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User Equipment (UE) radio capability provisioning service; Stage 3

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**



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# 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, certain modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

NOTE 1: The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

NOTE 2: 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

NOTE 3: 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

NOTE 4: The constructions "can" and "cannot" shall not to be used as 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

NOTE 5: The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The present document specifies the stage 3 protocol and data model for the Nucmf Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the UCMF.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [4] and 3GPP TS 29.501 [5].

# 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 23.501: "System Architecture for the 5G System; Stage 2".

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

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[6] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[7] 3GPP TR 21.900: "Technical Specification Group working methods".

[8] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[9] IETF RFC 6749: "The Oauth 2.0 Authorization Framework".

[10] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[11] IETF RFC 9113: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

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

[13] IETF RFC 9457: "Problem Details for HTTP APIs".

[14] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

[15] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[16] IETF RFC 7396: "JSON Merge Patch".

[17] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions 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].

## 3.2 Symbols

No symbol is defined in the present document.

## 3.3 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].

AF Application Function

IMEI-TAC Type Allocation Code part of an IMEI

NEF Network Exposure Function

NF Network Function

RACS Radio Capabilities Signalling optimisation

UCMF UE radio Capability Management Function

# 4 UE Radio Capability Provisioning Service

## 4.1 Service Description

### 4.1.1 Overview

The UE radio capability provisioning service, as defined in 3GPP TS 23.502 [3], is provided by the UE radio Capability Management Function (UCMF).

This service:

- allows NF service consumers to create, update and delete UCMF dictionary entries for Manufacturer-assigned UE Radio Capability IDs.

### 4.1.2 Service Architecture

The Service Architecture is defined in 3GPP TS 23.501 [2].

The UE radio capability provisioning service (Nucmf\_Provisioning) is part of the Nucmf service-based interface exhibited by the UCMF.

The known NF service consumers of the Nucmf\_Provisioning service are:

- Network Exposure Function (NEF); and

- Application Function (AF).

The Nucmf\_Provisioning service is provided by the UCMF and consumed by the NEF and the AF, as shown in figure 4.1.2-1 for the SBI representation model and in figure 4.1.2-2 for reference point representation model.



Figure 4.1.2-1: Nucmf\_Provisioning service Architecture, SBI representation



Figure 4.1.2-2: Nucmf\_Provisioning service Architecture, reference point representation

### 4.1.3 Network Functions

#### 4.1.3.1 UCMF

The UCMF is a functional element that provides service to the NF service consumer.

It allows NF consumers to provision (create, update and delete) UCMF dictionary entries for Manufacturer-assigned UE Radio Capability IDs.

#### 4.1.3.2 NF Service Consumers

The Network Exposure Function (NEF):

- Provision (create, update and delete) UCMF dictionary entries for Manufacturer-assigned UE Radio Capability IDs to the UCMF, if it receives the UE Radio Capability information from the untrusted AF.

The Application Function (AF):

- As the trusted AF, provision (create, update and delete) UCMF dictionary entries for Manufacturer-assigned UE Radio Capability IDs to the UCMF.

## 4.2 Service Operations

### 4.2.1 Introduction

Service operations defined for the Nucmf\_Provisioning Service are shown in table 4.2.1-1.

Table 4.2.1-1: Nucmf\_Provisioning Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| Nucmf\_Provisioning\_Create | This service operation is used by an NF service consumer to create UE radio capability provisioning resource for Manufacturer-assigned UE Radio Capability IDs. | NF service consumer (e.g. AF, NEF) |
| Nucmf\_Provisioning\_Update | This service operation is used by an NF service consumer to modify UE radio capability provisioning resource for Manufacturer-assigned UE Radio Capability IDs. | NF service consumer (e.g. AF, NEF) |
| Nucmf\_Provisioning\_Delete | This service operation is used by an NF service consumer to remove a UE radio capability provisioning resource. | NF service consumer (e.g. AF, NEF) |

### 4.2.2 Nucmf\_Provisioning\_Create service operation

#### 4.2.2.1 General

This service operation is used by an NF service consumer to create UE radio capability provisioning resource for Manufacturer-assigned UE Radio Capability IDs.

The following procedure using the Nucmf\_Provisioning\_Create service operation is supported:

- creating a UE radio capability provisioning resource.

