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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
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Contents

Foreword

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

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1 Scope

The present document specifies the protocol that is used for service based interface. The API definitions and data type definitions are aligned with the common charging architecture specified in TS 32.240 [1]. The present document is related to other 3GPP charging TSs as follows:

- The common 3GPP charging architecture is specified in TS 32.240 [1].
- The 5G data connectivity charging is specified in TS 32.255 [30].
- The 5G connection and mobility charging is specified in TS 32.256 [31].
- The service, operations and procedures of 5G charging for service based interface is specified in TS 32.290 [58].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition of the 5G System are specified in 3GPP TS 29.500 [299] and 3GPP TS 29.501 [300].

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 TS 32.240: "Telecommunication management; Charging management; Charging architecture and principles".

[2] - [13] Void.

[14] 3GPP TS 32.254: "Telecommunication management; Charging management; Exposure function Northbound Application Program Interfaces (APIs) charging ".

[15] - [28] Void.

[29] 3GPP TS 32.274: "Telecommunication management; Charging management;Short Message Service (SMS) charging".

[30] 3GPP TS 32.255: "Telecommunication management; Charging management; 5G Data connectivity domain charging; stage 2".

[31] 3GPP TS 32.256: "Telecommunication management; Charging management; 5G connection and mobility domain charging; stage 2".

[32] 3GPP TS 32.260: "Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging".

[33] 3GPP TS 32.275: "Telecommunication management; Charging management; MultiMedia Telephony (MMTel) charging".

[34] 3GPP TS 32.281: " Telecommunication management; Charging management; Announcement

[35] 3GPP TS 32.277: "Telecommunication management; Charging management; Proximity-based Services (ProSe) charging".

[36] 3GPP TS 32.257: "Telecommunication management; Charging management; Edge computing domain charging; stage 2".

[37] - [49] Void.

[50] - [57] Void.

[58] 3GPP TS 32.290: "Telecommunication management; Charging management; 5G system; Services, operations and procedures of charging using Service Based Interface (SBI).

[59] - [69] Void.[70] 3GPP TS 28.201: "Charging management; Network slice performance and analytics charging in the 5G System (5GS); Stage 2".

[71] 3GPP TS 28.202: "Charging management; Network slice management charging in the 5G System (5GS); Stage 2".

[72] - [99] Void.

[100] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[101] 3GPP TR 21.900: "Technical Specification Group working methods".

[102] 3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[103] - [199] Void

[200] - [252] Void

[253] 3GPP TS 28.532: "Management and orchestration; Management services".

[254] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[255] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[256] 3GPP TS 28.554: "Management and orchestration;5G end to end Key Performance Indicators (KPI)".

[257] 3GPP TS 28.623: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions".

[258] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP; Stage 3".

[259] 3GPP TS 29.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification".".

[260] 3GPP TS 29.228: "IP Multimedia (IM) Subsystem Cx and Dx interface; signalling flows and message contents".

[261] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[262] 3GPP TS 28.550: "Management and orchestration; Performance assurance ".

[263] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements ".

[264] - [298] Void

[299] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[300] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[301] 3GPP TS 29.594: "5G System; Spending Limit Control Service; Stage 3".

[302] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[303] 3GPP TS 24.501: "Non-Access-Stratum (NAS) Protocol for 5G System (5GS); Stage 3".

[304] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[305] 3GPP TS 29.510: "Network Function Repository Services; Stage 3".

[306] 3GPP TS 29.520: "5G System; Network Data Analytics Services;Stage 3".

[307] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[308] 3GPP TS 24.334: " Proximity-services (ProSe) User Equipment (UE) to ProSe function protocol aspects; Stage 3".

[309] 3GPP TS 29.558: "Enabling Edge Applications; Application Programming Interface (API) specification; stage 3".

[310] 3GPP TS 28.538: "Management and orchestration; Edge Computing Management".

[311] 3GPP TS 24.558: "Enabling Edge Applications; Protocol specification".

[312] - [370] Void

[371] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[372] - [389] Void

[390] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

[391] - [399] Void

[400] Void.

[401] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2) ".

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

[403] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[404] IETF RFC 3986: "Uniform Resource Identifiers (URI): Generic Syntax".

[405] IETF RFC 7315: "Private Extensions to the Session Initiation Protocol (SIP) for the 3rd Generation Partnership Projects (3GPP)".

[406] IETF RFC 3261: "SIP: Session Initiation Protocol".

[407] IETF RFC 8866: "SDP: Session Description Protocol".

[408] IETF RFC 5646: "Tags for Identifying Languages".

[409] - [499] Void.

[500] OpenAPI: "OpenAPI 3.0.0 Specification", https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md.

[501] - [599] Void.

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 [100].

3.2 Symbols

For the purposes of the present document, the following symbols apply:

Nchf Service based interface exhibited by CHF.

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
AMF	Access and Mobility Management Function
ATSSS	Access Traffic Steering, Switching, Splitting
CHF	Charging Function
CEF	Charging Enablement Function
CTF	Charging Trigger Function
GPSI	Generic Public Subscription Identifier
GUAMI	Globally Unique AMF Identifier
I-SMF	Intermediate SMF
MnS	Management Service
NF	Network Function
PEI	Permanent Equipment Identifier
QBC	QoS flow Based Charging
QFI	QoS Flow Identifier
SMSF	Short Message Service Function
SMF	Session Management Function
SSC	Session and Service Continuity
SUPI	Subscription Permanent Identifier

4 Overview

4.1 Service architecture

The Converged Charging Service or Offline Only Charging Service is provided by the CHF to the consumer and shown in the SBI representation model in figure 4.1.1.

The ConvergedCharging Service (Nchf_ ConvergedCharging) or Offline Only Charging Service (Nchf_OfflineOnlyCharging) is part of the Nchf service-based interface exhibited by the Charging Function (CHF). The list of NF Service Consumer(s) is provided in Table 5.1-1.

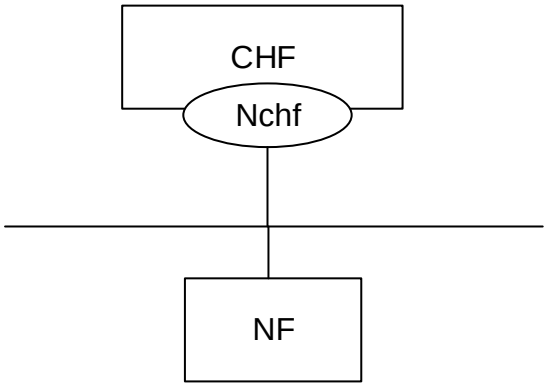

Figure 4.1.1: Reference Architecture for the Nchf_ConvergedCharging Service; SBI representation

4.2 Network functions

4.2.1 Charging Function (CHF)

The CHF is responsible for converged online charging and offline charging functionalities. The CHF provides the following:

- Quota;
- Re-authorisation triggers;
- Notification when Charging Domain determines rating conditions is affected or when CHF determines to terminate the charging service;
- Receiving service usage reports from NF Service Consumer; and
- CDRs generation.

4.2.2 NF Service Consumers

The NF Service Consumers shall support:

- Requesting and receiving the quota(s);
- Sending service usage reports; and
- Handling quota re-authorisation or abort notifications.

5 Services offered by the CHF

5.1 Introduction

The following services are provided by the CHF.

Table 5.1-1: NF Services provided by CHF

Service Name	Description	Consumer
Nchf_ConvergedCharging service	This service provides a converged charging for session and event based NF services, with and without quota management, as well as charging information record generation	SMF, SMSF, AMF, NEF, PGW-C+SMF, IMS-Node, CEF, MnS Producer, 5G DDNMF
Nchf_OfflineOnlyCharging service	This service provides an offline only charging for session based NF service.	SMF
Nchf_SpendingLimitControl	This service enables the PCF to retrieve policy counter status information per UE from the CHF by subscribing to spending limit reporting (i.e. notifications of policy counter status changes).	PCF

The "Nchf_SpendingLimitControl" service is defined in 29.594 [301].

5.2 Nchf_ConvergedCharging service

5.2.1 Service description

This service provides charging in converged charging scenario by the CHF to the NF service consumer as defined in subclause 6.2 in 3GPP TS 32.290[58].

It includes the following functionalities:

- Create resource at service establishment or no existing ChargingData resource, and may allocate quotas based on the request from NF consumer;
- During the service consumption lifecycle, update resource upon receiving the quota usage or service usage report under a number of circumstances and allocate subsequent quotas based on the request from NF consumer;
- Release upon service termination, Unit Count Inactivity Timer expiry or error response; and
- Notify NF Service Consumer of the re-authorisation triggers when CHF determines rating conditions is affected, or the abort triggers when CHF determines to terminate the charging service.
- Charging information record generation

5.2.2 Service operations

5.2.2.1 Introduction

The service operations defined for Nchf_ ConvergedCharging are shown in table 5.2.2.1-1.

Table 5.2.2.1-1: Nchf_ ConvergedCharging Operations

Service Operation Name	Description	Initiated by	Corresponding Converged charging messages in 3GPP TS 32.290[58]
Nchf_ ConvergedCharging_Create	First Interrogation of unit reservation; And/or initial report of service usage.	NF consumer	Charging Data Request/Response [Initial]
	One Time request for the service.		Charging Data Request/Response [Event]
Nchf_ ConvergedCharging_Update	Intermediate Interrogation for subsequent units reservation when: - the granted service unitfor one rating group are spent - expiry of granted service units validity time - service events occur, which might affect the rating of the current service And/or Intermediate report of service usage.	NF consumer	Charging Data Request/Response [Update]
Nchf_ ConvergedCharging_Release	Final Interrogation without any unit reservation And/or last report of service usage.	NF consumer	Charging Data Request/Response [Termination]
Nchf_ ConvergedCharging_Notify	Request that the user be re-authorized or the charging session context be terminated.	CHF	Charging Notify Request/Response

5.2.2.2 Nchf_ConvergedCharging_Create Operation

The Nchf_ConvergedCharging_Create service operation provides means for NF (CTF) to request quotas for service delivery or initial report of service usage.

The following procedures using the Nchf_ConvergedCharging_Create service operation are supported:

- No existing charging data resource.

