Admin Interface for the OSCORE Group Manager

draft-ietf-ace-oscore-gm-admin-05

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Recap

- **RESTful admin interface at the OSCORE Group Manager**
  - Create, (re-)configure and delete OSCORE groups
  - Support for both: i) Link Format and CBOR ; ii) CoRAL

- **Two new types of resources at the Group Manager**
  - A <u>single</u> *group-collection* resource, at /manage
  - One *group-configuration* resource per group, at /manage/GROUPNAME

- **Using ACE for authentication and authorization**
  - The Administrator is the Client
  - The Group Manager is the Resource Server
  - For secure communication, use transport profiles of ACE

Overview

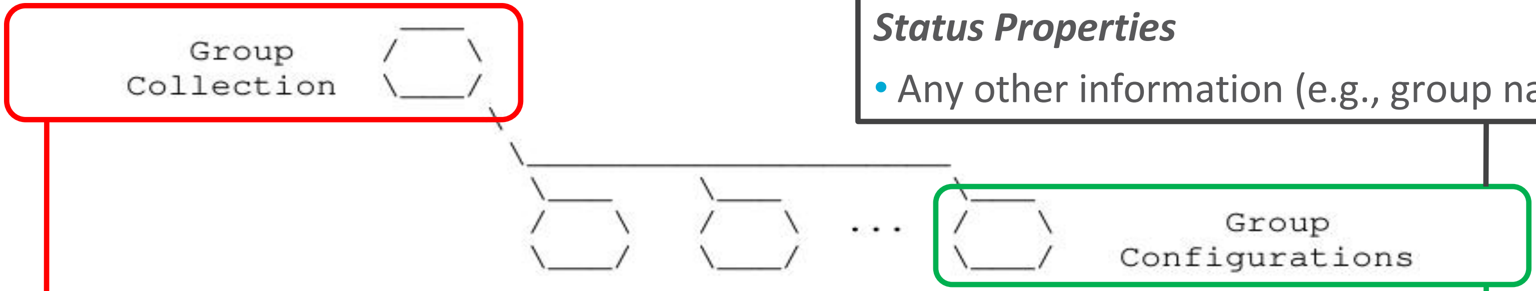


Figure 1: Resources of a Group Manager

Configuration Properties

- Security algorithms and parameters

Status Properties

- Any other information (e.g., group name)

Group-collection **resource**

- Retrieve the list of OSCORE groups
  - All groups (GET)
  - Group selected by filters (FETCH)
- Create a new OSCORE group (POST)
  - A group-configuration resource is created
  - A group-membership for joining nodes is also created, see *ace-key-groupcomm-oscore*

Group-configuration **resource**

- Retrieve the group configuration (GET)
- Retrieve part of the group configuration (FETCH)
- Overwrite the group configuration (PUT)
- Update the group configuration (PATCH/iPATCH)
- Delete the group (DELETE)

Updates since IETF 112

- **Terminology update**
  - Triggered by the revision of *draft-ietf-core-oscore-groupcomm*
  - Clear distinction between “public key” and “authentication credential”
  - Renamed the parameter ‘pub_key_enc’ to ‘cred_fmt’

- **Simplified selection/negotiation of group name upon group creation**
  - Kept: the name actually assigned to the new group is a decision of the Group Manager
  - Kept: the assigned group name has to be available at the Group Manager
  - Updated: the Administrator creating the group has to provide a suggested name
  - Updated: if the suggested name is already taken, the Group Manager assigns an available one
    - Keep the assignment of group names flexible and ultimately up to the Group Manager
    - Keep a tractable checking of group creation requests against authorization information in the token (more on this later)

Updates since IETF 112

- **Updates of existing group configuration (PUT/PATCH/iPATCH)**
  - Now made explicit how to inform current group members of the new configuration
  - Send a subset of the “Joining Response” message defined in *draft-ace-key-groupcomm-oscore*
  - Use the same content format application/ace-groupcomm+cbor

- **Considered possible addition upon group creation**
  - The Group Manager may recycle OSCORE Group IDs in a group
    - This allows an OSCORE group to “live forever”
    - Recently changed to be an optional feature in *draft-ietf-core-oscore-groupcomm*
  - **Should the Administrator have any saying in this when creating a group?** Proposal:
    - Define a new parameter for the group creation request, to indicate a group Status Property
    - If “true”, the Group Manager recycles Group IDs if actually able to
    - This cannot be changed later on as part of a group configuration update

Ok to add?

