# Ephemeral Diffie-Hellman Over COSE (EDHOC) and Object Security for Constrained Environments (OSCORE) Profile for Authentication and Authorization for Constrained Environments (ACE)

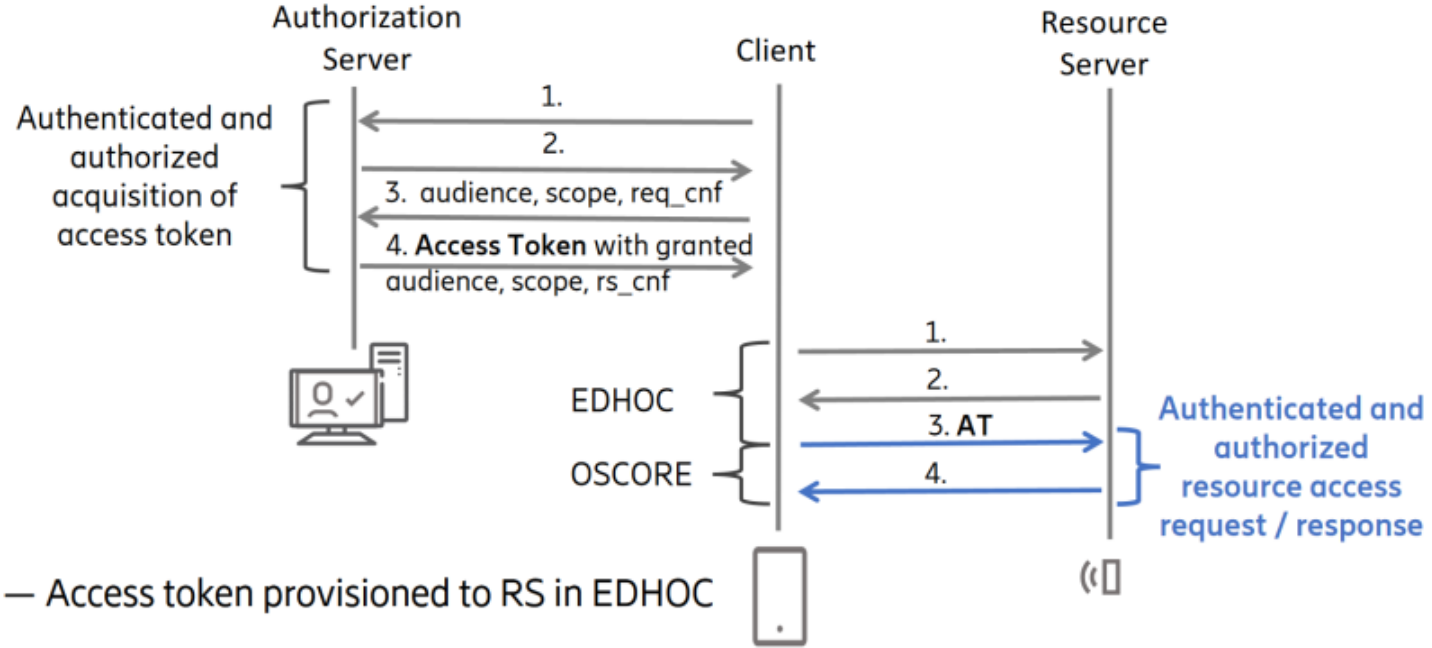
*draft-ietf-ace-edhoc-oscore-profile-05*

Göran Selander, Ericsson
John Preuß Mattsson, Ericsson
Marco Tiloca, RISE
**Rikard Höglund**, RISE

IETF 120 meeting – Vancouver – July 22nd, 2024

# Overview

- **New profile of the ACE framework**
  1. Uses EDHOC for key establishment (and optionally Access Token uploading in an EAD item)
  2. Uses OSCORE for secure communication (based on keying material from EDHOC)



# Main Updates in v -05 (1/3)

**CBOR diagnostic notation in examples**

- **Revised to use the construct e'' (*) for importing values from a CDDL model**
  - e'SOME_NAME' is replaced by the value assigned to SOME_NAME in the CCDL model in Appendix C
  - For example, {e'session_id' : h'01', e'cipher_suites': 3} stands for {0 : h'01', 2 : 3}.