#### 4.2.2.2 Creating UE radio capability provisioning resource

This procedure is used by the NF service consumer (e.g. NEF) to create a UE radio capability provisioning resource containing UCMF dictionary entries for Manufacturer-assigned UE Radio Capability IDs, as defined in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].



Figure 4.2.2.2-1: Creating new UE radio capability provisioning resource

To create a UE radio capability provisioning resource, the NF service consumer shall send an HTTP POST request to the UCMF with: "{apiRoot}/nucmf-provisioning/<apiVersion>/provisionings" as request URI as shown in step 1 of figure 4.2.2.2-1, and the "RacsData" data structure as request body. The "RacsData" data type shall contain one or more RACS configurations in the "racsConfigs" attribute which include:

- a RACS ID in the "racsId" attribute;

- UE radio capability information in the "racsParamEps" and/or "racsParam5Gs" attributes; and

- the related UE model(s) IMEI-TAC value(s) in the "imeiTacs" attribute.

Upon reception of the HTTP POST message from the NF service consumer requesting to create UCMF dictionary entries, the UCMF shall, for each requested RACS ID, check if there is any existing dictionary entry having the same RACS ID. If yes, the UCMF shall indicate "RACS\_ID\_DUPLICATED" in the "result" attribute for the requested RACS ID; otherwise if there is no other error the UCMF shall create a UCMF dictionary entry.

After processing all requested RACS IDs, if at least one UCMF dictionary entry is successfully provisioned, the UCMF shall create the resource "Individual UE radio capability provisioning" and respond "201 Created" as shown in step 2 of figure 4.2.2.2-1 with the successfully provisioned RACS information, the UCMF may include RACS report(s) within attribute "racsReports" with a list of RACS ID(s) and the corresponding failure code for which the provisioning has failed as specified in table 5.16.2.2.3-1 of 3GPP TS 29.122 [15] in the body of the HTTP response; otherwise the UCMF shall respond "500 Internal Server Error" and may include the RACS report(s) to indicate failure details.

### 4.2.3 Nucmf\_Provisioning\_Update service operation

#### 4.2.3.1 General

This service operation is used by an NF service consumer to modify UE radio capability provisioning resource for Manufacturer-assigned UE Radio Capability IDs.

The following procedure using the Nucmf\_Provisioning\_Update service operation is supported:

- modifying an existing UE radio capability provisioning resource.

#### 4.2.3.2 Modifying a UE radio capability provisioning resource



Figure 4.2.3.2-1: Modifying a UE radio capability provisioning resource

In order to modify a UE radio capability provisioning resource, i.e. add new UCMF dictionary entries, update and/or remove the existing UCMF dictionary entries for one or more RACS ID(s), the NF service consumer shall send an HTTP PUT or PATCH request to the UCMF with: "{apiRoot}/nucmf-provisioning/<apiVersion>/provisionings/{provisioningId}" as request URI as shown in step 1 of figure 4.2.3.2-1, and the "RacsData" or "RacsDataPatch" data structure as request body, correspondingly. The "RacsData" or "RacsDataPatch" data type shall contain one or more RACS configurations in the "racsConfigs" attribute which include:

- a RACS ID in the "racsId" attribute;

- UE radio capability information in the "racsParamEps" and/or "racsParam5Gs" attributes; and

- the related UE model(s) IMEI-TAC value(s) in the "imeiTacs" attribute.

Upon reception of the HTTP PUT message from the NF service consumer, the UCMF shall start replacing the existing UE radio capability provisioning resource and update the corresponding UCMF dictionary entr(ies).

Upon reception of the HTTP PATCH message from the NF service consumer, the UCMF shall start modifying the existing UE radio capability provisioning resource:

- remove RACS ID and its UE radio capability information with a NULL map key value, and the corresponding UCMF dictionary entry;

- replace the UE radio capability information for any existing RACS ID in the resource, and the corresponding UCMF dictionary entry; and/or

- create a UCMF dictionary entry for any new RACS ID if there is no ID conflict with other existing resources.

