

ETSI TS 129 675 V16.5.0 (2023-04)



TECHNICAL SPECIFICATION

**LTE;
5G;
User Equipment (UE) radio capability provisioning service;
Stage 3
(3GPP TS 29.675 version 16.5.0 Release 16)**



Reference

RTS/TSGC-0329675vg50

Keywords

5G,LTE

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:

<https://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our
Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2023.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under <https://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

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

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

| | |
|---|----|
| Intellectual Property Rights | 2 |
| Legal Notice | 2 |
| Modal verbs terminology..... | 2 |
| Foreword..... | 5 |
| 1 Scope | 7 |
| 2 References | 7 |
| 3 Definitions, symbols and abbreviations | 8 |
| 3.1 Definitions | 8 |
| 3.2 Symbols..... | 8 |
| 3.3 Abbreviations | 8 |
| 4 UE Radio Capability Provisioning Service | 8 |
| 4.1 Service Description | 8 |
| 4.1.1 Overview | 8 |
| 4.1.2 Service Architecture | 8 |
| 4.1.3 Network Functions..... | 9 |
| 4.1.3.1 UCMF | 9 |
| 4.1.3.2 NF Service Consumers..... | 9 |
| 4.2 Service Operations | 9 |
| 4.2.1 Introduction..... | 9 |
| 4.2.2 Nucmf_Provisioning_Create service operation | 10 |
| 4.2.2.1 General | 10 |
| 4.2.2.2 Creating UE radio capability provisioning resource | 10 |
| 4.2.3 Nucmf_Provisioning_Update service operation | 11 |
| 4.2.3.1 General | 11 |
| 4.2.3.2 Modifying a UE radio capability provisioning resource | 11 |
| 4.2.4 Nucmf_Provisioning_Delete service operation | 12 |
| 4.2.4.1 General | 12 |
| 4.2.4.2 Removing a UE radio capability provisioning resource..... | 12 |
| 5 Nucmf_Provisioning Service API | 13 |
| 5.1 Introduction | 13 |
| 5.2 Usage of HTTP..... | 13 |
| 5.2.1 General..... | 13 |
| 5.2.2 HTTP standard headers..... | 13 |
| 5.2.2.1 General | 13 |
| 5.2.2.2 Content type | 13 |
| 5.2.3 HTTP custom headers..... | 13 |
| 5.3 Resources | 14 |
| 5.3.1 Overview | 14 |
| 5.3.2 Resource: UE radio capability provisionings (Collection) | 14 |
| 5.3.2.1 Description | 14 |
| 5.3.2.2 Resource Definition | 14 |
| 5.3.2.3 Resource Standard Methods..... | 14 |
| 5.3.2.3.1 POST | 14 |
| 5.3.2.4 Resource Custom Operations | 15 |
| 5.3.3 Resource: Individual UE radio capability provisioning (Document)..... | 15 |
| 5.3.3.1 Description | 15 |
| 5.3.3.2 Resource Definition | 15 |
| 5.3.3.3 Resource Standard Methods..... | 16 |
| 5.3.3.3.1 GET | 16 |
| 5.3.3.3.2 PUT | 17 |
| 5.3.3.3.3 PATCH..... | 18 |
| 5.3.3.3.4 DELETE..... | 19 |
| 5.4 Custom Operations without associated resources..... | 20 |

| | | |
|--|--|-----------|
| 5.5 | Notifications | 20 |
| 5.6 | Data Model | 20 |
| 5.6.1 | General | 20 |
| 5.6.2 | Structured data types | 20 |
| 5.6.2.1 | Introduction | 20 |
| 5.6.2.2 | Type: RacsData | 20 |
| 5.6.2.3 | Type: RacsDataPatch | 21 |
| 5.6.3 | Simple data types and enumerations | 21 |
| 5.6.3.1 | Introduction | 21 |
| 5.6.3.2 | Simple data types | 21 |
| 5.7 | Error Handling | 22 |
| 5.7.1 | General | 22 |
| 5.7.2 | Protocol Errors | 22 |
| 5.7.3 | Application Errors | 22 |
| 5.8 | Feature negotiation | 22 |
| 5.9 | Security | 22 |
| Annex A (normative): OpenAPI specification | | 23 |
| A.1 | General | 23 |
| A.2 | Nucmf_Provisioning API | 23 |
| Annex B (informative): Change history | | 28 |
| History | | 29 |

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 Ncmf 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 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.
- [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 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".
- [12] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [13] IETF RFC 7807: "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.

