Admin Interface for the OSCORE Group Manager

Work in progress towards

draft-ietf-ace-oscore-gm-admin-02

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Recap

- Admin interface at the OSCORE Group Manager
  - Create and configure an OSCORE group, before a first joining can start
  - Same collection pattern intended for the CoAP pub-sub Broker
  - Supporting both: i) Link Format and CBOR ; ii) CoRAL

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

- Also 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

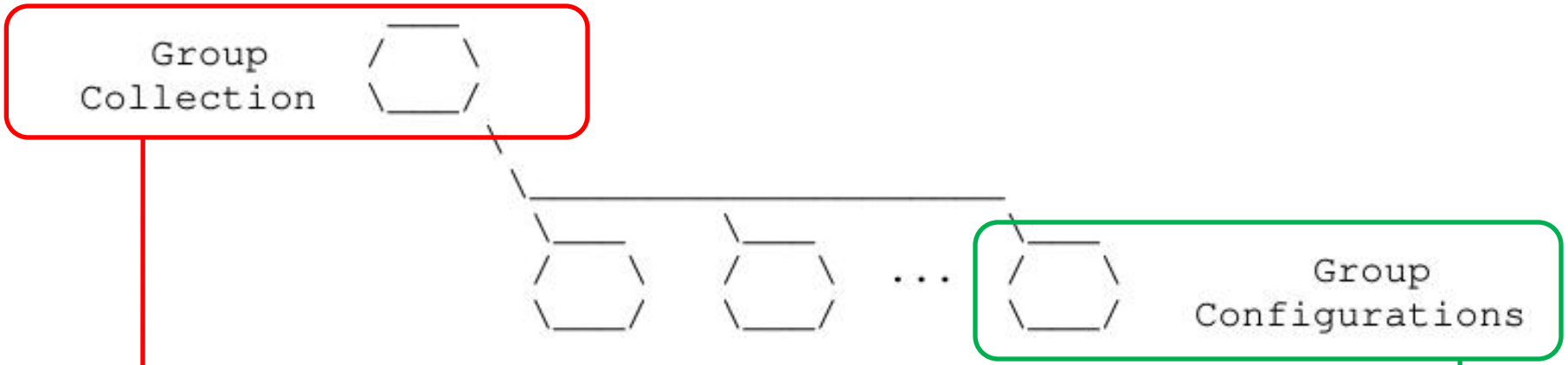


Figure 1: Resources of a Group Manager

***Group-collection* resource**

- 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*
- Retrieve the list of OSCORE groups
  - All groups (GET)
  - Group selected by filters (FETCH)

***Group-configuration* resource**

- Retrieve the group configuration (GET)
- Retrieve part of the group configuration (FETCH)
- Overwrite the group configuration (PUT)
- Delete the group (DELETE)

Define updates with PATCH

- Selective updates of an existing group configuration
  - Specify only parameters to update
  - Other parameters keep the same value (don't default as with PUT)

- Don't use to create a new group!
  - Use POST to the group-collection resource instead

- Keep the same content formats and its abbreviations
  - Custom CBOR documents: *application/ace-groupcomm+cbor*
    - Same as in draft-ietf-ace-key-groupcomm(-oscore)
  - CoRAL documents: *application/coral+cbor*

Group Configuration Parameters

- **Configuration properties**
  - hkdf
  - alg
  - cs_alg
  - cs_params
  - cs_key_params
  - cs_key_enc
  - pairwise_mode
  - ecdh_alg
  - ecdh_params
  - ecdh_key_params

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

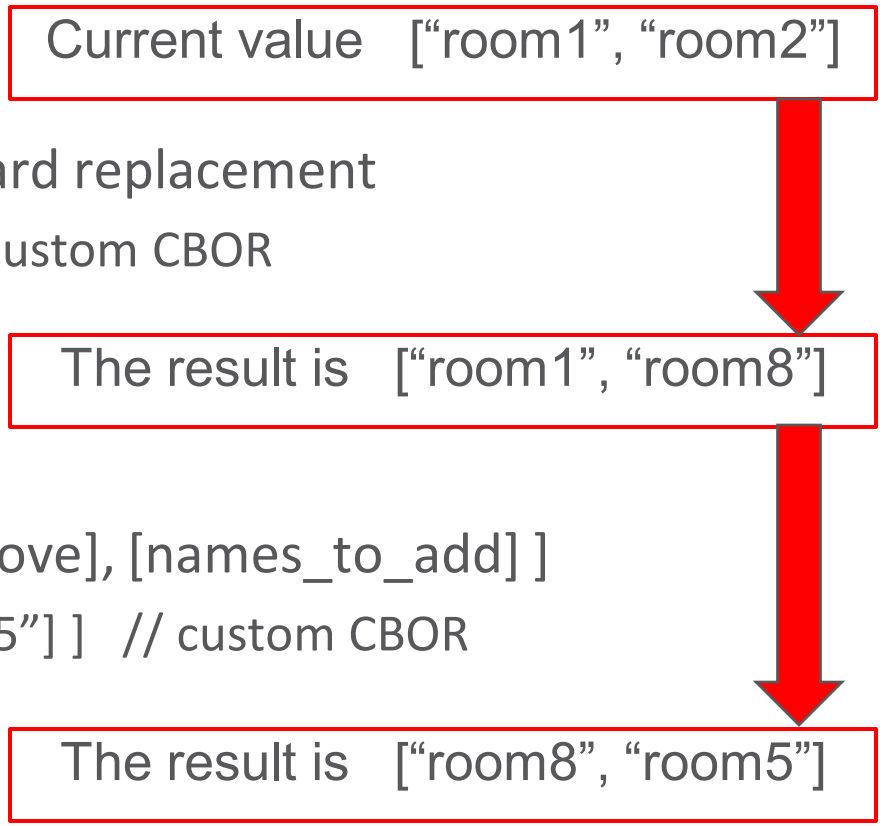
- Easy “replacement” update for most parameters
  - Specify the pair (“label”, new_value), like upon group creation
- ‘app_groups’ is a list of names and requires special handling

