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TECHNICAL SPECIFICATION

**5G;
Group Management -
Service Enabler Architecture Layer for Verticals (SEAL);
Protocol specification
(3GPP TS 24.544 version 18.2.0 Release 18)**

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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

1 Scope

The present document specifies the protocol aspects for the group management capability of SEAL to support vertical applications (e.g. V2X) over the 3GPP system.

The present document is applicable to the User Equipment (UE) supporting the group management client functionality as described in3GPP TS 23.434 [2], to the application server supporting the group management server functionality as described in 3GPP TS 23.434 [2] and to the application server supporting the vertical application server (VAL server) functionality as defined in specific vertical application service (VAL service) specification.

NOTE: The specification of the VAL server for a specific VAL service is out of scope for present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[3] IETF RFC 4825: "The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)".

[4] OMA OMA-TS-XDM _Group-V1_1_1-20170124-A: "Group XDM Specification".

[5] 3GPP TS 24.547: "Identity management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[6] IETF RFC 6750: "The OAuth 2.0 Authorization Framework: Bearer Token Usage".

[7] OMA OMA-SUP-XSD_poc_listService-V1_0: "PoC - List Service", version 1.0.

[8] OMA OMA-SUP-XSD_xdm_extensions-V1_0: "XML Schema Definition: XDM Extensions", version 1.0.

[9] OMA OMA-SUP-XSD_xdm2_1_extensions-V1_0: "XML Schema Definition: XDM 2.1 – Extensions", version 1.0.

[10] IETF RFC 7159: "The JavaScript Object Notation (JSON) Data Interchange Format".

[11] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[12] IETF RFC 5875: "An Extensible Markup Language (XML) Configuration Access Protocol (XCAP) Diff Event Package".

[13] IETF RFC 6050: "A Session Initiation Protocol (SIP) Extension for the Identification of Services".

[14] IETF RFC 6665: "SIP-Specific Event Notification".

[14A] 3GPP TS 24.545: "Location Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[15]   IETF RFC 7252: "The Constrained Application Protocol (CoAP)".

[16]   IETF RFC 7959: "Block-Wise Transfers in the Constrained Application Protocol (CoAP)".

[17]   IETF RFC 7641: "Observing Resources in the Constrained Application Protocol (CoAP)".

[18]   IETF RFC 8323: "CoAP (Constrained Application Protocol) over TCP, TLS, and WebSockets".

[19]   IETF RFC 8949: "Concise Binary Object Representation (CBOR)".

[20]   IETF RFC 9177: "Constrained Application Protocol (CoAP) Block- Wise Transfer Options Supporting Robust Transmission".

[21]   IETF RFC 8610: "Concise Data Definition Language (CDDL): A Notational Convention to Express Concise Binary Object Representation (CBOR) and JSON Data Structures".

[22]   Constrained RESTful Environments (CoRE) Parameters at IANA, https://www.iana.org/assignments/core-parameters/core-parameters.xhtml.

[23]   3GPP TS 24.546: "Configuration management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

3   Definitions of terms and abbreviations

3.1   Terms

For the purposes of the present document, the terms given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

SEAL group management client: An entity that provides the client side functionalities corresponding to the SEAL group management service.

SEAL group management server: An entity that provides the server side functionalities corresponding to the SEAL group management service.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.434 [2] apply:

SEAL client
SEAL server
SEAL service
VAL group
VAL group member
VAL server
VAL service
VAL user
Vertical
Vertical application

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

MIME   Multipurpose Internet Mail Extensions
SEAL   Service Enabler Architecture Layer for verticals
SGM-C   SEAL Group Management Client
SGM-S   SEAL Group Management Server

4 General description

Group management is a SEAL service that provides the group management related capabilities to one or more vertical applications. The present document enables a SEAL group management client (SGM-C) and a VAL server to manage group documents in a SEAL group management server (SGM-S).

5 Functional entities

5.1 SEAL group management client (SGM-C)

The SGM-C is a functional entity that acts as the application client for management of groups.

To be compliant with the HTTP procedures in the present document, a SGM-C:

- shall support the role of XCAP client as specified in IETF RFC 4825 [3];

- shall support the role of XDMC as specified in OMA OMA-TS-XDM_Group-V1_1_1 [4];

- shall support the procedure in clause 6.2.2;

- shall support the procedure in clause 6.2.3;

- shall support the procedure in clause 6.2.4;

- shall support the procedure in clause 6.2.5;

- shall support the procedure in clause 6.2.6;

- shall support the procedure in clause 6.2.7;

- shall support the procedure in clause 6.2.8;

- shall support the procedure in clause 6.2.9.

- shall support the procedure in clause 6.2.10; and

- shall support the procedure in clause 6.2.11.

To be compliant with the CoAP procedures in the present document the SGM-C:

- shall support the role of CoAP client as specified in IETF RFC 7252 [15];

- shall support the capability to observe resources as specified in IETF RFC 7641 [17];

- shall support the block-wise transfer as specified in IETF RFC 7959 [16];

- may support the robust block transfer as specified in IETF RFC 9177 [20];

- should support CoAP over TCP and Websocket as specified in IETF RFC 8323 [18];

- shall support CBOR encoding as specified in IETF RFC 8949 [19];

- shall support the procedures in clause 6.2.2;

- shall support the procedure in clause 6.2.3;

- shall support the procedure in clause 6.2.4;

- shall support the procedure in clause 6.2.5;

- shall support the procedure in clause 6.2.6;

- shall support the procedure in clause 6.2.7;

- shall support the procedure in clause 6.2.8;

- shall support the procedure in clause 6.2.9;

- shall support the procedure in clause 6.2.10; and

- shall support the procedure in clause 6.2.11.

NOTE 1: The security mechanism to be supported for the CoAP procedures is described in 3GPP TS 24.547 [5].

NOTE 2: Support for TCP for the CoAP procedures is required if the client connects over the network which blocks or impedes the use of UDP, e.g. when NATs are present in the communication path.

NOTE 3: The CoAP protocol supports mechanism for reliable message exchange over UDP. Use of TCP can also be beneficial if reliable transport is required for other reasons, e.g. better observability of resources. Usage of CoAP over TCP is an implementation choice.

NOTE 4: Support for the robust block transfer mechanism for the CoAP procedures is beneficial in environments where packet loss is highly asymmetrical and where performance optimization of block transfers is required.

5.2   SEAL group management server (SGM-S)

The SGM-S functional entity provides for management of groups supported within the vertical application layer.

To be compliant with the HTTP procedures in the present document, a SGM-S:

- shall support the role of XCAP server as specified in IETF RFC 4825 [3];

- shall support the role of Group XDMS as specified in OMA OMA-TS-XDM_Group-V1_1_1 [4];

- shall support the procedure in clause 6.2.2;

- shall support the procedure in clause 6.2.3;

- shall support the procedure in clause 6.2.4;

- shall support the procedure in clause 6.2.5;

- shall support the procedure in clause 6.2.6;

- shall support the procedure in clause 6.2.7;

- shall support the procedure in clause 6.2.8;

- shall support the procedure in clause 6.2.9.

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- shall support the procedure in clause 6.2.11.

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- shall support the block-wise transfer as specified inIETF RFC 7959 [16];

- shall support the robust block transfer as specified in IETF RFC 9177 [20];

- shall support CoAP over TCP and Websocket as specified in IETF RFC 8323 [18];

- shall support CBOR encoding as specified in IETF RFC 8949 [19];

- shall support the procedures in clause 6.2.2;

- shall support the procedure in clause 6.2.3;

- shall support the procedure in clause 6.2.4;

- shall support the procedure in clause 6.2.5;

- shall support the procedure in clause 6.2.6;

- shall support the procedure in clause 6.2.7;

- shall support the procedure in clause 6.2.8;

- shall support the procedure in clause 6.2.9;

- shall support the procedure in clause 6.2.10; and

- shall support the procedure in clause 6.2.11.

NOTE: The security mechanism to be supported for the CoAP procedures is described in 3GPP TS 24.547 [5].

6 Group management procedures

6.1 General

6.2 On-network procedures

6.2.1 General

6.2.1.1 Authenticated identity in HTTP request

Upon receiving an HTTP request, the SGM-S shall authenticate the identity of the sender of the HTTP request as specified in 3GPP TS 24.547 [5], and if authentication is successful, the SGM-S shall use the identity of the sender of the HTTP request as an authenticated identity.

6.2.1.2 Boot up procedure

Upon device boot up, the GMC in the UE shall subscribe to group announcement events as specified in clause 6.2.8.1.2 or clause 6.2.8.1.1, and also fetch the list of groups as specified in clause 6.2.10.1.

6.2.1.3 Authenticated identity in CoAP request

Upon receiving an CoAP request, the SGM-S shall authenticate the identity of the sender of the CoAP request as specified in 3GPP TS 24.547 [5], and if authentication is successful, the SGM-S shall use the identity of the sender of the CoAP request as an authenticated identity.

6.2.2 Group creation procedure

6.2.2.1 SGM client HTTP procedure

Upon receiving a request from the VAL user to create a group document, the SGM-C shall create an XML document as specified in clause 7 and shall send the XML document to the SGM-S according to procedures specified in IETF RFC 4825 [3] "*Create or Replace a Document*". In the HTTP PUT request, the SGM-C:

a) shall set the Request URI to a XCAP URI identifying an XML document to be created. In the Request-URI:

1) the "XCAP Root" is set to the URI of the SGM-S;

    2) the "auid" is set to specific VAL service identity; and

    3) the document selector is set to a document URI pointing to a group document addressed by a group ID;

  b) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6];

  c) shall include a Content-Type header field set to "application/vnd.3gpp.seal-group-doc+xml"; and

  d) shall include an application/vnd.3gpp.seal-group-doc+xml MIME body and in the <seal-group-doc> root element:

    1) shall set "uri" attribute to the VAL group identity to be created;

    2) may include <display-name> element containing a human readable name of the VAL group;

    3) if the VAL user has requested to include administrator users, shall include <administrators> element of a <list-service> element with list of administrator users:

    4) if the list of users available who are required to give user consent to be member for the group, shall include such list of users into the <explicit-member-list> element of a <list-service> element;

    5) if the list of users available who are members of the group, shall include such list of users into the <list> element of a <list-service> element;

    6) shall include <common> element of a <list-service> element. The <common> element:

      i) may include <seal-subject> element indicating the title or description for the group;

      ii) shall include <category> element indicating the category of the group;

      iii) shall include one or more <val-service-id> element(s) indicating list of supported services by the group; and

      iv) if the request is to configure VAL group request, shall include one or more <geo-id> element(s), each element indicating list of geographical areas to be addressed by the group; and

    7) shall include <val-specific-config> element of a <list-service>. The <val-specific-config> element:

      i) may include <group-priority> element to the priority as specified by VAL user; and

      ii) may include <external-group-id> element identifying the member UEs of the VAL group at the 3GPP core network.

Upon receiving an HTTP 200 (OK), the SGM-C shall notify the VAL user about successful group registration. Based on VAL user's request, if group events subscription is not already created, then the SGM-C shall create the group events subscription as specified in clause 6.2.8.1.1 for the event SUBSCRIBE_GROUP_MODIFICATION (0x02) as defined in clause A.1.2. If group events subscription already exists then the SGM-C shall modify the subscription as specified in clause 6.2.8.1.2.

6.2.2.2 SGM server HTTP procedure

Upon reception of an HTTP PUT request where the Request-URI of the HTTP PUT request identifies an XML document as specified in clause 7, the SGM-S:

  a) shall determine the identity of the sender of the received HTTP PUT request as specified in clause 6.2.1.1, and:

    1) if the identity of the sender of the received HTTP PUT request is not authorized to initiate group creation, shall respond with a HTTP 403 (Forbidden) response to the HTTP PUT request and skip rest of the steps;

  b) if value of the group URI received in HTTP PUT request does not conform to local policy, shall respond with an HTTP 409 (Conflict) response to the HTTP PUT request. The <uniqueness-failure> error element shall identify the error condition. The SGM-S shall include at least one <alt-value> element in the <uniqueness-failure> error element, whereby each <alt-value> element contains a Group ID acceptable for the SGM-S. The SGM-S shall skip rest of the steps; and

c) shall support receiving an XML document according to procedures specified in IETF RFC 4825 [3] "*PUT Handling*" where the Request-URI of the HTTP PUT request identifies an XML document.

Upon successful creation of group, for each VAL user in <list> element of a <list-service> element of the group document, the SGM-S shall send Group Announcement notification as specified in clause 6.2.7.3.1 with following clarification:

a) shall set the "IsJoinReq" parameter to "false"; and

b) shall include the "Members-list" parameter as specified in clause B.2.

6.2.2.3 Group member SGM client HTTP procedure

Upon receiving an HTTP POST request over a callback URI which was given to SGM-S at time of group events subscription, the SGM-C shall follow the procedure as specified in clause 6.2.7.2.1.

6.2.2.4 SGM client CoAP procedure

6.2.2.4 SGM client CoAP procedure

Upon receiving a request from the VAL user to create a group document, the SGM-C shall send a CoAP POST request to the SGM-S. In the CoAP POST request, the SGM-C:

a) shall set the CoAP URI to the VAL Group Documents resource URI to according to the resource definition in clause C.2.1.2.2.2:

   1) the "apiRoot" is set to the SGM-S URI;

b) shall include Content-Format option set to "application/vnd.3gpp.seal-group-doc+cbor";

c) shall include "VALGroupDocument" object:

   1) shall set "valGroupId" attribute to the VAL group identity to be created;

   2) may include "groupName" attribute containing a human readable name of the VAL group;

   3) may include "grpDesc" attribute containing a human readable description of the VAL group;

   4) if the VAL user has requested to include a list of users who are to be members of the group, shall include "memberDetails" object, and for each member:

      i)   shall set "memberId" attribute to the VAL user ID or VAL UE ID;

      ii) if the VAL user has requested this member to be an administrator of the group, shall set "membershipType" attribute to "ADMINISTRATOR";

      iii) if the VAL user has requested this member to be required to give user consent to be a member of the group, shall set "membershipType" attribute to "EXPLICIT";

      iv) if the VAL user has requested this member to not be required to give user consent to be a member of the group, shall set "membershipType" attribute to "IMPLICIT";

   5) shall include "category" attribute indicating the category of the group;

   6) may include one or more VAL service IDs in "valServiceIds" attribute indicating a list of supported VAL services by the group;

   7) if the request is to configure VAL group request, shall include one or more geographical area identifiers in "geoIds" attribute, each identifier indicating the geographical area to be addressed by the group;

   8) may include "priority" attribute set to the priority as specified by VAL user;

   9) may include "extGrpId" attribute identifying the member UEs of the VAL group at the 3GPP core network;

10) may include "com5GLanType" attribute set to the 5GLAN communication type if requested by the VAL user;

11) may include "valGrpConf" attribute set to VAL specific configuration data if provided by the VAL user; and

12) if the request is to form a temporary group, shall include a list of VAL group IDs of the constituent VAL groups in "inclValGroupIds" attribute; and

d) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

Upon receiving a CoAP 2.01 (Created) response, the SGM-C shall notify the VAL user about successful group creation. Based on VAL user's request, the SGM-C shall create a subscription to changes of the newly created as specified in clause 6.2.8.1.3.2 for the Individual VAL Group Document resource.

