Session Initiation and Rule exchange

Authors:
Sergio Aguilar Romero <Sergio.Aguilar.romero@upc.edu>
Carles Gomez <carles.gomez@upc.edu>
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.
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.
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) |
|-- ... +-- ... +----- ... +------------------------------------------------------------------|
Option 1 Example

- ACK-on-Error Mode.
- SCHC Instance is started with a SCHC Instance Message.
- Receiver uses the received Rules for Decompression.
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) |
 ++ ... +- ... +++++ ... +-------------------------+-------------------------+-------------------------|
```
### Option 2 Example

<table>
<thead>
<tr>
<th>Sender</th>
<th>Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>(W=0, FCN=6) (\rightarrow) Configure Rules for Session (Decompression Rule)</td>
<td></td>
</tr>
<tr>
<td>(W=0, FCN=5) (\rightarrow)</td>
<td></td>
</tr>
<tr>
<td>(W=0, FCN=4) (\rightarrow)</td>
<td></td>
</tr>
<tr>
<td>(W=0, FCN=3) (\rightarrow)</td>
<td></td>
</tr>
<tr>
<td>(W=0, FCN=2) (\rightarrow)</td>
<td></td>
</tr>
<tr>
<td>(W=0, FCN=1) (\rightarrow)</td>
<td></td>
</tr>
<tr>
<td>(W=0, FCN=0) (\rightarrow) Bitmap: 1111011</td>
<td></td>
</tr>
</tbody>
</table>

(no ACK - no DL enable)

| \(W=1, FCN=6\) \(\rightarrow\)                                             |
| \(W=1, FCN=5\) \(\rightarrow\)                                             |
| \(W=1, FCN=4\) \(\rightarrow\)                                             |
| \(W=1, FCN=3\) \(\rightarrow\)                                             |
| \(W=1, FCN=2\) \(\rightarrow\)                                             |
| \(W=1, FCN=1\) \(\rightarrow\)                                             |

\(- W=1, FCN=7 + RCS \rightarrow\) Integrity check: failure

\(- Compound ACK \rightarrow [C=0, W=0 - Bitmap:1111011, \ W=1 - Bitmap:1111011]\)

\(- W=1, FCN=1 \rightarrow\) Integrity check: success

\(- ACK, W=1, C=1 \rightarrow C=1\)

---

- The first SCHC Fragment carries the Rules for current Instance
- Receiver uses the received Rules for Decompression.
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.
Thanks!
Questions or Comments

Authors:
Sergio Aguilar Romero <Sergio.Aguilar.romero@upc.edu>
Carles Gomez <carles.gomez@upc.edu>
SCHC Update-Rules Message

- Specific message for Rules exchange and update

Sender device A

Configure Rules

|------ Update-Rules Message A ------->| Configure Rules

Receiver device B

|<------ Update-Rules Message B ------|

Sender device A

|--- Update-Rules Header ----|

|--- T ---| M ---| N ---|

--- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ... --- ...

--- RuleID | DTag | W | 11..1 | CBOR encoded Rule | padding (as needed)