After processing all requested RACS IDs, if at least one UCMF dictionary entry is successfully provisioned, the UCMF shall respond "200 OK" as shown in step 2 of figure 4.2.3.2-1 with the successfully provisioned RACS information, the UCMF may include RACS report(s) within attribute "racsReports" with a list of RACS ID(s) and the corresponding failure code for which the provisioning has failed as specified in table 5.16.2.2.3-1 of 3GPP TS 29.122 [15] in the body of the HTTP response; otherwise the UCMF shall respond "500 Internal Server Error" and may include the RACS report(s) to indicate failure details.

If the feature "ES3XX" is supported, and the UCMF determines the received HTTP PUT or PATCH request needs to be redirected, the UCMF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

### 4.2.4 Nucmf\_Provisioning\_Delete service operation

#### 4.2.4.1 General

This service operation is used by an NF service consumer to remove UE radio capability provisioning resource for Manufacturer-assigned UE Radio Capability IDs.

The following procedure using the Nucmf\_Provisioning\_Delete service operation is supported:

- removing an existing UE radio capability provisioning resource.

#### 4.2.4.2 Removing a UE radio capability provisioning resource



Figure 4.2.4.2-1: Removing a UE radio capability provisioning resource

In order to remove a UE radio capability provisioning resource, the NF service consumer shall send an HTTP DELETE request to the UCMF with: "{apiRoot}/nucmf-provisioning/<apiVersion>/provisionings/{provisioningId}" as request URI as shown in step 1 of figure 4.2.4.2-1.

Upon successful reception of the HTTP DELETE, the UCMF shall remove the corresponding resource and the corresponding UCMF dictionary entries, and send an HTTP "204 No Content" response as shown in step 2 of figure 4.2.4.2-1.

If the UCMF cannot successfully fulfil the received HTTP DELETE request due to the internal error or the error in the HTTP DELETE request, the UCMF shall send the HTTP error response as specified in clause 5.7.

If the feature "ES3XX" is supported, and the UCMF determines the received HTTP DELETE request needs to be redirected, the UCMF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

# 5 Nucmf\_Provisioning Service API

## 5.1 Introduction

The UE radio capability provisioning service shall use the Nucmf\_Provisioning API.

The API URI of the Nucmf\_Provisioning API shall be:

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

The request URIs used in HTTP requests from the NF service consumer towards the NF service producer shall have the Resource URI structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].

- The <apiName>shall be "nucmf-provisioning".

- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 5.3.

## 5.2 Usage of HTTP

### 5.2.1 General

HTTP/2, IETF RFC 9113 [11], shall be used as specified in clause 5.2 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

The OpenAPI [6] specification of HTTP messages and content bodies for the Nucmf\_Provisioning API is contained in Annex A.

### 5.2.2 HTTP standard headers

#### 5.2.2.1 General

See clause 5.2.2 of 3GPP TS 29.500 [4] for the usage of HTTP standard headers.

#### 5.2.2.2 Content type

JSON, IETF RFC 8259 [12], shall be used as content type of the HTTP bodies specified in the present specification as specified in clause 5.4 of 3GPP TS 29.500 [4]. The use of the JSON format shall be signalled by the content type "application/json".

JSON object used in the HTTP PATCH request shall be encoded according to "JSON Merge Patch" and shall be signalled by the content type "application/merge-patch+json", as defined in IETF RFC 7396 [16].

"Problem Details" JSON object shall be used to indicate additional details of the error in a HTTP response body and shall be signalled by the content type "application/problem+json", as defined in IETF RFC 9457 [13].

### 5.2.3 HTTP custom headers

The mandatory HTTP custom header fields specified in clause 5.2.3.2 of 3GPP TS 29.500 [4] shall be supported, and the optional HTTP custom header fields specified in clause 5.2.3.3 of 3GPP TS 29.500 [4] may be supported.

In this Release of the specification, no specific custom headers are defined for the Nucmf\_Provisioning API.

## 5.3 Resources

### 5.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 5.3.1-1 depicts the resource URIs structure for the Nucmf\_Provisioning API.



