

LPWAN WG

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[BCP 9](#) (Internet Standards Process)

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[BCP 25](#) (Anti-Harassment Procedures)

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Presence is logged ***

- * Scribe; please contribute online to the minutes at: <https://etherpad.tools.ietf.org/p/lpwan>
- ** Recordings and Minutes are public and may be subject to discovery in the event of litigation.
- *** From the Webex login

Agenda bashing

- [16:05] Administrivia [5min]
 - o Note_Well, Scribes, Agenda Bashing
 - o Status of drafts

- [16:10] Last updates of SCHC IP/UDP (Dominique) [15min]
- [16:25] SCHC YANG Data Model (Laurent) [25min]
- [16:50] AOB [10min]

WG progress

Milestones

Date	↕ Milestone
Done	Submit CoAP compression mechanism to the IESG for publication as a Proposed Standard
Done	Submit IP/UDP compression and fragmentation mechanism to the IESG for publication as a Proposed Standard
Done	Submit LPWAN specification to the IESG for publication as an Informational Document
Done	Adopt CoAP compression mechanism as a WG item
Done	Adopt IP/UDP compression and fragmentation mechanism as a WG item
Done	Adopt LPWAN specifications as WG item

Document advancement

Document	Date	Status	IPR	AD / Shepherd
Active Internet-Drafts (5 hits)				
draft-ietf-lpwan-coap-static-context-hc-12 LPWAN Static Context Header Compression (SCHC) for CoAP	2019-12-10 28 pages	AD Evaluation for 75 days Submitted to IESG for Publication:Proposed Standard Reviews: iotdir		Suresh Krishnan Pascal Thubert
draft-ietf-lpwan-ipv6-static-context-hc-24 Static Context Header Compression (SCHC) and fragmentation for LPWAN, application to UDP/IPv6	2019-12-05 83 pages	RFC Ed Queue : EDIT for 28 days Submitted to IESG for Publication:Proposed Standard Reviews: genart, intdir, opsdire, secdir		Suresh Krishnan Pascal Thubert
draft-ietf-lpwan-schc-over-lorawan-05 Static Context Header Compression (SCHC) over LoRaWAN	2019-12-20 24 pages	I-D Exists WG Document		
draft-ietf-lpwan-schc-over-nbiot-01 SCHC over NB-IoT	2019-11-16 22 pages	I-D Exists WG Document		
draft-ietf-lpwan-schc-over-sigfox-01 SCHC over Sigfox LPWAN	2019-11-04 10 pages	I-D Exists WG Document		
Related Internet-Drafts (5 hits)				
draft-thubert-lpwan-schc-over-ppp-00 SCHC over PPP	2019-12-03 5 pages	I-D Exists		

Interim, January 8th, 2020

SCHC yang data model

Ana Minaburo
Laurent Toutain

LPWAN Interim meeting 01/08/20

Yang data model

- Divided into 2 parts:
 - SCHC-ID : contains definition of types and identifier used in SCHC
 - Field-id id, MO id, CDA id
 - Type definitions for these fields
 - SCHC : defines the context model for compression and fragmentation
- Merged together when the model will be stable.

schc-id.yang

```
identity field-id-base-type {
    description "Field ID with SID";
}

identity fid-ipv6-version {
    base field-id-base-type;
    description "IPv6 version field from RFC8200";
}

identity fid-ipv6-trafficclass {
    base field-id-base-type;
    description "IPv6 Traffic Class field from RFC8200";
}

identity fid-ipv6-trafficclass-ds {
    base field-id-base-type;
    description "IPv6 Traffic Class field from RFC8200,
    DiffServ field from RFC3168";
}

identity fid-ipv6-trafficclass-ecn {
    base field-id-base-type;
    description "IPv6 Traffic Class field from RFC8200,
    ECN field from RFC3168";
}
```

```
typedef field-id-type {
    description "Field ID generic type.";
    type identityref {
        base field-id-base-type;
    }
}
```