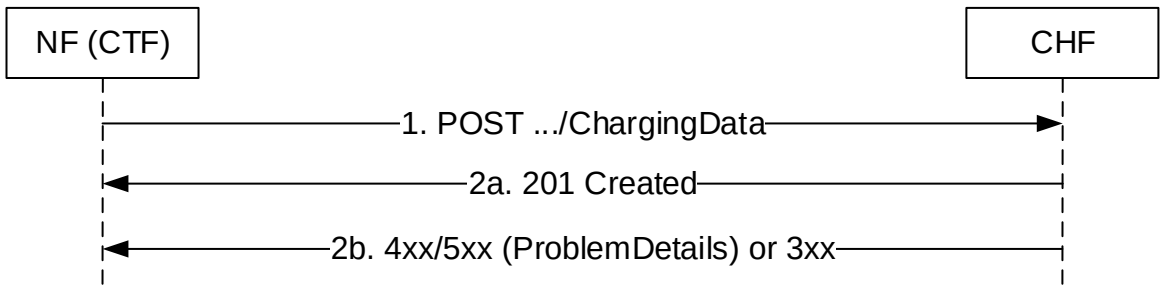

Figure 5.2.2.2-1: Nchf_ ConvergedCharging_Create Service Operation

1. NF (CTF) sends a Nchf_ConvergedCharging_Create request to the CHF to create resource for charging. Requested quota and notification URI for Nchf_ConvergedCharging_Notify service operation are included in the request body.

2a. At successful operation, "201 Created" response is returned. In the "201 Created" response, the CHF includes a Location header field and the allocated quota in the body. The Location header field shall contain the URI of the created resource. The NF (CTF) shall use the URI received in the Location header in subsequent requests to the CHF for the same PDU session.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.1.3.2.3.1-3 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.1.7.3-1.

5.2.2.3 Nchf_ConvergedCharging_Update Operation

The Nchf_ConvergedCharging_Update service operation provides means for NF (CTF) to update the charging data.

The following procedures using the Nchf_ConvergedCharging_Update service operation are supported:

- the granted service units for one rating group are spent
- expiry of granted service units' validity time
- charging events occur, which might affect the rating of the current service
- receiving re-authorization notification from CHF

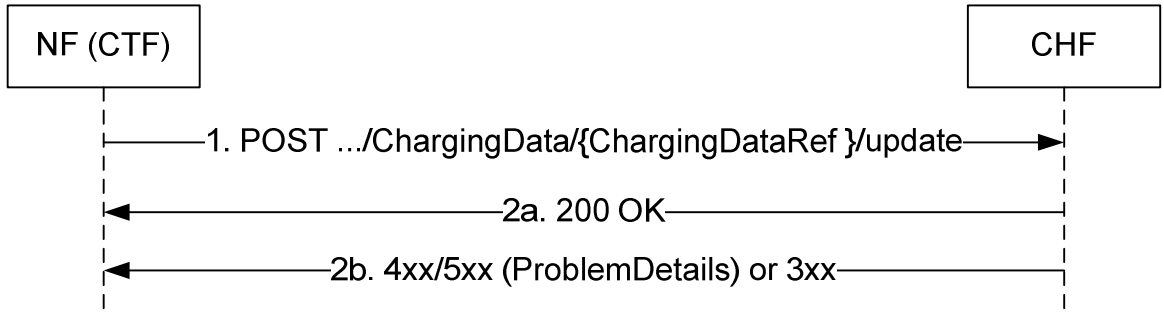

Figure 5.2.2.3-1: Nchf_ConvergedCharging_Update Service Operation

1. NF (CTF) sends a Nchf_ConvergedCharging_Update request to the CHF. The {ChargingDataRef } in the URI identifies the "Charging Data" to be updated. The requested service unit and previous used service unit is included in the request body.

2a. At successful operation, "200 OK" response is returned. The CHF includes the granted service unit in the "200 OK" response.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.1.3.3.4.2.2-2 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.1.7.3-1.

5.2.2.4 Nchf_ConvergedCharging_Release Operation

The Nchf_ConvergedCharging_Release service operation provides means for NF (CTF) to terminate charging Session.

The following procedures using the Nchf_ConvergedCharging_Release service operation are supported:

- Expiry of unit count inactivity timer in NF Consumer.
- Abort notification is received from CHF.

- Service termination in NF Consumer.

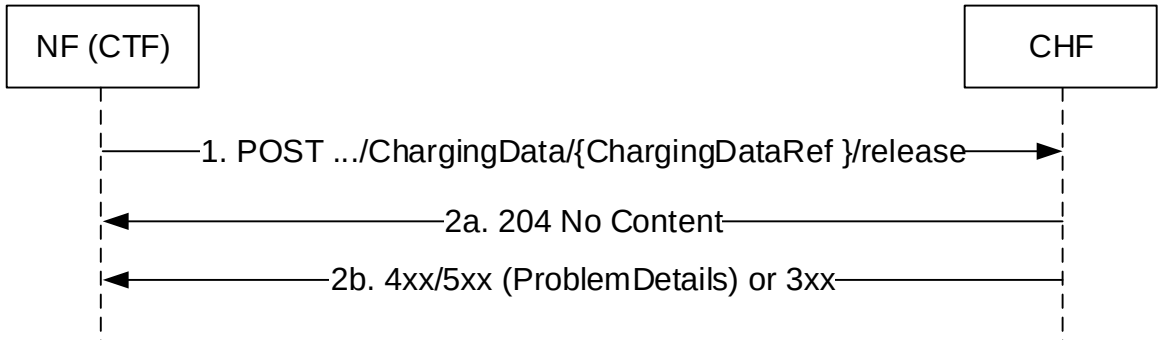

Figure 5.2.2.4-1: Nchf_ConvergedCharging_Release Service Operation

1. NF(CTF) sends a Nchf_ConvergedCharging_Release request to the CHF. The {ChargingDataRef } in the URI identifies the "Charging Data" to be updated and then released. The final used service unit is included in the request body.

2a. At successful operation, "204 No Content" response is returned.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.1.3.3.4.3.2-2 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.1.7.3-1.

5.2.2.5 Nchf_ConvergedCharging_Notify Operation

The Nchf_ConvergedCharging_Notify service operation provides means for CHF to notify the NF(CTF) to update or terminate charging of the PDU Session.

The following procedures using the Nchf_ConvergedCharging_Notify service operation are supported:

- CHF determines re-authorization.
- CHF determines abort of charging.

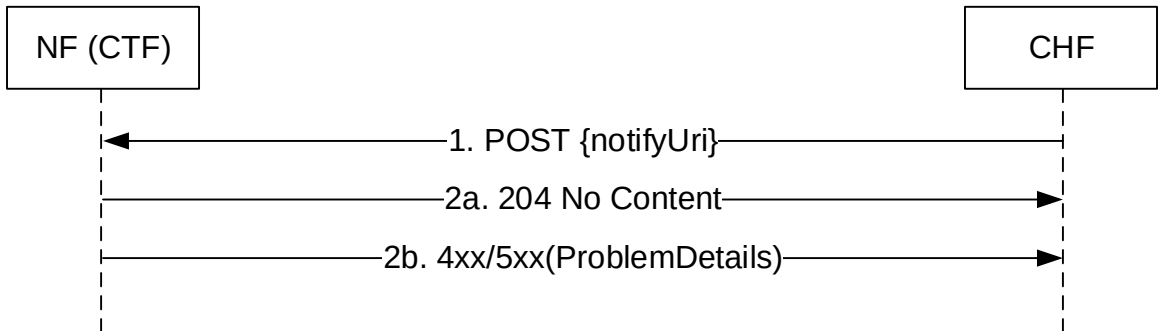

Figure 5.2.2.5-1: Nchf_ConvergedCharging_Notify Service Operation

1. The CHF sends a Nchf_ConvergedCharging_Notify request to the NF (CTF). The {notifyUri} identifies the notification URI which is sent in the Nchf_ConvergedCharging_Create and can be sent in Nchf_ConvergedCharging_Update request. The notification type is included in the request body.

2a. At successful operation, "204 No Content" response is returned.

2b. On failure , one of the HTTP status code listed in Table 6.1.5.2.3.1-2 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.1.7.3-1.

After successful operation, when the NF Service Consumer receives a Charging Notify Request while not waiting for any Charging Data Response from the CHF, CTF can send a new Charging Data Request.

5.3 Nchf_OfflineOnlyCharging service

5.3.1 Service description

This service provides charging in offline only charging scenario by the CHF to the NF service consumer (i.e. SMF) as defined in subclause 6.5 in 3GPP TS 32.290 [58].

It includes the following functionalities:

- Create resource at service establishment based on the request from NF consumer;
- During the service consumption lifecycle, update resource based on the request from NF consumer;
- Release upon service termination;
- Charging information record generation.

5.3.2 Service Operations

5.3.2.1 Introduction

The service operations defined for Nchf_OfflineOnlyCharging are shown in table 5.3.2.1-1.

Table 5.3.2.1-1: Nchf_OfflineOnlyCharging Operations

Service Operation Name	Description	Initiated by	Corresponding Offline only charging messages in 3GPP TS 32.290[58]
Nchf_OfflineOnlyCharging_Create	Initial report of service usage.	NF consumer	Charging Data Request/Response [Initial]
Nchf_OfflineOnlyCharging_Update	Intermediate report of service usage.	NF consumer	Charging Data Request/Response [Update]
Nchf_OfflineOnlyCharging_Release	Last report of service usage.	NF consumer	Charging Data Request/Response [Termination]

5.3.2.2 Nchf_OfflineOnlyCharging_Create Operation

The Nchf_OfflineOnlyCharging_Create operation provides means for NF (CTF) to request initial report of service usage.

The following procedures using the Nchf_OfflineOnlyCharging_Create service operation are supported:

- No existing charging data resource.

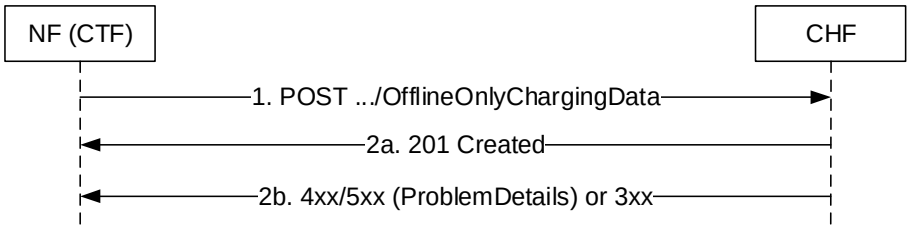

Figure 5.3.2.2-1: Nchf_OfflineOnlyCharging_Create Service Operation

1. NF (CTF) sends a Nchf_OfflineOnlyCharging_Create request to the CHF to create resource for starting charging.

2a. At successful operation, "201 Created" response is returned. In the "201 Created" response, the CHF includes a Location header field in the body. The Location header field shall contain the URI of the created resource. The NF (CTF) shall use the URI received in the Location header in subsequent requests to the CHF for the same PDU session.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.2.3.2.3.1-3 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.2.7.3-1.