Figure 5.3.1-1: Resource URI structure of the Nucmf\_Provisioning API

Table 5.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| UE radio capability provisionings | /provisionings | POST | Create a UE radio capability provisioning resource. |
| Individual UE radio capability provisioning | /provisionings/{provisioningId} | GET | Read an existing UE radio capability provisioning resource. |
| PUT | Modify an existing UE radio capability provisioning resource. |
| PATCH | Modify an existing UE radio capability provisioning resource. |
| DELETE | Remove an existing UE radio capability provisioning resource. |

### 5.3.2 Resource: UE radio capability provisionings (Collection)

#### 5.3.2.1 Description

The UE radio capability provisionings resource represents all the provisionings that exist in the UE radio capability provisioning service at a given UCMF instance.

#### 5.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nucmf-provisioning/<apiVersion>/provisionings**

This resource shall support the resource URI variables defined in table 5.3.2.2-1.

Table 5.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1. |

#### 5.3.2.3 Resource Standard Methods

##### 5.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.3.2.3.1-1.

Table 5.3.2.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.3.2.3.1-2 and the response data structures and response codes specified in table 5.3.2.3.1-3.

Table 5.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| RacsData | M | 1 | Contains information for the creation of an Individual UE radio capability provisioning resource. |

Table 5.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| RacsData | M | 1 | 201 Created | The creation of an Individual UE radio capability provisioning resource is confirmed and a representation of that resource is returned. |
| Array(RacsFailureReport) | M | 1..N | 500 Internal Server Error | The RACS data for all RACS IDs were not provisioned successfully. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

Table 5.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nucmf-provisioning/<apiVersion>/provisionings/{provisioningId} |

#### 5.3.2.4 Resource Custom Operations

None.

### 5.3.3 Resource: Individual UE radio capability provisioning (Document)

#### 5.3.3.1 Description

The Individual UE radio capability provisioning resource represents a single provisioning that exist in the UE radio capability provisioning service at a given UCMF instance.

#### 5.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nucmf-provisioning/<apiVersion>/provisionings/{provisioningId}**

This resource shall support the resource URI variables defined in table 5.3.3.2-1.

Table 5.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1. |
| provisioningId | string | Identifies the individual UE radio capability resource in the UCMF.  To enable the value to be used as part of a URI, the string shall only contain allowed characters according to the "lower-with-hyphen" naming convention defined in clause 5.1.3 of 3GPP TS 29.501 [5] and rules for a path segment defined in IETF RFC 3986 [14]. |

#### 5.3.3.3 Resource Standard Methods

##### 5.3.3.3.1 GET

This method shall support the URI query parameters specified in table 5.3.3.3.1-1.

Table 5.3.3.3.1-1: URI query parameters supported by the GET method on this resource

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

This method shall support the request data structures specified in table 5.3.3.3.1-2 and the response data structures and response codes specified in table 5.3.3.3.1-3.

Table 5.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 5.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | | P | | Cardinality | | Response codes | | Description | |
| RacsData | | M | | 1 | | 200 OK | | A representation of an Individual UE radio capability provisioning resource is returned. | |
| RedirectResponse | | O | | 0..1 | | 307 Temporary Redirect | | Temporary redirection, during resource retrieval.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) | |
| RedirectResponse | | O | | 0..1 | | 308 Permanent Redirect | | Permanent redirection, during resource retrieval.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) | |
| NOTE 1: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]). | | | | | | | | | |

Table 5.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

Table 5.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

##### 5.3.3.3.2 PUT

This method shall support the URI query parameters specified in table 5.3.3.3.2-1.

Table 5.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

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

This method shall support the request data structures specified in table 5.3.3.3.2-2 and the response data structures and response codes specified in table 5.3.3.3.2-3.

Table 5.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| RacsData | M | 1 | Contains the modification of an Individual UE radio capability provisioning data. |

Table 5.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| RacsData | M | 1 | 200 OK | The Individual UE radio capability provisioning resource is modified and a representation of that resource is returned. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during resource modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during resource modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| Array(RacsFailureReport) | M | 1..N | 500 Internal Server Error | The RACS data for all RACS IDs were not provisioned successfully. |
| NOTE 1: The mandatory HTTP error status codes for the PUT method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]). | | | | |

Table 5.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

Table 5.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

##### 5.3.3.3.3 PATCH

This method shall support the URI query parameters specified in table 5.3.3.3.3-1.

Table 5.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

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

This method shall support the request data structures specified in table 5.3.3.3.3-2 and the response data structures and response codes specified in table 5.3.3.3.3-3.