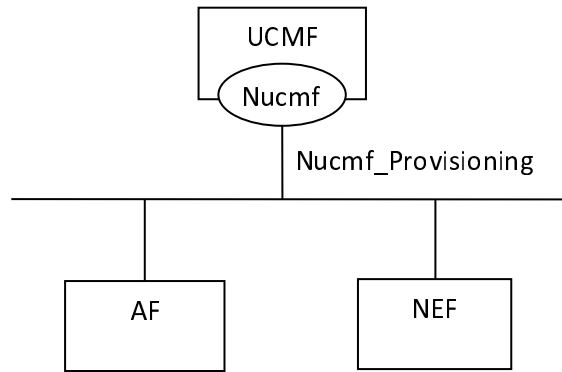


Figure 4.1.2-1: Nucmf_Provisioning service Architecture, SBI representation

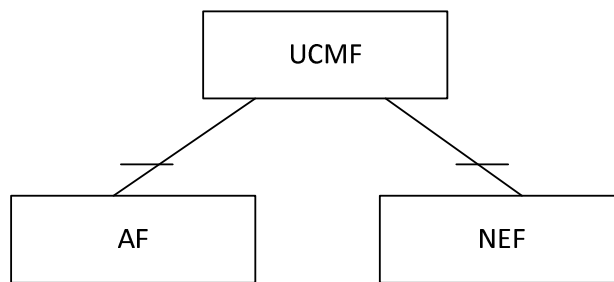


Figure 4.1.2-2: Nucmf_Provisioning service Architecture, reference point representation

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 (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 (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 (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].