5.3.2.3 Nchf_OfflineOnlyCharging_Update Operation

The Nchf_OfflineOnlyCharging_Update operation provides means for NF (CTF) to update the charging data.

The following procedures using the Nchf_OfflineOnlyCharging_Update service operation are supported:

- charging events occur.

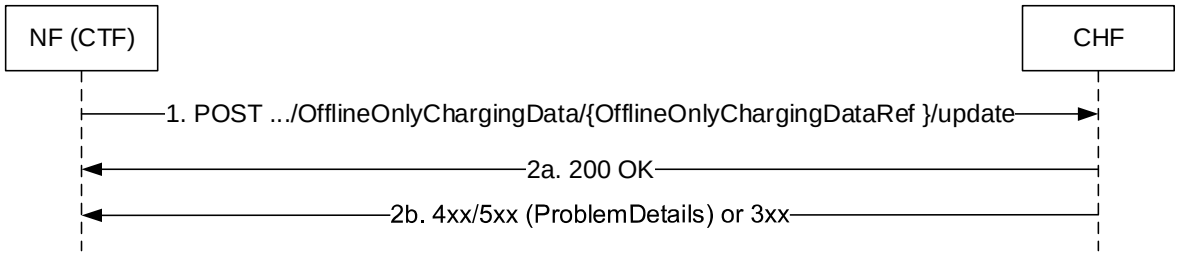

Figure 5.3.2.3-1: Nchf_OfflineOnlyCharging_Update Service Operation

1. NF (CTF) sends a Nchf_OfflineOnlyCharging_Update request to the CHF. The {OfflineChargingDataRef} in the URI identifies the "Offline Only Charging Data" to be updated. The used service unit is included in the request body.

2a. At successful operation, "200 OK" response is returned.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.2.3.3.4.2.2-2 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.2.7.3-1.

5.3.2.4 Nchf_OfflineOnlyCharging_Release Operation

The Nchf_OfflineOnlyCharging_Release service operation provides means for NF (CTF) to terminate charging Session.

The following procedures using the Nchf_OfflineOnlyCharging_Release service operation are supported.

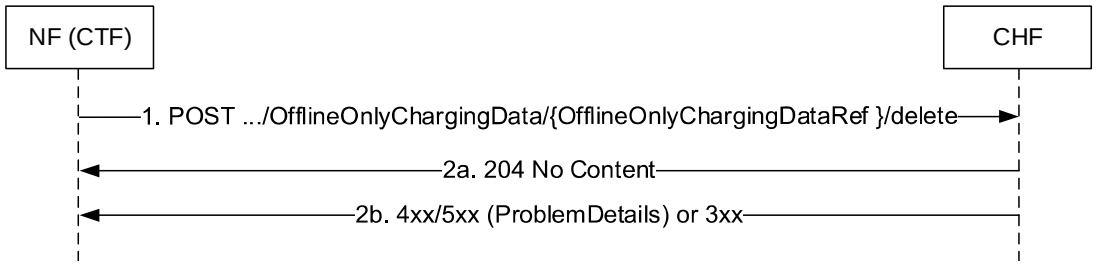

Figure 5.3.2.4-1: Nchf_OfflineOnlyCharging_Release Service Operation

1. NF(CTF) sends a Nchf_OfflineOnlyCharging_Release request to the CHF. The {OfflineChargingDataRef} in the URI identifies the "Offline Only Charging Data" to be updated and then released. The final used service unit is included in the request body.

2a. At successful operation, "204 No Content" response is returned.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.2.3.3.4.3.2-2 shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.2.7.3-1.

6 API definitions

6.1 Nchf_ ConvergedCharging Service API

6.1.1 Introduction

The APIs defined in this subclause implement the service operation defined in subclause 5.2.2.

The Nchf_ConvergedCharging service shall use the Nchf_ConvergedCharging API.

The request URI used in each HTTP request from the NF service consumer towards the CHF shall have the structure defined in subclause 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 "nchf-convergedcharging".
- The {apiVersion} shall be "v3".
- The {apiSpecificResourceUriPart} shall be set as described in subclause 6.1.3.

6.1.2 Usage of HTTP

6.1.2.1 General

HTTP/2 as described in IETF RFC 7540 [401] shall be used as specified in subclause 5.2 of 3GPP TS 29.500 [299].

6.1.2.2 HTTP standard headers

6.1.2.2.1 General

See subclause 5.2.2 of 3GPP TS 29.500 [299] for the usage of HTTP standard headers.

HTTP/2, shall be transported as specified in subclause 5.3 of 3GPP TS 29.500 [299].

6.1.2.2.2 Content type

JSON, IETF RFC 8259 [402], shall be used as content type of the HTTP bodies specified in the present specification, as specified in subclause 5.4 of 3GPP TS 29.500 [299].

6.1.2.3 HTTP custom headers

6.1.2.3.1 General

HTTP custom headers specified in clause 5.2.3.2 of 3GPP TS 29.500 [299] shall be supported, and Optional HTTP custom headers specified in clause 5.2.3.3 of TS 29.500[299] may be supported

No specific custom headers are defined in the present document.

6.1.3 Resources

6.1.3.1 Overview

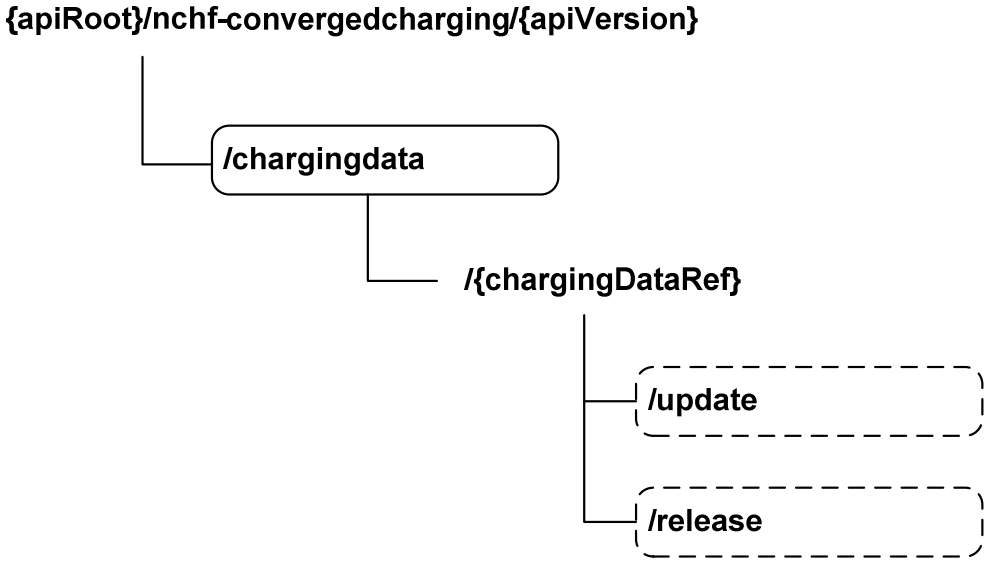

Figure 6.1.3.1-1: Resource URI structure of the Nchf_ConvergedCharging API

Charging Data Ref is a unique identifier for a charging data resource in a PLMN. It's created in CHF when CHF receives a Nchf_ ConvergedCharging_Create request and provided to NF (CTF) in the Location header field in the Nchf_ ConvergedCharging_Create response. The NF (CTF) shall use the Charging Data Ref received in subsequent requests to the CHF for the same charging data resource.

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description	Corresponding service operation
Charging Data	{apiRoot}/ nchf-convergedcharging/{apiVersion}/chargingdata	POST	Create a new Charging Data resource	Nchf_ ConvergedCharging_Create
Individual Charging Data	{apiRoot}/ nchf-convergedcharging/{apiVersion}/ chargingdata/{ChargingDataRef}/update	update (POST)	Update an existing Charging Data resource.	Nchf_ ConvergedCharging_Update
	{apiRoot}/ nchf-convergedcharging/{apiVersion}/ chargingdata /{ChargingDataRef}/release	release (POST)	Update and release an existing Charging Data resource.	Nchf_ ConvergedCharging_Release

6.1.3.2 Resource: Charging Data

6.1.3.2.1 Description

Charging Data resource represents a collection of the different charging data resources created by the CHF for converged charging as defined in 3GPP TS 32.290 [58].

6.1.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nchf-convergedcharging**/{apiVersion}/**chargingData**

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 6.1.1

6.1.3.2.3 Resource Standard Methods

6.1.3.2.3.1 POST

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingDataRequest	M	1	Parameters to create a new Charging Data resource.

Table 6.1.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ChargingDataResponse	M	1	201 Created	The creation of a Charging Data resource is confirmed, and a representation of that resource is returned. The Charging Data resource which is created and returned successfully. The representation of created resource is identified via Location header field in the 201 response.
n/a			307 Temporary Redirect	Dependent on support of ES3XX (NOTE 2)
n/a			308 Permanent Redirect	Dependent on support of ES3XX (NOTE 2)
ProblemDetails	O	0..1	400 Bad Request	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	400 Bad Request	Dependent on support of ES4XX (NOTE 2)
n/a			401 Unauthorized	(NOTE 2)
ProblemDetails	O	0..1	403 Forbidden	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	403 Forbidden	Dependent on support of ES4XX (NOTE 2)
ProblemDetails	O	0..1	404 Not Found	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	404 Not Found	Dependent on support of ES4XX (NOTE 2)
n/a			405 Method Not Allowed	(NOTE 2)
n/a			408 Request Timeout	(NOTE 2)
n/a			410 Gone	(NOTE 2)
n/a			411 Length Required	(NOTE 2)
n/a			413 Payload Too Large	(NOTE 2)
n/a			500 Internal Server Error	(NOTE 2)
n/a			503 Service Unavailable	(NOTE 2)
NOTE 1: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [299] for the POST method also apply. NOTE 2: Failure cases are described in clause 6.1.7.				