Table 5.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| RacsDataPatch | M | 1 | Contains the modification of an Individual UE radio capability provisioning data. |

Table 5.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| RacsData | M | 1 | 200 OK | The Individual UE radio capability provisioning resource is modified and a representation of that resource is returned. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during resource modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during resource modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| Array(RacsFailureReport) | M | 1..N | 500 Internal Server Error | The RACS data for all RACS IDs were not provisioned successfully. |
| NOTE 1: The mandatory HTTP error status codes for the PATCH method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]). | | | | |

Table 5.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

Table 5.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

##### 5.3.3.3.4 DELETE

This method shall support the URI query parameters specified in table 5.3.3.3.4-1.

Table 5.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

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

This method shall support the request data structures specified in table 5.3.3.3.4-2 and the response data structures and response codes specified in table 5.3.3.3.4-3.

Table 5.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

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

Table 5.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | | P | | Cardinality | | Response codes | | Description | |
| n/a | |  | |  | | 204 No Content | | The Individual UE radio capability resource was successfully removed. | |
| RedirectResponse | | O | | 0..1 | | 307 Temporary Redirect | | Temporary redirection, during resource removal.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) | |
| RedirectResponse | | O | | 0..1 | | 308 Permanent Redirect | | Permanent redirection, during resource removal.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) | |
| NOTE 1: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]). | | | | | | | | | |

Table 5.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

Table 5.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative UCMF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the UCMF (service) instance towards which the request is redirected. |

## 5.4 Custom Operations without associated resources

No custom operation is defined in this Release of the specification.

## 5.5 Notifications

Notifications are not applicable for the current Release.

## 5.6 Data Model

### 5.6.1 General

This clause specifies the application data model supported by the API.

Table 5.6-1 specifies the data types defined for the Nucmf\_Provisioning service based interface protocol.

Table 5.6-1: Nucmf\_Provisioning specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| RacsData | 5.6.2.2 | UE radio capability data |  |
| RacsDataPatch | 5.6.2.3 | UE radio capability data for PATCH request |  |

Table 5.6-2 specifies data types re-used by the Nucmf\_Provisioning service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nucmf\_Provisioning service based interface.

Table 5.6-2: Nucmf\_Provisioning re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| ProblemDetails | 3GPP TS 29.571 [17] | Used in error responses to provide more detailed information about an error. |  |
| RacsConfiguration | 3GPP TS 29.122 [15] | Represents the UE radio capability data configuration. |  |
| RacsConfigurationRm | 3GPP TS 29.122 [15] | Represents the UE radio capability data configuration with "nullable: true" property. |  |
| RacsFailureReport | 3GPP TS 29.122 [15] | Represents the report for UE radio capability data provisioning. |  |
| RedirectResponse | 3GPP TS 29.571 [17] | Contains redirection related information. | ES3XX |
| SupportedFeatures | 3GPP TS 29.571 [17] | Used to negotiate the applicability of the optional features defined in table 5.8-1. |  |

### 5.6.2 Structured data types

#### 5.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

#### 5.6.2.2 Type: RacsData

This type represents a UE radio capability data provided by the NF service consumer to the UCMF.

Table 5.6.2.2-1: Definition of type RacsData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| suppFeat | SupportedFeatures | C | 0..1 | Used to negotiate the supported optional features of the API as described in clause 5.2.7.  This attribute shall be provided in the POST request and in the response of successful resource creation. |  |
| racsConfigs | map(RacsConfiguration) | M | 1..N | Identifies the configuration related to manufacturer specific UE radio capability. Each element uniquely identifies an RACS configuration for an RACS ID and is identified in the map via the RACS ID as key. The response shall include successfully provisioned RACS data. |  |
| racsReports | map(RacsFailureReport) | O | 1..N | Supplied by the UCMF. Contains the RACS IDs for which the RACS data are not provisioned successfully.  Any string value can be used as a key of the map. |  |

#### 5.6.2.3 Type: RacsDataPatch

This type represents a UE radio capability data provided by the NF service consumer to the UCMF.

