

Transmission of SCHC-compressed packets over IEEE 802.15.4 networks

`draft-ietf-6lo-schc-15dot4-05`

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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
 - Same content as draft-gomez-6lo-schc-15dot4-05
 - In January 2023

- **Version -05**
 - RuleID reuse
 - Several updates to (and due to) PRO
 - Review and suggestions by Georgios
 - Discussed in the SCHC WG interim of February 20th, 2024
 - Other, minor updates

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- No change since -04

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1. Introduction

- Added:
 - Mechanism to provide the SCHC header compression context in an IEEE 802.15.4 network is out of the scope of this document
 - Align with SCHC WG work
 - Same text also added in Section 3.2 (“Network topologies”)

3.4. Multihop communication (I/IV)

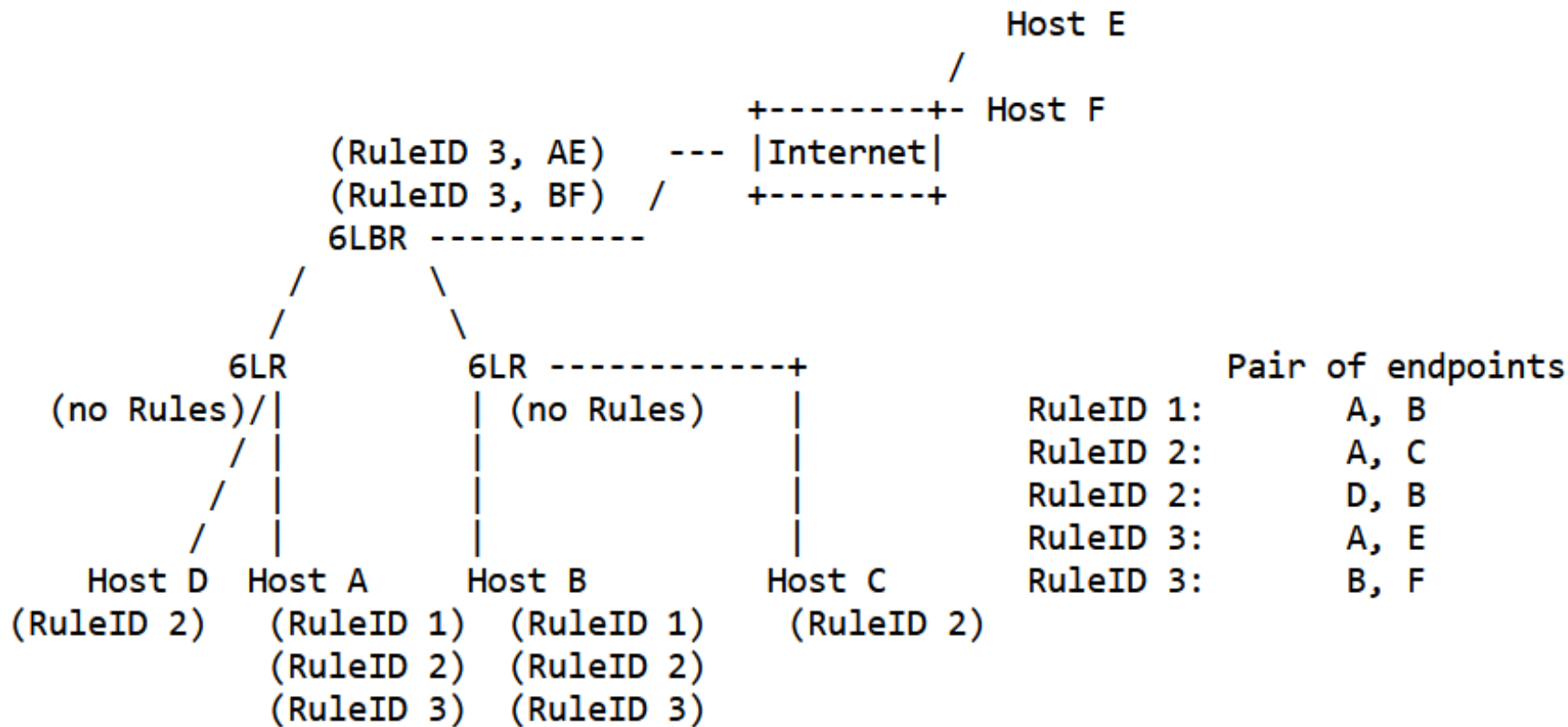
- RuleID reuse
 - SRO:
 - A RuleID MUST NOT be reused across disjoint pairs of endpoints
 - TRO:
 - If all 6LNs in the 6LoWPAN network are RALs, a RuleID MAY be reused across disjoint pairs of endpoints, to identify different Rules
 - Else, RuleIDs MUST NOT be reused across disjoint pairs of endpoints