6.2.2.5 SGM server CoAP procedure

Upon reception of an CoAP POST request where the CoAP URI of the request identifies the VAL Group Documents resource URI according to the resource definition in clause C.2.1.2.2.2, the SGM-S:

a) shall determine the identity of the sender of the received CoAP POST request as specified in clause 6.2.1.3, and:

1) if the identity of the sender of the received CoAP POST request is not authorized to create the VAL group document, shall respond with a 4.03 (Forbidden) response to the CoAP POST request and skip rest of the steps;

b) shall support handling an CoAP POST request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

c) shall create a new Individual VAL Group Document resource and for each VAL user in the list of members of the document shall create a new Individual Group Member resource and shall return the VAL group document and its resource URI in the CoAP 2.01 (Created) response as specified in clause C.2.1.2.2.3.1.

Upon successful creation of the group, for each group member the SGM-S shall send Group Announcement notification as specified in clause 6.2.7.5.1

6.2.2.6 Group member SGM client CoAP procedure

Upon receiving a group announcement notification, the SGM-C shall follow the procedure as specified in clause 6.2.7.4.1.

6.2.3 Group information query procedure

6.2.3.1 SGM client HTTP procedure

Upon receiving a request from the VAL user to retrieve an element of a group document, the SGM-C shall send an HTTP GET request to the SGM-S according to procedures specified in IETF RFC 4825 [3] "*Fetch an Element*". In HTTP GET request, the SGM-C:

a) shall set the Request-URI to a XCAP URI identifying an element within an XML document to be queried. In the Request-URI:

1) the "XCAP Root" is set to the URI of the SGM-S;

2) the "auid" is set to specific VAL service identity;

3) the document selector is set to a document URI pointing to a group document addressed by a group ID which contains the element to be queried; and

4) the node selector is set to a node URI identifying the element to be queried; and

b) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6].

6.2.3.2 SGM server HTTP procedure

Upon reception of an HTTP GET request where the Request-URI of the HTTP GET request identifies an element of a XML document as specified in clause 7, the SGM-S:

a) shall determine the identity of the sender of the received HTTP GET request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP GET request is not authorized to query group information, shall respond with a HTTP 403 (Forbidden) response to the HTTP GET request and skip rest of the steps; and

b) shall support handling an HTTP GET request from a SGM-C according to procedures specified in IETF RFC 4825 [3] "*GET Handling*".

6.2.3.3 SGM client CoAP procedure

Upon receiving a request from the VAL user to retrieve a part of a group document, the SGM-C shall send a CoAP GET request to the SGM-S with the CoAP URI set to the Individual VAL Group resource identifying the VAL group document and with the content filtering query parameters set according to the VAL user request. The procedure is described in clause 6.2.5.2.3.

6.2.3.4 SGM server CoAP procedure

Upon reception of a CoAP GET request for a part of a group document from the SGM-C, the SGM-S shall handle it as described in clause 6.2.5.2.4.

6.2.4 Group membership procedure

6.2.4.1 SGM client HTTP procedure

Upon receiving a request from the VAL user to update group membership element of a group document, a SGM-C shall send an HTTP PUT request to the SGM-S according to procedures specified in IETF RFC 4825 [3] "*Create or Replace an Element*". In HTTP PUT request, the SGM-C:

a) shall set the Request-URI to a XCAP URI identifying an element within an XML document to be updated. In the Request-URI:

1) the "XCAP Root" is set to the URI of the SGM-S;

2) the "auid" is set to specific VAL service identity;

3) the document selector is set to a document URI pointing to a group document addressed by a group ID which contains the element to be updated; and

4) the node selector is set to a node URI identifying the element to be updated; and

b) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6].

NOTE 1: The VAL client can use the procedure specified in this clause to update all possible elements which can be updated.

NOTE 2: If the VAL client is adding new member to the group, it may include VAL service specific information as an attribute of the new element or as an child element of the new element.

6.2.4.2 SGM server HTTP procedure

Upon reception of an HTTP PUT request where the Request-URI of the HTTP PUT request identifies an element of a XML document as specified in clause 7, the SGM-S:

a) shall determine the identity of the sender of the received HTTP PUT request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP PUT request is not authorized to update group information, shall respond with a HTTP 403 (Forbidden) response to the HTTP PUT request and skip rest of the steps;

b) shall support handling an HTTP PUT request from a SGM-C according to procedures specified in IETF RFC 4825 [3] "*PUT Handling*".

Upon successful modification of the group, the SGM-S shall notify all group members about the group modification by following the procedure specified in clause 6.2.8.2.2.2. In the group modify notification, the SGM-S shall set the "modificationType" parameter to the value GROUP_MEMBER_ADDED (0x01) as specified in clause B.3.

6.2.4.3   SGM client CoAP procedure

Upon receiving a request from the VAL user to update group membership of a group document, the SGM-C shall send a CoAP PUT request to the SGM-S. In the CoAP PUT request, the SGM-C:

a) shall set the CoAP URI identifying the individual VAL group document to be updated according to the resource definition in clause C.2.1.2.3.2::

1) the "apiRoot" is set to the SGM-S URI; and

2) the "groupDocId" to point to the VAL group document;

b) shall include Content-Format option set to "application/vnd.3gpp.seal-group-doc+cbor";

c) shall include "VALGroupDocument" object with "members" and "memberDetails" lists including the member identities and member details according to the requested group membership; and

d) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

NOTE 1: The VAL client can use the procedure specified in this clause to update all possible attributes which can be updated.

NOTE 2: If the VAL client is adding a new member to the group, it may include VAL service specific information in the "memberConfig" attribute of the "GroupMember" object.

6.2.4.4   SGM server CoAP procedure

Upon reception of an CoAP PUT request where the CoAP URI of the request identifies Individual VAL Group Document resource as described in clause C.2.1.2.3.2, the SGM-S:

a) shall determine the identity of the sender of the received CoAP PUT request as specified in clause 6.2.1.3, and:

1) if the identity of the sender of the received CoAP PUT request is not authorized to update the requested VAL group document, shall respond with a CoAP 4.03 (Forbidden) response to the CoAP PUT request and skip rest of the steps;

b) shall support handling an CoAP PUT request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

c) shall update the VAL group document pointed according to the "VALGroupDocument" received in the request, and:

1) for each new member in the group shall create a new individual group member resource; and

2) for each member removed from the group shall delete the corresponding individual group member resource.

Upon successful modification of the group, the SGM-S shall notify all group members about the group modification by following the procedure specified in clause 6.2.8.2.3.2.

6.2.5   Group configuration management procedure

6.2.5.1   Update group configuration

6.2.5.1.1   SGM client HTTP procedure

Upon receiving a request from the VAL user to update a group document, the SGM-C shall create an XML document as specified in clause 7 and shall send the XML document to the SGM-S according to procedures specified in IETF RFC 4825 [3] "*Create or Replace a Document*". In the HTTP PUT request, the SGM-C:

a) shall set the Request URI to a XCAP URI identifying an XML document to be updated. In the Request-URI:

    1) the "XCAP Root" is set to the URI of the SGM-S;

    2) the "auid" is set to specific VAL service identity; and

    3) the document selector is set to a document URI pointing to a group document addressed by a group ID;

b) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6];

c) shall include a Content-Type header field set to "application/vnd.3gpp.seal-group-doc+xml"; and

d) shall include an application/vnd.3gpp.seal-group-doc+xml MIME body and in the <seal-group-doc> root element:

    1) shall set "uri" attribute to the VAL group identity to be updated;

    2) may include <display-name> element containing a human readable name of the VAL group;

    3) if the VAL user has requested to include administrator users, shall include <administrators> element of a <list-service> element with list of administrator users;

    4) if the list of users available who are required to give user consent to be member for the group, shall include such list of users into the <explicit-member-list> element of a <list-service> element;

    5) if the list of users available who are members of the group, shall include such list of users into the <list> element of a <list-service> element;

    6) shall include <common> element of a <list-service> element. The <common> element:

       i) may include <seal-subject> element indicating the title or description for the group;

       ii) shall include <category> element indicating the category of the group; and

       iii) shall include <val-services> element indicating list of supported services by the group; and

    7) shall include <val-specific-config> element of a <list-service>. The <val-specific-config> element:

       i) may include <group-priority> element to the priority as specified by VAL user.

6.2.5.1.2   SGM server HTTP procedure

Upon reception of an HTTP PUT request where the Request-URI of the HTTP PUT request identifies an XML document as specified in clause 7, the SGM-S:

a) shall determine the identity of the sender of the received HTTP PUT request as specified in clause 6.2.1.1, and:

    1) if the identity of the sender of the received HTTP PUT request is not authorized to update the group document, shall respond with a HTTP 403 (Forbidden) response to the HTTP PUT request and skip rest of the steps; and

b) shall support receiving an XML document as specified in application usage of the specific vertical application according to procedures specified in IETF RFC 4825 [3] "*PUT Handling*".

Upon successful modification of the group, the SGM-S shall notify all group members about the group modification by following the procedure specified in clause 6.2.8.2.2.2. In the group modify notification, the SGM-S shall set the "modificationType" parameter to the value GROUP_CONFIG_UPDATE (0x03) as specified in clause B.3.

6.2.5.1.3 SGM client CoAP procedure

Upon receiving a request from the VAL user to update a group document, the SGM-C shall send a CoAP PUT request to the SGM-S. In the CoAP PUT request, the SGM-C:

a) shall set the CoAP URI identifying the individual VAL group document to be updated according to the resource definition in clause C.2.1.2.3.2:

1) the "apiRoot" is set to the SGM-S URI; and

2) the "groupDocId" to point to the VAL group document;

b) shall include Content-Format option set to "application/vnd.3gpp.seal-group-doc+cbor";

c) shall include "VALGroupDocument" object in the payload:

1) shall set "valGroupId" attribute to the same VAL group identity as in the group document to be updated;

2) may include "groupName" attribute containing a human readable name of the VAL group;

3) may include "grpDesc" attribute containing a human readable description of the VAL group;

4) if the VAL user has requested to include a list of users who are to be members of the group, shall include "memberDetails" object, and for each member:

   i) shall set "memberId" attribute to the VAL user ID or VAL UE ID;

   ii) if the VAL user has requested this member to be an administrator of the group, shall set "membershipType" attribute to "ADMINISTRATOR";

   iii) if the VAL user has requested this member to be required to give user consent to be a member of the group, shall set "membershipType" attribute to "EXPLICIT"; and

   iv) if the VAL user has requested this member to not be required to give user consent to be a member of the group, shall set "membershipType" attribute to "IMPLICIT";

5) shall include "category" attribute indicating the category of the group;

6) shall include one or more VAL service IDs in "valServiceIds" attribute indicating a list of VAL services supported by the group;

7) if the request is to configure VAL group request, shall include one or more geographical area identifiers in "geoIds" attribute, each identifier indicating the geographical area to be addressed by the group;

8) may include "priority" attribute set to the priority as specified by VAL user;

9) may include "extGrpId" attribute identifying the member UEs of the VAL group at the 3GPP core network;

10) may include "com5GLanType" attribute set to the 5GLAN communication type if requested by the VAL user; and

11) may include "valGrpConf" attribute set to VAL specific configuration data if provided by the VAL user; and

d) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

6.2.5.1.4 SGM server CoAP procedure

Upon reception of an CoAP PUT request where the CoAP URI of the request identifies an Individual VAL Group Document resource as described in clause C.2.1.2.3.2, the SGM-S:

a) shall determine the identity of the sender of the received CoAP PUT request as specified in clause 6.2.1.3, and:

1) if the identity of the sender of the received CoAP PUT request is not authorized to update the requested VAL group document, shall respond with a CoAP 4.03 (Forbidden) response to the CoAP PUT request and skip rest of the steps;

b) shall support handling an CoAP PUT request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

c) shall update the VAL group document pointed according to the "VALGroupDocument" received in the request, and:

1) for each new member in the group shall create a new individual group member resource; and

2) for each member removed from the group shall delete the corresponding individual group member resource.

Upon successful modification of the group, the SGM-S shall notify all group members about the group modification by following the procedure specified in clause 6.2.8.2.3.2.

6.2.5.2 Retrieve group document

6.2.5.2.1 SGM client HTTP procedure

Upon receiving a request from the VAL user to retrieve a group document, the SGM-C shall send an HTTP GET request to the SGM-S according to procedures specified in IETF RFC 4825 [3] "*Fetch a Document*". In HTTP GET request, the SGM-C:

a) shall set the Request-URI to a XCAP URI identifying an XML document to be retrieved. In the Request-URI:

1) the "XCAP Root" is set to the URI of the SGM-S;

2) the "auid" is set to specific VAL service identity; and

3) the document selector is set to a document URI pointing to a group document addressed by a group ID; and

b) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6].

6.2.5.2.2 SGM server HTTP procedure

Upon reception of an HTTP GET request where the Request-URI of the HTTP GET request identifies an XML document as specified in clause 7, the SGM-S:

a) shall determine the identity of the sender of the received HTTP GET request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP GET request is not authorized to retrieve the group document, shall respond with a HTTP 403 (Forbidden) response to the HTTP GET request and skip rest of the steps; and

b) shall support receiving an XML document as specified in application usage of the specific vertical application according to procedures specified in IETF RFC 4825 [3] "*GET Handling*".

6.2.5.2.3 SGM client CoAP procedure

Upon receiving a request from the VAL user to retrieve a group document, the SGM-C shall send a CoAP GET request to the SGM-S. In the CoAP GET request, the SGM-C:

a) shall set the CoAP URI identifying the group document to be retrieved according to resource API definition in clause C.2.1.2:

1) the "apiRoot" is set to the SGM-S URI; and

2) if the SGM-C does not know the "groupDocId" of the group document at the SGM-S, the SGM-C:

i) shall use the VAL Group Documents resource GET and shall set "val-group-id" query parameter to the VAL group ID and may set any of the other query parameters as described in clause C.2.1.2.2.3.2; or

    ii) shall use the Individual VAL Group Document resource GET and shall set "groupDocId" to point to the VAL group document and may set any of the content filtering query parameters as described in clause C.2.1.2.3.3.1; and

  b) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

6.2.5.2.4 SGM server CoAP procedure

Upon reception of an CoAP GET request where the CoAP URI of the request identifies VAL Group Documents resource as described in clause C.2.1.2.2.3.2, the SGM-S:

  a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.3, and:

    1) if the sender is not authorized to fetch the requested VAL group document(s), shall respond with a 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

  b) shall support handling a CoAP GET request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

  c) shall return a 2.05 (Content) response including all the VAL group documents matching all the given values of the query parameters.

