Profiling EDHOC for CoAP and OSCORE
~~Combining EDHOC and OSCORE~~

draft-ietf-core-oscore-edhoc-02

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Recap

- **EDHOC: lightweight authenticated key exchange developed in the LAKE WG**
  - Main use case: keying OSCORE for establishing a Security Context
  - Normal workflow: two round-trips, before starting to use OSCORE

- **Original contribution of this draft**
  - Optimized combination of EDHOC (run over CoAP) with OSCORE
  - EDHOC message_3 combined with the first OSCORE-protected request
    - A single EDHOC + OSCORE request, transporting both
  - Achieved minimum number of round trips to run EDHOC and use OSCORE

Update since IETF 111

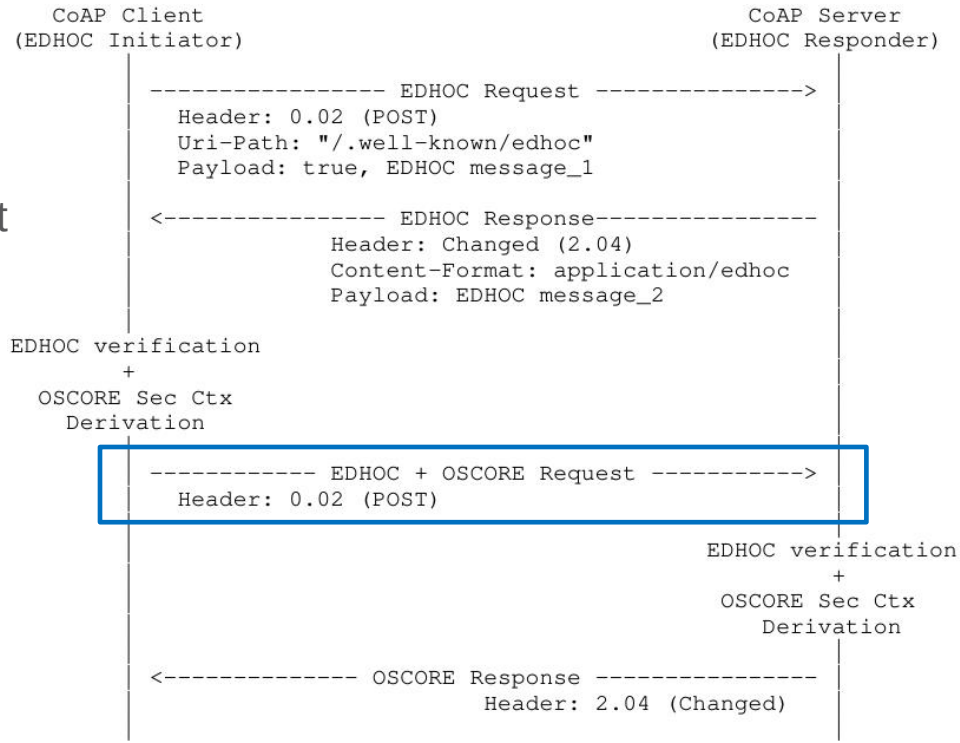
- **Agreed at IETF 111 to broaden the document scope**
  - Define CoRE-specific optimizations/features that are too specific for LAKE
  - New scope: profile the use of EDHOC for CoAP and OSCORE

- **What is covered now**
  - EDHOC + OSCORE request
  - Efficient conversion from OSCORE identifiers to EDHOC identifiers
  - Extension and consistency of EDHOC applicability statement
  - Web linking

- **Broader scope reflected in new title/abstract/introduction/TOC**

EDHOC + OSCORE request

- **Now aligned to EDHOC v -12**
  - "true" not part of EDHOC message_1
  - C_R not part of EDHOC message_3
  - Consistent (non-)use of Content-Format
  - Updated client and server processing
  - …
- **"EDHOC" CoAP Option number 21**
  - Requested for early IANA allocation in the CoAP Option Numbers registry
  - Not confirmed yet



OSCORE ID → EDHOC ID

- **Conversion method from OSCORE Sender/Recipient IDs to EDHOC IDs**
  - Was an appendix; now revised and part of the document body
- **Two "equivalent" EDHOC IDs exist for each OSCORE ID (CBOR *int* or *bstr*)**
  - This method deterministically picks either the *int* or the *bstr* EDHOC identifier
    - Required for the EDHOC+OSCORE request, as including an OSCORE Sender ID
    - Performance advantage: the selected EDHOC identifier is the smallest of the two
- **MUST use if:**
  - The server supports the EDHOC + OSCORE request;

  AND/OR
  - Explicitly indicated to use, e.g., in the applicability statement

If used → Additional EDHOC message processing to ensure that the peers comply

EDHOC applicability statement

- **It defines how client and server can use EDHOC**
  - Here extended with more information elements and consistency rules
- **If the server supports the EDHOC + OSCORE request …**
  - SHOULD indicate the support
  - SHOULD indicate the new ID conversion method (and no other method is admitted)
  - MUST NOT indicate that EDHOC message_4 shall be sent
- **Otherwise …**
  - MAY indicate the ID conversion method to use by both peers
  - If none is indicated, each peer independently uses any preferred method

Web linking

- **The EDHOC draft defines the resource type rt="core.edhoc"**
  - It can be used to discover EDHOC resources at the server
- **This draft defines target attributes for a link with rt=core.edhoc**
  - Different target attributes for different information elements of the applicability statement
  - Authentication methods, ciphersuites, support for EDHOC + OSCORE request, …
- **Discovery of applicability statements**
  - From the server or from a Resource Directory
  - Spare negotiation or Error Messages when running EDHOC
  - Besides rt="core.edhoc" , any attribute that MUST/SHOULD be in the link?

```
REQ: GET /.well-known/core

RES: 2.05 Content
     </sensors/temp>;osc,
     </sensors/light>;if="sensor",
     </.well-known/edhoc>;rt="core.edhoc";csuite="0";csuite="2";
     method="0";cred_t="c509";cred_t="ccs";idcred_t="4";comb_req
```

Open points

- **Need an IANA registry for EDHOC → OSCORE ID conversion methods?**
  - First entry would be the method defined in this document
  - Never specified in EDHOC/OSCORE messages
  - Specified in applicability statement and link-format documents
  - Opinions?

- **Error handling at the server (assuming the EDHOC option is understood)**
  - A request has EDHOC option but no OSCORE option
  - Proposal: return 4.00 (Bad Request) – Ok with this?

  - After OSCORE decryption, the request has the EDHOC and OSCORE options
  - Proposal: admit it, as possible with nested OSCORE – Ok with this?

Summary and next step

- **Profile of EDHOC for CoAP and OSCORE**
  - EDHOC + OSCORE request, optimizations, CoRE-specific features, …
- **We have running code (again) built for Eclipse Californium (Java)**
  - EDHOC + OSCORE request, aligned to EDHOC v -12
  - https://github.com/rikard-sics/californium/tree/edhoc
- **Next steps**
  - Use of “URI compression" option from Christian once it is available
    - https://datatracker.ietf.org/meeting/interim-2021-core-05/materials/slides-interim-2021-core-05-sessa-core-option-for-well-known-resources-00.pdf
  - Additional error handling
  - More on web-linking
  - Considerations on triggering block-wise; security considerations
- **Comments are reviews are welcome!**

Thank you!

Comments/questions?

https://github.com/core-wg/oscore-edhoc/

EDHOC + OSCORE request