ERICSSON

Ephemeral Diffie-Hellman Over COSE (EDHOC)

draft-selander-ace-cose-ecdhe-05

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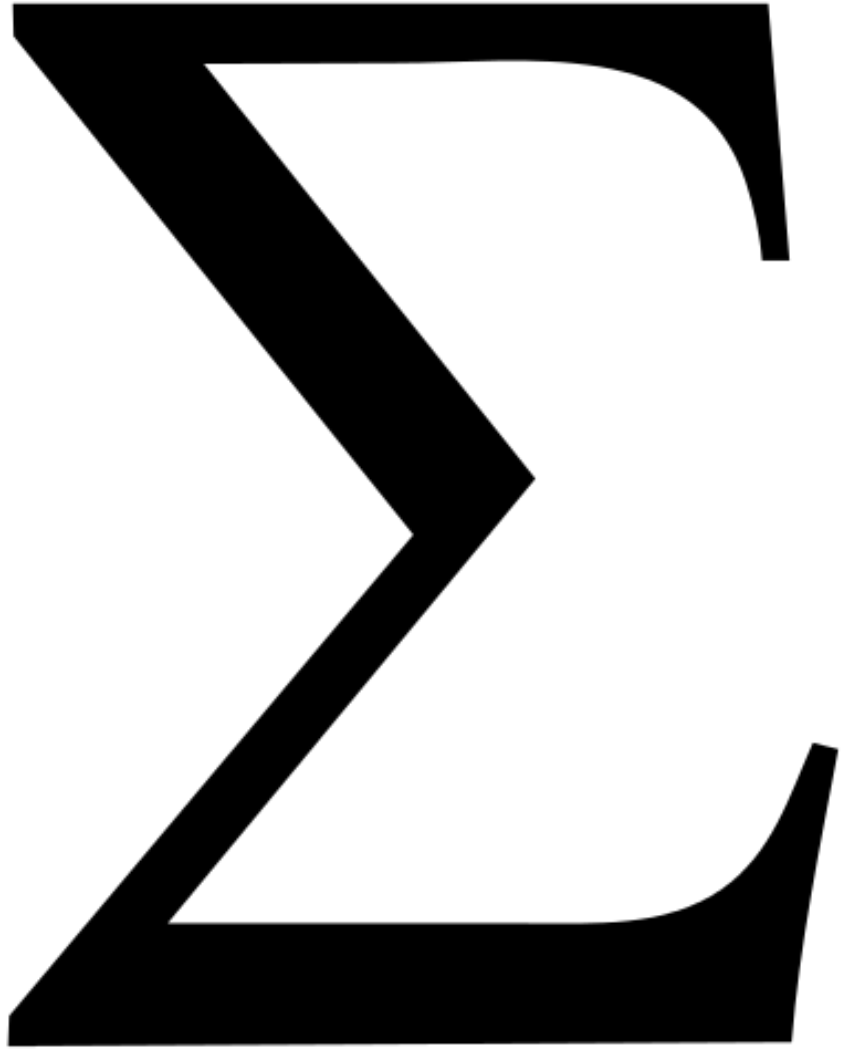
IETF98 ACE, MAR 27 2017

