Static Context Header Compression (SCHC)

draft-toutain-6lpwa-ipv6-static-context-hc-01
draft-toutain-lpwan-yang-static-context-hc-00

Laurent Toutain - Ana Minaburo

Laurent.Toutain@telecom-bretagne.eu
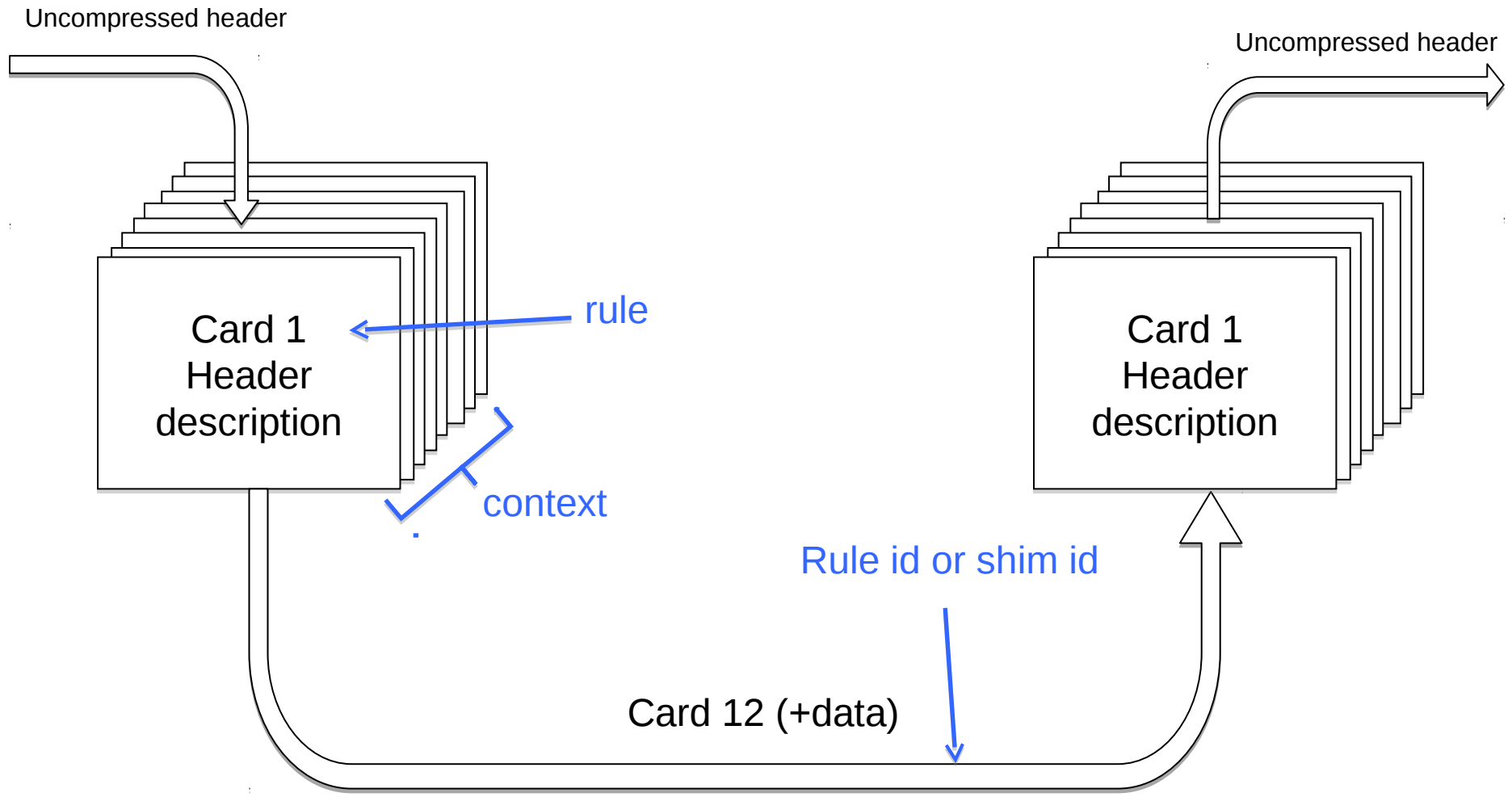ana@ackl.io

IETF 96 - Berlin

Advantages of RoHC and 6Lo(WPAN)

