draft-ietf-lpwan-schc-yang-data-model-07

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Model

- Draft: -07
- Yang Model: ietf-schc@2022-02-15.yang
- Covers RFC8724 and RFC8824
  - Rule definition (Compression/Fragmentation/No Compression)
  - Identifiers (FID, MO, CDA, Frag parameters,...)
  - Compound-ack and OAM augment the model
Model

module: ietf-schc
  +-rw schc
    |   +-rw rule* [rule-id-value rule-id-length]
    |     |   +-rw rule-id-value       uint32
    |     |   +-rw rule-id-length      uint8
    |     |   +-rw (nature)?
    |     |     |   +-:(fragmentation) {fragmentation}?
    |     |     |     |   +-rw fragmentation-mode    schc:fragmentation-mode-type
    |     |     |     |   +-rw l2-word-size?         uint8
    |     |     |     |   +-rw direction              schc:di-type
    |     |     |     |   +-rw dtag-size?             uint8
    |     |     |     |   +-rw w-size?                uint8
    |     |     |     |   +-rw fcn-size               uint8
    |     |     |     |   +-rw rcs-algorithm?        rcs-algorithm-type
    |     |     |     |   +-rw maximum-packet-size?  uint16
    |     |     |     |   +-rw window-size?           uint16
    |     |     |     |   +-rw max-interleaved-frames? uint8
    |     |     |     |   +-rw inactivity-timer?      uint64
    |     |     |     |   +-rw retransmission-timer?  uint64
    |     |     |     |   +-rw max-ack-requests?      uint8
    |     |     |     |   +-rw (mode)?
    |     |     |     |     |   +-:(no-ack)
    |     |     |     |     |   +-:(ack-always)
    |     |     |     |     |   +-:(ack-on-error)
    |     |     |     |   |   +-rw tile-size?            uint8
    |     |     |     |   |   +-rw tile-in-All1?         schc:all1-data-type
    |     |     |     |   |   +-rw ack-behavior?         schc:ack-behavior-type
    |     |     |     |   |   +-:(compression) {compression}?
    |     |     |     |   |   |   +-rw entry* [field-id field-position direction-indicator]
    |     |     |     |   |     |     |   +-rw field-id              schc:fid-type
    |     |     |     |   |     |     |   +-rw field-length           schc:fl-type
    |     |     |     |   |     |     |   +-rw field-position         uint8
    |     |     |     |   |     |     |   +-rw direction-indicator   schc:di-type
    |     |     |     |   |     |     |   +-rw target-value* [position]
    |     |     |     |   |     |     |   |   +-rw value?                 binary
    |     |     |     |   |     |     |   |   +-rw position              uint16
    |     |     |     |   |     |     |   +-rw matching-operator     schc:mo-type
    |     |     |     |   |     |     |   +-rw matching-operator-value* [position]
    |     |     |     |   |     |     |   |   |   +-rw value?                 binary
    |     |     |     |   |     |     |   |   |   +-rw position              uint16
    |     |     |     |   |     |     |   +-rw comp-decomp-action     schc:cda-type
    |     |     |     |   |     |     |   +-rw comp-decomp-action-value* [position]
    |     |     |     |   |     |     |   |   |   +-rw value?                 binary
    |     |     |     |   |     |     |   |   |   +-rw position              uint16
    |     |     |     |   |     |     |   +-:(no-compression)
Changes

- Dominique review:
  - Change some names to be closer to RFC8724
  - Max simultaneous frag: max-interleaved-frames

- Add some conditions for fragmentation parameter regarding the mode.
Hackathon results

- Implement JSON model:
  - Checked with yangson

```
<table>
<thead>
<tr>
<th>Rule 6/3</th>
<th>110</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV6.VER</td>
<td>4</td>
</tr>
<tr>
<td>IPV6.TC</td>
<td>8</td>
</tr>
<tr>
<td>IPV6.FC</td>
<td>20</td>
</tr>
<tr>
<td>IPV6.LEN</td>
<td>16</td>
</tr>
<tr>
<td>IPV6.NXT</td>
<td>8</td>
</tr>
<tr>
<td>IPV6.HOP_LMT</td>
<td>8</td>
</tr>
<tr>
<td>IPV6.DEV_PREFIX</td>
<td>64</td>
</tr>
<tr>
<td>IPV6.DEV_IID</td>
<td>64</td>
</tr>
<tr>
<td>IPV6.APP_PREFIX</td>
<td>64</td>
</tr>
<tr>
<td>IPV6.APP_IID</td>
<td>64</td>
</tr>
</tbody>
</table>
```