Upon reception of an CoAP GET request where the CoAP URI of the request identifies Individual VAL Group Document resource as described in clause C.2.1.2.3.3.1, the SGM-S:

  a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.3, and:

    1) if the sender is not authorized to fetch the requested VAL group document, shall respond with a 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

  b) shall support handling a CoAP GET request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

  c) shall check if the resource pointed at by the CoAP URI exists and:

    1) if it exists, shall return the VAL document in a 2.05 (Content) response with the content of the document matching the content filtering query parameters; or

    2) otherwise, shall return a 4.04 (Not found) response.

6.2.6 Location-based group creation procedure

6.2.6.1 SGM client HTTP procedure

Upon receiving a request from the VAL user to create a location based group, the SGM-C shall follow the procedure as defined in clause 6.2.2.1 with following clarifications.

The SGM-C:

  a) shall set <category> child element of <common> element of a <list-service> element to the value "location-based" as defined in clause 7; and

  b) shall set the location of tracking area in the <geo-id> child element of <common> element of a <list-service> element.

6.2.6.2 SGM server HTTP procedure

Upon receiving HTTP PUT request with <category> child element of <common> element of a <list-service> element set to the value "location-based", the SGM-S shall follow the procedure as defined in clause 6.2.2.2 with following clarifications. The SGM-S:

  a) shall obtain the list of users based on location as specified in clause 6.2.9 of 3GPP TS 24.545 [14A] and include the list of users in the group document.

6.2.6.3 SGM client CoAP procedure

Upon receiving a request from the VAL user to create a location based group, the SGM-C shall follow the procedure as defined in clause 6.2.2.4 with following clarifications. The SGM-C:

a) shall set "category" attribute to "LOCATION_BASED"; and

b) shall set the location of tracking area as an item in the list in the "geoIds" attribute.

6.2.6.4 SGM server CoAP procedure

Upon receiving a group creation request for a group with the "category" attribute value of "LOCATION_BASED", the SGM-S shall follow the procedure as defined in clause 6.2.2.5 with following clarifications. The SGM-S:

a) shall obtain the list of users based on the location provided in the "geoIds" attribute as specified in clause 6.2.9 of 3GPP TS 24.545 [14A] and include the list of users in the group document; and

b) for each new member in the group shall create a new individual group member resource.

6.2.7 Group announcement and join procedure

6.2.7.1 General

Upon successful creation of the group as specified in clause 6.2.2, the SGM-S follow the HTTP procedure specified in clause 6.2.7.3 to notify group announcement to group members and to handle group registration request from SGM-C. If CoAP is used the respective procedures are specified in clause 6.2.7.5.

The SGM-C shall follow the HTTP procedure specified in clause 6.2.7.2 to handle received group announcement notification and to request group registration. If CoAP is used the respective procedures are specified in clause 6.2.7.4.

6.2.7.2 SGM client HTTP procedure

6.2.7.2.1 Receiving group announcement notification

Upon receiving an HTTP POST request over a callback URI which was given to SGM-S at time of group events subscription, the SGM-C:

a) shall match subscription identity received in the "Identity" parameter of the HTTP POST request with the locally stored identity of the subscription. If subscription identity is not valid, then

   1) send an HTTP 406 (Not Acceptable) response and skip rest of the steps;

b) shall send an HTTP 200 (OK); and

c) if "Event" parameter is set to SUBSCRIBE_GROUP_ANNOUNCEMENT (0x01) as specified in clause B.2, shall notify the VAL user about announcement of group with group-ID and subject. If the notification contains "IsJoinReq" parameter with value set to "true", the SGM-C shall ask VAL user to join the group. The SGM-C may also decide to store the group announcement based on user's request.

6.2.7.2.2 Sending group registration request

Upon receiving request from VAL user to join the group, the SGM-C:

a) shall generate an HTTP POST request. In the HTTP POST request:

   1) shall set the Request URI to the value "/group-registration";

   2) shall include the Host header with public user identity of SGM-S;

   3) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6];

4) shall include in the HTTP request entity-body the "group-ID" parameter set to the group URI received in group announcement notification; and

5) may include the parameters specified in clause A.2.1 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10]; and

b) shall send an HTTP POST request to SGM-S.

Upon receiving an HTTP 200 (OK), the SGM-C shall notify the VAL user about successful group registration. Based on VAL user's request, if group events subscription is not already created, then the SGM-C shall create the group events subscription as specified in clause 6.2.8.1.1 for the event SUBSCRIBE_GROUP_MODIFICATION (0x02) and SUBSCRIBE_GROUP_IDENTITY_LIST (0x04) as defined in clause A.1.2. If group events subscription already exists then the SGM-C shall modify the subscription as specified in the clause 6.2.8.1.2.

6.2.7.2.3 Receiving group identity list notification

Upon receiving an HTTP POST request over a callback URI which was given to SGM-S at time of group events subscription, the SGM-C:

a) shall match subscription identity received in the "Identity" parameter of the HTTP POST request with the locally stored identity of the subscription. If subscription identity is not valid, then;

1) shall send an HTTP 406 (Not Acceptable) response and skip rest of the steps;

b) shall send an HTTP 200 (OK); and

c) if "Event" parameter is set to SUBSCRIBE_GROUP_IDENTITY_LIST (0x04) as specified in clause B.4, shall notify the VAL user about group list members.

6.2.7.3 SGM server HTTP procedure

6.2.7.3.1 Sending group announcement notification

Upon successful creation of group, for each VAL user in <explicit-member-list> element of a <list-service> element of the group document, the SGM-S:

a) shall check whether valid group events subscription exists or not for event SUBSCRIBE_GROUP_ANNOUNCEMENT (0x01) as defined in clause A.1.2; if valid subscription does not exist then skip rest of the steps;

b) shall generate an HTTP POST message to notify group announcement. In the HTTP POST message:

1) shall set request URI to callback URI received at the time of creating subscription;

2) shall set Content-Type header to "application/json";and

3) shall include an HTTP request entity-body serialized into a JavaScript Object Notation (JSON) structure; In the entity-body:

    i) shall set the "Identity" parameter to the identity of the subscription;

    ii) shall set the "Event" parameter to the value SUBSCRIBE_GROUP_ANNOUNCEMENT (ox01) as specified in clause B.2;

    iii) shall set the "GroupID" parameter to the identity of the VAL Group;

    iv) may set the "Subject" parameter to the value of <seal-subject> child element of a <common> element of a <list-service> element from the group document;

    v) shall set the "IsJoinReq" parameter to "true";

    vi) may include the "Val-services" parameter as specified in clause B.2;

    vii)if there are no privacy concerns with sharing the identity list, may include the "Members-list" parameter as specified in clause B.2; and

viii) if the group is created for 5G LAN-Type communication, may include the "5GVN Group Info" parameter providing 5GVN group information; and

c) shall send the HTTP POST request towards SGM-C.

6.2.7.3.2   Receiving group registration request

Upon reception of an HTTP POST request where the Request-URI of the HTTP POST request is set to "/group-registration", the SGM-S:

a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP POST request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP POST request and skip rest of the steps;

b) shall update the members information in group document; and

c) shall send an HTTP 200 (OK) response to SGM-C.

6.2.7.3.3   Sending group identity list notification

Upon successful creation of group, for each VAL user in <explicit-member-list> element of a <list-service> element of the group document, the SGM-S:

a) shall check whether valid group events subscription exists or not for event SUBSCRIBE_GROUP_IDENTITY_LIST (0x04) as defined in clause A.1.2; if valid subscription does not exist then skip rest of the steps;

b) shall generate an HTTP POST message to notify group announcement. In the HTTP POST message:

1) shall set request URI to callback URI received at the time of creating subscription;

2) shall set Content-Type header to "application/json"; and

3) shall include an HTTP request entity-body serialized into a JavaScript Object Notation (JSON) structure; In the entity-body;

i) shall set the "Identity" parameter to the identity of the subscription;

ii) shall set the "Event" parameter to the value SUBSCRIBE_GROUP_IDENTITY_LIST (0x04) as specified in clause B.4;

iii) shall set the "GroupID" parameter to the identity of the VAL Group; and

iv) shall include the "Members-list" parameter as specified in clause B.4; and

c) shall send the HTTP POST request towards SGM-C.

6.2.7.4   SGM client CoAP procedure

6.2.7.4.1   Subscribing to and receiving group announcement notification

In order to subscribe to group announcements, the SGM-C shall send an extended CoAP GET request with the CoAP URI set to the URI of the observable VAL Group Documents resource and with the " member-id " query parameter set to the VAL user ID or VAL UE ID and with the Observe option set to 0 (Register) as specified in IETF RFC 7641 [17].

Upon receiving a CoAP 2.05 (Content) response that matches the extended CoAP GET request which initiated the subscription, and which contains the Observe option, the SGM-C:

a) shall handle the response according to IETF RFC 7641 [17];

b) shall compare the received list of the VAL group documents with the local list of VAL group documents to determine the new group(s) in which the VAL user is a member, and for each such new group:

1) shall notify the VAL user about announcement of group with "valGroupId", "groupName" and "grpDesc"; and

2) if VAL user's "membershipType" value is "EXPLICIT", the SGM-C shall ask VAL user to join the group; and

c) shall update the local list of VAL group documents, and may also decide to store the group announcement based on user's request.

6.2.7.4.2 Sending group registration request

Upon receiving request from VAL user to join the group, the SGM-C shall send a CoAP PUT request to the SGM-S. In the CoAP PUT request, the SGM-C:

a) shall set the CoAP URI to the "resUri" of the group member corresponding to the VAL user, so that the CoAP URI of the request identifies the Individual Group Member resource to be updated according to the resource definition in clause C.2.1.2.4.3.2:

1) the "apiRoot" is set to the SGM-S URI;

2) the "groupDocId" is set to point to the VAL group document; and

3) the "memberId" is set to VAL user ID or VAL UE ID;

b) shall include Content-Format option set to "application/vnd.3gpp.seal-group-member-info+cbor";

c) shall include "GroupMember" object which:

1) shall contain "membershipState" with the "registered" attribute set to "true";

2) may contain "messageFilter" attribute; and

3) shall contain all the other attributes unchanged; and

d) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

Upon receiving a CoAP 2.04 (Changed), the SGM-C shall notify the VAL user about successful group registration. Based on VAL user's request, if subscription to modifications of this group is not already created, then the SGM-C shall create such a subscription as specified in clause 6.2.8.1.3.2.

6.2.7.4.3 Subscribing to and receiving group identity list notification

In order to subscribe to changes in the group's identity list, the SGM-C shall send an extended CoAP GET request with the CoAP URI set to the URI of the observable Individual VAL Group Document resource and with the "group-members" query parameter set to "true" and with the Observe option set to 0 (Register) as specified in IETF RFC 7641 [17].

Upon receiving a CoAP 2.05 (Content) response that matches the extended CoAP GET request which initiated the subscription, and which contains the Observe option, the SGM-C:

a) shall handle the response according to IETF RFC 7641 [17]; and

b) shall notify the VAL user about group members.

6.2.7.5 SGM server CoAP procedure

6.2.7.5.1 Receiving group announcement subscription

Upon reception of an extended CoAP GET request with the CoAP URI set to the URI of the observable VAL Group Documents resource with the " member-id " query parameter and with the Observe option set to 0 (Register), the SGM-S:

a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.3, and:

1) if the sender is not authorized to fetch the requested VAL group document(s), shall respond with a 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

b) shall support handling a CoAP GET request from a SGM-C according to procedures specified in IETF RFC 7252 [15];

c) shall register the SGM-C as an observer of this resource with the given value of the " member-id " query parameter, as per IETF RFC 7641 [17]; and

d) shall send a CoAP 2.05 (Content) response with the Observer option set to the initial sequence number of the notification and with the payload including all the VAL group documents in which the given value of the " member-id" query parameter matches any of the group members' "memberId" attribute.

6.2.7.5.2 Sending group announcement notification

Upon successful creation of a group, for each group member in the group document which has "EXPLICIT" membership type, the SGM-S:

a) shall check whether a valid group announcement subscription with a matching value of " member-id " exists or not, as defined in clause 6.2.7.5.1; if it does not exist then skip rest of the steps; and

b) shall send a CoAP 2.05 (Content) response with the Observer option set to incremented sequence number of the notification and with the payload including all the VAL group documents in which the subscription's value of the " member-id " query parameter matches any of the group members'"memberId" attribute. Each included VAL group document shall also have the list of group members included in "memberDetails" attribute.

6.2.7.5.3 Receiving subscription request and sending group identity list notification

Upon reception of an extended CoAP GET request with the CoAP URI set to the URI of the observable Individual VAL Group Document resource with the "group-members" query parameter set to "true" and with the Observe option set to 0 (Register), the SGM-S:

a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.1, and:

1) if the sender is not authorized to fetch the requested VAL group document, shall respond with a 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

b) shall support handling a CoAP GET request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

c) shall check if the resource pointed at by the CoAP URI exists and:

1) if it does not exist, shall return a 4.04 (Not found) response and skip rest of the steps;

2) shall register the SGM-C as an observer of this resource as per IETF RFC 7641 [17]; and

3) shall send a CoAP 2.05 (Content) response with the Observe option set to the initial sequence number of the notification and with the payload including the VAL group document with the content of the document matching the content filtering query parameters, i.e., including the member list in the "members" attribute.

Upon a change in the list of group members of the VAL group document, for each group identity list subscription, the SGM-S:

a) shall send a CoAP 2.05 (Content) response with the Observe option set to incremented sequence number of the notification and with the payload including the VAL group document with the content of the document matching the content filtering query parameters, i.e., including the member list in the "members" attribute.

6.2.8 Group subscription and notification procedure

6.2.8.1 Management of group events subscription

6.2.8.1.1 SIP based procedures

6.2.8.1.1.1 General

The VAL service will use the same identity which has been authenticated by VAL service with SIP core using SIP based REGISTER message. If VAL service do not support SIP protocol, then HTTP based method needs to be used.

The SGM-C shall use mechanism provided by VAL service to add access-token in SIP messages. The SGM-S shall identify the originating VAL user ID from the access-token received from SGM-C using the mechanism defined in VAL service specification.

6.2.8.1.1.2 Create subscription

In order to subscribe to notification of changes of one or more group documents of VAL groups identified by VAL group IDs, a SGM-C shall send an initial SIP SUBSCRIBE request to the network according to the UE originating procedures specified in 3GPP TS 24.229 [11] and IETF RFC 5875 [12]. In the initial SIP SUBSCRIBE request, the SGM-C:

   a) shall set the Request-URI to the configured public service identity for performing subscription proxy function of the SGM-S;

   b) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.seal" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [13];

   c) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.seal" in the Contact header field;

   d) shall include an application/resource-lists+xml MIME body. In the application/resource-lists+xml MIME body, the SGM-C shall include one <entry> element for each group document to be subscribed to, such that the "uri" attribute of the <entry> element contains a relative path reference to XCAP URI identifying an XML document to be subscribed to;and

   e) if the VAL server wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [14], to zero. Otherwise, shall set the Expires header field to the duration for which VAL user has requested for subscription.