Table 6.1.3.2.3.1-4: 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}/nchf-convergedcharging/[apiversion}/chargingdata/{chargingDataRef}

Table 6.1.3.2.3.1-5: 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 CHF (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 6.1.3.2.3.1-6: 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 CHF (service) instance.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected

6.1.3.2.4 Resource Custom Operations

None.

6.1.3.3 Resource: Individual Charging Data

6.1.3.3.1 Description

Individual Charging Data resource represents a Charging data resource created in the CHF.

6.1.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nchf-convergedcharging/{apiVersion} /chargingdata/{ChargingDataRef}**

This resource shall support the resource URI variables defined in table 6.1.3.3.2-1.

Table 6.1.3.3.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 6.1.1
ChargingDataRef	Charging data resource reference assigned by the CHF during the Nchf_ ConvergedCharging_Create operation,

6.1.3.3.3 Resource Standard Methods

None.

6.1.3.3.4 Resource Custom Operations

6.1.3.3.4.1 Overview

Table 6.1.3.3.4.1-1: Custom operations

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/ nchf-convergedcharging/{apiVersion}/ chargingdata/{ChargingDataRef }/update	POST	Update an existing Charging Data resource.
{apiRoot}/ nchf-convergedcharging/{apiVersion}/ chargingdata /{ChargingDataRef}/release	POST	Update and release an existing Charging Data resource.

6.1.3.3.4.2 Operation: update

6.1.3.3.4.2.1 Description

This operation updates an existing Charging Data resource.

6.1.3.3.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.1.3.3.4.2.2-1 and the response data structures and response codes specified in table 6.1.3.3.4.2.2-2.

Table 6.1.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingDataRequest	M	1	Parameters to modify an existing Charging Data resource matching the ChargingDataRef according to the representation in the ChargingData. The request URI is the representation in the Location header field in the 201 response of resource creation.

Table 6.1.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ChargingDataResponse	M	1	200 OK	The modification of a Charging Data resource is confirmed, and a representation of that resource is returned. The Charging Data resource which is modified and returned successfully.
n/a			307 Temporary Redirect	Dependent on support of ES3XX (NOTE 2)
n/a			308 Permanent Redirect	Dependent on support of ES3XX (NOTE 2)
ProblemDetails	O	0..1	400 Bad Request	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	400 Bad Request	Dependent on support of ES4XX (NOTE 2)
n/a			401 Unauthorized	(NOTE 2)
ProblemDetails	O	0..1	403 Forbidden	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	403 Forbidden	Dependent on support of ES4XX (NOTE 2)
ProblemDetails	O	0..1	404 Not Found	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	404 Not Found	Dependent on support of ES4XX (NOTE 2)
n/a			405 Method Not Allowed	(NOTE 2)
n/a			408 Request Timeout	(NOTE 2)
n/a			410 Gone	(NOTE 2)
n/a			411 Length Required	(NOTE 2)
n/a			413 Payload Too Large	(NOTE 2)
n/a			500 Internal Server Error	(NOTE 2)
n/a			503 Service Unavailable	(NOTE 2)
NOTE 1: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [299] for the POST method also apply. NOTE 2: Failure cases are described in clause 6.1.7.				

Table 6.1.3.3.4.2.2-3: 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 CHF (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 6.1.3.3.4.2.2-4: 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 CHF (service) instance.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected

6.1.3.3.4.3 Operation: release

6.1.3.3.4.3.1 Description

This operation update and release an existing Charging session

6.1.3.3.4.3.2 Operation Definition

This operation shall support the request data structures specified in table 6.1.3.3.4.3.2-1 and the response data structures and response codes specified in table 6.1.3.3.4.3.2-2.

Table 6.1.3.3.4.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingDataRequest	M	1	Parameters to modify and then release the Charging Data resource matching the ChargingDataRef according to the representation in the ChargingData. The request URI is the representation in the Location header field in the 201 response of resource creation.

Table 6.1.3.3.4.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case: The Charging Data resource matching the ChargingDataRef is modified and then released.
n/a			401 Unauthorized	(NOTE 2)
n/a			307 Temporary Redirect	Dependent on support of ES3XX (NOTE 2)
n/a			308 Permanent Redirect	Dependent on support of ES3XX (NOTE 2)
ProblemDetails	O	0..1	404 Not Found	Dependent on support of ES4XX (NOTE 2)
ChargingDataResponse	O	0..1	404 Not Found	Dependent on support of ES4XX (NOTE 2)
n/a			410 Gone	(NOTE 2)
n/a			411 Length Required	(NOTE 2)
n/a			413 Payload Too Large	(NOTE 2)
n/a			500 Internal Server Error	(NOTE 2)
n/a			503 Service Unavailable	(NOTE 2)
NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of TS 29.500 [4] also apply. NOTE 2: Failure cases are described in clause 6.1.7.				

Table 6.1.3.3.4.3.2-3: 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 CHF (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 6.1.3.3.4.3.2-4: 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 CHF (service) instance.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected

6.1.4 Custom Operations without associated resources

None.

6.1.5 Notifications

6.1.5.1 General

Notifications shall comply to subclause 6.2 of 3GPP TS 29.500 [299] and subclause 4.6.2.3 of 3GPP TS 29.501 [300].

6.1.5.2 Event Notification

6.1.5.2.1 Description

The Notification is used by the CHF to notify NF consumers , which implements the Nchf_ ConvergedCharging_Notify operation defined in 3GPP TS 32.290 [58].

6.1.5.2.2 Target URI

The Notification URI **"{notifyUri}"** shall be used with the resource URI variables defined in table 6.1.5.2.2-1.

Table 6.1.5.2.2-1: Resource URI variables for this resource

Name	Definition
notifyUri	String formatted as URI with the Notification URI is provided by the SMF during the creation and can be provided in update of the Charging Data resource and within the ChargingData type, as defined in subclause 6.1.6.

6.1.5.2.3 Standard Methods

6.1.5.2.3.1 POST

This method shall support the request data structures specified in table 6.1.5.2.3.1-1 and the response data structures and response codes specified in table 6.1.5.2.3.1-2.

Table 6.1.5.2.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingNotifyRequest	M	1	Provides Information about active Charging events. ChargingNotifyRequest data type is defined in subclause 6.1.6.

Table 6.1.5.2.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ChargingNotifyResponse	O	0..1	200	The receipt of the notification acknowledged, with information. Dependent on support of NotifyInfoResponse
n/a			204 No Content	The receipt of the notification is acknowledged, without information.
n/a			307 Temporary Redirect	Dependent on support of ES3XX (NOTE 2)
n/a			308 Permanent Redirect	Dependent on support of ES3XX (NOTE 2)
ProblemDetails	O	0..1	400 Bad Request	Dependent on support of NotifyInfoResponse (NOTE 2)
ChargingNotifyResponse	O	0..1	400 Bad Request	Dependent on support of NotifyInfoResponse (NOTE 2)
NOTE 1: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [299] for the POST method also apply. NOTE 2: Failure cases are described in clause 6.1.7.				

Table 6.1.5.2.3.1-3: 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 NF (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 6.1.5.2.3.1-4: 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 NF (service) instance.
3gpp-Sbi-Target-Nf-Id	string	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected

6.1.6 Data Model

6.1.6.1 General

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

The Nchf_ConvergedCharging Service API allows the NF consumer to consume the converged charging service from the CHF as defined in 3GPP TS 32.290 [58].

Table 6.1.6.1-1 specifies the data types defined for the ConvergedCharging service based interface protocol.

Table 6.1.6.1-1: Nchf_ ConvergedCharging specific Data Types

Data type	Section defined	Description	Applicability
ChargingDataRequest	6.1.6.2.1.1 6.1.6.2.2.1	Describes the attributes of Charging Data Request to CHF for initial, update and termination of the charging session.	
ChargingDataResponse	6.1.6.2.1.2 6.1.6.2.2.2	Describes the attributes of Charging Data Response from CHF on charging session initial, update and termination.	
ChargingNotifyRequest	6.1.6.2.1.3	Describes Notifications about events that occurred in request message.	
ChargingNotifyResponse	6.1.6.2.1.16	Describes the response of notification.	

Table 6.1.6.1-2 specifies data types re-used by the Nchf_ConvergedCharging 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 Nchf_ConvergedCharging service based interface.

Table 6.1.6.1-2: Nchf_ConvergedCharging re-used Data Types

Data type	Reference	Comments	Applicability
Supi	3GPP TS 29.571 [371]	The identification of the user (i.e. IMSI, NAI, GLI, GCI). (NOTE 1)	
Uint32	3GPP TS 29.571 [371]	Unsigned 32-bit integers	
Uint64	3GPP TS 29.571 [371]	Unsigned 64-bit integers	
PduSessionId	3GPP TS 29.571 [371]	The identification of the PDU session.	
PduSessionType	3GPP TS 29.571 [371]	the type of a PDU session	
Uri	3GPP TS 29.571 [371]	String providing an URI	
AccessType	3GPP TS 29.571 [371]	The identification of the type of access network.	
DateTime	3GPP TS 29.571 [371]	The time.	
ChargingId	3GPP TS 29.571 [371]	Charging identifier allowing correlation of charging information	
RatType	3GPP TS 29.571 [371]	The identification of the RAT type.	
RatingGroup	3GPP TS 29.571 [371]	The identification of the rating group	
IpAddr	3GPP TS 29.571 [371]	Ipv4 address, Ipv6 address, or Ipv6Prefix	
Ipv4Addr	3GPP TS 29.571 [371]	Ipv4 address.	
Ipv6Prefix	3GPP TS 29.571 [371]	The Ipv6 prefix allocated for the user.	
Ipv6Addr	3GPP TS 29.571 [371]	Ipv6 Address.	
Pei	3GPP TS 29.571 [371]	The Identification of a Permanent Equipment.	
TimeZone	3GPP TS 29.571 [371]	Time zone information	
NfInstanceId	3GPP TS 29.571 [371]	String uniquely identifying a NF instance.	
Gpsi	3GPP TS 29.571 [371]	String identifying a Gpsi	
DefaultQosInformation	3GPP TS 29.571 [371]	Identifies the information of the default QoS.	
SubscribedDefaultQos	3GPP TS 29.571 [371]	subscribed default QoS.	
AuthorizedDefaultQos	3GPP TS 29.512 [302]	Authorized default QoS.	
Ambr	3GPP TS 29.571 [371]	Aggregate Maximum Bit rate	
QosData	3GPP TS 29.512 [302]	Contains QoS parameters	
UserLocation	3GPP TS 29.571 [371]	User location information	
PlmnId	3GPP TS 29.571 [371]	PLMN id	
Guami	3GPP TS 29.571 [371]	Globally Unique AMF Identifier	
DurationSec	3GPP TS 29.571 [371]	Identifies a period of time in units of seconds.	
Snssai	3GPP TS 29.571 [371]	SNSSAI	