3.4. Multihop communication (II/IV)

- RuleID reuse
 - PRO:
 - In PRO, a RuleID MAY be reused across disjoint pairs of endpoints
 - To identify different Rules used by such disjoint pairs of endpoints, the endpoint nodes need to use an additional identifier
 - » This identifier may be an IPv6 address or a SCHC Header session ID

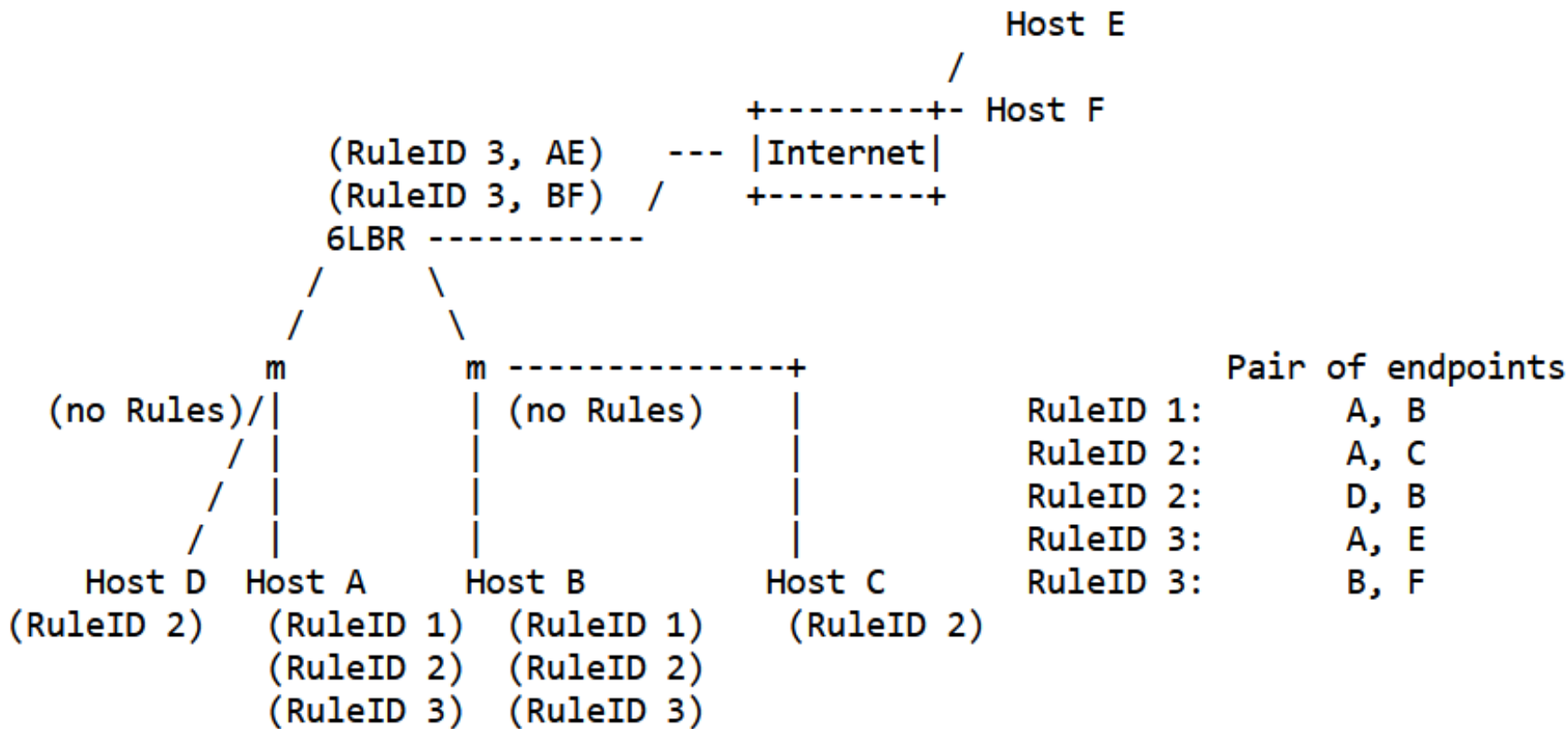
3.4. Multihop communication (III/IV)