Upon reception of an initial SIP SUBSCRIBE request:

   a) with the Event header field set to xcap-diff;

   b) with the Request-URI set to own public service identity for performing subscription proxy function of the SGM-S;

   c) with an application/resource-lists+xml MIME body; and

   d) with the ICSI value "urn:urn-7:3gpp-service.ims.icsi.seal" (coded as specified in 3GPP TS 24 229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [13];

the SGM-S:

   a) shall identify the originating VAL user ID and shall use the originating VAL user ID as an authenticated identity when performing the authorization;

   b) if the authenticated identity is not authorized to subscribe to notification of changes of any resource in the application/resource-lists+xml MIME body, shall reject the request with a SIP 403 (Forbidden) response and shall not continue with rest of the steps; and

   c) shall act as a notifier according to IETF RFC 5875 [12].

6.2.8.1.1.3 Modify subscription

In order to modify or refresh subscription, the SGM-C shall send SIP re-SUBSCRIBE request on the same dialog as the existing subscription, and with the same "Event" header. The SGM-C shall follow the steps specified in clause 6.2.8.1.1.2.1 to create SIP SUBSCRIBE request.

Upon reception of a SIP re-SUBSCRIBE request:

a) with the Event header field set to xcap-diff; and

b) with an application/resource-lists+xml MIME body;

the SGM-S:

a) shall act as a notifier according to IETF RFC 5875 [12].

6.2.8.1.1.4 Delete subscription

In order to delete the subscription, the SGM-C shall send SIP re-SUBSCRIBE request on the same dialog as the existing subscription, and with the same "Event" header. The SGM-C shall follow the steps specified in clause 6.2.8.1.1.2.1 to create SIP SUBSCRIBE request with following clarification:

a) shall set the Expires header field to zero.

Upon reception of a SIP re-SUBSCRIBE request:

a) with the Event header field set to xcap-diff; and

b) with Expires header field set to zero;

the SGM-S:

a) shall act as a notifier according to IETF RFC 5875 [12].

6.2.8.1.2 HTTP based procedures

6.2.8.1.2.1 Creating subscription

Upon successful service authorization of the VAL service, the SGM-C shall create a subscription for group events by sending an HTTP POST request to the SGM-S. In the HTTP POST request, the SGM-C:

a) shall set the Request URI to the URI of the SGM-S appended with VAL service identity and the value "/groupEventsSubscription";

b) shall include the Host header with public user identity of SGM-S;

c) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6]; and

d) include the parameters specified in clause A.1.2 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10].

Upon reception of an HTTP POST request from SGM-C where the Request-URI of the HTTP POST request contains "/groupEventsSubscription" without subscription identity, the SGM-S:

a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1, and:

   1) if the identity of the sender of the received HTTP POST request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP POST request and skip rest of the steps;

b) shall generate unique subscription identity and store the subscription details for the authorized user; and

c) shall send an HTTP 200 (OK) response including parameters specified in clause A.1.3.

6.2.8.1.2.2 Modify a subscription

Upon receiving a request from VAL user to modify existing subscription identified with unique subscription identity, the SGM-C:

a) shall generate an HTTP PUT request. In the HTTP PUT request:

   1) shall set the Request URI to the same Request URI used while creating subscription in clause 6.2.8.1.2.1.1 appended with subscription identity;

   2) shall include the Host header with public user identity of SGM-S;

   3) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6]; and

   4) include the parameters specified in clause A.1.2 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10];and

b) shall send the HTTP PUT request to the SGM-S.

Upon reception of an HTTP PUT request from SGM-C where the Request-URI of the HTTP PUT request is set to "/groupEventsSubscription" appended with subscription identity, the SGM-S:

a) shall determine the identity of the sender of the received HTTP PUT request as specified in clause 6.2.1.1, and:

   1) if the identity of the sender of the received HTTP PUT request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP PUT request and skip rest of the steps;

b) shall determine whether subscription for group events exists or not based on received subscription identity in request URI,and:

   1) if subscription does not exist, shall respond with an HTTP 406 (Not Acceptable) response to the HTTP PUT request and skip rest of the steps;

c) shall update the subscription details based on received parameters from the HTTP PUT request; and

d) shall send an HTTP 200 (OK) response including parameters specified in clause A.1.3.

6.2.8.1.2.3 Delete a subscription

Upon receiving a request from VAL user to delete existing subscription identified with unique subscription identity, the SGM-C:

a) shall generate an HTTP DELETE request. In the HTTP DELETE request:

   1) shall set the Request URI to the value "/groupEventsSubscription" appended with subscription identity;

   2) shall include the Host header with public user identity of SGM-S; and

   3) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6]; and

b) shall send the HTTP DELETE request to the SGM-S.

Upon reception of an HTTP DELETE request from SGM-C where the Request-URI of the HTTP DELETE request contains "/groupEventsSubscription" appended with subscription identity, the SGM-S:

a) shall determine the identity of the sender of the received HTTP DELETE request as specified in clause 6.2.1.1, and:

   1) if the identity of the sender of the received HTTP DELETE request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP DELETE request and skip rest of the steps;

b) shall determine whether subscription for group events exists or not based on received subscription identity in request URI,and:

1) if subscription does not exist, shall respond with an HTTP 406 (Not Acceptable) response to the HTTP DELETE request and skip rest of the steps;

c) shall delete the subscription details based on received parameters from the HTTP DELETE request; and

d) shall send an HTTP 200 (OK) response to the SGM-C.

6.2.8.1.3 CoAP based procedures

6.2.8.1.3.1 General

CoAP based procedures shall use the mechanisms to observe a resource as specified in IETF RFC 7641 [17].

NOTE: CoAP "observe" mechanism uses the principle of eventual consistency where an intermediate state change can be lost when UDP is used. If it is critical for the client to receive every change in the resource state (and not just the latest state), TCP can be used to avoid missing notifications.

6.2.8.1.3.2 Create a subscription

The CoAP resource representation defines in clause C.2.1.2 the following observable resources:

a) VAL Group Documents resource which represents a collection resource of VAL group documents, and which may be observed by the SGM-C with the purpose to be notified when the VAL user is defined as a group member; and

b) Individual VAL Group Document which represents a single VAL group document, and which may be observed by the SGM-C with the purpose to be notified when the VAL group document is modified. By means of the content filters the SGM-C may choose the part of the VAL group document to be included in the notification.

In order to subscribe to changes of an observable resource the SGM-C shall send an extended CoAP GET request with the CoAP URI set to the URI of the observable resource and with the Observe option set to 0 (Register) as specified in IETF RFC 7641 [17].

Upon reception of such an extended CoAP request from SGM-C where the CoAP URI of the request points at an observable resource and with the Observe option set to 0 (Register), the SGM-S:

a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.3, and:

1) if the sender is not authorized to fetch the requested resource, shall respond with a 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

b) shall support handling a CoAP GET request from a SGM-C according to procedures specified in IETF RFC 7252 [15];

c) shall register the SGM-C as an observer as per IETF RFC 7641 [17]; and

d) shall send a CoAP 2.05 (Content) response including the current content of the resource and the Observe option with the initial sequence number of the notification.

6.2.8.1.3.3 Delete a subscription

In order to unsubscribe from changes of an observable resource the SGM-C shall send a CoAP GET request matching the CoAP GET request used to create the subscription but with the Observe option set to 1 (Deregister) as specified in IETF RFC 7641 [17].

Upon reception of a CoAP GET that matches an active subscription but with the Observe option set to 1 (Deregister), the SGM-S:

a) shall perform the steps as for a normal CoAP GET request for the observable resource;

b) shall deregister the SGM-C as an observer as per IETF RFC 7641 [17]; and

c) shall send a CoAP 2.05 (Content) response including the current content of the resource and shall not include the Observe option.

6.2.8.2   Notifications

6.2.8.2.1   SIP based procedures

6.2.8.2.1.1 Client procedure

Upon receiving a SIP NOTIFY request associated with a subscription created as result of the sent initial SIP SUBSCRIBE request, the SGM-S:

a) shall handle the SIP NOTIFY request according to IETF RFC 5875 [12].

6.2.8.2.1.2   Server procedure

In order to send notification of group document update event, the SGM-S shall send SIP NOTIFY to SGM-C according to IETF RFC 5875 [12].

6.2.8.2.2   HTTP based procedures

6.2.8.2.2.1   Receiving group modify notification

Upon receiving an HTTP POST request over a callback URI which was given to the SGM-S at time of group events subscription, the SGM-C:

a) shall match subscription identity received in the "Identity" parameter of the HTTP POST request with the locally stored identity of the subscription. If subscription identity is not valid, then;

1) shall send an HTTP 406 (Not Acceptable) response and skip rest of the steps;

b) shall send an HTTP 200 (OK); and

c) if "Event" parameter is set to SUBSCRIBE_GROUP_MODIFICATION (0x02) as specified in clause B.3, shall notify the VAL user about modification of group with group-ID.

Based on VAL user's request, the SGM-C may also retrieve the group document identified by group ID received in group modify notification as specified in clause 6.2.5.2.

6.2.8.2.2.2   Sending group modify notification

To send the group modification notification to the SGM-C, the SGM-S:

a) shall check whether valid group events subscription exists for event SUBSCRIBE_GROUP_MODIFICATION (0x02) as defined in clause A.1.2 or not; if valid subscription does not exists then skip rest of the steps;

b) shall generate an HTTP POST message to notify group announcement. In the HTTP POST message:

1) shall set request URI to the callback URI received at the time of creating subscription;

2) shall set Content-Type header to "application/json"; and

3) shall include an HTTP request entity-body with the parameters specified in clause B.3 serialized into a JavaScript Object Notation (JSON) structure; and

c) shall sent the HTTP POST request towards SGM-C.

6.2.8.2.2.3   Receiving group deletion notification

Upon receiving an HTTP POST request over a callback URI which was given to the SGM-S at time of group events subscription, the SGM-C:

a) shall match subscription identity received in the "Identity" parameter of the HTTP POST request with the locally stored identity of the subscription. If subscription identity is not valid, then:

1) shall send an HTTP 406 (Not Acceptable) response and skip rest of the steps;

b) shall send an HTTP 200 (OK); and

c) if "Event" parameter is set to SUBSCRIBE_GROUP_DELETION (0x05) as specified in clause B.x, shall notify the VAL user about deletion of group with group-ID.

The SGM-C shall also delete the any local stored group document identified by group ID.

6.2.8.2.2.4 Sending group deletion notification

To send the group modification notification to the SGM-C, the SGM-S:

a) shall check whether valid group events subscription exists for event SUBSCRIBE_GROUP_DELETION (0x05) as defined in clause A.1.2 or not; if valid subscription does not exists then skip rest of the steps;

b) shall generate an HTTP POST message to notify group announcement. In the HTTP POST message:

   1) shall set request URI to the callback URI received at the time of creating subscription;

   2) shall set Content-Type header to "application/json"; and

   3) shall include an HTTP request entity-body with the parameters specified in clause B.x serialized into a JavaScript Object Notation (JSON) structure; and

c) shall sent the HTTP POST request towards SGM-C.

6.2.8.2.3 CoAP based procedures

6.2.8.2.3.1 Client procedure

Upon receiving a CoAP 2.05 (Content) response that matches the extended CoAP GET request which initiated the subscription, and which contains the Observe option, the SGM-C:

a) shall handle the response according to IETF RFC 7641 [17]; and

b) shall handle the modification according to the observable resource.

6.2.8.2.3.2 Server procedure

In order to send a notification when the resource which is being observed is modified, the SGM-S shall send a CoAP 2.05 (Content) response to SGM-C containing the modified resource and the Observe option according to IETF RFC 7641 [17]. In order to send a notification when the resource which is being observed is deleted, the SGM-S shall send a CoAP 4.04 (Not Found) response to SGM-C according to IETF RFC 7641 [17]. The Content-Format specified in a 2.xx notification shall be the same as the one used in the initial response to the GET request received for the subscription.

6.2.9 Group member leave

6.2.9.1 SGM client HTTP procedure

Upon receiving request from VAL user to leave the group, the SGM-C:

a) shall generate an HTTP POST request. In the HTTP POST request:

   1) shall set the Request URI to the URI of the SGM-S appended with VAL service identity and the value "/group-deregistration";

   2) shall include the Host header with public user identity of SGM-S;

   3) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6]; and

   4) shall include in the HTTP request entity-body the "group-ID" parameter set to the group URI of the group which VAL user has requested to leave; and

b) shall send the HTTP POST request to SGM-S.

Upon receiving an HTTP 200 (OK), the SGM-C shall notify the VAL user about successful group registration.

6.2.9.2 SGM server HTTP procedure

Upon reception of an HTTP POST request where the Request-URI of the HTTP POST request is set to "/group-deregistration", the SGM-S:

a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP POST request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP POST request and skip rest of the steps;

b) shall update the members information in group document; and

c) shall send an HTTP 200 (OK) response to SGM-C.

Upon successful modification of the group, the SGM-S shall notify all group members about the group modification by following the procedure specified in clause 6.2.8.2.2.2. In the group modify notification, the SGM-S shall set the "modificationType" parameter to the value GROUP_MEMBER_REMOVED (0x02) as specified in clause B.3.

6.2.9.3 SGM client CoAP procedure

Upon receiving request from VAL user to leave the group, the SGM-C shall send a CoAP DELETE request to the SGM-S. In the CoAP DELETE request, the SGM-C:

a) shall set the CoAP URI to the "resUri" of the group member corresponding to the VAL user, so that the CoAP URI of the request identifies the Individual Group Member resource to be deleted according to the resource definition in clause C.2.1.2.4.3.3:

1) the "apiRoot" is set to the SGM-S URI;

2) the "groupDocId" is set to point to the VAL group document; and

3) the "memberId" is set to VAL user ID or VAL UE ID; and

b) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

Upon receiving a CoAP 2.02 (Deleted) response, the SGM-C shall notify the VAL user about successful group deregistration. Based on VAL user's request, if subscription to modifications of this group is already created, then the SGM-C shall delete that subscription as specified in clause 6.2.8.1.3.3.

6.2.9.4 SGM server CoAP procedure

Upon reception of an CoAP DELETE request where the CoAP URI of the request identifies Individual Group Member resource as described in clause C.2.1.2.4.3.3, the SGM-S:

a) shall determine the identity of the sender of the received CoAP DELETE request as specified in clause 6.2.1.3, and:

1) if the identity of the sender of the received CoAP DELETE request is not authorized to delete the requested group member resource, shall respond with a CoAP 4.03 (Forbidden) response to the CoAP DELETE request and skip rest of the steps;

b) shall support handling an CoAP DELETE request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

c) shall delete the individual group member resource pointed at by the CoAP URI and shall update the "members" and "memberDetails" lists in the VAL group document.

