Enrollment with Application Layer Security (EALS)

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Application Layer Security

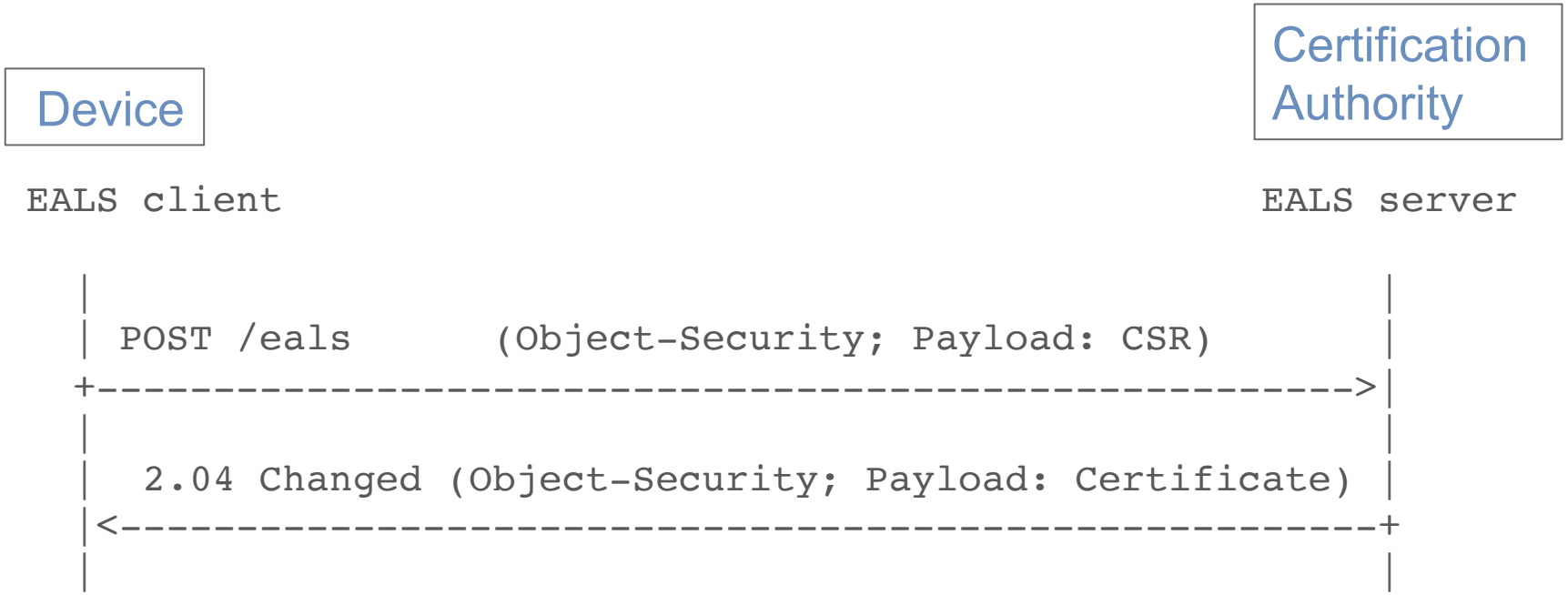
- Ongoing work in CoRE and ACE on application layer security protocols suitable for IoT:
  - OSCOAP (confidentiality, integrity and replay protection)
  - Secure Group Communication for CoAP (e.g. secure multicast)
    - Extension to OSCOAP
  - EDHOC (key exchange)
  - OSCOAP/EDHOC profile for ACE (authorization and access control)
- OSCOAP/EDHOC uses CoAP, CBOR, and COSE
- Can we also do certificate enrollment based on application layer primitives?