Define updates with PATCH

› Two ways to update 'app_groups'

› Overwrite – New array of names as hard replacement
  – app_group : ["room1", "room8"] // custom CBOR
  – app_group "room1" // CoRAL
    app_group "room8"

› Addition/deletion – [[names_to_remove], [names_to_add]]
  – app_group_diff : [["room1"], ["room5"]] // custom CBOR
  – app_group_del "room1" // CoRAL
    app_group_add "room8"



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

Define updates with PATCH

- Error handling to be thought through

- 4.00 (Bad request)
  - Any malformed payload

- 4.09 (Conflict)
  - New parameter values yield an overall inconsistent configuration
  - Possibly to be covered already at group creation/overwriting

- 4.22 (Unprocessable entity)
  - Any obvious reason ???
  - Why/when more appropriate than 5.03 (Service unavailable)

Format of ‘scope’ using AIF

- New AIF Data Model
  - Similar to the one in *draft-ace-key-groupcomm-oscore*
- AIF-Generic<Toid, Tperm> = [*[Toid, Tperm]]
  - Toid: Text string, specifying a name pattern for security groups
  - Tperm: Unsigned integer, indicating permissions as flag bits
- Possible permissions – Over group names matching the pattern
  - Retrieve list of security groups and read their configuration – Keep together?
  - Overwrite or update the current configuration of a security group
  - Create and delete a security group – Split?
- Useful also to later enable additional administrators
  - E.g. only update configurations of groups already created by another Admin

Thank you!

Comments/questions?

Backup

Group-collection resource

- **GET**
  - Retrieve the full list of existing OSCORE groups
  - In fact, the list of links to the respective *group-configuration* resource

```
=> 0.01 GET
   Uri-Path: manage

<= 2.05 Content
   Content-Format: 40 (application/link-format)

   <coap://[2001:db8::ab]/manage/gp1>;rt="core.osc.gconf",
   <coap://[2001:db8::ab]/manage/gp2>;rt="core.osc.gconf",
   <coap://[2001:db8::ab]/manage/gp3>;rt="core.osc.gconf"
```

```
=> 0.01 GET
   Uri-Path: manage

<= 2.05 Content
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gcoll#>
   #base </manage/>
   item <gp1>
   item <gp2>
   item <gp3>
```

Group-collection resource

- **FETCH**
  - Retrieve a partial list of existing OSCORE groups, by filter criteria
  - In fact, the list of links to the respective *group-configuration* resource

```
=> 0.05 FETCH
   Uri-Path: manage
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
       "alg" : 10,
       "hkdf" : 5
   }

<= 2.05 Content
   Content-Format: 40 (application/link-format)

   <coap://[2001:db8::ab]/manage/gp1>;rt="core.osc.gconf",
   <coap://[2001:db8::ab]/manage/gp2>;rt="core.osc.gconf",
   <coap://[2001:db8::ab]/manage/gp3>;rt="core.osc.gconf"
```

```
=> 0.05 FETCH
   Uri-Path: manage
   Content-Format: TBD1 (application/coral+cbor)

   alg 10
   hkdf 5

<= 2.05 Content
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gcoll#>
   #base </manage/>
   item <gp1>
   item <gp2>
   item <gp3>
```

Group-collection resource

- **POST**
  - Create a new OSCORE group.
  - The GM decides the name, if not specified.

```
=> 0.02 POST
   Uri-Path: manage
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   alg 10
   hkdf 5
   pairwise_mode True
   active True
   group_title "rooms 1 and 2"
   app_group "room1"
   app_group "room2"
   as_uri <coap://as.example.com/token>

<= 2.01 Created
   Location-Path: manage
   Location-Path: gp4
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   group_name "gp4"
   joining_uri <coap://[2001:db8::ab]/ace-group/gp4/>
   as_uri <coap://as.example.com/token>
```

```
=> 0.02 POST
   Uri-Path: manage
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "alg" : 10,
     "hkdf" : 5,
     "pairwise_mode" : True,
     "active" : True,
     "group_title" : "rooms 1 and 2",
     "app_groups": : ["room1", "room2"],
     "as_uri" : "coap://as.example.com/token"
   }

<= 2.01 Created
   Location-Path: manage
   Location-Path: gp4
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "group_name" : "gp4",
     "joining_uri" : "coap://[2001:db8::ab]/ace-group/gp4/",
     "as_uri" : "coap://as.example.com/token"
   }
```