Updates since IETF 112

- **Defined a proper format of ‘scope’, using an AIF data model**
  - Driven mostly by two discussions

- **Early comment from Jim Schaad**
  - An Administrator uploads a token T1 at the Group Manager
  - The Administrator creates groups G1 and G2
  - T1 expires; the Administrator gets a new token T2 and uploads it at the Group Manager
  - The Administrator has a new identity → Not recognizable as the creator of G1 and G2!
  - What should **‘scope’** be in token T2, such that:
    - The Administrator can create new groups, <u>and continue accessing G1 and G2</u>
      - Not trivial: <u>the Group Manager</u> took the final decision on G1 and G2 names
    - There is no need to update access policies on the Authorization Server

Updates since IETF 112

- **More comments from Christian Amsüss**
  - Good to admit multiple Administrators for a same group, with different privileges
    - A set of Administrators can access an existing group configuration resource, …
    - … as allowed to perform some operations on a group created by another Administrator
  - This opens to “classes” of Administrators, to be enforced through **‘scope’**

- **Follow-up discussions among co-authors led to …**
  - … what was in Section 2.1.1 of v -04 as a placeholder, with a technical direction …
  - … which is now fully elaborated in the latest v -05

Use a structured scope and AIF

- **How is scope in *ace-key-groupcomm-oscore* ?**
  - This is for users of groups
    - Group members; external signature verifiers
  - Using the AIF-OSCORE-GROUPCOMM data model
  - Good to consider as a starting point

- **Scope = << [+ scope_entry] >>**
  - scope_entry = [Toid, Tperm]
  - Toid : tstr, with value a group name
  - Tperm : uint, encoding roles as flag bits

Tperm

bit	7	6	5	4	3	2	1	0
								0

Role allowed if bit set to 1

0: Reserved (bit always set to 0)
1: Requester
2: Responder
3: Monitor
4: Verifier
5, 6, 7: Unassigned

Format of ‘scope’ in gm-admin (1/3)

- **New AIF Data Model** – AIF-Generic<Toid, Tperm> = [*[Toid, Tperm]]
  - Toid: Text string, specifying a wildcard pattern for group names
  - Tperm: Unsigned integer, indicating admin permissions as flag bits
  - Permissions apply to groups whose name matches the pattern!

- **Possible permissions in Tperm**
  - 0: Retrieve list of existing security groups
    - Always granted
  - 1: Create a new group and its configuration
  - 2: Read the configuration of a group
  - 3: Overwrite/update a group configuration
  - 4: Delete a group and its configuration

Permissions are related to a name pattern

- They survive across different issued tokens and changes of security identity (Jim’s point)

Possible to consider more Administrators than the group creator (Christian’s point)

- Expected for a creator: (1)(2)(3)(4) all granted
- Expected for a non-creator: (1) not granted; some of (2)(3)(4) granted; restrictive name pattern

Format of ‘scope’ in gm-admin (2/3)

- **New data model AIF-OSCORE-GROUPCOMM-ADMIN**
  - This is for Administrators of groups
  - Admit creator and non-creator Administrators

- **Scope = << [+ scope_entry] >>**
  - scope_entry = [Toid, Tperm]
  - Toid : tstr, i.e., a wildcard pattern of group names
  - Tperm : uint, encoding permissions as bit flags
    - Permissions apply to groups whose name matches the pattern in Toid!