Upon successful modification of the group, the SGM-S shall notify all group members about the group modification by following the procedure specified in clause 6.2.8.2.3.2. In the notification, the SGM-S shall send the modified VAL group document.

6.2.10 Group list fetch procedure

6.2.10.1 SGM client HTTP procedure

Upon receiving request from VAL user to fetch the list of groups in which the VAL user is a member, the SGM-C:

a) shall generate an HTTP POST request. In the HTTP POST request:

1) shall set the Request URI to the URI of the SGM-S appended with VAL service identity and the value "/group-list-fetch";

2) shall include the Host header with public user identity of SGM-S;

3) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6]; and

4) shall include the parameters specified in clause A.3.1 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10]; and

b) shall send an HTTP POST request to SGM-S.

Upon receiving an HTTP 200 (OK), the SGM-C shall notify the VAL user about the list of the groups where the VAL UE is a member.

Based on VAL user's request, if group events subscription is not already created, then the SGM-C shall create the group events subscription as specified in clause 6.2.8.1.1 for the event SUBSCRIBE_GROUP_MODIFICATION (0x02) as defined in clause A.1.2. If group events subscription already exists then the SGM-C shall modify the subscription as specified in clause 6.2.8.1.2.

6.2.10.2 SGM server HTTP procedure

Upon reception of an HTTP POST request where the Request-URI of the HTTP POST request is set to "/group-list-fetch", the SGM-S:

a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP POST request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP POST request and skip rest of the steps; and

b) shall send an HTTP 200 (OK) response to SGM-C. In the response, the SGM-S shall include the parameters specified in clause A.3.2 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10];

6.2.10.3 SGM client CoAP procedure

Upon receiving request from VAL user to fetch the list of groups in which the VAL user is a member, the SGM-C shall send a CoAP GET request with the CoAP URI set to the URI of the VAL Group Documents resource with the " member-id" query parameter set to the VAL user ID or VAL UE ID and optionally with the "time-period" query parameter when the group was created.

Upon receiving request from VAL user to fetch the list of groups in which the VAL user is a member, the SGM-C shall send a CoAP GET request to the SGM-S. In the CoAP GET request, the SGM-C:

a) shall set the CoAP URI to the URI of the VAL Group Documents resource:

1) the "apiRoot" is set to the SGM-S URI; and

    2) shall set " member-id query parameter to the VAL user ID or VAL UE ID and may set "time-period" query parameter to the time period when the group was created as described in clause C.2.1.2.2.3.2; and

  b) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

Upon receiving a CoAP 2.05 (Content) response the SGM-C shall notify the VAL user about the list of the groups where the VAL UE is a member.

6.2.10.4 SGM server CoAP procedure

Upon reception of an CoAP GET request where the CoAP URI of the request identifies VAL Group Documents resource as described in clause C.2.1.2.2.3.2, the SGM-S:

  a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.3, and:

    1) if the sender is not authorized to fetch the requested VAL group document(s), shall respond with a 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

  b) shall support handling a CoAP GET request from a SGM-C according to procedures specified in IETF RFC 7252 [15]; and

  c) shall return a 2.05 (Content) response including all the VAL group documents matching all the given values of the query parameters.

6.2.11 Temporary groups procedure

6.2.11.1 SGM client HTTP procedure

In order to form a temporary group, the SGM-C shall generate an HTTP POST request. In the HTTP POST request:

  a) shall set the Request-URI to the URI of the SGM-S appended with the value "/temporary-groups";

  b) shall include the Host header with public user identity of SGM-S;

  c) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6];

  d) shall include the parameters specified in clause A.4.1 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10]; and

  e) shall send the HTTP POST request to the SGM-S.

Upon receiving an HTTP POST request from SGM-S contains parameters of VAL Group Ids and VAL Group Id, the SGM-C shall respond with an HTTP 200 (OK) message including a parameter VAL Group Id set to the VAL group ID of the temporary group.

6.2.11.2 SGM server HTTP procedure

Upon receiving an HTTP POST request from SGM-S where the Request-URI of the HTTP POST request contains "/temporary-groups", the SGM-S:

  a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1, and:

    1) if the identity of the sender of the received HTTP POST request is not authorized user, shall respond with an HTTP 403 (Forbidden) response to the HTTP POST request and skip rest of the steps;

  b) shall check whether any of the received VAL group IDs is a temporary group, and:

    1) if any of the received VAL group IDs is a temporary group, shall respond with an HTTP 403 (Forbidden) response to the HTTP POST request and skip rest of the steps; and

    2) else shall create and store the received parameters in the HTTP POST request message;

   c) shall notify the VAL server regarding the temporary group creation with the received parameters; and

   d) shall generate an HTTP POST request message. In the HTTP POST request:

      1) shall set the request URI to the URI of the SGM-C received at the time of creating groups;

      2) shall include the parameters specified in clause B.5 serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10]; and

      3) shall send the HTTP POST request to every SGM-C of the constituent VAL groups.

Upon receiving an HTTP 200 (OK) message contains only one parameter of VAL Group Id, the SGM-S shall send an HTTP 200 (OK) response to SGM-C. In the response, the SGM-S shall include the parameters specified in clause A.4.2serialized into a JavaScript Object Notation (JSON) structure as specified in IETF RFC 7159 [10];

6.2.11.3   SGM client CoAP procedure

In order to form a temporary group, the SGM-C shall follow the procedure to create a group as defined in clause 6.2.2.4 with the following clarifications. The SGM-C:

   a) shall set "category" attribute to "TEMPORARY";and

   b) shall include the list of VAL group IDs of the constituent VAL groups in the "inclValGroupIds" attribute.

Upon receiving a CoAP 2.01 (Created) response, the SGM-C shall notify the VAL user about successful formation of the temporary group.

6.2.11.4   SGM server CoAP procedure

Upon receiving a group creation request for a group with the "category" attribute value of "TEMPORARY", the SGM-S shall follow the procedure as defined in clause 6.2.2.5 with the following clarifications. The SGM-S:

   a) before creating the group, shall check whether any of the received VAL group IDs is a temporary group, and:

      1) if any of the received VAL group IDs is a temporary group, shall not create the group and respond with a CoAP 4.03 (Forbidden) response to the CoAP POST request; and

   b) upon successful group creation, shall notify the VAL server regarding the temporary group creation.

6.2.12   Group deletion procedure

6.2.12.1   SGM client HTTP procedure

Upon receiving a request from the VAL user to delete a group, the SGM-C shall generate an HTTP DELETE request. In the HTTP DELETE request:

   a) shall set the Request-URI to a XCAP URI identifying the XML document to be deleted. In the Request-URI:

      1) the "XCAP Root" is set to the URI of the SGM-S;

      2) the "auid" is set to specific VAL service identity; and

      3) the document selector is set to a document URI pointing to a group document addressed by a group ID; and

   b) shall include an Authorization header field with the "Bearer" authentication scheme set to an access token of the "bearer" token type as specified in IETF RFC 6750 [6].

Upon receiving an HTTP 200 (OK), the SGM-C shall notify the VAL user about successful group deletion.

6.2.12.2   SGM server HTTP procedure

Upon reception of an HTTP DELETE request where the Request-URI of the HTTP DELETE request identifies an XML document as specified in clause 7, the SGM-S:

a) shall determine the identity of the sender of the received HTTP DELETE request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP DELETE request is not authorized to delete the group document, shall respond with a HTTP 403 (Forbidden) response to the HTTP DELETE request and skip rest of the steps; and

b) shall support deleting the XML document according to procedures specified in IETF RFC 4825 [3] "*DELETE Handling*".

Upon successful deletion of the group, the SGM-S shall notify all group members about the group deletion, by following the procedure specified in clause 6.2.8.2.2.4. In the group deletion notification, the SGM-S shall set the Event parameter to the value SUBSCRIBE_GROUP_DELETION (0x05) as specified in clause B.x.

6.2.12.3   SGM client CoAP procedure

Upon receiving request from VAL user to delete a group, the SGM-C shall send a CoAP DELETE request to the SGM-S. In the CoAP DELETE request, the SGM-C:

a) shall set the CoAP URI identifying the individual VAL group document to be deleted according to the resource definition in clause C.2.1.2.3.2:

1) the "apiRoot" is set to the SGM-S URI; and

2) the "groupDocId" to point to the VAL group document; and

b) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [5].

Upon receiving a CoAP 2.02 (Deleted) response, the SGM-C shall notify the VAL user about successful group deletion. If subscription to this group is already created, then the SGM-C shall delete that subscription as specified in clause 6.2.8.1.3.3.

6.2.12.4   SGM server CoAP procedure

Upon reception of an CoAP DELETE request where the CoAP URI of the request identifies individual VAL group document to be deleted according to the resource definition in clause C.2.1.2.3.2, the SGM-S:

a) shall determine the identity of the sender of the received CoAP DELETE request as specified in clause 6.2.1.3, and:

1) if the identity of the sender of the received CoAP DELETE request is not authorized to delete the requested group member resource, shall respond with a CoAP 4.03 (Forbidden) response to the CoAP DELETE request and skip rest of the steps;

b) shall support handling an CoAP DELETE request from a SGM-C according to procedures specified in IETF RFC 7252 [15];

c) shall delete the individual VAL group document pointed at by the CoAP URI; and

d) shall de-register all the group members as observers of the resource as per IETF RFC 7641 [17].

Upon successful deletion of the group, the SGM-S shall notify all group members about the group deletion by following the procedure specified in clause 6.2.8.2.3.2. In the notification, the SGM-S shall send the modified VAL group document.

6.3   Off-network procedures

The off-network procedures are out of scope of the present document in this release of the specification.

7 Coding

7.1 General

7.2 Application unique ID

The AUID shall be set to the VAL service ID as specified in specific VAL service specification.

7.3 Data structure

The <list-service> element:

    a) shall include an "uri" attribute representing the VAL group identity;

    b) may include a <display-name> element containing a human readable name of the VAL group;

    c) shall include a <common> element. The <common> element:

        1) may include a <seal-subject> element indicating group description;

        2) shall include a <category> element indicating category of the group;

        3) shall include one or more <val-service-id> element(s) indicating list of services supported by the group; and

        4) may include one or more <geo-id> element(s) indicating list of geographical areas to be addressed by the group;

    d) may include a <administrators> element containing list of group members who are administrator for the group;

    e) may include a <explicit-members-list> element containing list of users who explicitly needs to register to join the group;

    f) may include a <list> element containing list of members who are implicitly registered to join the group; and

    g) shall include a <val-specific-config> element. The <val-specific-config> element:

        1) may include a <group-priority> element; and

        2) may include an<external-group-id> element.

7.4 XML Schema

7.4.1 General

The Group Document shall be composed according to the XML schema described in [7] and extended with extensions from the XML Schemas defined in [8] and [9], and extended with extensions from the XML schema defined in clause 7.4.2.

7.4.2 XML schema for SEAL group document specific extension

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema
  xmlns="urn:3gpp:ns:seal:GroupInfo:1.0"
  targetNamespace="urn:3gpp:ns:seal:GroupInfo:1.0"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:ls="urn:oma:xml:poc:list-service"
  xmlns:sealgi="urn:3gpp:ns:seal:GroupInfo:1.0"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
```

```
      <xs:import namespace="urn:oma:xml:xdm:extensions"/>
      <xs:import namespace="urn:ietf:params:xml:ns:resource-lists"/>

      <!-- SEAL specific "list-service" child elements -->
      <xs:element name="common" type="sealgi:common-type"/>
      <xs:element name="administrators" type="ls:list-type"/>
      <xs:element name="explicit-member-list" type="ls:list-type"/>
      <xs:element name="val-specific-config" type="sealgi:valSpecificConfigType"/>

      <xs:complexType name="common-type">
        <xs:sequence>
          <xs:element name="seal-subject" type="sealgi:subjectType" minOccurs="0"/>
          <xs:element name="category" type="sealgi:groupCategoryType"/>
          <xs:element name="val-service-id" type="sealgi:serviceNameType" minOccurs="0"
      maxOccurs="unbounded"/>
          <xs:element name="geo-id" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
          <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:anyAttribute namespace="##any" processContents="lax"/>
      </xs:complexType>
      <xs:complexType name="valSpecificConfigType">
        <xs:sequence>
          <xs:element name="group-priority" type="sealgi:priorityType" minOccurs="0"/>
          <xs:element name="external-group-id" type="xs:string" minOccurs="0"/>
          <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:anyAttribute namespace="##any" processContents="lax"/>
      </xs:complexType>

      <xs:simpleType name="subjectType">
        <xs:restriction base="xs:string">
          <xs:minLength value="0"/>
          <xs:maxLength value="255"/>
        </xs:restriction>
      </xs:simpleType>
      <xs:simpleType name="groupCategoryType">
        <xs:restriction base="xs:string">
          <xs:enumeration value="normal"/>
          <xs:enumeration value="location-based"/>
          <xs:enumeration value="regroup"/>
        </xs:restriction>
      </xs:simpleType>
      <xs:simpleType name="priorityType">
        <xs:restriction base="xs:unsignedShort">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="255"/>
        </xs:restriction>
      </xs:simpleType>

      <xs:complexType name="serviceNameType">
        <xs:sequence>
          <xs:element name="serviceType" minOccurs="0" maxOccurs="unbounded" type="Services">
            <xs:unique name="uniqueserviceType">
              <xs:selector xpath="serviceType"/>
              <xs:field xpath="."/>
            </xs:unique>
          </xs:element>
        </xs:sequence>
      </xs:complexType>