SID	Assigned to		
10000	identity /compression-decompression-action-base-type	10037	identity /field-id-base-type/ fid-coap-option-uri-port
10001	identity /compression-decompression-action-base-type/cda-appiid	10038	identity /field-id-base-type/ fid-coap-option-uri-query
10002	identity /compression-decompression-action-base-type/cda-compute-checksum	10039	identity /field-id-base-type/ fid-coap-tkl
10003	identity /compression-decompression-action-base-type/cda-compute-length	10040	identity /field-id-base-type/ fid-coap-token
10004	identity /compression-decompression-action-base-type/cda-deviid	10041	identity /field-id-base-type/ fid-coap-type
10005	identity /compression-decompression-action-base-type/cda-lsb	10042	identity /field-id-base-type/ fid-coap-version
10006	identity /compression-decompression-action-base-type/cda-mapping-sent	10043	identity /field-id-base-type/ fid-ipv6-appiid
10007	identity /compression-decompression-action-base-type/cda-not-sent	10044	identity /field-id-base-type/ fid-ipv6-appprefix
10008	identity /compression-decompression-action-base-type/cda-value-sent	10045	identity /field-id-base-type/ fid-ipv6-deviid
10009	identity /direction-indicator-base-type	10046	identity /field-id-base-type/ fid-ipv6-devprefix
10010	identity /direction-indicator-base-type/di-bidirectional	10047	identity /field-id-base-type/ fid-ipv6-flowlabel
10011	identity /direction-indicator-base-type/di-down	10048	identity /field-id-base-type/ fid-ipv6-hoplimit
10012	identity /direction-indicator-base-type/di-up	10049	identity /field-id-base-type/ fid-ipv6-nexthead
10013	identity /field-id-base-type	10050	identity /field-id-base-type/ fid-ipv6-payloadlength
10014	identity /field-id-base-type/ fid-coap-code	10051	identity /field-id-base-type/ fid-ipv6-trafficclass
10015	identity /field-id-base-type/ fid-coap-code-class	10052	identity /field-id-base-type/ fid-ipv6-trafficclass-ds
10016	identity /field-id-base-type/ fid-coap-code-detail	10053	identity /field-id-base-type/ fid-ipv6-trafficclass-ec
10017	identity /field-id-base-type/ fid-coap-mid	10054	identity /field-id-base-type/ fid-ipv6-version
10018	identity /field-id-base-type/ fid-coap-option-accept	10055	identity /field-id-base-type/ fid-udp-app-port
10019	identity /field-id-base-type/ fid-coap-option-block1	10056	identity /field-id-base-type/ fid-udp-checksum
10020	identity /field-id-base-type/ fid-coap-option-block2	10057	identity /field-id-base-type/ fid-udp-dev-port
10021	identity /field-id-base-type/ fid-coap-option-content-format	10058	identity /field-id-base-type/ fid-udp-length
10022	identity /field-id-base-type/ fid-coap-option-end-option	10059	identity /field-length-base-type
10023	identity /field-id-base-type/ fid-coap-option-etag	10060	identity /field-length-base-type/ fl-token-length
10024	identity /field-id-base-type/ fid-coap-option-if-match	10061	identity /field-length-base-type/ fl-variable
10025	identity /field-id-base-type/ fid-coap-option-if-none-match	10062	identity /matching-operator-base-type
10026	identity /field-id-base-type/ fid-coap-option-location-path	10063	identity /matching-operator-base-type/ mo-equal
10027	identity /field-id-base-type/ fid-coap-option-location-query	10064	identity /matching-operator-base-type/ mo-ignore
10028	identity /field-id-base-type/ fid-coap-option-max-age	10065	identity /matching-operator-base-type/ mo-matching
10029	identity /field-id-base-type/ fid-coap-option-no-response	10066	identity /matching-operator-base-type/ mo-msb
10030	identity /field-id-base-type/ fid-coap-option-observe		
10031	identity /field-id-base-type/ fid-coap-option-proxy-scheme		
10032	identity /field-id-base-type/ fid-coap-option-proxy-uri		
10033	identity /field-id-base-type/ fid-coap-option-size1		
10034	identity /field-id-base-type/ fid-coap-option-size2		
10035	identity /field-id-base-type/ fid-coap-option-uri-host		
10036	identity /field-id-base-type/ fid-coap-option-uri-path		

