LPWAN WG

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*** From the Webex login

Agenda bashing

[16:05] Administrivia [5min]
- Note_Well, Scribes, Agenda Bashing
- 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, opsdir, 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

draft-ietf-lpwan-ipv6-static-context-hc status

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What has happened since IETF106?

- IETF106 LPWAN meeting on Nov 19th
- Issued -23 on Nov 28th
  - Several editorial improvements
  - App. A compression rules example update
- Carsten provided a second review, Nov 29th, on -23
  - About 60 comments/questions/edits
  - Thanks a lot, Carsten !
  - We responded to all points

What has happened since IETF106?

- Issued -24 on Dec 5th, lots of editorial improvements and also
  - Multiple compression Rules matching
  - Better use of RECOMMENDED in Integrity Checking
  - Better MUST about differentiating All-0 Fragment and ACK REQ
  - Better MUST about differentiating All-1 Fragment and Sender Abort
  - Clarified lifetime of DTag in ACK-Always/ACK-on-Error receiver
  - Clarified Attempts counter in ACK-Always receiver
  - Privacy-providing tunnel assumption in Security Considerations
- -24 approved by Suresh
- Released to RFC Editors on Dec 11th

Conclusions, next steps

- Worked hard to write a good enough specification
  - Functional
  - Efficient
  - Unambiguous
  - Understandable
  - While being mindful of elapsed time and risks associated with being late
- Now put to the test
  - schc-over-foo drafts being written, questions/comments by authors
  - Questions by implementers

Thank you!

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

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 fcnsize?         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
    - Ie 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 ?

AOB ?