**3GPP TSG-CT WG1 Meeting #135-eC1-222716**

**E-Meeting, 6th – 12th April 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.549** | **CR** | **0002** | **rev** | **<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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | CoAP encoding | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo, Motorola Mobility | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eSEAL | | | | |  | ***Date:*** | | | 2022-04-06 |
|  |  | | | |  | |  | | |  |
| ***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 can be 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:*** | | CoAP encoding needs to be specified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Specified CoAP encoding.  Add related references. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 3 is not complete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, B, B.1, B.1.1(new), B.1.2(new), B.1.3(new), B.2(new), B.2.1(new), B.2.1.1(new), B.2.1.2(new), B.2.1.2.1(new), B.2.1.2.2(new), B.2.1.2.2.1(new), B.2.1.2.2.2(new), B.2.1.2.2.3(new), B.2.1.2.2.3.1(new), B.2.1.3(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 \* \* \* \*

# 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] 3GPP TS 24.526: "User Equipment (UE) policies for 5G System (5GS); Stage 3".

[4] 3GPP TS 24.547: "Identity management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification;".

[5] OMA OMA-TS-XDM\_Group-V1\_1\_1-20170124-A: "Group XDM Specification".

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

[7] IETF RFC 7231: "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content".

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

[9] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[10] 3GPP TS 23.502: "Procedures for the 5G System (5GS); Stage 2".

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

[TT] Internet draft draft-ietf-core-problem-details-01: "Problem Details For CoAP APIs".

\* \* \* Next Change \* \* \* \*

Annex <B> (normative):  
CoAP resource representation and encoding

\* \* \* Next Change \* \* \* \*

# B.1 General

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

## B.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 specified for SEAL-UU APIs shall be defined relative to the above root API URI.

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

NOTE: 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>

\* \* \* Next Change \* \* \* \*

## B.1.2 Use of cache

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

\* \* \* Next Change \* \* \* \*

## B.1.3 Error handling

Table B.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. The CoAP client shall mandatorily support the processing of the status code for all the applicable methods, when received in a CoAP response message.

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Response body | Data type | Cardinality | Response  Codes  (NOTE) | Remarks | Applied Methods |
| ProblemDetails | 1 | 4.00 Bad Request | Incorrect parameters were passed in the request. | POST |
| ProblemDetails | 1 | 4.01 Unauthorized | The client is not authorized. | POST |
| ProblemDetails | 1 | 4.02 Bad Option | The request could not be understood by the server due to one or more unrecognized or malformed options. | POST |
| 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. | POST |
| ProblemDetails | 1 | 4.04 Not Found | The resource URI was incorrect. | POST |
| 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 |
| 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 |
| 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. | POST |
| ProblemDetails | 1 | 5.00 Internal Server Error | The server encountered an unexpected condition that prevented it from fulfilling the request. | POST |
| ProblemDetails | 1 | 5.03 Service Unavailable | The server is unable to handle the request. | POST |
| NOTE: In addition to the above response codes, the CoAP server may 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 [ZZ]. | | | | | |

Editor's Note: Handling of "ProblemDetails" indicated in Table B.1.3-1 based on the IETF draft draft-ietf-core-problem-details [TT] is FFS.

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

# B.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 Annex C.1 of 3GPP TS 24.546 [xx].

\* \* \* Next Change \* \* \* \*

# B.2 Resource representation and APIs for event triggered network slice adaptation

\* \* \* Next Change \* \* \* \*

## B.2.1 ETN\_SliceAdaptation API

\* \* \* Next Change \* \* \* \*

### B.2.1.1 API URI

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

- the <apiName>shall be "etn\_sa";

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

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

\* \* \* Next Change \* \* \* \*

### B.2.1.2 Resources

\* \* \* Next Change \* \* \* \*

#### B.2.1.2.1 Overview



Figure B.2.1.2.1-1: Resource URI structure of the ETN\_SliceAdaptation API

Table B.2.1.2.1-1 provides an overview of the resources and applicable CoAP method.

Table C.2.1.2.1-1: Resources and method overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | CoAP method | Description |
| Slice Adaptation | /val-services/{valServiceId}/slice-adaptation | POST | Create slice adaptation. |

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

\* \* \* Next Change \* \* \* \*

#### B.2.1.2.2 Resource: Slice Adaptation

\* \* \* Next Change \* \* \* \*

##### B.2.1.2.2.1 Description

The Slice Adaptation resource allows an SNSCE-C to send:

a) a list of one or more VAL UEs;

b) a requested S-NSSAI;

c) optionally a requested DNN; and

d) optionally a requested slice adaptation cause,

for a specific VAL service, toward a SNSCE-S, to create a network triggered slice adaptation of the list of one or more VAL UEs for that specific VAL service by the SNSCE-S.

\* \* \* Next Change \* \* \* \*

##### B.2.1.2.2.2 Resource Definition

Resource URI: **{apiRoot}/etn-sa/<apiVersion>/val-services/{valServiceId}/slice-adaptation**

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

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

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause B.1.1 |
| apiVersion | string | See clause B.2.1.1 |
| valServiceId | string | Identifier of a VAL service. |

\* \* \* Next Change \* \* \* \*

##### B.2.1.2.2.3 Resource Standard Method

\* \* \* Next Change \* \* \* \*

###### B.2.1.2.2.3.1 POST

This operation creates a list of one or more VAL UEs, which are to be triggered for a slice adaptation for a given VAL service by the SNSCE-S.

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

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| VAL UE List | string | M | 1..N | Represents a space-separated List of VAL UE Ids within the VAL service, for which the network slice adaptation trigger applies. |  |
| Requested S-NSSAI | string | M | 1 | The new S-NSSAI which is requested. |  |
| Requested DNN | string | O | 1 | The new DNN which is requested. |  |
| Slice adaptation cause | string | O | 1 | Indicates the cause for the slice adaptation. |  |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  Codes (NOTE) | Description |
| n/a | M | 1 | 2.01 Created | The slice adaption of the VAL UE list for the VAL service identity with the value "valServiceId" was created successfully. |
| NOTE: The mandatory CoAP error status codes for the POST method listed in table B.1.3-1 shall also apply. | | | | |

\* \* \* Next Change \* \* \* \*

### B.2.1.3 Error Handling

General error responses are defined in clause B.1.3.

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