- Mentioned match of multiple compression rules
- Improved bit ordering specification
- Removed recommendation that DTag be a counter
- Clarified what is optional per profile vs. at runtime
- Included case of under-resourced receiver
- Rewrote IPv6 Flow Label field compression recommendations
Thank you for your attention