Key Management for OSCORE Groups in ACE

draft-ietf-ace-key-groupcomm-oscore-01

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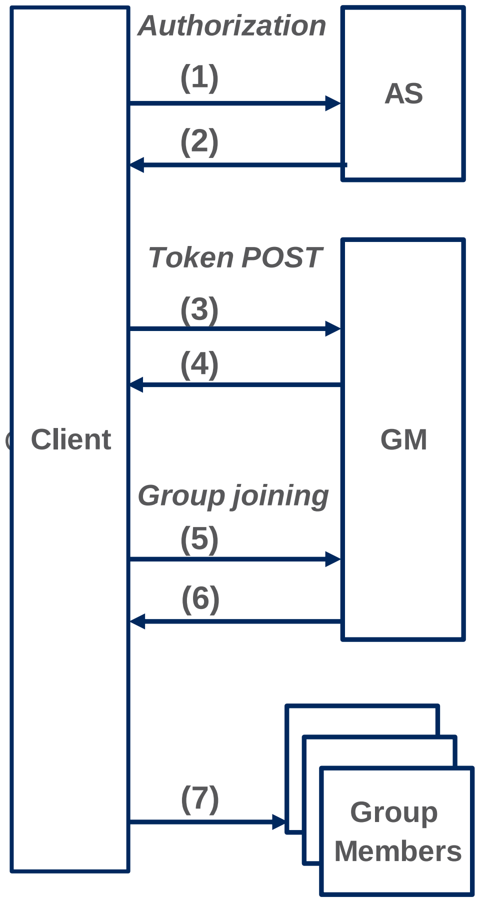
Recap

- Message content and exchanges for:
  - Joining an OSCORE group through its Group Manager (GM)
  - Provisioning keying material to joining nodes and groups (rekeying)
- Build on *ace-key-groupcomm*
- Out of Scope:
  - Authorizing access to resources at group members
  - Actual secure communication in the OSCORE group



Status

- Adopted in December 2018

- Version -00 as simple adopted repost

- Version -01 mostly updates:
  - Format of the Join Response, Group Manager ---> Client
  - Agreement on countersignature algorithm / parameters
  - Related IANA registrations

Updates from v -00

- New structure for the **Join Response** message
  - 'kty' , "Group_OSCORE_Security_Context object"
  - 'k' , Group_OSCORE_Security_Context object
    - 'ms' , OSCORE Master Secret
    - 'clientID' , Sender ID of the joining node (if present)
    - 'hkdf' , KDF algorithm (if present)
    - ' alg' , AEAD algorithm (if present)
    - 'salt' , OSCORE Master Salt (if present)
    - 'contextID' , Group ID
    - 'rpl' , Replay Window Type and Size (if present)
    - 'cs_alg' , countersignature algorithm
    - 'cs_params' , countersignature parameters (if present)
  - 'profile' , "coap_group_oscore"
  - 'exp' , lifetime of the derived OSCORE Context
  - 'pub_keys' , public keys of group members (if present)
  - …

Defined in ace-key-groupcomm together with IANA Registry

Extends the CBOR-encoded OSCORE Security Context Object of the OSCORE profile

Defined in the OSCORE Profile

Defined here and added to "OSCORE Security Context Parameters" Registry

Defined in ace-key-groupcomm together with IANA Registry

Updates from v -00

- Upon joining the group, the Client:
  - Provides its own public key, but …
  - May miss details about countersigning in the OSCORE group

- The Client needs to know before actually joining
  - Three approaches are described

- Approach #1 – Blind attempt
  - The Join Request includes the public key in the preferred format
  - The Group Manager may reply with the new ‘key info’ parameter
    - ‘sign_alg’ and ‘sign_parameters’ (optional)
  - The Client sends a new Join Request, considering ‘key info’

Updates from v -00

- Approach #2 – Negotiation upon Token POST
  - The Client MAY ask for information, including ‘key_info’
    - POST request uses “application/ace+cbor”
    - ‘key_info’ encodes the CBOR simple value Null
  - The reply from the Group Manager includes ‘key info’
    - ‘sign_alg’ and ‘sign_parameters’ (optional)
    - MUST if ‘key_info’ was in the POST request, MAY otherwise
  - The Client sends the Join Request, considering ‘key info’

- Approach #3 – Learn upon discovering the OSCORE Group
  - E.g., using the CoRE RD as in *draft-tiloca-core-oscore-discovery*

Implementation

- Ongoing development in Californium

- Build on the ACE implementation:
  - https://bitbucket.org/lseitz/ace-java/branch/oscore-joining

- Status:
  - Complete interaction C – AS, with structured 'scope'
  - Work in progress on the Join Response content

Summary

- 1. Updated structure of the Join Response
  - Extended the OSCORE Security Context Object
  - Specific instance of ‘kty’ and ‘profile’ from *draft-ietf-ace-key-groupcomm*

- 2. Agreement on countersignature algorithm and parameters
  - Blind attempt upon sending the Join Request
  - Negotiation during the Token POST
  - Contextual with OSCORE group discovery (e.g. through CoRE RD)

- Feedback/comments?
  - Is this a good direction?
  - Are all three agreement methods needed and good to go?

Thank you!

Comments/questions?

https://github.com/ace-wg/ace-key-groupcomm-oscore