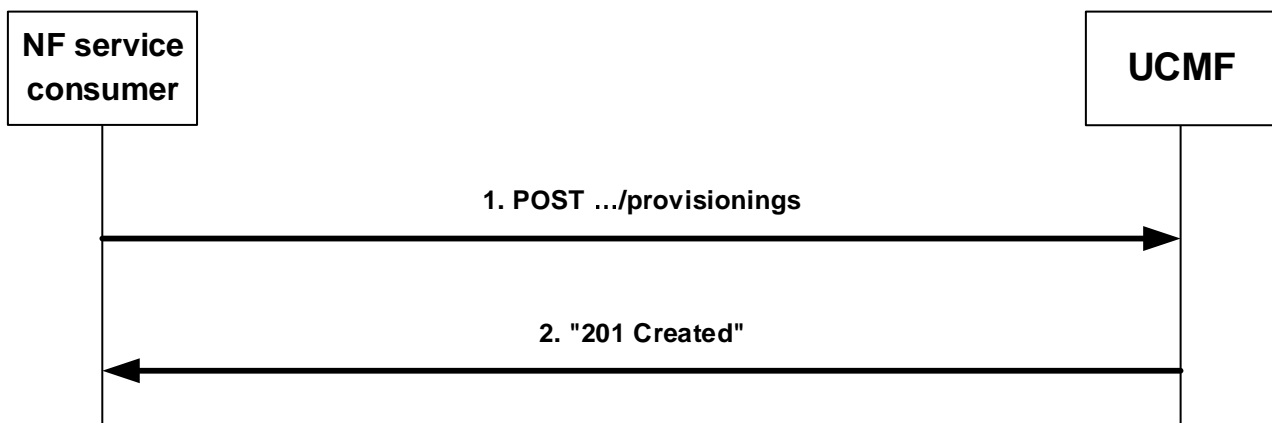


Figure 4.2.2.2-1: Creating new UE radio capability provisioning resource

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

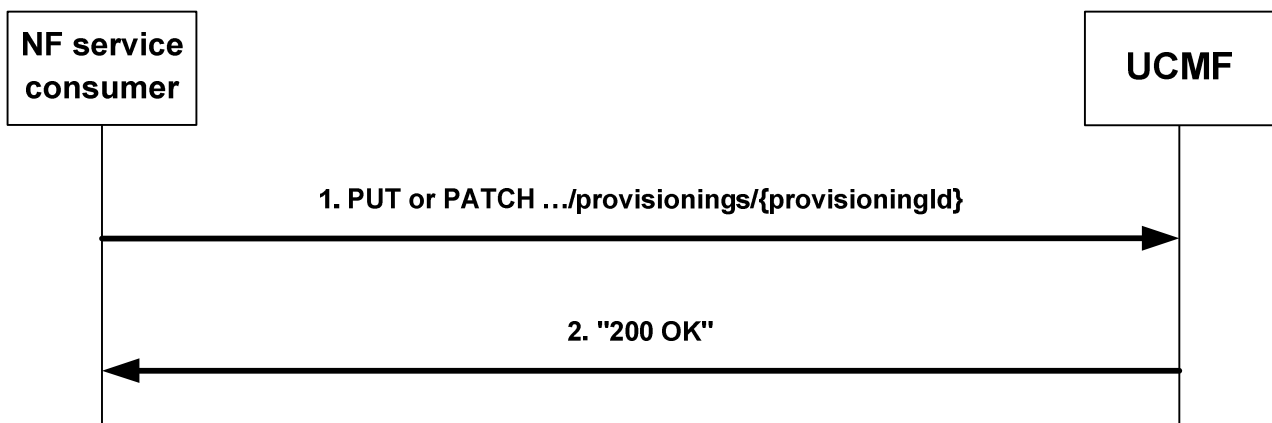


Figure 4.2.3.2-1: Modifying a UE radio capability provisioning resource

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

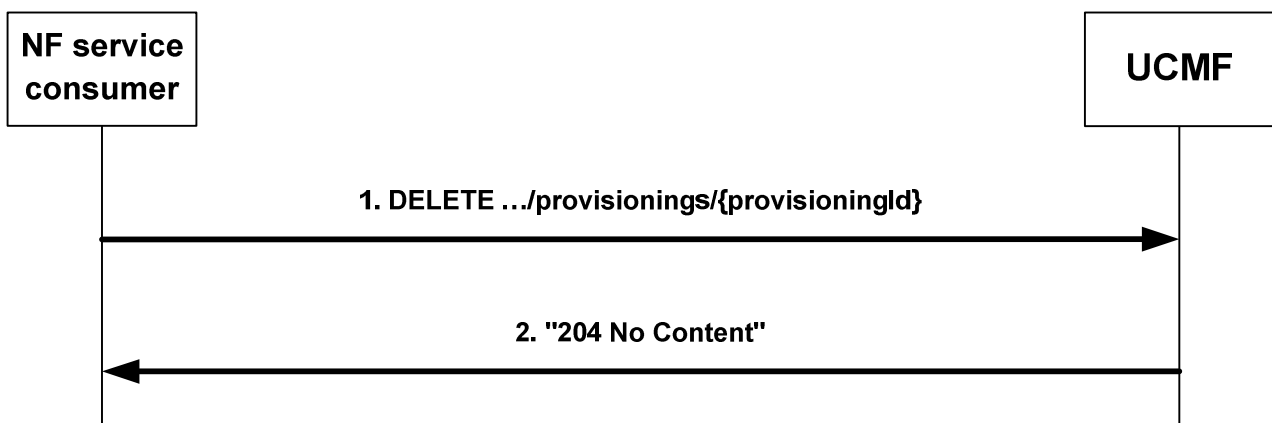


Figure 4.2.4.2-1: Removing a UE radio capability provisioning resource

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 7540 [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 7807 [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 applicable.

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

5.3 Resources

5.3.1 Overview

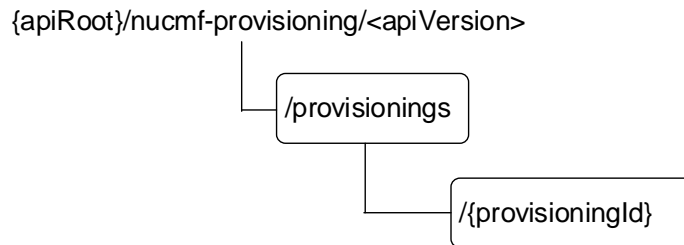


Figure 5.3.1-1: Resource URI structure of the Nucmf_Provisioning API

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. |
| apiVersion | 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. |
| apiVersion | 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. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during resource retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |

NOTE: 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.

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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during resource modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |
| 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 PUT method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.

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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during resource modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |
| 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 PATCH method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.

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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during resource removal. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UCMF (service) instance. Applicable if the feature "ES3XX" is supported. |

NOTE: 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.

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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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 | An alternative URI of the resource located in an alternative UCMF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (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 Nudmf_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 |
|----------------|------------------------|---|-------------|--|---------------|
| supFeat | 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. | |

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: 1.0.1
  description: |
    UCMF_Provisioning Service.
    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
  description: 3GPP TS 29.675 V16.5.0; User Equipment (UE) radio capability provisioning service;
  Stage 3.
  url: http://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'
'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'
'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'
      '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'
'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 payload body 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'
'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.
      readOnly: true
    required:
      - racsConfigs
  RacsDataPatch:
    description: >
    Represents a modification of a UE radio capability data provided by the NF service.
    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 |
| 2020-12 | CT#90e | CP-203139 | 0013 | | F | Essential corrections and alignments | 16.3.0 |
| 2020-12 | CT#90e | CP-203139 | 0015 | 1 | F | Storage of YAML files in ETSI Forge | 16.3.0 |
| 2020-12 | CT#90e | CP-203136 | 0017 | | F | Correct UCMF id | 16.3.0 |
| 2021-09 | CT#93e | CP-212218 | 0026 | | F | Correcting resource definitions | 16.4.0 |
| 2023-03 | CT#99e | CP-230126 | 0035 | | F | Support of temporary and permanent redirections | 16.5.0 |
| 2023-03 | CT#99e | CP-230159 | 0038 | | F | Update of info and externalDocs fields | 16.5.0 |

History

| Document history | | |
|-------------------------|----------------|-------------|
| V16.1.0 | August 2020 | Publication |
| V16.2.0 | November 2020 | Publication |
| V16.3.0 | January 2021 | Publication |
| V16.4.0 | September 2021 | Publication |
| V16.5.0 | April 2023 | Publication |