LPWAN IETF 113
JSON representation

```
{"ietf-schc:schc": {"rule": [{"comp-decomp-action": 'cda-not-sent',
  "direction-indicator": 'di-bidirectional',
  "field-id": 'fid-ipv6-version',
  "field-length": '4',
  "field-position": 1,
  "matching-operator": 'mo-equal',
  "target-value": [{"position": 0,
    "value": b'AA='}]],
{"comp-decomp-action": 'cda-not-sent',
  "direction-indicator": 'di-bidirectional',
  "field-id": 'fid-ipv6-trafficclass',
  "field-length": '8',
  "field-position": 1,
  "matching-operator": 'mo-equal',
  "target-value": [{"position": 0,
    "value": b'AA='}],
...
  "matching-operator": 'mo-ignore'}}],
"rule-id-length": '3',
"rule-id-value": '6'},
{"direction": 'di-up',
"dtag-size": '2',
"fcn-size": '3',
"fragmentation-mode": 'fragmentation-mode-no-ack',
"rcs-algorithm": 'rcs-RFC8724',
"rule-id-length": '11',
"rule-id-value": '12']}
```

~ 2500 Bytes
CBOR representation

```
b'a11a000186faa10182a3058aa7061a000186e407040801051a000186b3091a000186f2011a000186b00d81a2010024106a7061a000186e107080801051a000186b3091a000186f2011a000186b00d81a20100240a7061a000186dd07140801051a000186b3091a000186f3011a000186b00d81a20100240a6061a000186e07100801051a000186b3091a000186f3011a000186aca7061a000186f07080801051a000186b3091a000186f2011a000186b00d81a201002413aa7061a000186de07080801051a000186b3091a000186f3011a000186b00d81a20100241ffaa7061a000186dc07400801051a000186b3091a000186f2011a000186b00d81a20100248200104701f2101d2a7061a000186db07400801051a000186b3091a000186f2011a000186b00d81a201002480000000000000001a6061a000186d907400801051a000186b3091a000186f3011a000186b1a6061a000186d807400801051a000186b3091a000186f3011a000186b1181f06181e03a7181f0c181e0b031a000186b5181c1a000186f604021503161a000186f0'
```

~ 400 Bytes

LPWAN IETF 113
CBOR representation (diagnostic)

```
{100090: {1:
    [[5:
        [{6: 100068, 7: 4, 8: 1, 5: 100019, 9: 100082, 1: 100016, 13: [{1: 0, 2: h'06'}]},
         {6: 100065, 7: 8, 8: 1, 5: 100019, 9: 100082, 1: 100016, 13: [{1: 0, 2: h'}]},
         {6: 100061, 7: 20, 8: 1, 5: 100019, 9: 100083, 1: 100016, 13: [{1: 0, 2: h'2'}]},
         {6: 100064, 7: 16, 8: 1, 5: 100019, 9: 100083, 1: 100012},
         {6: 100063, 7: 8, 8: 1, 5: 100019, 9: 100082, 1: 100016, 13: [{1: 0, 2: h'3A'}]},
         {6: 100062, 7: 8, 8: 1, 5: 100019, 9: 100083, 1: 100016, 13: [{1: 0, 2: h'FF'}]},
         {6: 100060, 7: h'', 8: 1, 5: 100019, 9: 100082, 1: 100016, 13: [{1: 0, 2: h'200104701F2101D2'}]},
         {6: 100059, 7: h'', 8: 1, 5: 100019, 9: 100082, 1: 100016, 13: [{1: 0, 2: h'0000000000000001'}]},
         {6: 100057, 7: h'', 8: 1, 5: 100019, 9: 100083, 1: 100017}],
    31: 6,
    30: 3},

    {31: 12,
     30: 11,
     3: 100021,
     28: 100086,
     4: 2,
     21: 3,
     22: 100080}
}
```

Impact of SID size mainly on identifiers