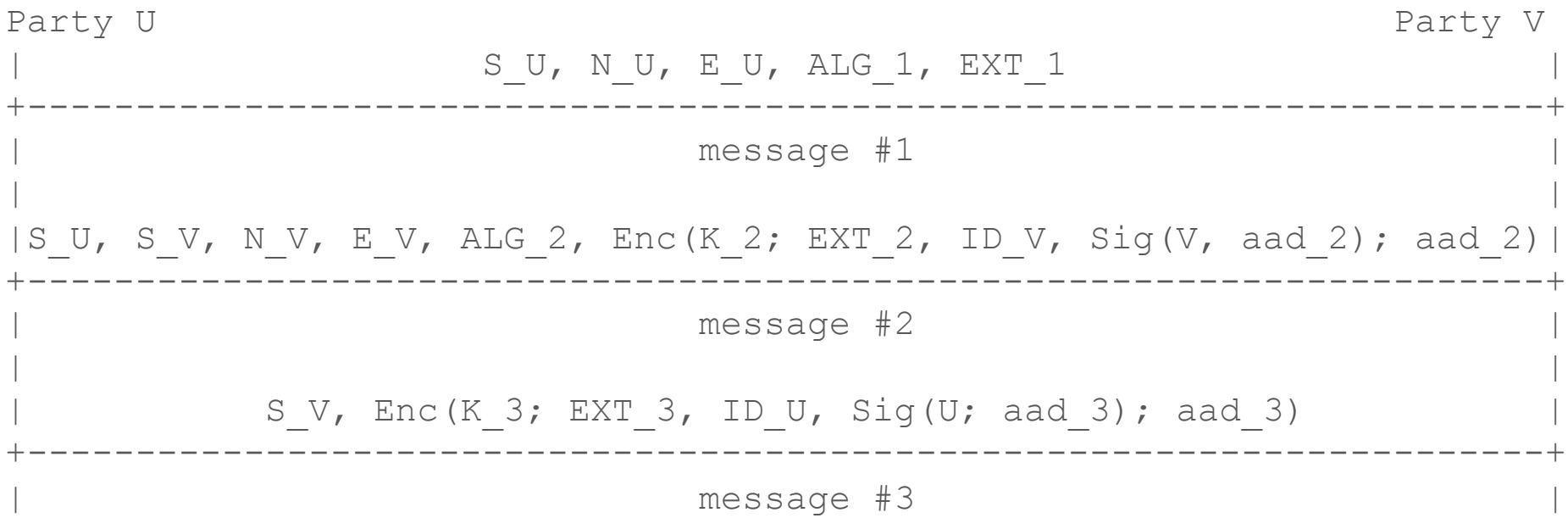
DESIGN GOALS

- Use strong existing design – SIGMA-I
- Small code and message size
- Reuse existing primitives
  - CBOR
  - COSE
- Minimize choices
- Stay in one UDP packet
- End-to-End not Hop-by-Hop Security
- Counter proposal – carry DTLS inside of CoAP



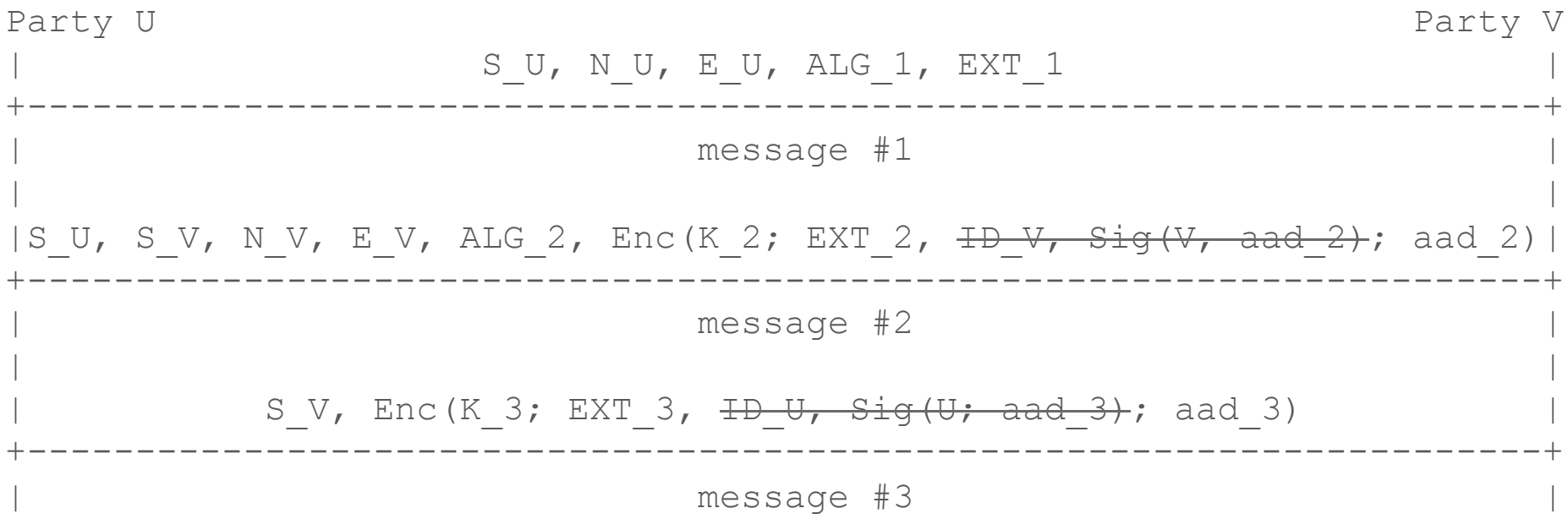
EDHOC with Asymmetric Keys

- The parties exchanging messages are called "U" and "V". U and V exchange identities and ephemeral public keys. They compute the shared secret and derive the keying material.



EDHOC with Symmetric Keys

- Similar to the asymmetric case but without COSE_Sign0 with an COSE_Encrypt0 in message_1 to encrypt EXT_1 and get PSK proof-of-possession already in message_1 (may be used for DoS protection).