- RoHC: flexible, field description
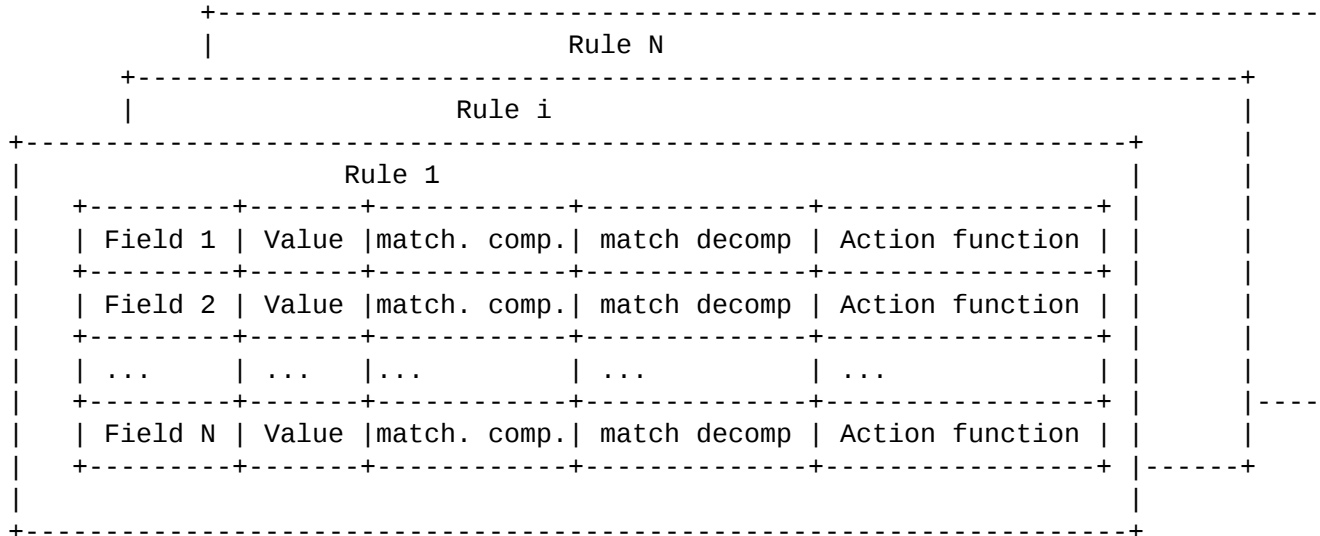- 6Lo(WPAN): IPv6 address compression

Context:
- Efficient compression
- Adapted to LP-WAN architecture:
  – Star topology
  – Nodes with predictable traffic

Static Context Header Compression

Uncompressed header

Uncompressed header

Card 1
Header
description

rule

context

.

Card 1
Header
description

Rule id or shim id

Card 12 (+data)

Context

```
          +------------------------------------------------------------------+
          |                          Rule N                                  |
      +------------------------------------------------------------------+   |
      |                          Rule i                              |   |   |
  +------------------------------------------------------------------+   |   |
  |                         Rule 1                               |   |   |   |
  |   +---------+-------+-----------+-------------+----------------+ |   |   |
  |   | Field 1 | Value |match. comp.| match decomp | Action function | |   |   |
  |   +---------+-------+-----------+-------------+----------------+ |   |   |
  |   | Field 2 | Value |match. comp.| match decomp | Action function | |   |   |
  |   +---------+-------+-----------+-------------+----------------+ |   |   |
  |   | ...     | ...   |...        | ...          | ...           | |   |   |
  |   +---------+-------+-----------+-------------+----------------+ |   |---+
  |   | Field N | Value |match. comp.| match decomp | Action function | |   |
  |   +---------+-------+-----------+-------------+----------------+ |------+
  |                                                              |
  +------------------------------------------------------------------+
```

Fields : uncompressed packet, compressed packet, other

Context

```
/-------------------+------------+---------------------------\
| Function          | Compression | Decompression            |
|                   |            |                           |
+-------------------+------------+---------------------------+
|elided             |not sent    |use value stored in ctxt   |
|send-value         |send        |build field from value     |
|compute-IPv6-length|elided      |compute IPv6 length        |
|compute-UDP-length |elided      |compute UDP length         |
|compute-UDP-checksum|elided     |compute UDP checksum       |
|ESiid-DID          |elided      |build IID from L2 ES addr  |
|LCiid-DID          |elided      |build IID from L2 LA addr  |
\-------------------+------------+---------------------------/
```