ProblemDetails	3GPP TS 29.571 [371]	additional details of the error	
ServiceId	3GPP TS 29.571 [371]	Identifier of service	
SscMode	3GPP TS 29.571 [371]	SSC Mode type	
PresenceInfo	3GPP TS 29.571 [371]	PRA information including PRAId, PRA element list and PRA status	
Qfi	3GPP TS 29.571 [371]	QoS flow identifier designated as "Qfi".	
AmfId	3GPP TS 29.571 [371]	AMF identifier	
Dnn	3GPP TS 29.571 [371]	Data Network Name	
GroupId	3GPP TS 29.571 [371]	Network internal Identifier for a group of IMSIs	
ExternalGroupId	3GPP TS 29.571 [371]	External Group Identifier for one or more subscriptions associated to a group of IMSIs	
Bytes	3GPP TS 29.571 [371]	String with format "byte"	
Tai	3GPP TS 29.571 [371]	Tracking Area Identifier	
Area	3GPP TS 29.571 [371]	List of TACs or Operator specific codes	
CoreNetworkType	3GPP TS 29.571 [371]	5GC or EPC	
ServiceAreaRestriction	3GPP TS 29.571 [371]	Service Area restriction	
GlobalRanNodeId	3GPP TS 29.571 [371]	Global RAN Node Id	
QosCharacteristics	3GPP TS 29.512 [302]	Map of QoS characteristics for non standard 5QIs and non-preconfigured 5QIs.	
SupportedFeatures	3GPP TS 29.571 [371]	See TS 29.500 [299] clause 6.6	
NsiLoadLevelInfo	3GPP TS 29.520 [306]	Represents the load level information for an S-NSSAI and the associated network slice instance	
ServiceExperienceInfo	3GPP TS 29.520 [306]	ServiceExperience	
ApplicationChargingId	3GPP TS 29.571 [371]	Application provided charging identifier allowing correlation of charging information.	AF_Charging_Identifier
SharingLevel	3GPP TS 28.541 [254]	Ressources sharing level	
MobilityLevel	3GPP TS 28.541 [254]	UE mobility Level	
SsT	3GPP TS 28.541 [254]	Slice Service type (SST)	
Support	3GPP TS 28.541 [254]	Supported, Not Supported indicator	
Float	3GPP TS 29.571 [371]	Number with format "float"	
MaPduIndication	3GPP TS 29.512 [302]	MA PDU session indication	ATSSS

AtsssCapability	3GPP TS 29.571 [371]	ATSSS capabilities	ATSSS
SteeringFunctionality	3GPP TS 29.571 [371]	Steering functionalities for MA PDU session	ATSSS
SteeringMode	3GPP TS 29.512 [302]	Steering mode for MA PDU session	ATSSS
OperationalState	3GPP TS 28.623 [257]	Operational state	
AdministrativeState	3GPP TS 28.623 [257]	Administrative state	
RanNasRelCause	3GPP TS 29.512 [302]	Indicates the RAN or NAS release cause code information.	EnhancedDiagnostics
Ecgi	3GPP TS 29.571 [371]	E-UTRA Cell Id	
Ncgi	3GPP TS 29.571 [371]	NR Cell Id	
ServingLocation	3GPP TS 28.538 [310]	Serving location	Edge Computing
SoftwareImageInfo	3GPP TS 28.538 [310]	Software image information	Edge Computing
AffinityAntiAffinity	3GPP TS 28.538 [310]	Affinity and anti-requirements	Edge Computing
VirtualResource	3GPP TS 28.538 [310]	Virtual resource requirements	Edge Computing
NOTE 1: A SUPI containing GLI or GCI is used to support 5G-RG and FN-RG in scenarios of wireline network.			

6.1.6.2 Structured data types

6.1.6.2.1 Common Data Type

6.1.6.2.1.1 Type ChargingDataRequest

Table 6.1.6.2.1.1-1: Definition of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
subscriberIdentifier	Supi	O_M	0..1	Identifier of the subscriber that uses the requested service.	
nfConsumerIdentification	NFIdentification	M	1	This is a grouped field which contains a set of information identifying the NF consumer of the charging service.	
chargingId	ChargingId	O_M	0..1	Charging identifier for correlation between different records. Only applicable if not available in the service specific information.	
invocationTimeStamp	DateTime	M	1	The time at which the request is send	
invocationSequenceNumber	Uint32	M	1	This field contains the sequence number of the charging service invocation by the NF consumer, i.e. the order of charging data requests. The sequence number in charging data request [initial] starts from 1, and increased by 1 for subsequent charging data request. It is allowed to start from 0 for backwards compatibility.	
retransmissionIndicator	boolean	O_C	0..1	This field indicates, if included, this is a retransmitted request message.	
oneTimeEvent	boolean	O_C	0..1	Indicates, if included, that this is event based charging and whether this is a one-time event. If true, this is a one-time event that there will be no update or release.	
oneTimeEventType	EventType	O_C	0..1	Indicates the type of the one time event, i.e. Immediate or Post event charging.	
notifyUri	Uri	O_C	0..1	Identifies the recipient of Notifications sent by the CHF. In case of session based charging it shall be present in create request message, and may be present in update.	
supportedFeatures	SupportedFeatures	O_C	0..1	This IE shall be present if at least one optional feature defined in clause 6.1.8 is supported.	
serviceSpecificationInfo	String	O_C	0..1	Identifies service specific document that applies to the request, e.g. the service specific document ('middle tier' TS) and 3GPP release the service specific document is based upon.	
multipleUnitUsage	array(MultipleUnitUsage)	O_C	0..N	This field contains the parameters for the quota management request and/or usage reporting.	
triggers	array(Trigger)	O_C	0..N	This field identifies the event(s) triggering the request.	

6.1.6.2.1.2 Type ChargingDataResponse

Table 6.1.6.2.1.2-1: Definition of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability
invocationTimestamp	DateTime	M	1	This field holds the timestamp of the charging service response from the CHF.	
invocationResult	InvocationResult	O_C	0..1	This field holds the result of charging service invocation by the NF consumer	
invocationSequenceNumber	Uint32	M	1	This field contains the sequence number of the charging service invocation by the NF consumer. The same value of the sequence number received in the request should be used in the response	
sessionFailover	SessionFailover	O_C	0..1	This field indicates whether alternative CHF is supported for ongoing charging service failover handling by NF consumer.	
supportedFeatures	SupportedFeatures	O_C	0..1	This IE shall be present if at least one optional feature defined in clause 6.1.8 is supported.	
multipleUnitInformation	array(MultipleUnitInformation)	O_C	0..N	This field holds the parameters for the quota management and/or usage reporting information. It may have multiple occurrences.	
triggers	array(Trigger)	O_C	0..N	This field identifies the chargeable event(s) supplied by CHF to override/activate the existing chargeable event(s) in NF consumer. The presence of the triggers attribute without any triggerType is used by CHF to disable all the triggers except rating group level triggers.	

6.1.6.2.1.3 Type ChargingNotifyRequest

Table 6.1.6.2.1.3-1: Definition of type ChargingNotifyRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
notificationType	NotificationType	M	1	Type of notification to indicate re-authorization or termination.	
reauthorizationDetails	array(ReauthorizationDetails)	O_C	0..N	descriptors for re-authorization to determine which quota or usage reporting to be updated.	

6.1.6.2.1.4 Type NFIdentification

Table 6.1.6.2.1.4-1: Definition of type NFIdentification

Attribute name	Data type	P	Cardinality	Description	Applicability
nodeFunctionality	NodeFunctionality	M	1	This field contains the function of the node.	
nFName	NfInstanceId	O_C	0..1	Identifier of NF instance. At least one of the nFName or nFIPv4Address or nFIPv6Address shall be present.	
nFIPv4Address	Ipv4Addr	O_C	0..1	The IPv4 address of the NF. At least one of the nFName or nFIPv4Address or nFIPv6Address shall be present.	
nFIPv6Address	Ipv6Addr	O_C	0..1	The IPv6 address of the NF. At least one of the nFName or nFIPv4Address or nFIPv6Address shall be present.	
nFFqdn	string	O_C	0..1	FQDN of the NF	
nFPLMNID	PlmnId	O_C	0..1	This field holds the PLMN ID of the network the NF belongs to.	

6.1.6.2.1.5 Type MultipleUnitUsage

Table 6.1.6.2.1.5-1: Definition of type MultipleUnitUsage

Attribute name	Data type	P	Cardinality	Description	Applicability
ratingGroup	RatingGroup	M	1	The identifier of a rating group.	
requestedUnit	RequestedUnit	O_C	0..1	This field indicates that quota management is required, and may contain the amount of requested service units. (See TS 32.290 [58] clause 7)	
usedUnitContainer	array(UsedUnitContainer)	O_C	0..N	This field contains the amount of used non-monetary service units measured.	

6.1.6.2.1.6 Type InvocationResult

Table 6.1.6.2.1.6-1: Definition of type InvocationResult

Attribute name	Data type	P	Cardinality	Description	Applicability
error	ProblemDetails	OC	0..1	More information on the error shall be provided in the "cause" attribute of the "ProblemDetails" structure in case of unsuccessful charging service invocation by the NF consumer. The "invalidParams" attribute of the "ProblemDetails" structure shall contain invalid parameters which caused the rejection.	
failureHandling	FailureHandling	OC	0..1	This field holds the failure handling to be performed by the NF consumer when charging service invocation is temporarily prevented. The provided value shall always override any already existing value in NF consumer. In case of failure, it indicates which action to be performed by the NF consumer. In case of success, it indicates which action to be performed by the NF consumer in case subsequent charging service invocation are temporarily prevented.	