EDHOC Key Schedule

- Use HKDF for as the primitive
- K_i = HKDF(PSK, Ephemeral Secret, info structure)
- Info structure = [
    * Algorithm Identifier or IV identifier
    * aad information
        * aad information = [
            * Message i data
            * Hash of all previous messages
            * certificate if one is used.

EXAMPLE

- Sending EDHOC embedded in OSCOAP has been removed. EDHOC is now sent as payload.

- OSCOAP Master Secret, Master Salt, and identities can be obtained from EDHOC.

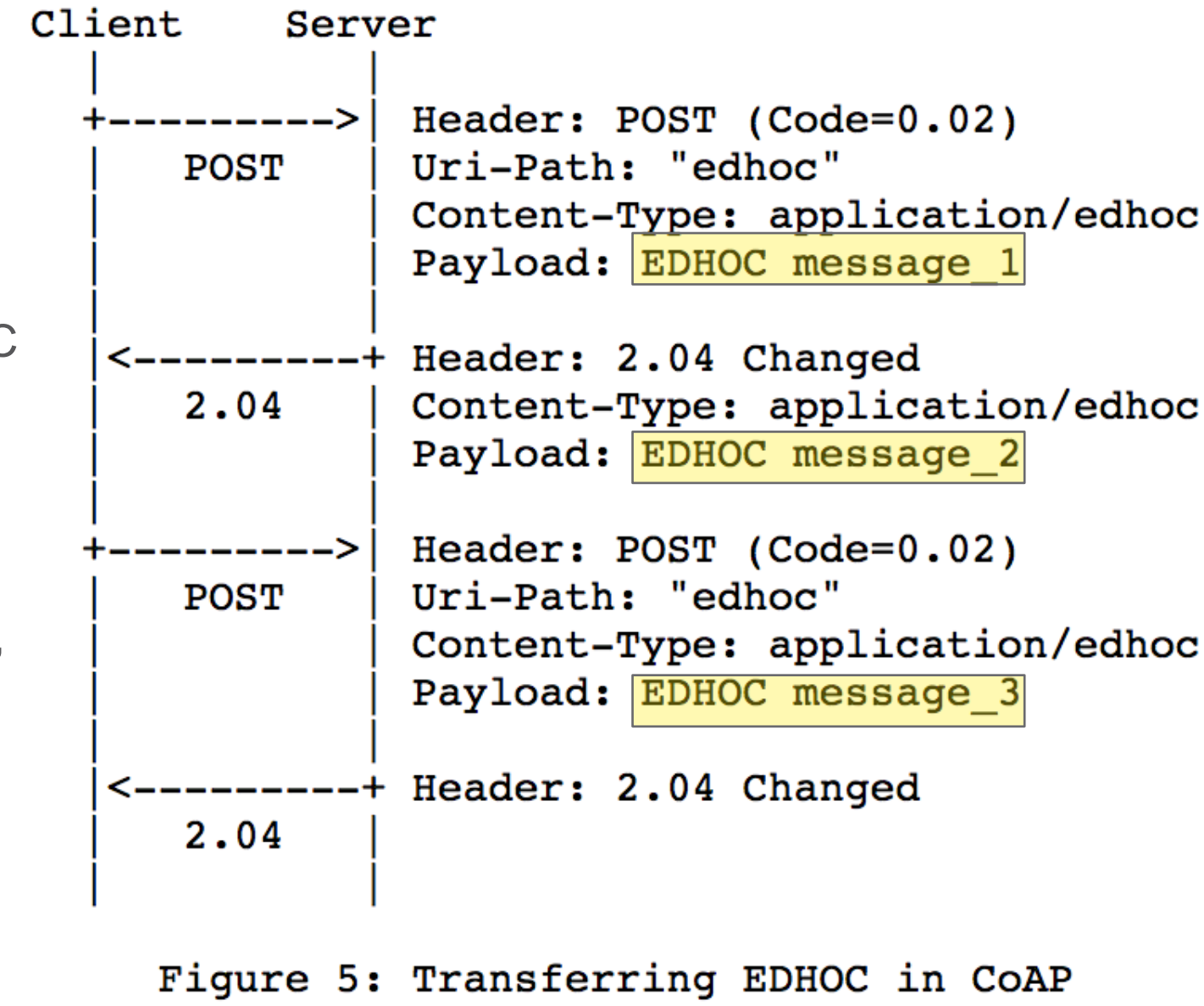


Figure 5: Transferring EDHOC in CoAP

NEXT STEPS

- One existing implementation of -05 by Jim Schaad. One more implementation ongoing by SICS
- Look for better review of cryptographic properties
- Test vectors, error messages.

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