

Transmission of SCHC-compressed packets over IEEE 802.15.4 networks

`draft-ietf-6lo-schc-15dot4-12`

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Main goal

```
+-----+
| CoAP, other |
+-----+
| UDP, other  |
+-----+
|   IPv6     |
+-----+
| 6LoWPAN HC |
+-----+
|6LoWPAN Frag|
+-----+
|  802.15.4  |
+-----+
```

Traditional

```
+-----+
| CoAP, other |
+-----+
| UDP, other  |
+-----+
|   IPv6     |
+-----+
|  SCHC HC   |
+-----+
|6LoWPAN Frag|
+-----+
|  802.15.4  |
+-----+
```

<-- NEW

SCHC-based

SCHC (RFC 8724) exploits a priori knowledge of header field values

Status

- WG adoption
 - draft-ietf-6lo-schc-15dot4-00
 - In January 2023
- Version -12
 - Various improvements after Esko Dijk's review (many thanks!)
 - Technical, editorial and presentation/format
 - Aligned with the more stable new terminology from draft-ietf-schc-architecture-05

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- Stable structure
 - No new section

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2.2. Background on previous specifications

- RFC 6775 defines the term 6LoWPAN Node (6LN)
 - “Any host or router participating in a LoWPAN”
- In RFC 9008, a 6LN is constrained to only leaf node
 - In this draft, we had adopted the same approach, for RPL-related content (TRO)
 - However, it is too constraining considering the whole document
- Removed the paragraph in 2.2 constraining the use of 6LN to leaf node

3.5. Multihop communication (I/II)

- There exist hybrid solutions combining features of Route-Over and Mesh-Under
 - Such solutions MAY use functionality defined in this document for multihop communication as appropriate
- Clarification on example scenarios
 - Rules are shown only for IPv6 (or + upper layers) C/D
 - Additional SCHC Strata can also be used, will need corresponding Rules to be stored as well
 - Not shown in the figures for clarity

3.5. Multihop communication (II/II)

- Clarification on example scenarios (continued)
 - Routers shown do not generate application-layer messages
 - In real scenarios, nodes acting as routers might also act as hosts, e.g. generating application-layer messages
 - Not shown in the figures for clarity
 - Such nodes will need to support also the functionality for hosts
- Routers **MAY** use SCHC C/D for the transmission of control-plane or management-plane messages
 - They need to store Rules, and use single-hop or multihop transmission procedures accordingly
 - SCHC C/D has been defined for some protocols atop IPv6:
 - UDP (RFC 8724), CoAP (RFC 8824, 8824-bis in progress)
 - ICMPv6 (in progress), QUIC (in progress)

4.3. PRO (I/II)

- Destination Context Identifier (DCI)
 - Added: If a network comprises SCHC-only and 6LoWPAN-only nodes for C/D, the prefix context to be used for both types of nodes SHOULD be the same
- Allow routers have access to ECN bits
 - The Bit pointer gives the starting position of **Traffic Class, followed by** the Hop Limit and the IPv6 destination address in the SCHC residue of the SCHC-compressed IPv6 header (in bits) [...]
 - SRO and PRO support ECN-capable routers

4.3. PRO (II/II)

- Address Length → Address Residue Length
- Indicates the size of the IPv6 destination address residue (in bits)
- The possible values encoded by this field range from 0 to 127
 - Not enough to represent from 0 to 128 bits!
 - Tentative: value 127 is used when the IPv6 destination address residue size is either 127 bits or 128 bits

Terminology

- Aligned the draft with the more stable new terms in the SCHC architecture draft
 - draf-ietf-schc-architecture-05
 - New terms:
 - SCHC Stratum Header → SCHC Control Header
 - SCHC Payload → SCHC Data
 - SCHC Packet → SCHC Datagram
- Ongoing discussion on other SCHC architecture terms and concepts
 - A design team has been formed in the SCHC WG

Next steps

- Sort out the last details about PRO
- Continue monitoring the progress of draft-ietf-schc-architecture
- Reviews and implementation feedback are welcome!
 - Approaching WGLC ?

Comments/Questions?

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