Application layer analogy of EST

- EST: Certificate Management over CMS (CMC) authenticated with transport layer security
- EALS: CMC authenticated with application layer security

Transport layer	**Application layer**
TLS/DTLS handshake	EDHOC
TLS/DTLS record layer	OSCOAP
EST	EALS

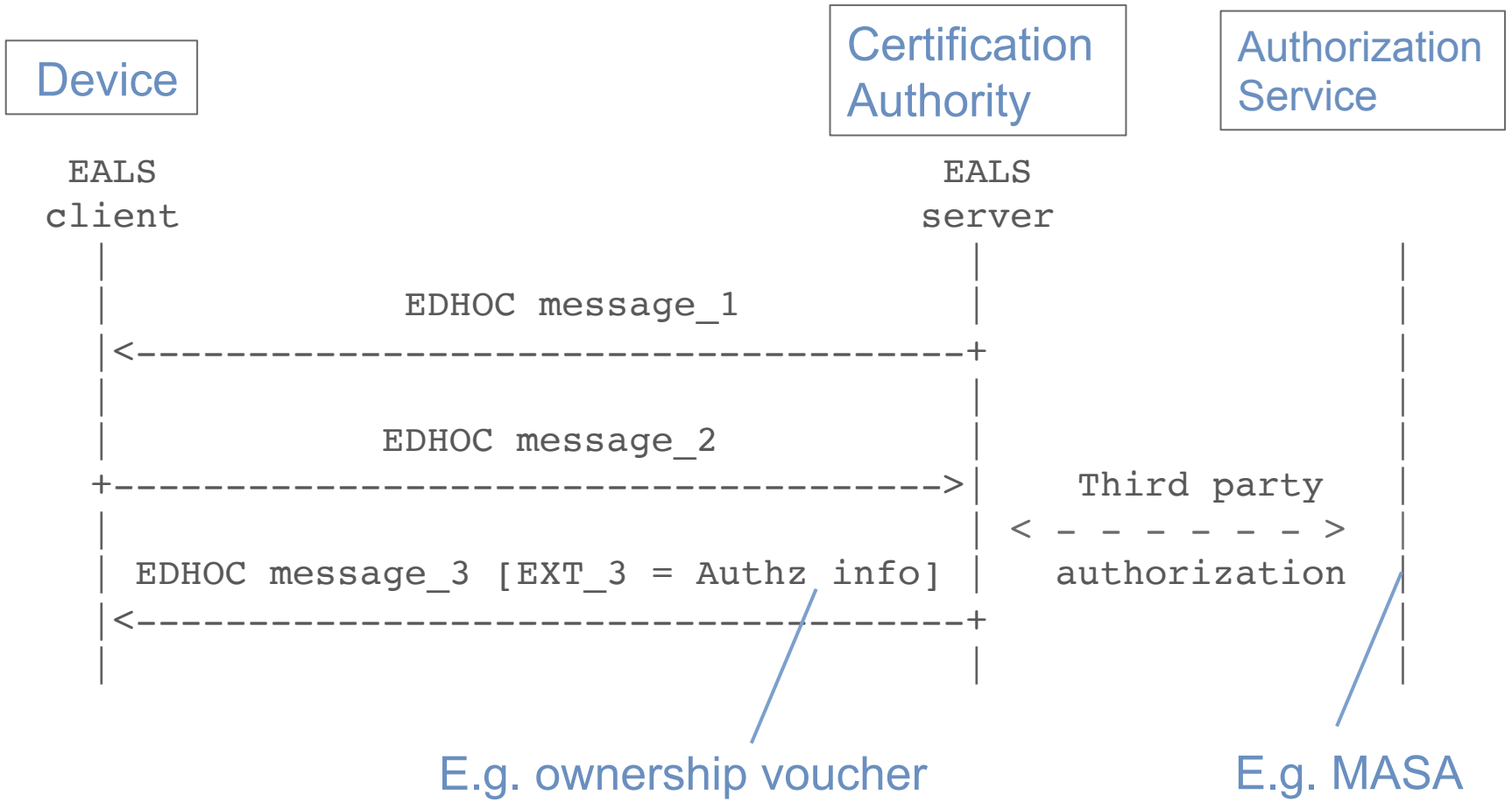
Phase 2: Enrollment



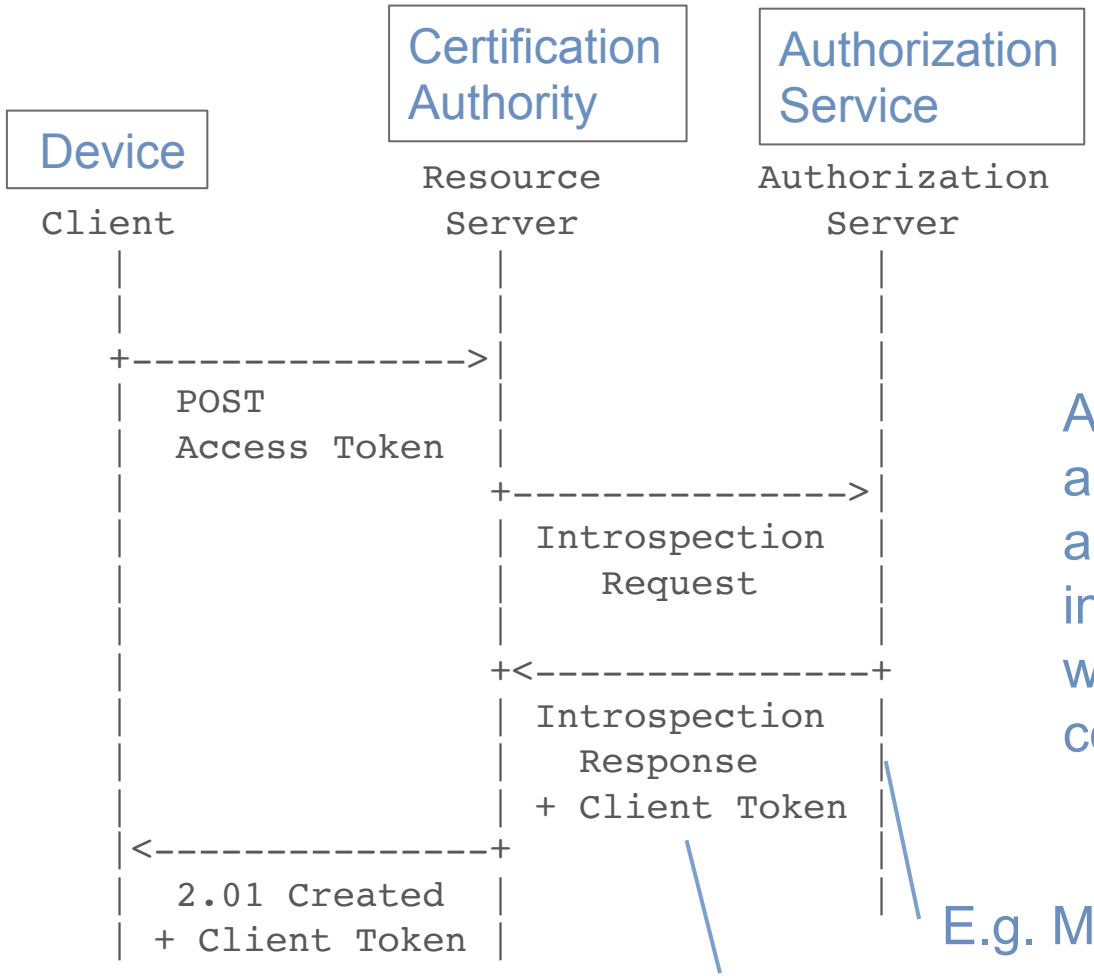
Simple CMC protected with OSCOAP
CSR = Certification Signing Request

The figure is a simplification, e.g. the EALS server may be Registration Authority/Registrar which in turn communicates with the CA

Phase 1: EDHOC



Phase 1 (alt.): ACE Client Token



ACE establishes authorization information and keys in Client and RS, which may have never communicated before.

Thank you!

Comments/questions?

https://tools.ietf.org/html/draft-selander-ace-eals