Table 5.6.2.3-1: Definition of type RacsDataPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| racsConfigs | map(RacsConfigurationRm) | O | 1..N | Identifies the configuration related to manufacturer specific UE radio capability. Each element uniquely identifies an RACS configuration for an RACS ID and is identified in the map via the RACS ID as key. |  |

### 5.6.3 Simple data types and enumerations

#### 5.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

#### 5.6.3.2 Simple data types

The simple data types defined in table 5.6.3.2-1 shall be supported.

Table 5.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

## 5.7 Error Handling

### 5.7.1 General

For the Nucmf\_Provisioning API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [5]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [4] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [4].

In addition, the requirements in the following clauses are applicable for the Nucmf\_Provisioning API.

### 5.7.2 Protocol Errors

No specific procedures for the Nucmf\_Provisioning service are specified.

### 5.7.3 Application Errors

The application errors defined for the Nucmf\_Provisioning service are listed in table 5.7.3-1.

Table 5.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Nucmf\_Provisioning API. They shall be negotiated using the extensibility mechanism defined in clause 6.6.2 of 3GPP TS 29.500 [4].

Table 5.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | ES3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation, according to Stateless NF procedures as specified in clauses 6.5.3.2 and 6.5.3.3 of 3GPP TS 29.500 [4] and according to HTTP redirection principles for indirect communication, as specified in clause 6.10.9 of 3GPP TS 29.500 [4]. |

## 5.9 Security

As indicated in 3GPP TS 33.501 [8] and 3GPP TS 29.500 [4], the access to the Nucmf\_Provisioning API may be authorized by means of the Oauth2 protocol (see IETF RFC 6749 [9]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [10]) plays the role of the authorization server.

If Oauth2 is used, an NF service consumer, prior to consuming services offered by the Nucmf\_Provisioning API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [10], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF service consumer used for discovering the Nucmf\_Provisioning service.

The Nucmf\_Provisioning API defines a single scope "nucmf-provisioning" for the entire service, and it does not define any additional scopes at resource or operation level.

Annex A (normative):  
OpenAPI specification

# A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI 3.0.0 specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see clause 5B of the 3GPP TR 21.900 [7] for further information) and clause 5.3.1 of the 3GPP TS 29.501 [5].

# A.2 Nucmf\_Provisioning API

openapi: 3.0.0

info:

title: Nucmf\_Provisioning

version: 1.2.0-alpha.3

description: |

UCMF\_Provisioning Service.

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externalDocs:

description: >

3GPP TS 29.675 V18.3.0; User Equipment (UE) radio capability provisioning service; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.675/

servers:

- url: '{apiRoot}/nucmf-provisioning/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

- {}

- oAuth2ClientCredentials:

- nucmf-provisioning

paths:

/provisionings:

post:

summary: Create an Individual UE radio capability provisioning

operationId: CreateProvisioning

tags:

- UE radio capability provisionings (Collection)

requestBody:

description: Create new provisionings for a given SCS/AS.

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/RacsData'

responses:

'201':

description: >

Created. The creation of an Individual UE radio capability provisioning

resource is confirmed and a representation of that resource is returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RacsData'

headers:

Location:

description: Contains the URI of the newly created resource.

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

description: The RACS data for all RACS IDs were not provisioned successfully.

content:

application/json:

schema:

type: array

items:

$ref: 'TS29122\_RacsParameterProvisioning.yaml#/components/schemas/RacsFailureReport'

minItems: 1

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

/provisionings/{provisioningId}:

parameters:

- name: provisioningId

in: path

description: Provisioning ID

required: true

schema:

type: string

get:

summary: Get an Individual UE radio capability provisioning

operationId: GetProvisioning

tags:

- Individual UE radio capability provisioning (Document)

responses:

'200':

description: OK. The provisioning information related to the request URI is returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RacsData'

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

patch:

summary: Update (PATCH) an Individual UE radio capability provisioning

operationId: UpdateProvisioning

tags:

- Individual UE radio capability provisioning (Document)

requestBody:

description: Update an existing parameter provisioning.

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/RacsDataPatch'

responses:

'200':

description: >

OK. The Individual UE radio capability provisioning resource is modified

and a representation of that resource is returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RacsData'

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

description: The RACS data for all RACS IDs were not provisioned successfully.

content:

application/json:

schema:

type: array

items:

$ref: 'TS29122\_RacsParameterProvisioning.yaml#/components/schemas/RacsFailureReport'

minItems: 1

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

put:

summary: Replace (PUT) an Individual UE radio capability provisioning

operationId: ReplaceProvisioning

tags:

- Individual UE radio capability provisioning (Document)

requestBody:

description: Update an existing parameter provisioning.