- **Any comments?**

Tperm

bit	7	6	5	4	3	2	1	0
								1

Permission granted if bit set to 1

0: Retrieve list of groups (bit always set to 1)

1: Create a group and its configuration

2: Read group configuration

3: Change group configuration

4: Delete a group and its configuration

5, 6, 7: Unassigned

Format of ‘scope’ in gm-admin (3/3)

- **What does it mean on the Group Manager as Resource Server? (Section 6)**
  - An Administrator request is served if ‘scope’ has at least one scope entry allowing so
  - Added detailed rules for request processing to each resource handler

- **What does it mean on the Authorization Server? (Section 4)**
  - As usual, check the requested ‘scope’ against access policies for the Administrator
    - If not possible to grant as is, grant the intersection of what is asked and what is allowed
  - Practically, this gets tricky when checking <u>name patterns against name patterns</u>
  - The current text has an actionable and very detailed procedure for the AS
  - **Proposal for next version**:
    - Keep the high level process and goal above in Section 4
    - Move the detailed procedure to an Appendix, as an example

Objections?

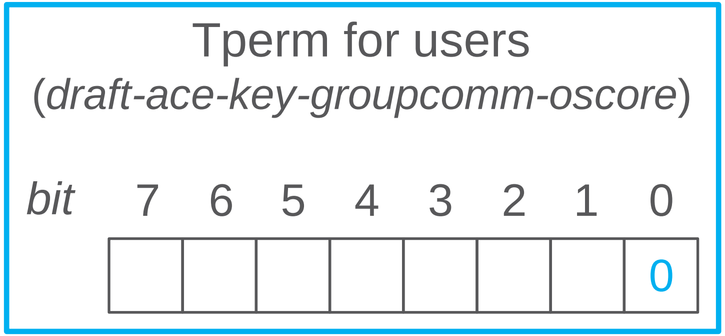
Todo (?): mixed set of scope entries

- **Under a same Group Manager a Client might be both:**
  - (A) User for some groups
  - (B) Administrator for some groups

- **The two types of scope entry are distinguishable!**
  - For A, the least significant bit is always 0
  - For B, the least significant bit is always 1

- **Proposal**: allow both types of scope entry
  to be present in the same scope

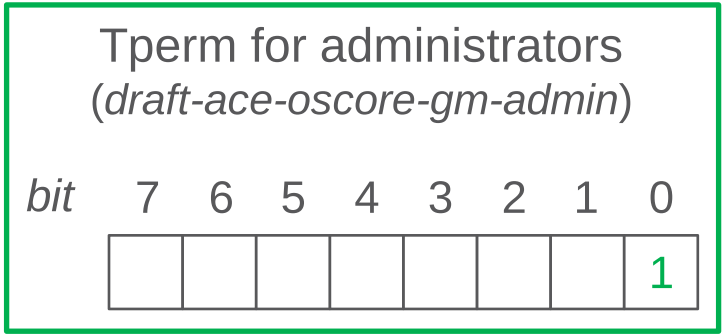
- **Objections?**



Tperm for users

(*draft-ace-key-groupcomm-oscore*)

bit	7	6	5	4	3	2	1	0
								0



Tperm for administrators

(*draft-ace-oscore-gm-admin*)

bit	7	6	5	4	3	2	1	0
								1

Summary and next steps

- **Latest updates**
  - Terminology and parameters consistent with “public key” vs. “authentication credential”
  - Defined AIF data model to express ‘scope’ for Administrators
  - Updated request processing at the Group Manager, per the AIF-based authorization info
  - Simplified selection/negotiation of group name upon group creation
  - Revised order of content in Sections 2-5; editorial improvements

- **Planned next steps**
  - Consider allowing ‘scope’ to include a mix of:
    - Scope entries for Administrators (AIF data model defined here)
    - Scope entries for group users (AIF data model from *ace-key-groupcomm-oscore*)
  - Consider moving detailed scope checking procedure at the AS to an appendix
  - More details on error handling (e.g., no group names currently available to assign)

- **Comments and reviews are welcome!**

Thank you!