      <xs:simpleType name="Services">
        <xs:restriction base="xs:string">
          <xs:enumeration value="V2X"/>
          <xs:enumeration value="Others"/>
        </xs:restriction>
      </xs:simpleType>
</xs:schema>
```

7.5   Semantics

The <display-name> element of <list-service> element contains a human readable name of the VAL group.

The value of the "uri" attribute in the <list-service> element shall represent a VAL group identity.

The <administrators> element of a <list-service> element shall contain the group members who are administrator of the group and have special authorities as defined by VAL service to manage the group. The administrator user does not require explicit registration to join the group.

The <explicit-member-list> element of a <list-service> element shall contain the group members who are not administrator of the group and require explicit registration to join the group.

The <list> element of a <list-service> element shall contain the group members who are not administrator of the group and also do not require explicit registration to join the group.

The <seal-subject> child element of a <common> element of a <list-service> element shall indicate the title or description for the Group. The length of the value of the <seal-subject> element should not exceed 255 characters.

The <category> child element of a <common> element of a <list-service> element shall indicate the category of the group. The possible values for this element are "normal", "location-based" and "regroup".

The <val-service-id> child element of a <common> element of a <list-service> element shall indicate the service supported by the group.

The <geo-id> child element of a <common> element of a <list-service> element shall indicate geographical area addressed by the group.

The <group-priority> child element of a <val-specific-config> element of a <list-service> element contains a positive number which provides VAL group priority among different VAL groups within VAL service. More than one VAL group can have same priority.

The <external-group-id> child element of a <val-specific-config> element of a <list-service> element identifies the member UEs of the VAL group at the 3GPP core network.

The VAL service may further extend the <val-specific-config> element of a <list-service> element to include VAL service specific configuration.

7.6   MIME type

The MIME type for VAL user profile configuration shall be set to "vnd.3gpp.seal-group-doc+xml".

7.7   IANA registration template

Your Name:

<MCC name>

Your Email Address:

<MCC email address>

Media Type Name:

Application

Subtype name:

vnd.3gpp.seal-group-doc+xml

Required parameters:

None

Optional parameters:

"charset" the parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in section 9.1 of IETF RFC 7303.

Encoding considerations:

binary.

Security considerations:

Same as general security considerations for application/xml media type as specified in section 9.1 of IETF RFC 7303. In addition, this media type provides a format for exchanging information in SIP or in HTTP. So the security considerations from IETF RFC 3261 apply while exchanging information in SIP and the security considerations from IETF RFC 2616 apply while exchanging information in HTTP.

The information transported in this media type does not include active or executable content.

Mechanisms for privacy and integrity protection of protocol parameters exist. Those mechanisms as well as authentication and further security mechanisms are described in 3GPP TS 24.229.

This media type does not include provisions for directives that institute actions on a recipient's files or other resources.

This media type does not include provisions for directives that institute actions that, while not directly harmful to the recipient, may result in disclosure of information that either facilitates a subsequent attack or else violates a recipient's privacy in any way.

This media type does not employ compression.

Interoperability considerations:

Same as general interoperability considerations for application/xml media type as specified in section 9.1 of IETF RFC 7303. Any unknown XML elements and any unknown XML attributes are to be ignored by recipient of the MIME body.

Published specification:

3GPP TS 24.544 "Group Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification", available via http://www.3gpp.org/specs/numbering.htm.

Applications Usage:

Applications supporting the SEAL group management procedures as described in the published specification.

Fragment identifier considerations:

The handling in section 5 of IETF RFC 7303 applies.

Restrictions on usage:

None

Provisional registration? (standards tree only):

N/A

Additional information:

1. Deprecated alias names for this type: none

2. Magic number(s): none

3. File extension(s): none

4. Macintosh File Type Code(s): none

5. Object Identifier(s) or OID(s): none

Intended usage:

Common

Person to contact for further information:

- Name: <MCC name>

- Email: <MCC email address>

- Author/Change controller:

    i) Author: 3GPP CT1 Working Group/3GPP_TSG_CT_WG1@LIST.ETSI.ORG

    ii) Change controller: <MCC name>/<MCC email address>

Annex A (normative):
Parameters for different operations

A.1   Creating group events subscription

A.1.1   General

The information in this annex provides a normative description of the parameters which will be sent by SGM-C while creating group events subscription and the parameters which will be sent by SGM-S as a response to request for creating subscription.

A.1.2   Client side parameters

The SGM-C shall convey the following parameters while sending request for creating group events subscription.

Table A.1.2-1: Client side parameters for creating group events subscription

Parameter	Description
VAL User Id	REQUIRED. Represents a VAL user who initiates subscription.
Callback-URI	REQUIRED. Represents where to send HTTP notifications
Subscription Info	REQUIRED. Represents a space-separated list of the subscription type information as specified in table A.1.2-2.

Table A.1.2-2: Subscription information

Parameter	Description
Event	REQUIRED. Represents the type of notification which client requires. This specification defines following type of notifications: - 0x01: SUBSCRIBE_GROUP_ANNOUNCEMENT - 0x02: SUBSCRIBE_GROUP_MODIFICATION - 0x04: SUBSCRIBE_GROUP_IDENTITY_LIST - 0x05: SUBSCRIBE_GROUP_DELETION
expiry time	REQUIRED. Represents the time in seconds up to which the subscription is desired to be kept active and the time after which the subscribed event shall stop generating notifications.
Group ID list	REQUIRED if "Event" parameter is set to SUBSCRIBE_GROUP_MODIFICATION (0x02) or SUBSCRIBE_GROUP_IDENTITY_LIST (0x04). Represents a space-separated list of VAL group ID of the groups
Minimum Interval	OPTIONAL. Indicates the minimum time interval between consecutive notifications. Defaults to 0 if not provided.

A.1.3   Server side parameters

The SGM-S shall convey the following parameters while sending response to the creating group events subscription request.

Table A.1.3-1: Server side parameters for response to creating group events subscription

Parameter	Description
Identity	REQUIRED. A unique string representing subscription identity.

A.2 Group registration (join) operation

A.2.1 Client side parameters

The SGM-C shall convey the following parameters while sending group registration request.

Table A.2.1-1: Client side parameters for group registration request

Parameter	Description
Message Filters	OPTIONAL. Group message communication will be sent to the VAL UE after applying message filters as described in table A.2.1-2.

Table A.2.1-2: Message Filter Information

Parameter	Description
VAL UE Id	Required. Represent the VAL UE identity who has provided these filters.
Identities	OPTIONAL. Represents a space-separated list of VAL UE identities. The messages from these VAL UEs will be send to the VAL UE.
Max number of messages (NOTE 1))	OPTIONAL. Represents the total number of messages a VAL UE is interested to receive in a given time.
Time frame	OPTIONAL. Represents the time in seconds. This parameter is required if Max number of messages parameter is present.
Message Types (NOTE 2)	OPTIONAL. Represents a space-separated list of message types (e.g. high priority messages, or group configuration messages, etc.). The messages of these message types will be sent to the VAL UE.
NOTE 1: The value for max number of messages is up to the implementation of a particular vertical requirement.	
NOTE 2: Message types are as decided by the vertical which uses the SEAL.	

A.3 Creating group events subscription

A.3.1 General

The information in this annex provides a normative description of the parameters which will be sent by SGM-C while fetching list of groups and the parameters which will be sent by SGM-S as a response to request for fetching list of groups.

A.3.2 Client side parameters

The SGM-C shall convey the following parameters while sending request for fetching list of groups.

Table A.3.2-1: Client side parameters for creating group events subscription

Parameter	Description
VAL User Id	REQUIRED. Represents a VAL user who requests to fetch the list group.
Time period	OPTIONAL. Represents start and end time to inform SMG-S to provide list of the groups created between specified time period. If not present, the SGM-S provides list of all groups in which the VAL user is a member.

A.3.3 Server side parameters

The SGM-S shall convey the following parameters while sending response to fetching list of groups.

Table A.3.3-1: Server side parameters for response to creating group events subscription

Parameter	Description
VAL Group IDs	OPTIONAL. Represents space separated list of group identities.

A.4 Temporary groups

A.4.1 Client side parameters

The SGM-C shall convey the following parameters while sending request for forming a temporary group.

Table A.4.1-1: Client side parameters for forming a temporary group

Parameter	Description
VAL Group Ids	REQUIRED. Represents the list of VAL group IDs to be combined.
VAL Service Ids	OPTIONAL. Represents a subset of the common VAL service(s) to be applied for the temporary group.

A.4.2 Server side parameters

The SGM-S shall convey the following parameters while sending response to the request of forming a temporary group.

Table A.4.2-1: Server side parameters for response to form a temporary group

Parameter	Description
VAL Group Id	OPTIONAL. Represents the VAL group ID of the temporary group.
VAL Service Ids	OPTIONAL. Represents the list of VAL services whose service communications are to be enabled on this temporary group.
Result	REQUIRED. Represents success or failure of the temporary group formation

Annex B (normative): Parameters for notifications

B.1 General

The information in this annex provides a normative description of the parameters which will be sent by SGM-S while sending different types of notification

B.2 Group announcement notification

The SGM-S shall convey the following parameters while sending group announcement notification to SGM-C.

Table B.2-1: Parameters for group announcement notification

Parameter	Description
Identity	REQUIRED. A unique string representing notification channel identity.
Event	REQUIRED. Shall be set to SUBSCRIBE_GROUP_ANNOUNCEMENT (0x01) as specified in table A.1.2-2.
GroupID	REQUIRED. An URI that represent a VAL group identity
Subject	REQUIRED. A string representing the title or description for the group.
IsJoinReq	OPTIONAL. A Boolean indicating whether user needs to perform registration to join the group or not. This Boolean will be set to "true" for each user in <explicit-member-list> element if present in the document.
Val-services	OPTIONAL. Represents list of services supported by the group.
Members-list	OPTIONAL. Represents list of VAL users who are member of the group.
VAL service specific information	OPTIONAL. Provides placeholder for VAL service specific information.
5GVN Group Info	OPTIONAL. Represents a 5GVN group information as specified in table B.2-2.

NOTE: The Group announcement notification is considered as Group creation notification when "IsJoinReq" parameter is not present or set to "false".

Table B.2-2: Parameters for 5GVN group information

Parameter	Description
Communication Type	REQUIRED. Represents the type of the group. This specification defiles following type of the communication transport: - 0x01: ETHERNET_TYPE - 0x02: IPv4_TYPE - 0x04: IPv6_TYPE - 0x08: IPV4V6_TYPE
DNN	OPTIONAL. Represents data network name for the 5GVN group.
S-NSSAI	OPTIONAL. Represents S-NSSAI for the 5GVN group.

B.3 Group modify notification

The SGM-S shall convey the following parameters while sending group modifynotification to SGM-C.

Table B.3-1: Parameters for group group modifynotification

Parameter	Description
Identity	REQUIRED. A unique string representing notification channel identity.
Event	REQUIRED. Shall be set to SUBSCRIBE_GROUP_MODIFICATION (0x02) as specified in table A.1.2-2.
groupID	REQUIRED. An URI that represents a VAL group identity
VAL service specific information	OPTIONAL. Provides placeholder for VAL service specific information.
modification Type	REQUIRED. Specifies the type of the modification of group document. This specification defines following types of modifications: 0x01: GROUP_MEMBER_ADDED 0x02: GROUP_MEMBER_REMOVED 0x03: GROUP_CONFIG_UPDATE

B.4 Group Identity List notification

The SGM-S shall convey the following parameters while sending identify list notification to SGM-C.

Table B.4-1: Parameters for group identity list notification

Parameter	Description
Identity	REQUIRED. A unique string representing notification channel identity.
Event	REQUIRED. Shall be set to SUBSCRIBE_GROUP_IDENTITY_LIST (0x04) as specified intable A.1.2-2..
GroupID	REQUIRED. An URI that represents a VAL group identity
Members-list	REQUIRED. Represents list of VAL users who are member of the group.
Message Filter List	OPTIONAL. Represents the message filters of all VAL UEs that provided message filters. Each message filter is specified as described in table A.2.1-2. This parameter is present only for the identify list notification towards VAL server, for the VAL server to apply those filters during group communications.

B.5 Temporary group formation notification

The SGM-S shall convey the following parameters while sending temporary group formation notification to SGM-C.

Table B.5-1: Parameters for temporary group formation notification

Parameter	Description
VAL Group Ids	REQUIRED. Represents the list of constituent VAL group IDs.
VAL Group Id	REQUIRED. Represents the VAL group ID of the temporary group.

B.6 Group deletion notification

The SGM-S shall convey the following parameters while sending group deletion notification to SGM-C.

Table B.6-1: Parameters for group deletion notification

Parameter	Description
Identity	REQUIRED. A unique string representing notification channel identity.
Event	REQUIRED. Shall be set to SUBSCRIBE_GROUP_DELETION (0x05) as specified in table A.1.2-2.
GroupID	REQUIRED. An URI that represent a VAL group identity
DeletionReason	OPTIONAL. A string representing the reason of the deletion for the group.

Annex C (normative):
CoAP resource representation and encoding

C.1 General

The information in this annex provides a normative description of CoAP resource representation and encoding.

The general rules for resource URI structure, cache usage, error handling, and common data types are described in clause C.1 of 3GPP TS 24.546 [23].

C.2 Resource representation and APIs for group management

C.2.1 SU_GroupManagement API

C.2.1.1 API URI

The CoAP URIs used in CoAP requests from SGM-C towards the SGM-S shall have the Resource URI structure as defined in clause C.1.1 of 3GPP TS 24.546 [23] with the following clarifications:

- The <apiName> shall be "su-gm".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause C.2.1.2.

C.2.1.2 Resources

C.2.1.2.1 Overview

{apiRoot}/su-gm/<apiVersion>

/group-documents

/{groupDocId}

/members

/{memberId}
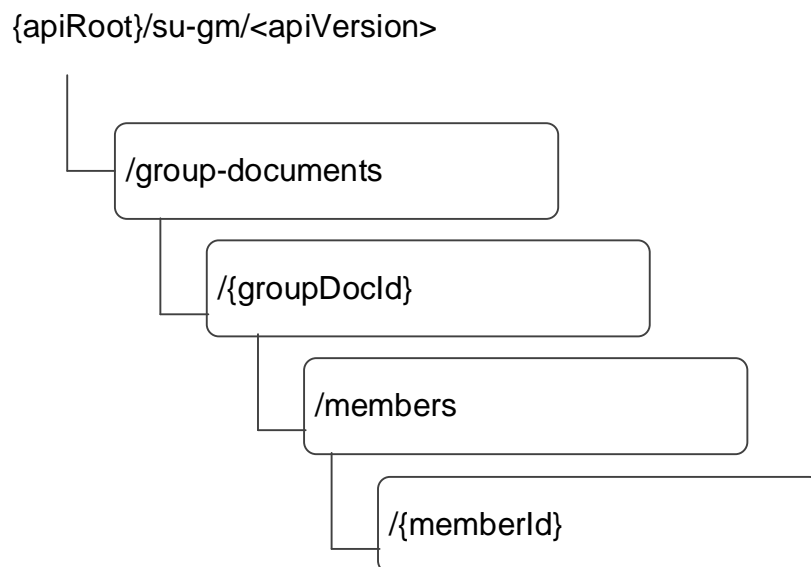
Figure C.2.1.2.1-1: Resource URI structure of the SU_GroupManagement API

Table C.2.1.2.1-1 provides an overview of the resources and applicable CoAP methods.

Table C.2.1.2.1-1: Resources and methods overview

Resource name	Resource URI	CoAP method	Description
VAL Group Documents	/group-documents	POST	Create a new VAL group document.
		GET	Retrieve VAL group documents according to the query parameters. If there are no query parameters, do not fetch any VAL group document.
Individual VAL Group Document	/group-documents/{groupDocId}	GET (NOTE)	Retrieve an individual VAL group's membership and configuration information according to query parameter on the resource identified by {groupDocId}. If there are no query parameter, fetch the whole VAL group document resource identified by {groupDocId}.
		PUT	Update an individual VAL group's membership and configuration information identified by {groupDocId}.
		DELETE	Delete a VAL group document.
Individual VAL Group Member Information	/group-documents/{groupDocId}/members/{memberId}	GET (NOTE)	Retrieve VAL group member information according to the query parameters.
		PUT	Create or update VAL group member information.
		DELETE	Delete VAL group member information.
VAL Group Membership	/group-membership/{valTargetUe}	GET (NOTE)	Retrieve a list of VAL groups in which the VAL user or VAL UE is a member according to the query parameters.
NOTE: The GET method can also be used to observe this resource.			

Editor's note: Whether any changes required in the API along with its data model based on limitations of constrained devices is FFS.

C.2.1.2.2   Resource: VAL Group Documents

C.2.1.2.2.1   Description

The VAL Group Documents resource represents all the VAL group documents that are created at a given SGM-S, or allows to create a new VAL group.

C.2.1.2.2.2   Resource Definition

Resource URI: **{apiRoot}/su-gm/<apiVersion>/group-documents**

This resource shall support the resource URI variables defined in the table C.2.1.2.2.2-1.

Table C.2.1.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause C.1.1 of 3GPP TS 24.546 [23]
apiVersion	string	See clause C.2.1.1

C.2.1.2.2.3 Resource Standard Methods

C.2.1.2.2.3.1 POST

This operation creates a VAL group at the SGM-S.

This method shall support the request data structures specified in table C.2.1.2.2.3.1-1 and the response data structures and response codes specified in table C.2.1.2.2.3.1-2, and the response options specified in table C.2.1.2.2.3.1-3.

Table C.2.1.2.2.3.1-1: Data structures supported by the POST Request payload on this resource

Data type	P	Cardinality	Description
VALGroupDocument	M	1	Details of the VAL group that needs to be created,