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/RacsData'

responses:

'200':

description: >

OK. The Individual UE radio capability provisioning resource is modified and a

representation of that resource is returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RacsData'

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

description: The RACS data for all RACS IDs were not provisioned successfully.

content:

application/json:

schema:

type: array

items:

$ref: 'TS29122\_RacsParameterProvisioning.yaml#/components/schemas/RacsFailureReport'

minItems: 1

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: Remove an Individual UE radio capability provisioning

operationId: RemoveProvisioning

tags:

- Individual UE radio capability provisioning (Document)

responses:

'204':

description: >

No Content. The Individual UE radio capability resource was successfully removed.

The content shall be empty.

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes:

nucmf-provisioning: Access to the Nucmf\_Provisioning API

schemas:

RacsData:

description: Represents a UE radio capability data provided by the NF service consumer.

type: object

properties:

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

racsConfigs:

type: object

additionalProperties:

$ref: 'TS29122\_RacsParameterProvisioning.yaml#/components/schemas/RacsConfiguration'

minProperties: 1

description: >

Identifies the configuration related to manufacturer specific UE radio capability.

Each element uniquely identifies an RACS configuration for an RACS ID and is

identified in the map via the RACS ID as key. The response shall include

successfully provisioned RACS data.

racsReports:

type: object

additionalProperties:

$ref: 'TS29122\_RacsParameterProvisioning.yaml#/components/schemas/RacsFailureReport'

minProperties: 1

description: >

Contains the RACS IDs for which the RACS data are not provisioned successfully. The

failure reason is also included. Any string value can be used as a key of the map.

readOnly: true

required:

- racsConfigs

RacsDataPatch:

description: >

Represents a modification of a UE radio capability data provided by the NF service

consumer.

type: object

properties:

racsConfigs:

type: object

additionalProperties:

$ref: 'TS29122\_RacsParameterProvisioning.yaml#/components/schemas/RacsConfigurationRm'

minProperties: 1

description: >

Identifies the configuration related to manufacturer specific UE radio

capability. Each element uniquely identifies an RACS configuration for an RACS ID

and is identified in the map via the RACS ID as key.