- RuleID reuse
 - PRO updated example:
 - RuleID 2 and RuleID 3 are reused



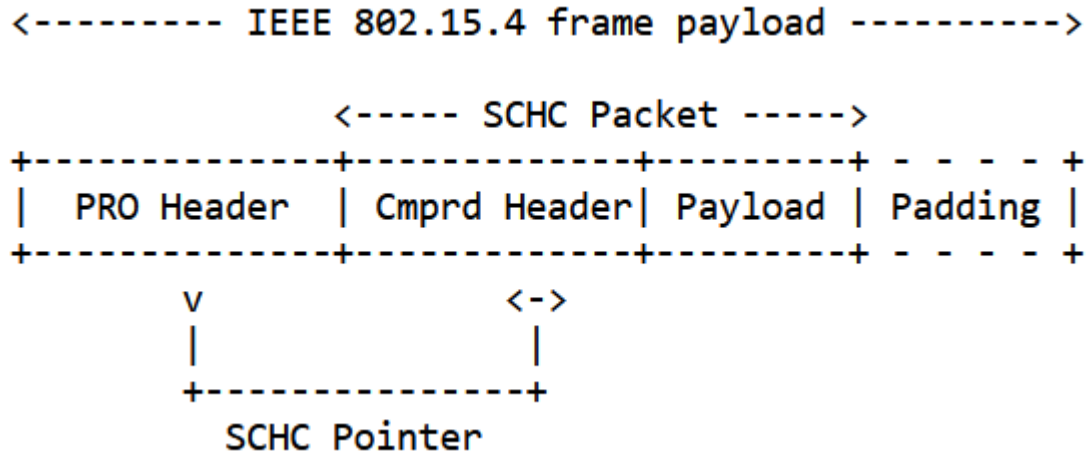
3.4. Multihop communication (IV/IV)