Comments/questions?

https://github.com/ace-wg/ace-oscore-gm-admin

Backup

Group Configuration Parameters

- **Configuration properties**
  - hkdf
  - cred_fmt
  - group_mode
  - sign_enc_alg
  - sign_alg
  - sign_params
  - pairwise_mode
  - alg
  - ecdh_alg
  - ecdh_params
  - det_req
  - det_hash_alg

- **Status properties**
  - rt = “core.osc.gconf”
  - active
  - group_name // Plain immutable identifier
  - group_title // Descriptive string
  - ace_groupcomm_profile
  - exp
  - **app_groups** // Names of application groups
  - joining_uri
  - ? group_policies
  - ? max_stale_sets
  - ? as_uri // Link to the AS

- When using PATCH, easy “replacement” update for most parameters
  - Specify the pair (“label”, new_value), like when creating the group
- ‘app_groups’ is a list of names and requires special handling

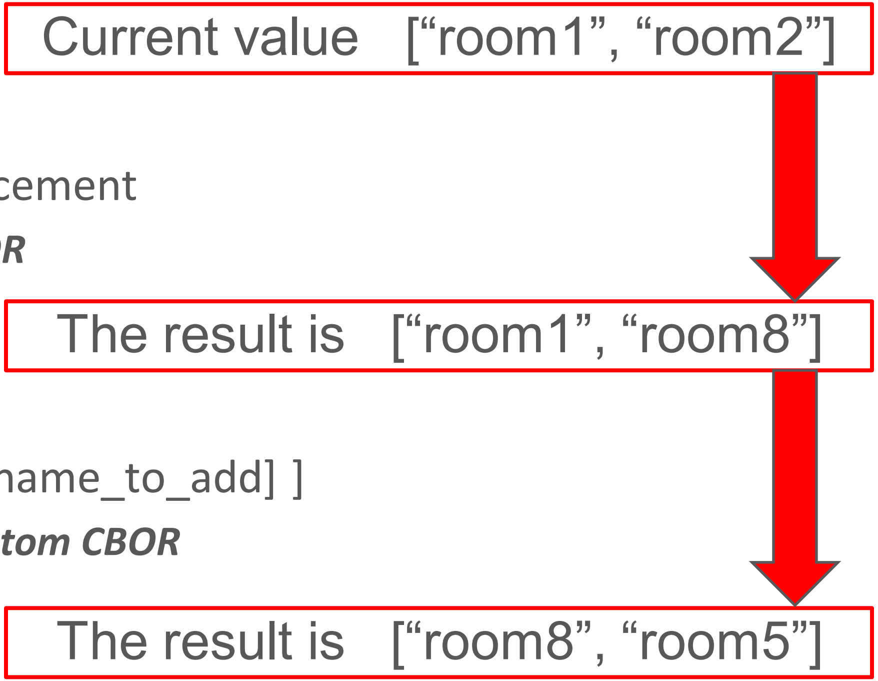
Configuration update with PATCH

- **Two ways to update ‘app_groups’**
  - List of associated applications groups

- **Overwrite** – New array of names as hard replacement
  - app_groups : [“room1”, “room8”] ***Custom CBOR***
  - app_group “room1”
    app_group “room8” } ***CoRAL***

- **Addition/deletion** – [[*name_to_remove], [*name_to_add]]
  - app_groups_diff : [[“room1”], [“room5”]] ***Custom CBOR***
  - app_group_del “room1”
    app_group_add “room8” } ***CoRAL***

- Overwrite and addition/deletion **not together** in the same PATCH payload



Current value [“room1”, “room2”]

The result is [“room1”, “room8”]

The result is [“room8”, “room5”]

Configuration update with PATCH

- **4.00 (Bad request)**
  - Any malformed or invalid payload
  - iPATCH is used as request method, but:
    - ‘app_groups_diff’ is included (Custom CBOR)
    - ‘app_group_del’ and/or ‘app_group_add’ are included (CoRAL)

- **4.09 (Conflict)**
  - New parameter values would yield an inconsistent group configuration

- **4.22 (Unprocessable entity)** might be returned just as per RFC 8132
  - The server is unable to or is incapable of processing the request