6.1.6.2.1.7 Type Trigger

Table 6.1.6.2.1.7-1: Definition of type Trigger

Attribute name	Data type	P	Cardinality	Description	Applicability
triggerType	TriggerType	Oc	0..1	the events whose occurrence lead to charging event is issued towards the CHF	
triggerCategory	TriggerCategory	M	1	This field indicates whether the charging data generated by the NF consumer for the trigger lead to a Charging Event towards the CHF immediately or not.	
timeLimit	DurationSec	O_C	0..1	Time limit if trigger type is "Expiry of data time limit"	
volumeLimit	Uint32	O_C	0..1	Volume limit if trigger type is "Expiry of data volume limit". This attribute is not valid from Nchf_ ConvergedCharging API version v2.0.0	
volumeLimit64	Uint64	O_C	0..1	Volume limit if trigger type is "Expiry of data volume limit". This attribute replaces the volumeLimit attribute from Nchf_ ConvergedCharging API v2.0.0	
eventLimit	Uint32	O_C	0..1	Event limit if trigger type is "Expiry of data event limit".	
maxNumberOfcc c	Uint32	O_C	0..1	Maximum number if trigger type is "Max nb of number of charging condition changes"	
tariffTimeChange	DateTime	O_C	0..1	This field contains UTC time indicating the switch time when the tariff will be changed.	

6.1.6.2.1.8 Type MultipleUnitInformation

Table 6.1.6.2.1.8-1: Definition of type MultipleUnitInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
resultCode	ResultCode	OC	0..1	This field contains the result of the Rating group quota allocation.	
ratingGroup	RatingGroup	M	1	The identifier of a rating group.	
grantedUnit	GrantedUnit	OC	0..1	This field holds the granted quota.	
triggers	array(Trigger)	OC	0..N	This field holds triggers for usage reporting associated to the rating group, which is supplied from the CHF. The presence of the triggers attribute without any triggerType is used by CHF to disable all the triggers to the associated rating group.	
validityTime	DurationSec	OC	0..1	This field defines the time in order to limit the validity of the granted quota for a given category instance.	
quotaHoldingTime	DurationSec	OC	0..1	This field holds the quota holding time in seconds. It applies equally to the granted time quota and to the granted volume quota. The NF Consumer shall deem a quota to have expired when no traffic associated with the quota is observed for the value indicated by this attribute. A quotaHoldingTime value of zero indicates that this mechanism shall not be used. If the quotaHoldingTime attribute is not present, then a locally configurable default value in the NF Consumer shall be used.	
finalUnitIndication	FinalUnitIndication	OC	0..1	This field indicates the granted final units for the service.	
timeQuotaThreshold	integer	OC	0..1	indicates the threshold in seconds for the granted time quota.	
volumeQuotaThreshold	Uint64	OC	0..1	indicates the threshold in octets when the granted quota is volume	
unitQuotaThreshold	integer	OC	0..1	indicates the threshold in service specific units, that are defined in the service specific documents, when the granted quota is service specific	

6.1.6.2.1.9 Type RequestedUnit

Table 6.1.6.2.1.9-1: Definition of type RequestedUnit

Attribute name	Data type	P	Cardinality	Description	Applicability
time	Uint32	O_C	0..1	This field holds the amount of requested time (seconds).	
totalVolume	Uint64	O_C	0..1	This field holds the amount of requested volume (bytes) in both uplink and downlink directions.	
uplinkVolume	Uint64	O_C	0..1	This field holds the amount of requested volume (bytes) in uplink direction.	
downlinkVolume	Uint64	O_C	0..1	This field holds the amount of requested volume (bytes) in downlink direction.	
serviceSpecificUnits	Uint64	O_C	0..1	This field holds the amount of requested service specific units.	
NOTE: If no attribute is included i.e., "RequestedUnit": {}, the category and amount is determined by CHF, online charging with centralized unit determination and rating scenario.					

6.1.6.2.1.10 Type UsedUnitContainer

Table 6.1.6.2.1.10-1: Definition of type UsedUnitContainer

Attribute name	Data type	P	Cardinality	Description	Applicability
serviceId	ServiceId	O_C	0..1	This field identity of the used service	
quotaManagementIndicator	QuotaManagementIndicator	O_C	0..1	an indicator on whether the reported used units are with or without quota management control. If the attribute is not present, it indicates the used unit is without quota management applied.	
triggers	array (Trigger)	O_C	0..N	This field specifies the reason for usage reporting for one or more types of unit associated to the rating group.	
triggerTimestamp	DateTime	Oc	0..1	This field holds the timestamp when the reporting trigger occur.	
time	Uint32	O_C	0..1	This field holds the amount of used time(seconds).	
totalVolume	Uint64	O_C	0..1	This field holds the amount of used volume (bytes) in both uplink and downlink directions.	
uplinkVolume	Uint64	O_C	0..1	This field holds the amount of used volume (bytes) in uplink direction.	
downlinkVolume	Uint64	O_C	0..1	This field holds the amount of used volume (bytes) in downlink direction.	
serviceSpecificUnits	Uint64	O_C	0..1	This field holds the amount of used service specific units.	
eventTimeStamps	Array(DateTime)	O_C	0..N	This field holds the timestamps of the event reported in the Service Specific Unit s, if the reported units are event based	
localSequenceNumber	integer	M	1	holds the Used Unit sequence number, i.e. the order when charging event occurs. It starts from 1 and increased by 1 for each Used Unit generation.	

6.1.6.2.1.11 Type GrantedUnit

Table 6.1.6.2.1.11-1: Definition of type GrantedUnit

Attribute name	Data type	P	Cardinality	Description	Applicability
tariffTimeChange	DateTime	O_C	0..1	This field contains UTC time indicating the switch time when the tariff will be changed.	
time	Uint32	O_C	0..1	This field holds the amount of granted time(seconds).	
totalVolume	Uint64	O_C	0..1	This field holds the amount of granted volume(bytes) in both uplink and downlink directions.	
uplinkVolume	Uint64	O_C	0..1	This field holds the amount of granted volume (bytes) in uplink direction.	
downlinkVolume	Uint64	O_C	0..1	This field holds the amount of granted volume(bytes) in downlink direction.	
serviceSpecificUnits	Uint64	O_C	0..1	This field holds the amount of granted requested service specific units.	

6.1.6.2.1.12 Type FinalUnitIndication

Table 6.1.6.2.1.12-1: Definition of type FinalUnitIndication

Attribute name	Data type	P	Cardinality	Description	Applicability
finalUnitAction	FinalUnitAction	M	1	indicates to the service consumer the action to be taken when the user's account cannot cover the service cost	
restrictionFilterRule	IPFilterRule	O_C	0..1	filter rule corresponding to services that are to remain accessible even if there are no more service units granted.	
restrictionFilterRuleList	array(IPFilterRule)	O_C	1..N	used instread of restrictionFilterRule if more than one restrictionFilterRule is needed	FilterRuleList
filterId	string	O_C	0..1	the IP packet filter corresponding to services that are to remain accessible even if there are no more service units granted. May be used as a reference to a list of IPFilterRules.	
filterIdList	array(string)	O_C	1..N	used instead of filterId if more than one filterId is needed	FilterRuleList
redirectServer	RedirectServer	O_C	0..1	the address information of the redirect server with which the end user is to be connected when the account cannot cover the service cost.	

6.1.6.2.1.13 Type RedirectServer

Table 6.1.6.2.1.13-1: Definition of type RedirectServer

Attribute name	Data type	P	Cardinality	Description	Applicability
redirectAddressType	RedirectAddressType	M	1	The type of redirect server address	
redirectServerAddress	string	M	1	the address of redirect server	

6.1.6.2.1.14 Type ReauthorizationDetails

Table 6.1.6.2.1.14-1: Definition of type ReauthorizationDetails

Attribute name	Data type	P	Cardinality	Description	Applicability
service	ServiceId	O_C	0..1	identifier for a service	
ratingGroup	RatingGroup	O_C	0..1	identifier of a rating group. This attribute shall be present if serviceIdentifier attribute is present.	
quotaManagementIndicator	QuotaManagementIndicator	O_C	0..1	an indicator on whether the re-authorization notification is for quota management control or not.	
NOTE 1: The service is always applicable for a rating group. If both ratingGroup and quotaManagementIndicator are included, the quotaManagementIndicator is considered to be applicable for that ratingGroup. If all attributes are included, the quotaManagementIndicator is considered to be applicable for that ratingGroup and service combination. If only the quotaManagementIndicator is included, it is applicable for all ratingGroups.					

6.1.6.2.1.15 Void

6.1.6.2.1.16 Type ChargingNotifyResponse

Table 6.1.6.2.1.16-1: Definition of type ChargingNotifyResponse

Attribute name	Data type	P	Cardinality	Description	Applicability
invocationResult	InvocationResult	O_C	0..1	This field holds the result of notification.	

6.1.6.2.2 5G Data Connectivity Specified Data Type

6.1.6.2.2.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.1.1 for 5G data connectivity charging described in 3GPP TS 32.255[30].

Table 6.1.6.2.2.1-1: 5G Data Connectivity Specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
pDUSessionChargingInformation	PDUSessionChargingInformation	O_M	0..1	This field holds the 5G data connectivity specific information.	
roamingQBCInformation	RoamingQBCInformation	O_M	0..1	This field holds the 5G data connectivity specific information roaming QBC.	

6.1.6.2.2.2 Type ChargingDataResponse

This clause is additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.1.2 for 5G data connectivity charging described in 3GPP TS 32.255[30].

Table 6.1.6.2.2.2-1: 5G Data Connectivity Specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability
pDUSessionChargingInformation	PDUSessionChargingInformation	O_M	0..1	This field holds the 5G data connectivity specific information.	
roamingQBCInformation	RoamingQBCInformation	O_M	0..1	This field holds the 5G data connectivity specific information roaming QBC.	

6.1.6.2.2.3 Type MultipleUnitUsage

This clause is additional attributes of the type MultipleUnitUsage defined in clause 6.1.6.2.1.5 for 5G data connectivity charging described in 3GPP TS 32.255[30].

Table 6.1.6.2.2.3-1: 5G Data Connectivity Specified attribute of type MultipleUnitUsage

Attribute name	Data type	P	Cardinality	Description	Applicability
uPFID	NfInstanceId	O_C	0..1	identifier of UPF	
multihomedPDUAddress	PDUAddress	O_C	0..1	IPv6 prefix used by UPF. It may only be used for IPv6 multi-homed PDU sessions and then only for reporting used units.	

6.1.6.2.2.4 Type MultipleUnitInformation

This clause is additional attributes of the type MultipleUnitInformationdefined in clause 6.1.6.2.1.8 for 5G data connectivity charging described in 3GPP TS 32.255[30].