- RuleID reuse
 - Mesh-under, added example:
 - RuleID 2 and RuleID 3 are reused

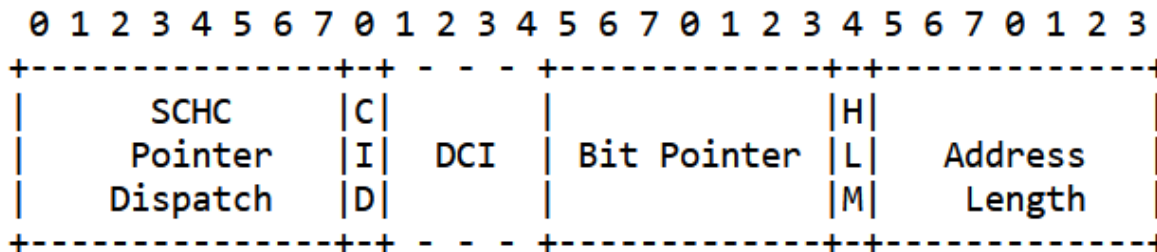


3.4.3. PRO frame format (I/III)

- NEW:
 - PRO frame format

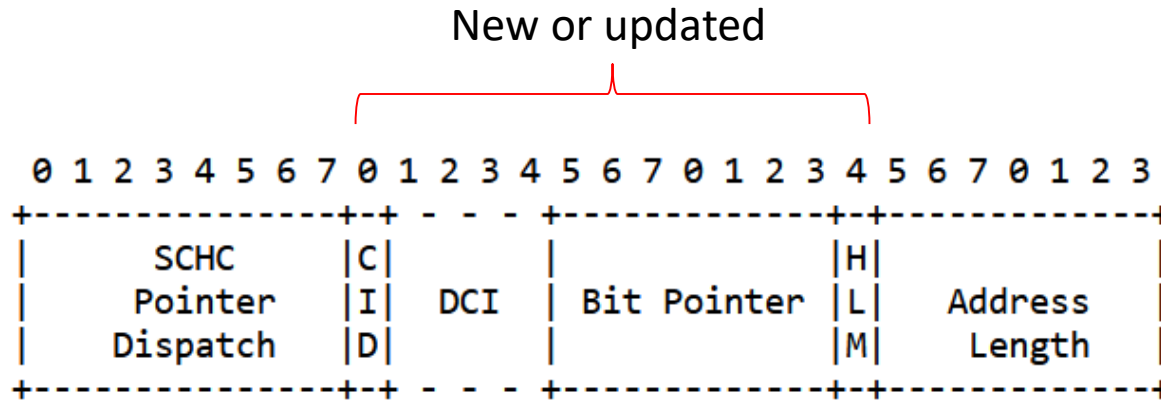


- PRO Header



3.4.3. PRO frame format (II/III)

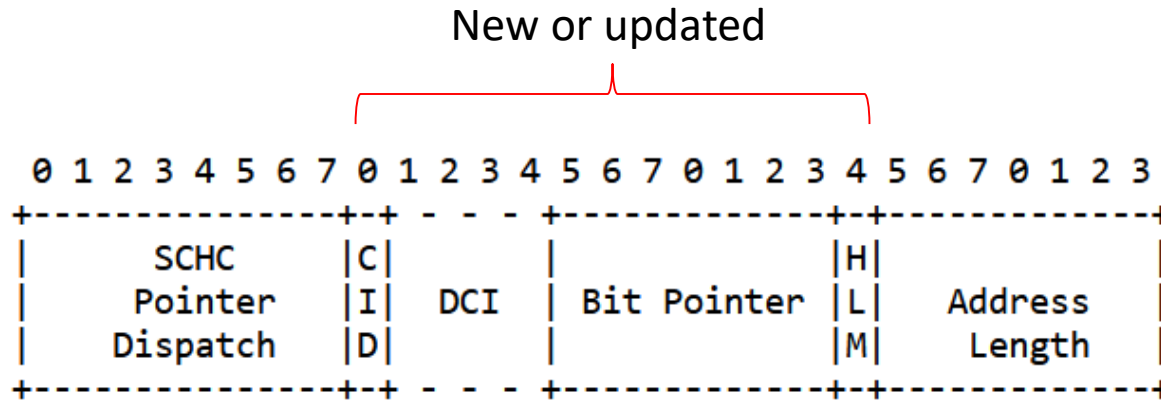
- NEW:



- Context Identifier (CID)
 - Signal the presence (or not) of the optional DCI
- Destination Context Identifier (DCI)
 - Identifies prefix of the IPv6 destination address
 - » Similar to RFC 6282
 - » How this context is distributed and maintained is out of the scope

3.4.3. PRO frame format (III/III)

- NEW:



- Bit Pointer
 - Starting position of Hop Limit and IPv6 destination address residue in the SCHC-compressed IPv6 header
- HLM
 - If set to 0, Hop Limit field is compressed to its 4 LSBs
 - If set to 1, Hop Limit field is not compressed

6.1. Compression of IPv6 and UDP headers

- RFC 8724:
 - "In a Rule, the Field Descriptors are listed in the order in which the fields appear in the packet header"
- Update RFC 8724:
 - "[...] in PRO, the Field Descriptors of the IPv6 destination address (i.e., IPv6 DevPrefix and IPv6 DevIID) MUST appear before the Field Descriptors of the IPv6 source address (i.e., IPv6 AppPrefix and IPv6 AppIID)"
 - The rest of fields appear in the same order as in the IPv6 packet header
- In PRO, one Rule MUST be defined for each direction between the two involved C/D endpoints
 - In such a Rule, the destination endpoint takes the "Dev" role

6.1.1. Compression of IPv6 addresses

- RFC 8724:
 - "If the Rule is intended to compress packets with different prefix values, match-mapping SHOULD be used"
 - "If several IIDs are possible, then the TV contains the list of possible IIDs, the MO is set to "match-mapping" and the CDA is set to "mapping-sent "
- Update RFC 8724:
 - In PRO, a source node MUST NOT use the match-mapping operator or the "mapping-sent" CDA to compress the IPv6 destination address prefix or IID
 - 6LRs do not store SCHC context, and therefore do not know the match-mapping index meaning

Comments/Questions?

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