Static Context Header Compression

End System   LPWAN Radio   LPWAN Gateway   LPWAN Application

Static Context Header Compression

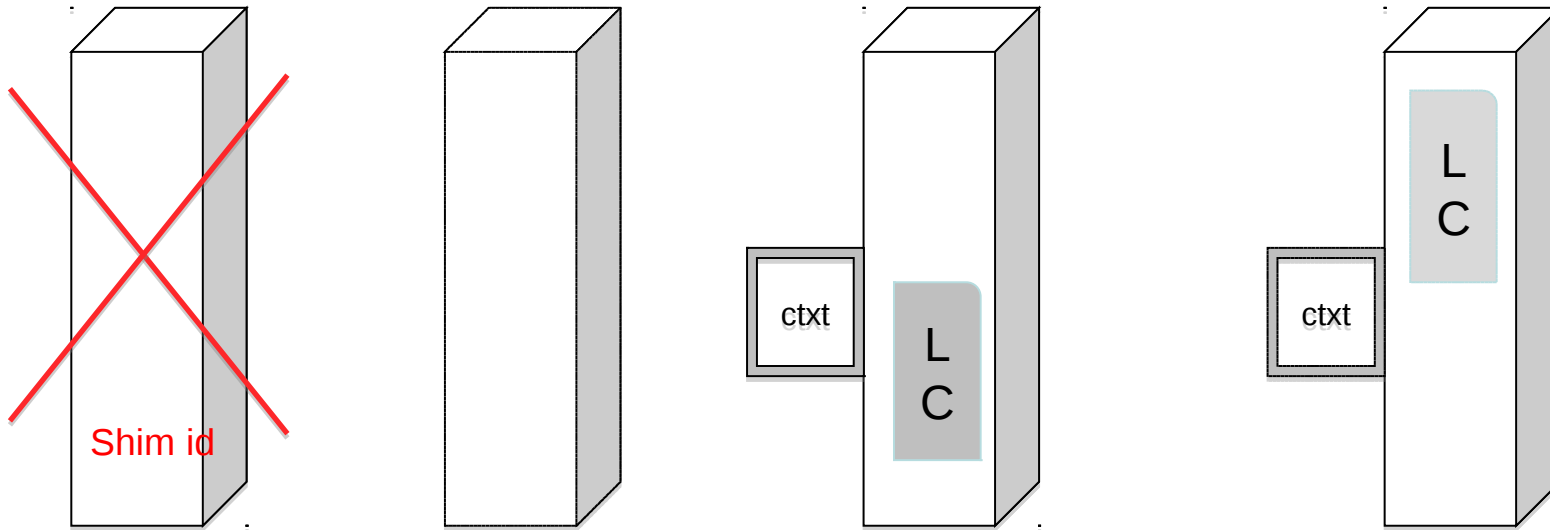End System   LPWAN Radio   LPWAN Gateway   LPWAN Application

Shim id

ctxt

L
C

ctxt

L
C
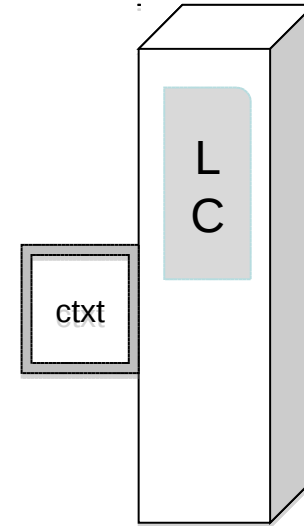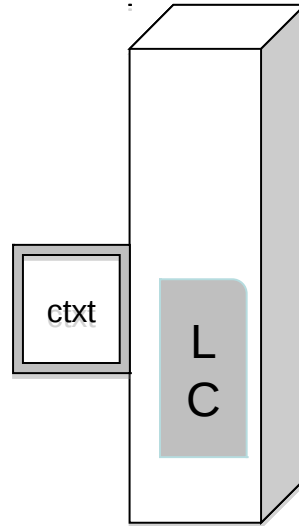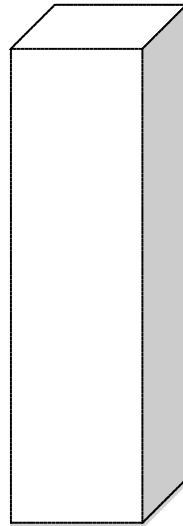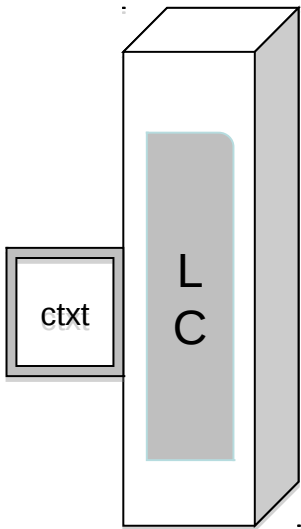
Be used for legacy applications
Optimization: Out of scope for IETF
-need to reconstruct IPv6 and ULP for forwarding and authentication