Table C.2.1.2.2.3.1-2: Data structures supported by the POST Response payload on this resource

Data type	P	Cardinality	Response codes	Description
VALGroupDocument	M	1	2.01 Created	VAL group created successfully. The "groupDocId" of the created resource shall be returned in the "Location-Path" option.
NOTE: The mandatory CoAP error status codes for the GET Request listed in table C.1.3-1 of 3GPP TS 24.546 [23] shall also apply.				

Table C.2.1.2.2.3.1-3: Options supported by the 2.01 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location-Path	string	M	1	Contains the location path of the newly created resource relative to the request URI. It contains the groupDocId segment of the complete resource URI according to the structure: {apiRoot}/su-gm/<apiVersion>/group-documents/{groupDocId}

C.2.1.2.2.3.2 GET

This operation retrieves VAL group documents satisfying filter criteria.

This method shall support the URI query parameters specified in table C.2.1.2.2.3.2-1.

Table C.2.1.2.2.3.2-1: URI query parameters supported by the GET Request on this resource

Name	Data type	P	Cardinality	Description
val-group-id	string	O	0..1	Identifies a VAL group.
val-service-id	string	O	0..1	Identifies a VAL service.
member-id	ValTargetUe	O	0..1	Identifies a VAL user or VAL UE to match a group member.
time-period	array(DateTime)	O	2..2	Identifies the time period within which the group was created. The first element is the start time, followed by the end time of the time period.

This method shall support the request options specified in table C.2.1.2.2.3.2-2, the response data structures and response codes specified in table C.2.1.2.2.3.2-3, and the response options specified in table C.2.1.2.2.3.2-4.

Table C.2.1.2.2.3.2-2: Options supported by the GET Request on this resource

Name	Data type	P	Cardinality	Description
Observe	Uinteger	O	0..1	When set to 0 (Register) it extends the GET request to subscribe to the changes of this resource. When set to 1 (Deregister) it cancels the subscription.
NOTE: Other request options also apply in accordance with normal CoAP procedures.				

This method shall support the response data structures and response codes specified in table C.2.1.2.2.3.2-3.

Table C.2.1.2.2.3.2-3: Data structures supported by the GET Response payload on this resource

Data type	P	Cardinality	Response codes	Description
array(VALGroupDocument)	M	0..N	2.05 Content	List of VAL group documents. This response shall include VAL group documents matching all the query parameters provided in the request.
NOTE: The mandatory CoAP error status codes for the GET method listed in table C.1.3-1 of 3GPP TS 24.546 [23] also apply.				

Table C.2.1.2.2.3.2-4: Options supported by the 2.05 Response Code on this resource

Name	Data type	P	Cardinality	Description
Observe	Uinteger	O	0..1	Sequence number of the notification.
NOTE: Other response options also apply in accordance with normal CoAP procedures.				

C.2.1.2.3 Resource: Individual VAL Group Document

C.2.1.2.3.1 Description

The Individual VAL Group Document resource represents an individual group document that is created at the SGM-S.

C.2.1.2.3.2 Resource Definition

Resource URI: **{apiRoot}/su-gm/<apiVersion>/group-documents/{groupDocId}**

This resource shall support the resource URI variables defined in the table C.2.1.2.3.2-1.

Table C.2.1.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause C.1.1 of 3GPP TS 24.546 [23]
apiVersion	string	See clause C.2.1.1
groupDocId	string	Represents an individual group document resource.

C.2.1.2.3.3   Resource Standard Methods

C.2.1.2.3.3.1   GET

This operation retrieves VAL group information satisfying filter criteria.

This method shall support the URI query parameters specified in table C.2.1.2.3.3.1-1.

Table C.2.1.2.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
group-members	boolean	O	0..1	This is a content filtering flag. When set to "true", it indicates to the SGM-S to include the members list information of the VAL group. Set to "false" or omitted otherwise.
group-member-details	boolean	O	0..1	This is a content filtering flag. When set to "true", it indicates to the SGM-S to include the details of all the members of the VAL group. Set to "false" or omitted otherwise.
group-configuration	boolean	O	0..1	This is a content filtering flag. When set to "true", it indicates to the SGM-S to include the configuration information of the VAL group. Set to "false" or omitted otherwise.

This method shall support the request options specified in table C.2.1.2.3.3.1-2, the response data structures and response codes specified in table C.2.1.2.3.3.1-3, and the response options specified in table C.2.1.2.3.3.1-4.

Table C.2.1.2.3.3.1-2: Options supported by the GET Request on this resource

Name	Data type	P	Cardinality	Description
Observe	Uinteger	O	0..1	When set to 0 (Register) it extends the GET request to subscribe to the changes of this resource. When set to 1 (Deregister) it cancels the subscription.
NOTE: Other request options also apply in accordance with normal CoAP procedures.				

Table C.2.1.2.3.3.1-3: Data structures supported by the GET Response payload on this resource

Data type	P	Cardinality	Response codes	Description
VALGroupDocument	M	1	2.05 Content	The VAL group information based on the request from the VAL server. This response shall include VAL group members list if group-members flag is set to "true" in the request, VAL group member details if group-member-details flag is set to "true" in the request, VAL group configuration information if the group-configuration flag is set to "true" in the request, VAL group identifier, the whole VAL group document resource if all the flags are omitted/set to "false" in the request.
NOTE: The mandatory CoAP error status codes for the GET method listed in table C.1.3-1of 3GPP TS 24.546 [23] also apply.				

Table C.2.1.2.3.3.1-4: Options supported by the 2.05 Response Code on this resource

Name	Data type	P	Cardinality	Description
Observe	Uinteger	O	0..1	Sequence number of the notification.
NOTE: Other response options also apply in accordance with normal CoAP procedures.				

C.2.1.2.3.3.2   PUT

This operation updates the VAL group document.

This method shall support the request data structures specified in table C.2.1.2.3.3.2-1 and the response data structures and response codes specified in table C.2.1.2.3.3.2-2.

Table C.2.1.2.3.3.2-1: Data structures supported by the PUT Request payload on this resource

Data type	P	Cardinality	Description
VALGroupDocument	M	1	Updated details of the VAL group document.

Table C.2.1.2.3.3.2-2: Data structures supported by the PUT Response payload on this resource

Data type	P	Cardinality	Response codes	Description
VALGroupDocument	O	0..1	2.04 Changed	The VAL group document updated successfully, and the updated VAL group document may be returned in the response.
NOTE: The mandatory CoAP error status codes for the PUT method listed in table C.1.3-1 of 3GPP TS 24.546 [23] shall also apply.				

C.2.1.2.3.3.3   DELETE

This operation deletes the VAL group document.

This method shall support the response data structures and response codes specified in table C.2.1.2.3.3.3-1.

Table C.2.1.2.3.3.3-1: Data structures supported by the DELETE Response payload on this resource

Data type	P	Cardinality	Response codes	Description
n/a			2.02 Deleted	The individual VAL group document matching the groupDocId is deleted.
NOTE: The mandatory CoAP error status codes for the DELETE method listed in table C.1.3-1 1 of 3GPP TS 24.546 [23] shall also apply.				

C.2.1.2.4   Resource: Individual VAL Group Member

C.2.1.2.4.1   Description

The Individual VAL Group Member resource represents an individual group member information that is maintained at the SGM-S.

C.2.1.2.4.2   Resource Definition

Resource URI: **{apiRoot}/su-gm/<apiVersion>/group-documents/{groupDocId}/members/{memberId}**

This resource shall support the resource URI variables defined in the table C.2.1.2.4.2-1

Table C.2.1.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause C.1.1 of 3GPP TS 24.546 [23]
apiVersion	string	See clause C.2.1.1
groupDocId	string	Represents an individual group document resource.
memberId	ValTargetUe	Identifies an individual VAL group member.

C.2.1.2.4.3   Resource Standard Methods

C.2.1.2.4.3.1   GET

This operation retrieves the individual VAL group member's information.

This method shall support the request options specified in table C.2.1.2.4.3.1-1, the response data structures and response codes specified in table C.2.1.2.4.3.1-2, and the response options specified in table C.2.1.2.4.3.1-3.

Table C.2.1.2.4.3.1-1: Options supported by the GET Request on this resource

Name	Data type	P	Cardinality	Description
Observe	Uinteger	O	0..1	When set to 0 (Register) it extends the GET request to subscribe to the changes of this resource. When set to 1 (Deregister) it cancels the subscription
NOTE: Other request options also apply in accordance with normal CoAP procedures.				

Table C.2.1.2.4.3.1-2: Data structures supported by the GET Response payload on this resource

Data type	P	Cardinality	Response codes	Description
GroupMember	M	1	2.05 Content	The VAL group member information.
NOTE: The mandatory CoAP error status codes for the GET method listed in table C.1.3-1 of 3GPP TS 24.546 [23] also apply.				

Table C.2.1.2.4.3.1-4: Options supported by the 2.05 Response Code on this resource

Name	Data type	P	Cardinality	Description
Observe	Uinteger	O	0..1	Sequence number of the notification
NOTE: Other response options also apply in accordance with normal CoAP procedures.				

C.2.1.2.4.3.2   PUT

This operation creates or updates the VAL group member information.

This method shall support the request data structures specified in table C.2.1.2.4.3.2-1 and the response data structures and response codes specified in table C.2.1.2.4.3.2-2.

Table C.2.1.2.4.3.2-1: Data structures supported by the PUT Request payload on this resource

Data type	P	Cardinality	Description
GroupMember	M	1	New or updated details of the VAL group member.

Table C.2.1.2.4.3.2-2: Data structures supported by the PUT Response payload on this resource

Data type	P	Cardinality	Response codes	Description
GroupMember	O	0..1	2.01 Created	The VAL group member resource was created successfully, and the created resource may be returned in the response.
GroupMember	O	0..1	2.04 Changed	The VAL group member resource was updated successfully, and the updated resource may be returned in the response.
NOTE: The mandatory CoAP error status codes for the PUT method listed in table C.1.3-1 of 3GPP TS 24.546 [23] shall also apply.				

C.2.1.2.4.3.3   DELETE

This operation deletes the VAL group member information.

This method shall support the response data structures and response codes specified in table C.2.1.2.4.3.3-1.

Table C.2.1.2.4.3.3-1: Data structures supported by the DELETE Response payload on this resource

Data type	P	Cardinality	Response codes	Description
n/a			2.02 Deleted	The VAL group member resource matching the groupDocId and memberId is deleted.
NOTE: The mandatory CoAP error status codes for the DELETE method listed in table C.1.3-1 1 of 3GPP TS 24.546 [23] shall also apply.				

C.2.1.3   Data Model

C.2.1.3.1   General

This clause specifies the application data model supported by the API. Data types listed clause C.1.4 of 3GPP TS 24.546 [23] apply to this API.

Table C.2.1.3.1-1 specifies the data types defined specifically for the SU_GroupManagement API service.

Table C.2.1.3.1-1: SU_GroupManagement API specific Data Types

Data type	Section defined	Description	Applicability
VALGroupDocument	C.2.1.3.2.2	VAL group document details.	
GroupCategory	C.2.1.3.3.3	Represents the category of the VAL group.	
GroupMember	C.2.1.3.2.3	Represents membership and configuration details of the VAL group member.	
MembershipType	C.2.1.3.3.2	Represents the type of membership of the VAL group member.	
MembershipState	C.2.1.3.2.4	Represents the state of the member in the group. E.g., an explicit member will register in the group by setting its "registered" attribute to "true", or will set that attribute to "false" when leaving the group.	
MessageFilter	C.2.1.3.2.5	The message filter information applicable to member VAL UEs or VAL users of the VAL group.	

Table C.2.1.3.1-2 specifies data types re-used by the SU_GroupManagement API service.

Table C.2.1.3.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
ExternalGroupId	3GPP TS 24.546 [23]	External group identifier.	
ScheduledCommunicationTime	3GPP TS 24.546 [23]	Represents a scheduled communication time.	
Uri	3GPP TS 24.546 [23]	Unified resource identifier.	
ValTargetUe	3GPP TS 24.546 [23]	Used to identify either a VAL User or a VAL UE.	

C.2.1.3.2 Structured data types

C.2.1.3.2.1 Introduction

C.2.1.3.2.2 Type: VALGroupDocument

Table C.2.1.3.2.2-1: Definition of type VALGroupDocument

Attribute name	Data type	P	Cardinality	Description	Applicability
valGroupId	string	M	1	This is VAL group identity (VAL group ID) as per 3GPP TS 23.434 [2]], which is a unique identifier within the VAL service that represents a VAL group, set of VAL users or VAL UEs according to the VAL service.	
category	GroupCategory	M	1	Indicates the category of the group, e.g. "NORMAL" or "LOCATION_BASED".	
groupName	string	O	0..1	A human readable name of the VAL group.	
grpDesc	string	O	0..1	Text description of the VAL group.	
members	array(ValTrgetUe)	O	1..N	List of VAL User IDs or VAL UE IDs, which are members of the VAL group.	
memberDetails	array(GroupMember)	O	1..N	List of detailed member information for each member of the VAL group.	
valGrpConf	string	O	0..1	Configuration data for the VAL group, provided by the VAL client.	
inclValGroupIds	array(string)	O	1..N	List of VAL group IDs constituting the VAL group.	
valServiceIds	array(string)	O	1..N	List of VAL services whose communications are enabled on the group.	
resUri	Uri	O	0..1	The URI for individual VAL group document resource. (NOTE)	
extGrpId	ExternalGroupId	O	0..1	The external group identifier, identifying the member UEs of the VAL group at the 3GPP core network.	
com5GLanType	Com5GLanType	O	0..1	Identifies the 5G LAN-Type communication.	
geoIds	array(GeographicalAreaId)	O	1..N	List of geographical area ids addressed by the VAL group.	
priority	GroupPriority	O	0..1	Indicates VAL group priority among different VAL groups within VAL service.	
NOTE: The "resUri" attribute is set by the SGM-S and is not modifiable by the SGM-C.					

C.2.1.3.2.3 Type: GroupMember

Table C.2.1.3.2.3-1: Definition of type GroupMember

Attribute name	Data type	P	Cardinality	Description	Applicability
memberId	ValTargetUe	M	1	This is a VAL group member identity (VAL user ID or VAL UE ID) as per 3GPP TS 23.434 [2]..	
membershipType	MembershipType	M	1	Indicates the type of membership applicable for the group member, e.g. "ADMINISTRATOR", "EXPLICIT" or "IMPLICIT".	
membershipState	MembershipState	O	0..1	Indicates the current state of the member in the group, e.g. it may indicate that an "EXPLICIT" member is registered (joined) the group. When absent the state is unknown.	
messageFilter	MessageFilter	O	0..1	The message filter applicable to traffic sent to the group member in the context of the group.	
memberConfig	string	O	0..1	VAL service specific configuration.	
resUri	Uri	O	0..1	The URI for individual VAL group member resource. (NOTE)	
NOTE: The "resUri" attribute is set by the SGM-S and is not modifiable by the SGM-C.					

C.2.1.3.2.4 Type: MembershipState

Table C.2.1.3.2.3-1: Definition of type MembershipState

Attribute name	Data type	P	Cardinality	Description	Applicability
registered	boolean	O	0..1	Indicates if the member is registered in the group. It is set to "true" that an "EXPLICIT" member is registered (joined) the group. When absent or "false" the member is not unregistered.	

C.2.1.3.2.5 Type: MessageFilter

Table C.2.1.3.2.5-1: Definition of type MessageFilter

Attribute name	Data type	P	Cardinality	Description	Applicability
tgtUe	array(ValTargetUe)	O	1..N	List of VAL USER or UE IDs whose messages will be sent to the owner of this message filter (VAL User or VAL UE).	
maxMsgs	Uinteger	O	0..1	Total number of messages allowed to be sent to the owner of this message filter in the given time frame defined in the filter.	
scheds	array(ScheduledCommunicationTime)	O	1..N	Time frame associated to the total number of messages in maxMsgs attribute.	
msgTypes	array(string)	O	1..N	List of message types allowed to be sent to the owner of this message filter. Message types may be VAL service specific and are not defined by this specification.	

C.2.1.3.3   Simple data types and enumerations

C.2.1.3.3.1   Simple data types

Table C.2.1.3.3.1-1 Simple data types

Type name	Description
GeographicalAreaId	String identifying a geographical area.
GroupPriority	Integer between and including 0 and 255 which provides VAL group priority among different VAL groups within VAL service.

C.2.1.3.3.2   Enumeration: MembershipType

Table C.2.1.3.3.2-1: Enumeration MembershipType

Enumeration value	Description	Applicability
ADMINISTRATOR	This type of group membership indicates that the group member is an administrator of the group and has special authorities as defined by VAL service to manage the group. The administrator is not required to perform explicit registration to join the group.	
EXPLICIT	This type of group membership indicates that the group member is an explicit member who is not an administrator of the group and who is required to perform explicit registration to join the group.	
IMPLICIT	This type of group membership indicates that the group member is an implicit member who is not an administrator of the group and who is not required to perform explicit registration to join the group.	

C.2.1.3.3.3   Enumeration: GroupCategory

Table C.2.1.3.3.3-1: Enumeration GroupCategory

Enumeration value	Description	Applicability
NORMAL	Indicates a "normal" group category.	
LOCATION_BASED	Indicates a "location based" group category.	
REGROUP	Indicates a "regroup" group category.	
TEMPORARY	Indicates a "temporary" group category.	

C.2.1.3.3.4   Enumeration: Com5GLanType

Table C.2.1.3.3.4-1: Enumeration Com5GLanType

Enumeration value	Description	Applicability
IPV4	IPv4	
IPV6	IPv6	
IPV4V6	IPv4 and IPv6	
ETHERNET	Ethernet	

C.2.1.4 Error Handling

General error responses are defined in clause C.1.3 of 3GPP TS 24.546 [23].

C.2.1.5 CDDL Specification

C.2.1.5.1   Introduction

The data model described in clause C.2.1.3 shall be binary encoded in the CBOR format as described in
IETF RFC 8949 [19].

Clause C.2.1.5.2 uses the Concise Data Definition Language described in IETF RFC 8610 [21] and provides
corresponding representation of the SU_GroupManagement API data model.

C.2.1.5.2   CDDL document

