Session Initiation and Rule exchange

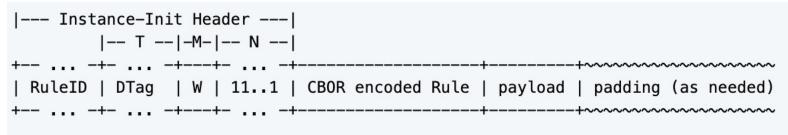Authors:
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Session Initiation and Rule Exchange

- The objective is to discuss the following new idea:
  - A new message to start the SCHC Instance and performed Rule exchange.
- It can be of interest for new use cases and O&M.
- Two options have been identified.

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Session Initiation and Rule Exchange

- Option 1
  - Special message called SCHC Instance-Init Message.
  - Can be a special case from the reserved SCHC messages (like the SCHC Sender-Abort).
  - Application payload can be optional.

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Session Initiation and Rule Exchange

- SCHC Instance-Init Message
  - Instance Rule is encoded using CBOR.
  - CBOR encoded Rule is generated according to the Yang Model, Sid files and CORECONF.
  - Instance Rule may include only updated information or the complete Rule.

```
|--- Instance-Init Header ---|
        |-- T --|-M-|-- N --|
+-- ... -+- ... -+--+- ... -+----------------+---------+~~~~~~~~~~~~~~~~~~~~~
| RuleID | DTag  | W | 11..1 | CBOR encoded Rule | payload | padding (as needed)
+-- ... -+- ... -+--+- ... -+----------------+---------+~~~~~~~~~~~~~~~~~~~~~
```

draft …

Option 1 Example

```
Sender                Receiver
  |-----Instance-Init--->| Configure Rules for Session (Decompression Rule)
  |-----W=0, FCN=6 ----->|
  |-----W=0, FCN=5 ----->|
  |-----W=0, FCN=4 ----->|
  |-----W=0, FCN=3 ----->|
  |-----W=0, FCN=2 --X-->|
  |-----W=0, FCN=1 ----->|
  |-----W=0, FCN=0 ----->| Bitmap: 1111011
(no ACK)
  |-----W=1, FCN=6 ----->|
  |-----W=1, FCN=5 ----->|
  |-----W=1, FCN=4 ----->|
  |-----W=1, FCN=3 ----->|
  |-----W=1, FCN=2 ----->|
  |-----W=1, FCN=1 --X-->|
  |-- W=1, FCN=7 + RCS ->| Integrity check: failure
  |<--- Compound ACK ----| [C=0, W=0 – Bitmap:1111011,
  |-----W=0, FCN=2 ----->|        W=1 – Bitmap:1111101]
  |-----W=1, FCN=1 ----->| Integrity check: success
  |<--- ACK, W=1, C=1 ---| C=1
 (End)
```

- ACK-on-Error Mode.
- SCHC Instance is started with a SCHC Instance Message.
- Receiver uses the received Rules for Decompression.

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Session Initiation and Rule Exchange

- Option 2
  - In ACK-on-Error mode, the first SCHC fragment sent is always numbered W=0, FCN=2^N -2.
  - This fragment can contain the Rule for current Instance.
  - Rule is encoded in CBOR as in option 1.

```
|-- SCHC Fragment Header ----|
        |-- T --|-M-|-- N --|
+-- ... -+- ... -+--+- ... -+-----------------+-------...------+~~~~~~~~~~~~~~~~~~~
| RuleID | DTag  | W | 2^N-2 | CBOR encoded Rule | Fragment Payload | padding (as needed)
+-- ... -+- ... -+--+- ... -+-----------------+-------...------+~~~~~~~~~~~~~~~~~~~
```

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Option 2 Example

```
Sender                Receiver
   |-----W=0, FCN=6 ----->| Configure Rules for Session (Decompression Rule)
   |-----W=0, FCN=5 ----->|
   |-----W=0, FCN=4 ----->|
   |-----W=0, FCN=3 ----->|
   |-----W=0, FCN=2 --X-->|
   |-----W=0, FCN=1 ----->|
   |-----W=0, FCN=0 ----->| Bitmap: 1111011
(no ACK – no DL enable)
   |-----W=1, FCN=6 ----->|
   |-----W=1, FCN=5 ----->|
   |-----W=1, FCN=4 ----->|
   |-----W=1, FCN=3 ----->|
   |-----W=1, FCN=2 ----->|
   |-----W=1, FCN=1 --X-->|
   |-- W=1, FCN=7 + RCS ->| Integrity check: failure
   |<--- Compound ACK ----| [C=0, W=0 – Bitmap:1111011,
   |-----W=0, FCN=2 ----->|       W=1 – Bitmap:1111101]
   |-----W=1, FCN=1 ----->| Integrity check: success
   |<--- ACK, W=1, C=1 ---| C=1
 (End)
```

- The first SCHC Fragment carries the Rules for current Instance
- Receiver uses the received Rules for Decompression.

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Conclusions

- Rules can be exchanged at the start of each SCHC Instance.
- Rules can be encoded in CBOR for exchange. Rule updates can also be exchanged.
- Security implications must be addressed (e.g., changing destination IP).
- Security can be enforced with the Yang Model (SCHC Access Control).
- Other messages like SCHC Rules Update Message can be generated to direct rule exchange.

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Thanks!
Questions or Comments

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SCHC Update-Rules Message

- Specific message for Rules exchange and update

```
              Sender                              Receiver
              device A                            device B
                    |----- Update-Rules Message A ----->| Configure Rules
Configure Rules     |<---- Update-Rules Message B ------|
```

```
|---  Update-Rules Header ---|
         |-- T --|-M-|-- N --|
+-- ... -+- ... -+---+- ... -+-----------------+~~~~~~~~~~~~~~~~~~~~
| RuleID | DTag  | W | 11..1 | CBOR encoded Rule | padding (as needed)
+-- ... -+- ... -+---+- ... -+-----------------+~~~~~~~~~~~~~~~~~~~~
```

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