Static Context Header Compression

- Static: Values do not evolve during transmission:
  - IPv6/UDP have only static values
  - CoAP can also be compressed:
    - More complex: asymmetric compression

Yang model for SCHC

```
+--rw generic-rules
|   +--rw context-name?                      string
|   +--rw context-rules* [rule-id]
|      +--rw rule-name?                       string
|      +--rw rule-id                          int8
|      +--rw rule-fields* [field-pos]
|         +--rw field-name?                    string
|         +--rw field-pos                      int8
|         +--rw field-value?                   LPWA-types
|         +--rw field-compression-match
|         |   +--rw operator?                  enumeration
|         |   +--rw (operator-lsb)?
|         |      +--:(lsb-length)
|         |         +--rw lsb-length?          LPWA-types
|         +--rw field-decompression-match
|         |   +--rw operator?                  enumeration
|         |   +--rw (operator-lsb)?
|         |      +--:(lsb-length)
|         |         +--rw lsb-length?          LPWA-types
|         +--rw action-function?              LPWA-action-functions
```
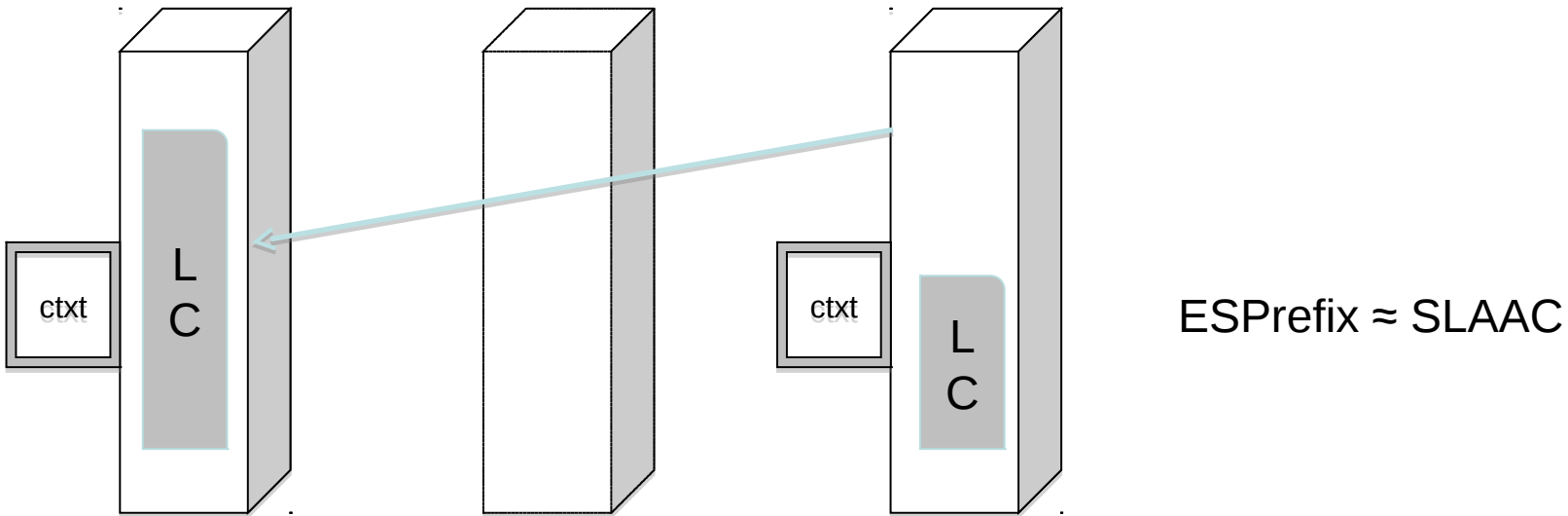
With CoMI/CoOL

End System   LPWAN Radio   LPWAN Gateway

ESPrefix ≈ SLAAC

```
iPATCH /c Content-Format(application/cool-value-pairs+cbor)
  [
    [field-SID, rule-id, field-pos], value
  ]
```