- The Group Manager
  - Creates a new *group-configuration* resource (for the Administrator)
  - Creates a new *group-membership* resource (for joining nodes)

Group-configuration resource

- **GET**
  - Retrieve the full current configuration of the OSCORE group

```
=> 0.01 GET
   Uri-Path: manage
   Uri-Path: gp4

<= 2.05 Content
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "alg" : 10,
     "hkdf" : 5,
     "cs_alg" : -8,
     "cs_params" : [[1], [1, 6]],
     "cs_key_params" : [1, 6],
     "cs_key_enc" : 1,
     "pairwise_mode" : True,
     "ecdh_alg" : -27,
     "ecdh_params" : [[1], [1, 6]],
     "ecdh_key_params" : [1, 6],
     "rt" : "core.osc.gconf",
     "active" : True,
     "group_name" : "gp4",
     "group_title" : "rooms 1 and 2",
     "ace-groupcomm-profile" : "coap_group_oscore_app",
     "exp" : "1360289224",
     "app_groups": : ["room1", "room2"],
     "joining_uri" : "coap://[2001:db8::ab]/ace-group/gp4/",
     "as_uri" : "coap://as.example.com/token"
   }
```

```
=> 0.01 GET
   Uri-Path: manage
   Uri-Path: gp4

<= 2.05 Content
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   alg 10
   hkdf 5
   cs_alg -8
   cs_params.alg_capab.key_type 1
   cs_params.key_type_capab.key_type 1
   cs_params.key_type_capab.curve 6
   cs_key_params.key_type 1
   cs_key_params.curve 6
   cs_key_enc 1
   pairwise_mode True
   ecdh_alg -27
   ecdh_params.alg_capab.key_type 1
   ecdh_params.key_type_capab.key_type 1
   ecdh_params.key_type_capab.curve 6
   ecdh_key_params.key_type 1
   ecdh_key_params.curve 6
   rt "core.osc.gconf",
   active True
   group_name "gp4"
   group_title "rooms 1 and 2"
   ace-groupcomm-profile "coap_group_oscore_app"
   exp "1360289224"
   app_group "room1"
   app_group "room2"
   joining_uri <coap://[2001:db8::ab]/ace-group/gp4/>
   as_uri <coap://as.example.com/token>
```

Group-configuration resource

- **FETCH**
  - Retrieve a selection of the current configuration of the OSCORE group

```
=> 0.05 FETCH
   Uri-Path: manage
   Uri-Path: gp4
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "conf_filter" : ["alg",
                      "hkdf",
                      "pairwise_mode",
                      "active",
                      "group_title",
                      "app_groups"]
   }

<= 2.05 Content
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "alg" : 10,
     "hkdf" : 5,
     "pairwise_mode" : True,
     "active" : True,
     "group_title" : "rooms 1 and 2",
     "app_groups": : ["room1", "room2"]
   }
```

```
=> 0.05 FETCH
   Uri-Path: manage
   Uri-Path: gp4
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   alg
   hkdf
   pairwise_mode
   active
   group_title
   app_groups

<= 2.05 Content
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   alg 10
   hkdf 5
   pairwise_mode True
   active True
   group_title "rooms 1 and 2"
   app_group "room1"
   app_group "room2"
```

Group-configuration resource

- **PUT**
  - Update the configuration of the OSCORE group
  - Default values apply, like when creating the group

```
=> PUT
   Uri-Path: manage
   Uri-Path: gp4
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   alg 11
   hkdf 5

<= 2.04 Changed
   Content-Format: TBD1 (application/coral+cbor)

   #using <http://coreapps.org/core.osc.gconf#>
   group_name "gp4"
   joining_uri <coap://[2001:db8::ab]/ace-group/gp4/>
   as_uri <coap://as.example.com/token>
```

```
=> PUT
   Uri-Path: manage
   Uri-Path: gp4
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "alg" : 11 ,
     "hkdf" : 5
   }

<= 2.04 Changed
   Content-Format: TBD2 (application/ace-groupcomm+cbor)

   {
     "group_name" : "gp4",
     "joining_uri" : "coap://[2001:db8::ab]/ace-group/gp4/",
     "as_uri" : "coap://as.example.com/token"
   }
```

Group-configuration resource

- **DELETE**
  - Delete the OSCORE group

```
=> DELETE
   Uri-Path: manage
   Uri-Path: gp4

<= 2.02 Deleted
```

- The Group Manager
  - Deallocates the *group-configuration* resource
  - Deallocates the *group-membership* resource