**3GPP TSG-CT WG1 Meeting #133-eC1-217069**

**E-meeting, 11-19 November 2021**

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.546** | **CR** | **0014** | **rev** | **-** | **Current version:** | **17.0.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **X** |

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| --- |
|  |
| ***Title:***  | Addition of CoAP resource representation and encoding |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eSEAL |  | ***Date:*** | 2021-11-04 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)...Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | For specification of CoAP used in SEAL Configuration Management, resource representation and encoding needs to be added. It is proposed to add in a new annex of the TS. |
|  |  |
| ***Summary of change:*** | CoAP resource representation and encoding is added in a new annex. |
|  |  |
| ***Consequences if not approved:*** | SEAL CM does not support CoAP as required by stage 2. |
|  |  |
| ***Clauses affected:*** | 2, Annex X (new) |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* First Change \* \* \* \*

Annex X (normative):
CoAP resource representation and encoding

# X.1 General

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

## X.1.1 Resource URI structure

All API URIs of SEAL-UU APIs shall be specified as follows:

{apiRoot}/<apiName>/<apiVersion>

"apiRoot" is configured by means outside the scope of the present document. It includes one of the schemes ("coaps", "coaps+tcp", "coaps+ws"), host and optional port, and an optional prefix string. "apiName" and "apiVersion" shall be set dependent on the API, as defined in the corresponding clauses below.

All resource URIs in the clauses below are defined relative to the above root API URI.

URIs which differ only in the scheme shall point to the same resource.

NOTE 1: The "apiVersion" will only be increased if the new API version contains backward incompatible changes.

The root structure may be followed by "apiSpecificSuffixes" that are dependent on the API and are defined separately for each API as resource URI where they apply:

{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>

## X.1.2 Use of cache

Editor’s Note: The use of cache and the related CoAP options is FFS.

## X.1.3 Error handling

Table X.1.3-1 lists response payload types that are applicable to all APIs and as responses for all requests in the present specification unless otherwise specified..

Table X.1.3-1: Response payloads supported for responses to all requests.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Response body | Data type | Cardinality | ResponseCodes(NOTE 1) | Remarks(NOTE 2, NOTE 4) | Applied Methods |
| ProblemDetails | 1 | 4.00 Bad Request | Incorrect parameters were passed in the request.  | GET, POST PUT, PATCH, DELETE |
| ProblemDetails | 1 | 4.01 Unauthorized | The client is not authorized. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 4.02 Bad Option | The request could not be understood by the server due to one or more unrecognized or malformed options. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 4.03 Forbidden | This represents the case when the server is able to understand the request but unable to fulfil the request due to errors (e.g. the requested parameters are out of range). More information may be provided in the "invalidParams" attribute of the "ProblemDetails" structure.(NOTE 3) | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 4.04 Not Found | The resource URI was incorrect. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 4.06 Not Acceptable | The content format provided in the "Accept" option is not acceptable by the server. | GET |
| ProblemDetails | 1 | 4.13 Request Entity Too Large | If the received CoAP request contains entity larger than the server is able to process, the server shall reject the CoAP request with this status code. The server should include Size1 option in the response with the maximum size of the request entity it can handle. | POST, PUT, PATCH |
| ProblemDetails | 1 | 4.15 Unsupported Content-Format | The code indicates that the resource is in a format which is not supported by the server for the method. | POST, PUT, PATCH |
| ProblemDetails | 1 | 4.29 Too Many Requests | The code indicates that due to excessive traffic which, if continued over time, may lead to (or may increase) an overload situation.The CoAP option "Max-Age" may be added in the response to indicate how long the client has to wait before making a new request. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 5.00 Internal Server Error  | The server encountered an unexpected condition that prevented it from fulfilling the request. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 5.03 Service Unavailable  | The server is unable to handle the request. | GET, POST, PUT, PATCH, DELETE |
| NOTE 1: In addition to the above response codes, the CoAP server can also send other valid CoAP response codes, if applicable. The list of all valid CoAP response codes can be found in CoAP Response Code Registry at IANA [ianacoap]. |

Editor’s Note: Handling of "ProblemDetails" indicated in Table X.1.3-1 based on the IETF draft [coap-details] is FFS.

Editor’s Note: Handling PATCH method indicated in Table X.1.3-1 is FFS.

Specific errors are contained in the related API definition for each API.

# X.2 Resource representation and APIs for VAL user profile

## X.2.1 SU\_UserProfile API

### X.2.1.1 API URI

The CoAP URIs used in CoAP requests from SCM-C towards the SCM-S shall have the Resource URI structure as defined in clause 6.5 with the following clarifications:

- the <apiName>shall be "su-up";

- the <apiVersion> shall be "v1"; and

- the <apiSpecificSuffixes> shall be set as described in clause X.2.1.2.