```
;;; VALGroupDocument
;;+ Represents details of the VAL group document information.
VALGroupDocument = {
 valGroupId: text                 ; The VAL group identity.
 category: GroupCategory
 ? groupName: text                ; A human readable name of the VAL group.
 ? grpDesc: text                  ; The text description of the VAL group.
 ? members: [+ ValTargetUe]       ; The list of VAL User IDs or VAL UE IDs, which are members of the
VAL group.
 ? memberDetails: [+ GroupMember]; The list of detailed information of members of the VAL group.
 ? valGrpConf: text               ; Configuration data for the VAL group.
 ? inclValGroupIds: [+ text]      ; The list of VAL group IDs constituting the VAL group.
 ? valServiceIds: [+ text]        ; The list of VAL services enabled on the group.
 ? resUri: Uri
 ? extGrpId: ExternalGroupId
 ? com5GLanType: Com5GLanType
 ? geoIds: [+ GeographicalAreaId]; The list of geographical area ids addressed by the VAL group.
 ? priority: GroupPriority
}

;;; GroupCategory
;;+ The category of the VAL group.
GroupCategory = "NORMAL" / "LOCATION_BASED" / "REGROUP" / "TEMPORARY" / text ; text value provides
forward-compatibility with future extensions to the enumeration but is not used to encode content
defined in the present version of this API.

;;; GroupMember
;;+ Represents details of the VAL group member.
GroupMember = {
 memberId: ValTargetUe            ; Identifies the member of the VAL group. Once set, this
information cannot be updated.
 membershipType: MembershipType
 ? membershipState: MembershipState
 ? messageFilter: MessageFilter
 ? memberConfig: text
 ? resUri: Uri
}

;;; GroupPriority
;;+ VAL group priority a positive integer which provides VAL group priority among different VAL
groups within VAL service.
GroupPriority = 0..255

;;; GeographicalAreaId
;;+ Identifies a geographical area.
GeographicalAreaId = text

;;; MembershipType
;;+ Indicates the type of group membership.
MembershipType = "ADMINISTRATOR" / "EXPLICIT" / "IMPLICIT" / text ; text value provides forward-
compatibility with future extensions to the enumeration but is not used to encode content defined in
the present version of this API.

;;; MembershipState
;;+ Represents the state of the member in the group.
MembershipState = {
 ? registered: bool
}

;;; MessageFilter
;;+ Represents the message filters applicable to a VAL User ID or VAL UE ID.
```

```
MessageFilter = {
 ? tgtUe: [+ ValTargetUe]        ; List of VAL User or UE IDs whose message to be sent.
 ? maxMsgs: Uinteger
 ? scheds: [+ ScheduledCommunicationTime]; Time frame associated with total number of messages.
 ? msgTypes: [+ text]            ; List of message types to be sent to VAL UE.
}

;;; ScheduledCommunicationTime
;;+ Represents an offered scheduled communication time.
ScheduledCommunicationTime = {
 ? daysOfWeek: [1*6 DayOfWeek]   ; Identifies the day(s) of the week. If absent, it indicates every
day of the week.
 ? timeOfDayStart: TimeOfDay
 ? timeOfDayEnd: TimeOfDay
}

;;; ValTargetUe
;;+ Represents information identifying a VAL user ID or a VAL UE ID.
ValTargetUe =  {
 (
 valUserId: text                ; Unique identifier of a VAL user.
 //
 valUeId: text                  ; Unique identifier of a VAL UE.
 )
}

;;; ExternalGroupId
;;+ string containing a local identifier followed by "@" and a domain identifier. Both the local
identifier and the domain identifier shall be encoded as strings that do not contain any "@"
characters. See Clauses 4.6.2 and 4.6.3 of 3GPP TS 23.682 for more information.
ExternalGroupId = text

;;; Com5GLanType
;;+ Communication type for a 5GVN-based group communication
Com5GLanType = "IPV4" / "IPV6" / "IPV4V6" / "ETHERNET" / text ; text value provides forward-
compatibility with future extensions to the enumeration but is not used to encode content defined in
the present version of this API.

;;; DayOfWeek
;;+ integer between and including 1 and 7 denoting a weekday. 1 shall indicate Monday, and the
subsequent weekdays shall be indicated with the next higher numbers. 7 shall indicate Sunday.
DayOfWeek = 1..7

;;; TimeOfDay
;;+ String with format partial-time or full-time as defined in clause 5.6 of IETF RFC 3339.
Examples, 20:15:00, 20:15:00-08:00 (for 8 hours behind UTC).
TimeOfDay = text

;;; Uinteger
;;+ Unsigned Integer, i.e. only value 0 and integers above 0 are permissible.
Uinteger = int .ge 0

;;; Uri
;;+ string providing an URI formatted according to IETF RFC 3986.
Uri = text
```

C.2.1.6 Media Type

The media type for a VAL group document shall be "application/vnd.3gpp.seal-group-doc+cbor".

The media type for a VAL group member information shall be "application/vnd.3gpp.seal-group-member-info+cbor".

Editor's Note: It is possible to specify other payload format for CoAP than CBOR, and the details about other payload format is FFS.

C.2.1.7 Media Type registration for application/vnd.3gpp.seal-group-doc+cbor

Type name: application

Subtype name: vnd.3gpp.seal-group-doc+cbor

Required parameters: none

Optional parameters: none

Encoding considerations: Must be encoded as using IETF RFC 8949 . See "VALGroupDocument" data type in 3GPP TS 24.544 clause C.2.1.3.2.2 for details.

Security considerations: See Section 10 of IETF RFC 8949 and Section 11 of IETF RFC 7252

Interoperability considerations: Applications must ignore any key-value pairs that they do not understand. This allows backwards-compatible extensions to this specification.

Published specification: 3GPP TS 24.544 "Group Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification", available via http://www.3gpp.org/specs/numbering.htm.

Applications that use this media type: Applications supporting the SEAL group management procedures as described in the published specification.

Fragment identifier considerations: Fragment identification is the same as specified for "application/cbor" media type in IETF RFC 8949 [19]. Note that currently that RFC does not define fragmentation identification syntax for "application/cbor".

Additional information:

    Deprecated alias names for this type: N/A

    Magic number(s): N/A

    File extension(s): none

    Macintosh file type code(s): none

Person & email address to contact for further information: <MCC name>, <MCC email address>

Intended usage: COMMON

Restrictions on usage: None

Author: 3GPP CT1 Working Group/3GPP_TSG_CT_WG1@LIST.ETSI.ORG

Change controller: <MCC name>/<MCC email address>

C.2.1.8 Media Type registration for application/vnd.3gpp.seal-group-member-info+cbor

Type name: application

Subtype name: vnd.3gpp.seal-group-member-info+cbor

Required parameters: none

Optional parameters: none

Encoding considerations: Must be encoded as using IETF RFC 8949 See "GroupMember" data type in 3GPP TS 24.544 clause C.2.1.3.2.3 for details.

Security considerations: See Section 10 of IETF RFC 8949]and Section 11 of IETF RFC 7252 .

Interoperability considerations: Applications must ignore any key-value pairs that they do not understand. This allows backwards-compatible extensions to this specification.

Published specification: 3GPP TS 24.544 "Group Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification", available via http://www.3gpp.org/specs/numbering.htm.

Applications that use this media type: Applications supporting the SEAL group management procedures as described in the published specification.

Fragment identifier considerations: Fragment identification is the same as specified for "application/cbor" media type in IETF RFC 8949 . Note that currently that RFC does not define fragmentation identification syntax for "application/cbor".

Additional information:

Deprecated alias names for this type: N/A

Magic number(s): N/A

File extension(s): none

Macintosh file type code(s): none

Person & email address to contact for further information: <MCC name>, <MCC email address>

Intended usage: COMMON

Restrictions on usage: None

Author: 3GPP CT1 Working Group/3GPP_TSG_CT_WG1@LIST.ETSI.ORG

Change controller: <MCC name>/<MCC email address>

Annex D (informative):
Change history

						Change history	
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2019-09	CT1#120	C1-196115				Draft skeleton provided by the rapporteur.	0.0.0
2019-10	CT1#120					Implementing the following p-CR agreed by CT1: C1-196603, C1-196605, C1-196851, C1-196852	0.1.0
2019-11	CT1#121					Implementing the following p-CR agreed by CT1: C1-198615, C1-198811, C1-198812, C1-198813, C1-198814	0.2.0
2019-12	CT-86	CP-193152				Presentation for information at TSG CT	1.0.0
2020-03	CT1#122-e					Implementing the following p-CR agreed by CT1: C1-201004, C1-200634, C1-200635, C1-200636, C1-200637, C1-200887, C1-200888, C1-200640, C1-200884, C1-200885, C1-200822, C1-200644	1.1.0
2020-03	CT-87e	CP-200168				Presentation for approval at TSG CT	2.0.0
2020-03	CT-87e					Version 16.0.0 created after approval	16.0.0
2020-06	CT-88e	CP-201129	0001		B	SIP based subscribe/notify procedures for SEAL group management	16.1.0
2020-06	CT-88e	CP-201129	0002	1	F	Removal of Editor's notes	16.1.0
2020-06	CT-88e	CP-201129	0003		F	Indication from SGM-S to SGM-C about group join required	16.1.0
2020-06	CT-88e	CP-201129	0004		F	Corrections in HTTP request-uri value	16.1.0
2020-06	CT-88e	CP-201129	0005	1	B	Adding IANA registration template for SEAL group document	16.1.0
2020-06	CT-88e	CP-201129	0006		F	Adding VAL user id in subscription parameter	16.1.0
2020-09	CT-89e	CP-202163	0007		D	Removing Heading level-7 as per drafting rules	16.2.0
2020-12	CT-90e	CP-203210	0009		F	Corrections to group creation procedure	16.3.0
2020-12	CT-90e	CP-203210	0010	2	F	Adding Identity List notification and corrections to group announcement procedure	16.3.0
2020-12	CT-90e	CP-203210	0011		F	Corrections to group modification procedure	16.3.0
2020-12	CT-90e	CP-203210	0012	1	F	Updates to configure VAL group request	16.3.0
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History

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