- **Use registered CBOR abbreviations**
  - Together with comments
  - "scope" : "write" ⟹ / scope / 9 : "write"

```
Header: POST (Code=0.02)
Uri-Host: "as.example.com"
Uri-Path: "token"
Content-Format: application/ace+cbor
Payload:
{
  / audience /      5 : "tempSensor4711",
  / scope /         9 : "write",
  e'edhoc_info_param'  : {
     e'session_id' : h'01'
  }
}
```

```
; ACE Profiles
coap_edhoc_oscore = 4

; OAuth Parameters CBOR Mappings
edhoc_info_param = 47

; CBOR Web Token (CWT) Claims
edhoc_info_claim = 41

; CWT Confirmation Methods
x5chain = 5
x5bag = 6
x5t = 7
x5u = 8
c5c = 9
c5b = 10
c5t = 11
c5u = 12
kcwt = 13
kccs = 14

; EDHOC Information
session_id = 0
methods = 1
cipher_suites = 2
message_4 = 3
comb_req = 4
uri_path = 5
osc_ms_len = 6
osc_salt_len = 7
osc_version = 8
cred_types = 9
id_cred_types = 10
eads = 11
initiator = 12
responder = 13
```

(*) Proposed in *draft-ietf-cbor-edn-e-ref*

# Main Updates in v -05 (2/3)

- **Editorial improvements**
- **IANA considerations**
  - Fixed name of registry columns
  - Change controller: s/IESG/IETF
  - Revised, detailed registration policies for the new registry "EDHOC Information"
- **Simplification: only CWTs are supported as Access Tokens**
  - That is, rule out JWTs otherwise admitted by ACE
  - CWTs are anyway RECOMMENDED in RFC 9200
- **Made [1] an informative reference**
  - The ACE alternative workflow is just considered as an example
  - The concept of "token series" taken from there is expanded and customized here



[1] https://datatracker.ietf.org/doc/draft-ietf-ace-workflow-and-params/

# Main Updates in v -05 (3/3)

- **Clarification: EDHOC can be used in the forward or reverse message flow**
  - I.e., the EDHOC Initiator can be (i) the ACE Client or (ii) the ACE Resource Server (RS)
    I. The Client starts EDHOC by sending EDHOC message_1 to RS
    II. The Client sends a “trigger request” to RS, which replies with EDHOC message_1
  - What to use depends on the deployment setting, and mostly on which identity to protect the most (the Initiator's identity is protected against active attackers)

- **Allow transporting the Access Token in the EAD item of any EDHOC message**
  - EDHOC forward message flow: EAD1 or EAD3
  - EDHOC reverse message flow: EAD2 or EAD4
  - What to use depends on
    - The used EDHOC message (see above)
    - The security/privacy properties to achieve (still to be discussed, see also issue #8)



Issue #8: https://github.com/ace-wg/ace-edhoc-oscore-profile/issues/8

# Next Steps

- **Consistency-checking authentication credentials from different EDHOC fields**
  - E.g., if an EAD item transports the CWT including C's authentication credential, …
  - … the authentication credential from ID_CRED_X and the EAD item have to be the same
- **IANA review feedback on Section 10.3**
  - Add column in the “OAuth Parameters CBOR Mappings” registry called "Original Specification“
- **Describe actions to take after invalidation/deletion of authentication credentials**
  - Building on and expanding the high-level guidelines from *draft-ietf-lake-edhoc-impl-cons*
- **Cover the usage of the EDHOC reverse message flow in more detail**
- **Proof-of-possession of the Client's private key at the AS**
  - When receiving the Client's authentication credential in the 'req_cnf' parameter of the Access Token Request
- **Discussion and guidelines on Access Tokens issued to a group-audience**

Thank you!

Comments/questions?

https://github.com/ace-wg/ace-edhoc-oscore-profile