### X.2.1.2 Resources

#### X.2.1.2.1 Overview



Figure X.2.1.2.1-1: Resource URI structure of the SU\_UserProfile API

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

Table X.2.1.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | CoAP method | Description |
| User Profiles | /{valServiceId}/user-profiles | GET | Retrieve VAL User or VAL UE's user profiles for a given VAL service, according to query criteria. |
| POST | Create user profile. |
| Individual User Profile | /{valServiceId}/user-profiles/{profileDocId} | GET | Retrieve an individual user profile. |
| PUT | Update an individual user profile. |
| DELETE | Delete an individual user profile. |

#### X.2.1.2.2 Resource: User Profiles

##### X.2.1.2.2.1 Description

The User Profiles resource allows a SCM-C to retrieve all the user profiles of a VAL user or a VAL UE for a specific VAL service that are available at a given SCM-S, or allows to create a new user profile.

##### X.2.1.2.2.2 Resource Definition

Resource URI: **{apiRoot}/ss-up/<apiVersion>/{valServiceId}/user-profiles**

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

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

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause X.1.1 |
| apiVersion | string | See clause X.2.1.1 |
| valServiceId | string | String identifying a VAL service. |

##### X.2.1.2.2.3 Resource Standard Methods

###### X.2.1.2.2.3.1 GET

This operation retrieves VAL User or VAL UE profile information satisfying the filter criteria.

This method shall support the URI query parameters specified in table X.2.1.2.2.3.1-1.

Table X.2.1.2.2.3.1-1: URI query parameters supported by the GET Request on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| val-tgt-ue | ValTargetUe | M | 1 | Identifying a VAL target UE or VAL user. |
| profile-index | ProfileIndex | O | 1 | Index of the user profile. |

This method shall support the response data structures and response codes specified in table X.2.1.2.2.3.1-2.

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| array(ProfileDoc) | M | 1..N | 2.05 Content | List of VAL User / VAL UE profile documents. This response shall include user profile information matching the query parameters provided in the request.  |
| NOTE: The mandatory CoAP error status codes for the GET Request listed in table X.1.E also apply. |

###### X.2.1.2.2.3.2 POST

This operation creates a VAL User or VAL UE profile information at the SCM-S for a given VAL service.

This method shall support the request data structures specified in table X.2.1.2.2.3.2-1, the response data structures and response codes specified in table X.2.1.2.2.3.2-2, and the response options specified in table X.2.1.2.2.3.2-3.

Table X.2.1.2.2.3.2-1: Data structures supported by the POST Request payload on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table X.2.1.2.2.3.2-2: Data structures supported by the POST Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ProfileDoc | O | 1 | 2.01 Created | The user profile was created successfully.The "profileDocId" of the created resource shall be returned in the "Location-Path" option. |
| NOTE: The mandatory CoAP error status codes for the POST method listed in table X.1.3 also apply. |

Table X.2.1.2.2.3.2-3: 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 profileDocId segment of the complete resource URI according to the structure: {apiRoot}/su-up/<apiVersion>/user-profiles/{profileDocId} |

#### X.2.1.2.3 Resource: Individual User Profile

##### X.2.1.2.3.1 Description

The Individual User Profile resource represents an individual user profile that is created at the SCM-S for a given VAL service. This resource is observable.

##### X.2.1.2.3.2 Resource Definition

Resource URI: **{apiRoot}/su-up/<apiVersion>/{valServiceId}/user-profiles/{profileDocId}**

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

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

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause X.1.1 |
| apiVersion | string | See clause X.2.1.1 |
| valServiceId | string | String identifying a VAL service. |
| profileDocId | string | Represents an individual user profile resource. |

##### X.2.1.2.3.3 Resource Standard Methods

###### X.2.1.2.3.3.1 GET

This operation retrieves the user profile document.

This method shall support the request options specified in table X.2.1.2.3.3.1-1, the response data structures and response codes specified in table X.2.1.2.3.3.1-2, and the response options specified in table X.2.1.2.3.3.1-3.

Table X.2.1.2.3.3.1-1: Options supported by the GET Request on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Observe | uint | O | 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 X.2.1.2.3.3.1-2: Data structures supported by the GET Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ProfileDoc | M | 1 | 2.05 Content | The User profile information based on the request from the SCM-C. |
| NOTE: The mandatory CoAP error status codes for the GET Request listed in table X.1.3 also apply. |

Table X.2.1.2.3.3.1-3: Options supported by the 2.05 Response Code on this resource

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

###### X.2.1.2.3.3.2 PUT

This operation updates the user profile document.

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

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

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| ProfileDoc | M | 1 | Updated details of the user profile document. |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ProfileDoc | O | 1 | 2.04 Changed | The user profile document updated successfully and the updated user profile document may be returned in the response.  |
| NOTE: The mandatory CoAP error status codes for the PUT method listed in table X.1.3 also apply. |

###### X.2.1.2.3.3.3 DELETE

This operation deletes the user profile document.

This method shall support the request data structures specified in table X.2.1.2.3.3.3-1 and the response data structures and response codes specified in table X.2.1.2.3.3.3-2.

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

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table X.2.1.2.3.3.3-2: Data structures supported by the DELETE Response payload on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| n/a |  |  | 2.02 Deleted | The individual User profile document matching the profileDocId is deleted.  |
| NOTE: The mandatory CoAP error status codes for the PUT method listed in table X.1.E also apply. |

### X.2.1.4 Data Model

#### X.2.1.4.1 General

Table X.2.1.4.1-1 specifies the data types defined specifically for the SU\_UserProfile API service.