Annex B (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **Tdoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2019-06 |  |  |  |  |  | TS skeleton of UE Radio Capability Provisioning Service | 0.0.0 |
| 2019-09 |  |  |  |  |  | Includes pCRs agreed in CT3#105: C3-193417, C3-193594, C3-193648. | 0.1.0 |
| 2019-10 |  |  |  |  |  | Includes pCRs agreed in CT3#106: C3-194435. | 0.2.0 |
| 2019-11 |  |  |  |  |  | Rapporteur changes:  - fill in the referred clause number of TS 29.122 in clauses 4.2.2.2 and 4.2.3.2.  - correct the TS version in externalDocs and step the openAPI file version. | 0.3.0 |
| 2019-12 |  |  |  |  |  | Sent to plenary for information. | 1.0.0 |
| 2020-03 |  |  |  |  |  | Includes pCRs agreed in CT3#108-e: C3-201197. | 1.1.0 |
| 2020-03 | CT#87e | CP-200189 |  |  |  | TS sent to plenary for approval | 2.0.0 |
| 2020-03 | CT#87e | CP-200189 |  |  |  | TS approved by plenary | 16.0.0 |
| 2020-06 | CT#88e | CP-201243 | 0003 | - | F | Correcting errors in clause 5.6 | 16.1.0 |
| 2020-06 | CT#88e | CP-201244 | 0004 | 1 | F | Storage of YAML files in ETSI Forge | 16.1.0 |
| 2020-06 | CT#88e | CP-201243 | 0002 | 1 | F | Update to UE radio capability information data type | 16.1.0 |
| 2020-06 | CT#88e | CP-201189 | 0001 | 3 | F | Addition of IMEI-TAC values for RACS operations | 16.1.0 |
| 2020-06 | CT#88e | CP-201190 | 0006 | 1 | F | Avoid using the same data type for PUT and PATCH | 16.1.0 |
| 2020-06 | CT#88e | CP-201256 | 0005 | 1 | F | URI of the Nucmf\_Provisioning service | 16.1.0 |
| 2020-06 | CT#88e | CP-201243 | 0007 | 1 | F | Correct OpenAPI scope | 16.1.0 |
| 2020-06 | CT#88e | CP-201243 | 0008 | 1 | F | Supported headers, Resource Data type and yaml mapping | 16.1.0 |
| 2020-06 | CT#88e | CP-201255 | 0009 |  | F | Update of OpenAPI version and TS version in externalDocs field | 16.1.0 |
| 2020-09 | CT#89e | CP-202072 | 0011 |  | F | Resource correction | 16.2.0 |
| 2020-09 | CT#89e | CP-202078 | 0012 | 1 | F | Reference point representation | 17.0.0 |
| 2020-12 | CT#90e | CP-203139 | 0014 |  | A | Essential corrections and alignments | 17.1.0 |
| 2020-12 | CT#90e | CP-203139 | 0016 | 1 | A | Storage of YAML files in ETSI Forge | 17.1.0 |
| 2020-12 | CT#90e | CP-203136 | 0018 | 1 | A | Correct UCMF id | 17.1.0 |
| 2021-03 | CT#91e | CP-210218 | 0019 |  | F | Update of “description” field for racsReports | 17.2.0 |
| 2021-03 | CT#91e | CP-210218 | 0020 |  | F | OpenAPI reference | 17.2.0 |
| 2021-03 | CT#91e | CP-210221 | 0021 | 1 | F | Adding some missing description fields to data type definitions in OpenAPI specification files | 17.2.0 |
| 2021-03 | CT#91e | CP-210219 | 0022 |  | F | Support of optional HTTP custom header fields | 17.2.0 |
| 2021-03 | CT#91e | CP-210220 | 0023 |  | F | Terminology alignment: usage of “NF service consumer” | 17.2.0 |
| 2021-03 | CT#91e | CP-210235 | 0024 |  | F | Correcting the receiver of HTTP DELETE request | 17.2.0 |
| 2021-03 | CT#91e | CP-210240 | 0025 |  | F | Update of OpenAPI version and TS version in externalDocs field | 17.2.0 |
| 2021-09 | CT#93e | CP-212218 | 0027 |  | A | Correcting resource definitions | 17.3.0 |
| 2021-12 | CT#94e | CP-213239 | 0028 |  | F | API URI of the Nucmf\_Provisioning API | 17.4.0 |
| 2022-03 | CT#95e | CP-220201 | 0029 | 1 | F | Formatting of description fields | 17.5.0 |
| 2022-03 | CT#95e | CP-220194 | 0030 |  | F | Update of info and externalDocs fields | 17.5.0 |
| 2022-06 | CT#96 | CP-221155 | 0031 |  | F | Alignment with the SBI template | 17.6.0 |
| 2022-06 | CT#96 | CP-221152 | 0032 |  | F | Update of info and externalDocs fields | 17.6.0 |
| 2022-12 | CT#98e | CP-223213 | 0033 | 1 | F | Adding the mandatory error code 502 Bad Gateway | 18.0.0 |
| 2022-12 | CT#98e | CP-223190 | 0034 |  | F | Update of info and externalDocs fields | 18.0.0 |
| 2023-03 | CT#99 | CP-230126 | 0037 | 1 | F | Support of temporary and permanent redirections | 18.1.0 |
| 2023-03 | CT#99 | CP-230162 | 0040 |  | F | Update of info and externalDocs fields | 18.1.0 |
| 2023-06 | CT#100 | CP-231131 | 0041 |  | F | Resolve ENs on redirection responses | 18.2.0 |
| 2023-12 | CT#102 | CP-233228 | 0042 |  | B | Update obsoleted IETF HTTP RFCs | 18.3.0 |
| 2023-12 | CT#102 | CP-233228 | 0043 |  | F | ProblemDetails RFC 7807 obsoleted by RFC 9457 | 18.3.0 |
| 2023-12 | CT#102 | CP-233238 | 0044 |  | F | Update of info and externalDocs fields | 18.3.0 |