Table 6.1.6.2.2.4-1: 5G Data Connectivity Specified attribute of type MultipleUnitInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
uPFID	NfInstanceId	Oc	0..1	UPF id	

6.1.6.2.2.5 Type UsedUnitContainer

This clause is additional portion of the type UsedUnitContainer defined in clause 6.1.6.2.1.10 for 5G data connectivity charging described in 3GPP TS 32.255[30].

Table 6.1.6.2.2.5-1: 5G Data Connectivity Specified portion of type UsedUnitContainer

Attribute name	Data type	P	Cardinality	Description	Applicability
pDUContainerInformation	PDUContainerInformation	O_C	0..1	the 5G data connectivity specific information	

6.1.6.2.2.6 Type PDUSessionChargingInformation

Table 6.1.6.2.2.6-1: Definition of type PDUSessionChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
chargingId	ChargingId	O_M	0..1	Charging identifier for correlation between different records of a single PDU session	
sMFChargingId	string	O_M	0..1	Used instead of ChargingId when feature is active.	SMF_Charging_Id
homeProvided ChargingId	ChargingId	Oc	0..1	Charging identifier for correlation between H-SMF and V-SMF.	
sMFHomeProvidedChargingId	string	O_M	0..1	Used instead of homeProvidedChargingId when feature is active.	SMF_Charging_Id
userInformation	UserInformation	O_M	0..1	including information of user and user equipment,	
userLocationinfo	UserLocation	O_C	0..1	provides information on the location	
mAPDUNon3GPPUserLocationInfo	UserLocation	O_C	0..1	provides information on the location under the non-3GPP access for the MA PDU session	ATSSS
non3GPPUserLocationTime	DateTime	O_C	0..1	represents the UTC time provided by the non-3GPP access, and is related to the userLocationTime. This filed is only present if the non-3GPP access provides a time.	
mAPDUNon3GPPUserLocationTime	DateTime	O_C	0..1	represents the UTC time provided by the non-3GPP access, and is related mAPDUNon3GPPUserLocationInfo. This filed is only present if the non-3GPP access for the MA PDU session provides a time.	ATSSS
presenceReportingAreaInformation	map(PresenceInfo)	O_C	0..N	When the data type is present in response message, it includes the PRA information provisioned by the CHF, in which case the "presenceState" attribute within the PresenceInfo data type shall not be supplied. When the data type is present in request message, it's used to report user presence reporting area status. The "praId" attribute within the PresenceInfo data type shall be the key of the map. The location related attributes (i.e. "trackingAreaList", "ecgiList", "ncgiList") within the PresenceInfo data type are not required in the request message, and may be ignored by the CHF.	
uetimeZone	TimeZone	O_C	0..1	the UE Timezone the UE is currently located	
pduSessionInformation	PDUSessionInformation	O_C	0..1	PDU session level information, including PDU session ID, PDU type, SSC Mode, QoS, network slicing etc. It needs to be present in the request, but it is optional in the response.	

unitCountInactivityTimer	DurationSec	O_C	0..1	threshold for the time period resource idle Upon the initial interaction with the CHF, the SMF use this attribute to provide pre-configured threshold to CHF. when present in response message, it contains the threshold supplied by CHF in response of initial request to override existing threshold in SMF. It's only present when unit count inactivity timer trigger is active.	
rANSecondaryRATUsageReport	RANSecondaryRATUsageReport	O_C	0..1	Secondary RAT usage reported from RAN.	

6.1.6.2.2.7 Type UserInformation

Table 6.1.6.2.2.7-1: Definition of type UserInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
servedGPSI	Gpsi	O_C	0..1	the Generic Public Subscription Identifier (GPSI) of the served party, if available.	
servedPEI	Pei	O_C	0..1	the identification of Permanent Equipment Identifier.	
unauthenticatedFlag	boolean	O_C	0..1	indicates the served SUPI is not authenticated	
roamerInOut	RoamerInOut	O_C	0..1	In-bound or Out-bound roamer	

6.1.6.2.2.8 Type PDUSessionInformation

Table 6.1.6.2.2.8-1: Definition of type PDUSessionInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
networkSlicingInfo	NetworkSlicingInfo	O_M	0..1	information of network slice serving the PDU session	
pduSessionID	PduSessionId	M	1		
pduType	PduSessionType	O_M	0..1	type of the PDU session	
sscMode	SscMode	O_C	0..1	information of SSC Mode type.	
hPlmnId	PlmnId	O_C	0..1	PLMN identifier of the home network	
servingNetworkFunctionID	ServingNetworkFunctionID	O_C	0..1	This field holds serving Network Function identifier.	
servingCNPlmnId	PlmnId	O_C	0..1	Serving Core Network Operator PLMN ID selected by the UE in shared networks.	
ratType	RatType	O_C	0..1	the RAT Type of the PDU session	
mAPDUNon3GPPRATType	RatType	O_C	0..1	the RAT Type of non-3GPP access for the MA PDU session	ATSSS
dnnId	Dnn	M	1	a Data Network Name	
dnnSelectionMode	DnnSelectionMode	O_C	0..1	This field indicates how the DNN was selected.	
chargingCharacteristics	string	O_C	0..1	the Charging Characteristics for this PDU session. It carries the value in hexadecimal representation Pattern: '^[0-9a-fA-F]{1,4}$'	
chargingCharacteristicsSelectionMode	ChargingCharacteristicsSelectionMode	O_C	0..1	information about how the "Charging Characteristics" was selected.	
startTime	DateTime	O_C	0..1	the UTC time which represents the start of a PDU session at the SMF	
stopTime	DateTime	O_C	0..1	the UTC time which represents the stop of a PDU session at the SMF	
3gppPSDataOffStatus	3GPPPSDataOffStatus	O_C	0..1	This field holds the 3GPP Data off Status when UE's 3GPP Data Off status is Activated or Deactivated.	
sessionStopIndicator	boolean	O_C	0..1	This field indicates to the CHF that the PDU session has been terminated.	
pduAddress	PDUAddress	O_C	0..1	Group of user ip address/prefix	
diagnostics	Diagnostics	O_C	0..1	provides a detailed cause value from SMF.	
enhancedDiagnostics	EnhancedDiagnostics5G	O_C	0..N	provides a more detailed cause value from SMF.	EnhancedDiagnostics
authorizedQoSInformation	AuthorizedDefaultQos	O_C	0..1	This field holds the authorized QoS applied to PDU session.	
subscribedQoSInformation	SubscribedDefaultQos	O_C	0..1	This field holds the subscribed Default QoS	
authorizedSessionAMBR	Ambr	O_C	0..1	This field holds the authorized session-AMBR.	
subscribedSessionAMBR	Ambr	O_C	0..1	This field holds the subscribed session-AMBR.	
mAPDUSessionInformation	MAPDUSessionInformation	O_C	0..1	This field holds the MA PDU session information.	ATSSS
redundantTransmissionType	RedundantTransmissionType	O_C	0..1	Indicates the redundant transmission type. If this field isn't present, it should be seen as a non-redundant transmission.	URLLC

pDUSessionPairID	Uint32	OC	0..1	This field identifies the two redundant PDU Sessions that belong together for dual connectivity based end to end redundant user plane paths type.	URLLC
cpCIoTOptimisationIndicator	boolean	OC	0..1	This field holds the indicator whether control plane optimization CIoT for 5GS is used during the PDU session, if this feature is enabled. The default value is false.	5GSCIoT
5GSControlPlaneOnlyIndicator	boolean	OC	0..1	This field holds the indicator whether the control plane only is used, i.e., the PDU data only transfers to control plane in case of control plane CIoT optimization. The default value is false.	5GSCIoT
smallDataRateControlIndicator	boolean	OC	0..1	This field holds the indicator whether the small data rate control for 5GS CIoT is used during the PDU session. The default value is false.	5GSCIoT
5GLANTypeService	5GLANTypeService	OC	0..1	5G LAN Type service information, if present, the 5G LAN Type service is used.	5GLAN

6.1.6.2.2.9 Type PDUContainerInformation

Table 6.1.6.2.2.9-1: Definition of type PDUContainerInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
timeofFirstUsage	DateTime	OC	0..1	the UTC time indicating time stamp for the first IP packet to be transmitted and mapped to the reporting used unit.	
timeofLastUsage	DateTime	OC	0..1	the UTC time indicating time stamp for the last IP packet to be transmitted and mapped to the reporting used unit.	
qoSInformation	QoSData	OC	0..1	the QoS applied for the reporting used unit. In case gbrUl or gbrDl are present for GBR flow, the GBR targets are "GUARANTEED", otherwise, are " NOT_GUARANTEED".	
qoSCharacteristics	QosCharacteristics	OC	0..1	Map of QoS characteristics for non standard 5QIs and non-preconfigured 5QIs.	
afChargingIdentifier	ChargingId	OC	0..1	An identifier, provided from the AF, may be used to correlate the measurement for the Charging key/Service identifier values in this PCC rule with application level reports.	
afChargingIdString	ApplicationChargingId	OC	0..1	Used instead of afChargingIdentifier when feature is active.	AF_Charging_Identifier
userLocationInformation	UserLocation	OC	0..1	provides information on the location	
uetimeZone	TimeZone	OC	0..1	the UE Time Zone during the used unit container interval.	
rATType	RatType	OC	0..1	the RAT Type of the used unit	
servingNodeID	array(ServingNetworkFunctionID)	OC	0..N	the list of serving node identifiers during the used unit container interval.	
presenceReportingAreaInformation	map(PresenceInfo)	OC	0..N	the Presence Reporting Area status of UE during the used unit container interval.	
3gppPSDataOffStatus	3GPPPSDataOffStatus	OC	0..1	the 3GPP Data off Status during the used unit container interval.	
sponsorIdentity	string	OC	0..1	an identifier of the sponsor.	
applicationserviceProviderIdentity	string	OC	0..1	an identifier of the application service provider	
chargingRuleBaseName	string	OC	0..1	the reference to group of PCC rules predefined at the SMF.	
mAPDUSteeringFunctionality	SteeringFunctionality	OC	0..1	Steering functionality .	ATSSS
mAPDUSteeringMode	SteeringMode	OC	0..1	Steering Mode	ATSSS
trafficForwardingWay	TrafficForwardingWay	OC	0..1	This field identifies which traffic forwarding way is used for the 5G LAN VN Group communication.	5GLAN
qosMonitoringReport	array(QosMonitoringReport)	OC	0..N	This field holds Qos Monitoring reporting information.	