Table X.2.1.4.1-1: SU\_Userrofile API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| ProfileDoc | X.2.1.4.2.2 | Profile information associated with VAL user ID or VAL UE ID. |  |
| ValTargetUe | X.2.1.4.2.3 | Information identifying a VAL user ID or VAL UE ID. |  |

Table X.2.1.4.1-2 specifies data types re-used by the SU\_UserProfile API service.

Table X.2.1.4.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| n/a |  |  |  |

#### X.2.1.4.2 Structured data types

##### X.2.1.4.2.1 Introduction

##### X.2.1.4.2.2 Type: ProfileDoc

Table X.2.1.4.2.2-1: Definition of type ProfileDoc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| profileDocId | string | O | 1 | Contains the profileDocId of the complete resource URI of this user profile document according to the structure: {apiRoot}/su-up/<apiVersion>/user-profiles/{profileDocId}This attribute shall be provided by the SCM-S in CoAP responses. |  |
| profileInformation | ProfileInfo | M | 1 | Profile information associated with a VAL user or a VAL UE as specified in valTgtUe. |  |
| valTgtUe | ValTargetUe | M | 1 | Unique identifier of a VAL user or a VAL UE. |  |

###### X.2.1.4.2.3 Type: ProfileInfo

Table X.2.1.4.2.3-1: Definition of type ProfileInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| profileName | string | O | 1 | Name of the user profile. |  |
| status | boolean | M | 1 | Indicates whether the user profile is enabled or disabled. |  |
| profileIndex | Uint8 | M | 1 | Unique identifier of user profile within the scope of multiple user profiles for a VAL user. |  |
| array(ProfileConfig) | ProfileConfig | O | 1..N | List of profile configurations. |  |
| isDefault | boolean | O | 1 | Indicates whether the user profile is the default profile for VAL user or not. |  |

##### X.2.1.4.2.3 Type: ProfileConfig

Table X.2.1.4.2.3-1: Definition of type ProfileConfig

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| configType | ProfileConfigType | M | 1 | Indicates the type of the profile configuration. |  |
| configData | string | M | 1 | Actual user profile configuration data. |  |

##### X.2.1.4.2.3 Type: ValTargetUe

Table X.2.1.4.2.3-1: Definition of type ValTargetUe

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valUserId | string | O | 0..1 | Unique identifier of a VAL user. |  |
| valUeId | string | O | 0..1 | Unique identifier of a VAL UE. |  |
| NOTE: Either "valUserId" or "valUeId" shall be present. |

#### X.2.1.4.3 Simple data types and enumerations

##### X.2.1.4.3.1 Enumeration: ProfileConfigType

Table X.2.1.4.3.1-1: Enumeration ProfileConfigType

|  |  |  |
| --- | --- | --- |
| **Enumeration value** | **Description** | **Applicability** |
| COMMON | Indicates VAL service specific common user profile configuration. |  |
| ON\_NETWORK | Indicates VAL service specific user profile configuration for on-network features. |  |
| OFF\_NETWORK | Indicates VAL service specific user profile configuration for off-network features |  |
| NOTE: Can be extended in the future releases to cater for other types. |

### X.2.1.5 Error Handling

General error responses are defined in clause X.1.3.

### X.2.1.6 CDDL Specification

#### X.2.1.6.1 Introduction

The data model described in clause X.2.1.4 shall be binary encoded in the CBOR format as described in IETF RFC 8949 [rfc8949].

Clause X.2.1.6.2 uses the Concise Data Definition Language [rfc8610] and provides corresponding representation of the SU\_UserProfile API data model.

#### X.2.1.6.2 CDDL document

;;; ProfileDoc

;;+ Represents user profile information associated with a VAL user ID or a VAL UE ID.

ProfileDoc = {

 ? profileDocId: text

 profileInformation: ProfileInfo

 valTgtUe: ValTargetUe

}

;;; 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.

 )

}

;;; ProfileInfo

;;+ User profile information.

ProfileInfo = {

 ? profileName: text ; Name of the profile

 status: bool ; Indicates whether the user profile is enabled or disabled.

 profileIndex: ProfileIndex

 ? profileConfigs: [+ ProfileConfig]

 ? isDefault: bool ; Indicates whether the user profile is the default profile for VAL user or not.

}

;;; ProfileConfig

;;+ Profile configuration.

ProfileConfig = {

 configType: ProfileConfigType

 configData: text ; Actual user profile configuration data.

}

;;; ProfileConfigType

;;+ Indicates the type of the profile configuration.

ProfileConfigType = "COMMON" / "ON\_NETWORK" / "OFF\_NETWORK" / text

;;; ProfileIndex

;;+ Unique identifier of user profile within the scope of multiple user profiles for a VAL user.

ProfileIndex = 0..255

### X.2.1.7 Media Type

The media type for a user profile document shall be "application/cbor".

Editor’s Note: Consider defining a media type for the user profile, such as "vnd.3gpp.seal-user-profile-info+cbor".

\* \* \* End of Changes \* \* \* \*