Questions - CoAP identityref

- Do you agree to divide fields into sub-fields (coap-code-class, coap-code-detail,...) ?
- CoAP option naming space:
 - Carsten proposes to reserve the whole space to link the option repository to the id
 - How can we do that in Yang ?
 - What size we reserve ?
 - Largest one in IANA : 2053 OCF-Content-Format-Version [[Michael Koster](#)]

0-255 IETF Review or IESG Approval

256-2047 Specification Required

2048-64999 Expert Review

65000-65535 Experimental use (no operational use)

- LT: may be a waste of space, what procedure when new option created ?
- CoAP End Option (0xFF) is treated as an option
 - Conflict if Core uses this value for a specific option.

SCHC model

```
module: schc
  +--rw schc
    +--rw version?   uint64
    +--rw rule* [rule-id rule-length]
    +--rw rule-id           uint32
    +--rw rule-length       rule-length-type
    +--rw (nature)?
      +--:(fragmentation)
      | +--rw dtagsize?      uint8
      | +--rw wsize?        uint8
      | +--rw fcsize?       uint8
      | +--rw (mode)?
      |   +--:(no-ack)
      |   +--:(ack-always)
      |   +--:(ack-on-error)
      |   +--rw ack-method?  enumeration
```

```
+--:(compression)
+--rw entry* [field-id field-position direction-indicator]
+--rw field-id           schc-id:field-id-type
+--rw field-length?      schc-id:field-length-type
+--rw field-position     int8
+--rw direction-indicator schc-id:direction-indicator-type
+--rw target-values* [position]
| +--rw numerical?      uint64
| +--rw string?        string
| +--rw position        uint8
+--rw mo?                schc-id:matching-operator-type
+--rw mo-value* [position]
| +--rw numerical?      uint64
| +--rw string?        string
| +--rw position        uint8
+--rw cda?                schc-id:cda-type
+--rw cda-value* [position]
  +--rw numerical?      uint64
  +--rw string?        string
  +--rw position        uint8
```

Open questions - a version number ?

- Added a version for the context
 - Can be useful to check version between a device and core
 - Not a key to simplify queries (don't recopy version in each query)
 - How to structure the version number ? a int or int.int.int ? a identityref ?

Open questions - fragmentation TBD

- Fragmentation is not defined here
 - Use openSCHC table ?
 - How to implement profile (technology dependant)
 - What are the technologies (SF, LoRaWAN DRx, NB-IoT, ...)

Open questions (Compression)

- Target value:
 - Generalization of the matching-list
 - If a single value has position 0
 - Pos + value:
 - value : int64 or string
 - Can be only a number (for compactness representation)
 - Int64 can be too small (i.e. IPv6 address)
 - Yang uses strings for 128 bit identifiers
 - No bit arrays in yang data types

```
grouping target-values-struct {  
  leaf numerical {  
    type uint64;  
  }  
  leaf string {  
    type string;  
  }  
  leaf position {  
    type uint8;  
  }  
}
```

Open Questions (Compression)

- MO and CDA have an argument entry:
 - Currently no usage for CDA
 - Structured as a TV
 - Several arguments
 - Limitation is one argument is also a list of arguments.
 - Who cares ?

LPWAN interim LoRaWAN IID

08/01/2020

Olivier Gimenez

Current IID proposition

1. $\text{key} = \text{LoRaWAN AppSKey}$
2. $\text{cmac} = \text{aes128_cmac}(\text{key}, \text{devEui})$
3. $\text{IID} = \text{cmac}[0..7]$

Potential issue: LoRa Alliance might refuse to reuse AppSKey

Other proposition

- Based on RFC7217 where the IID is "stable for each subnet":
- $RID = F(\text{Prefix}, \text{Net_Iface}, \text{Network_ID}, \text{DAD_Counter}, \text{secret_key})$, where `Net_Iface` can be `DevEUI` and `Network_ID` the LoRaWAN netid.
- How `secret_key` is setup ?
- Potential issue: will not change over time

AOB ?