6.1.6.2.2.10 Type NetworkSlicingInfo

Table 6.1.6.2.2.10-1: Definition of type NetworkSlicingInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
sNSSAI	Snssai	M	1	Single Network Slice Selection Assistance Information	

6.1.6.2.2.11 Type PDUAddress

Table 6.1.6.2.2.11-1: Definition of type PDUAddress

Attribute name	Data type	P	Cardinality	Description	Applicability
pduIPv4Address	Ipv4Addr	O_C	0..1	the IPv4 address of the served SUPI allocated for the PDU session	
pduIPv6Address withPrefix	Ipv6Addr	O_C	0..1	the IPv6 address with prefix of the served SUPI allocated for the PDU session	
pduAddressprefix length	integer	O_C	0..1	PDU Address prefix length of an IPv6 typed Served PDU Address. The field needs not available for prefix length of 64 bits.	
iPv4dynamicAddr essFlag	boolean	O_C	0..1	This field indicates whether served IPv4 address is dynamically allocated. This field is missing if address is static.	
iPv6dynamicPrefi xFlag	boolean	O_C	0..1	This field indicates whether served IPv6 address prefix is dynamically allocated. This field is missing if address is static.	
addIpv6AddrPrefi xes	Ipv6Prefix	O_C	0..1	One additional IPv6 prefix allocated for the PDU session. May be used when there is only one additional IPv6 address prefix.	
addIpv6AddrPrefi xList	array(Ipv6Prefix)	O_C	0..N	List of additional IPv6 prefix allocated for the PDU session.	
NOTE 1: If both the addIpv6AddrPrefixList and addIpv6AddrPrefixes are included, the IPv6 address prefix in addIpv6AddrPrefixes is also present in the addIpv6AddrPrefixList.					

6.1.6.2.2.12 Type ServingNetworkFunctionID

Table 6.1.6.2.2.12-1: Definition of type ServingNetworkFunctionID

Attribute name	Data type	P	Cardinality	Description	Applicability
servingNetworkF unctionInformatio n	NFIdentification	M	1	Serving Network Function information: i.e. AMF, I-SMF, SGW, V-SMF, SGSN or ePDG. For V-SMF, the NFIdentification.nodeFunctional ity shall have the value SMF.	
aMFId	AmfId	O_C	0..1	AMF identifier	

6.1.6.2.2.13 Type RoamingQBCInformation

Table 6.1.6.2.1.13-1: Definition of type RoamingQBCInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
multipleQFIcontainer	array(MultipleQFIcontainer)	Oc	0..N	list of QFI containers	
uPFID	NfInstanceId	O_C	0..1	identifer of UPF, included for backwards compatibility and can be included based on operators requirement	
roamingChargingProfile	RoamingChargingProfile	O_C	0..1	Roaming Charging Profile associated to the PDU session for roaming QBC.	

6.1.6.2.2.14 Type MultipleQFIcontainer

Table 6.1.6.2.1.14-1: Definition of type MultipleQFIcontainer

Attribute name	Data type	P	Cardinality	Description	Applicability
triggers	array (Trigger)	Oc	0..N	This field holds reason for closing the QFI unit container.	
triggerTimestamp	DateTime	Oc	0..1	This field holds the UTC time indicating timestamp when the reporting trigger occur.	
time	Uint32	O_C	0..1	This field holds the amount of time.	
totalVolume	Uint64	O_C	0..1	This field holds the amount of volume in both uplink and downlink directions.	
uplinkVolume	Uint64	O_C	0..1	This field holds the amount of volume in uplink direction.	
downlinkVolume	Uint64	O_C	0..1	This field holds the amount of volume in downlink direction.	
localSequenceNumber	integer	M	1	QFI data container sequence number. It starts from 1 and increased by 1 for each container generation	
qFIContainerInformation	QFIContainerInformation	O_C	0..1	This field holds the QFI data container information	

6.1.6.2.2.15 Type RoamingChargingProfile

Table 6.1.6.2.1.15-1: Definition of type RoamingChargingProfile

Attribute name	Data type	P	Cardinality	Description	Applicability
triggers	array(Trigger)	O_C	0..N	Trigger for roaming QBC	
partialRecordMethod	PartialRecordMethod	Oc	0..1	method uses for partial record closure	

6.1.6.2.2.16 Type QFIContainerInformation

Table 6.1.6.2.1.16-1: Definition of type QFIContainerInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
qFI	Qfi	O_M	0..1	QoS Flow Identifier (QFI)	
reportTime	DateTime	M	1	the UTC time indicating time stamp when the QFI data container was closed	
timeofFirstUsage	DateTime	O_C	0..1	the UTC time indicating time stamp for the first IP packet to be transmitted and mapped to the QFI container	
timeofLastUsage	DateTime	O_C	0..1	the UTC time indicating time stamp for the last IP packet to be transmitted and mapped to the QFI container.	
qoSInformation	QoSData	O_C	0..1	the QoS applied to QFI container. In case gbrUl or gbrDl are present for GBR QoS flow, the GBR targets are "GUARANTEED", otherwise, are " NOT_GUARANTEED".	
qoSCharacteristics	QosCharacteristics	O_C	0..1	Map of QoS characteristics for non standard 5QIs and non-preconfigured 5Qis.	
userLocationInformation	UserLocation	O_C	0..1	provides information on the location	
uetimeZone	TimeZone	O_C	0..1	UE Time Zone the UE is currently located	
presenceReportingAreaInformation	map(PresenceInfo)	O_C	0..N	the Presence Reporting Area status of UE during the QFI container interval.	
rATType	RatType	O_C	0..1	the RAT Type of the used unit	
servingNetworkFunctionID	array(ServingNetworkFunctionID)	O_C	0..N	the list of serving Node Identifiers during the used QFI container interval.	
3gppPSDataOffStatus	3GPPPSDataOffStatus	O_C	0..1	the 3GPP Data off Status during the QFI container interval.	
3gppChargingId	ChargingId	O_C	0..1	IP-CAN bearer (or PDP context) Charging identifier used to identify this IP-CAN bearer (or PDP context) in different records created by PGW-C+SMF. Charging Id is generated by P-GW at IP-CAN bearer (or PDP context) activation and is included in all containers in order to identify the containers which pertain to the IP-CAN bearer (or PDP context). Only applicable for 5GS and EPS interworking, or GERAN/UTRAN access.	5GIEPC_CH, TEI17_NIESGU
diagnostics	Diagnostics	O_C	0..1	provides a more detailed cause value for the release. Only applicable for 5GS and EPS interworking, or GERAN/UTRAN access	5GIEPC_CH, TEI17_NIESGU
enhancedDiagnostics	array(string)	O_C	0..N	provides a set of causes for the release Only applicable for 5GS and EPS interworking, or GERAN/UTRAN access.	5GIEPC_CH, TEI17_NIESGU

6.1.6.2.2.17 Type RANSecondaryRATUsageReport

Table 6.1.6.2.2.17-1: Definition of type RANSecondaryRATUsageReport

Attribute name	Data type	P	Cardinality	Description	Applicability
rANSecondaryRATType	RatType	O_M	0..1	RAT type associated to the reported usage on secondary RAT. The following values are applicable: - "NR" - "EUTRA"	
qosFlowsUsageReports	Array(QosFlowsUsageReport)	O_M	0..N	list of containers per QFI with volumes reported.	

6.1.6.2.2.18 Type QosFlowsUsageReport

Table 6.1.6.2.2.18-1: Definition of type QosFlowsUsageReport

Attribute name	Data type	P	Cardinality	Description	Applicability
qFI	Qfi	O_M	0..1	QoS Flow Identifier (QFI)	
startTimestamp	DateTime	O_C	0..1	Start time of the reported usage	
endTimestamp	DateTime	O_C	0..1	End time of the reported usage	
downlinkVolume	Uint64	O_C	0..1	Amount of volume in downlink direction.	
uplinkVolume	Uint64	O_C	0..1	Amount of volume in uplink direction.	

6.1.6.2.2.19 Type MAPDUSessionInformation

Table 6.1.6.2.2.19-1: Definition of MAPDUSessionInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
mAPDUSessionIndicator	MaPduIndication	O_C	0..1	MA PDU session indication, i.e., MA PDU Request or MA PDU Network-Upgrade Allowed.	ATSSS
aTSSSCapability	AtsssCapability	O_C	0..1	ATSSS capability	ATSSS

6.1.6.2.2.20 Type EnhancedDiagnostics5G

Table 6.1.6.2.2.19-1: Definition of EnhancedDiagnostics5G

Attribute name	Data type	P	Cardinality	Description	Applicability
ranNasCauseList	array(RanNasRelCause)	O_M	0..1	List of the RAN or NAS release cause code information.	EnhancedDiagnostics

6.1.6.2.2.21 Type QosMonitoringReport

Table 6.1.6.2.2.21-1: Definition of QosMonitoringReport

Attribute name	Data type	P	Cardinality	Description	Applicability
ulDelays	array(integer)	O_C	0..N	Uplink packet delay in units of milliseconds. (NOTE)	
dlDelays	array(integer)	O_C	0..N	Downlink packet delay in units of milliseconds. (NOTE)	
rtDelays	array(integer)	O_C	0..N	Round trip delay in units of milliseconds. (NOTE)	

NOTE: In the present document the maximum number of elements in the array is 2. If more than one value is received at one given point of time for UL packet delay, DL packet delay or round trip packet delay respectively, the NF service consumer reports the minimum and maximum packet delays to the CHF.

6.1.6.2.2.22 Type 5GLANTypeService

Table 6.1.6.2.2.22-1: Definition of type 5GLANTypeService

Attribute name	Data type	P	Cardinality	Description	Applicability
internalGroupIdentifier	GroupId	M	0..1	Identifier of the 5G LAN VN group.	

6.1.6.2.3 SMS Specified Data Type

6.1.6.2.3.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.3.1 for SMS charging described in 3GPP TS 32.274[28].

Table 6.1.6.2.3.1-1: SMS Specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
sMSChargingInformation	SMSChargingInformation	O_M	0..1	This field holds the SMSspecific information.	

6.1.6.2.3.2 Type SMSChargingInformation

Table 6.1.6.2.3-2: Definition of type SMSChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
originatorInfo	OriginatorInfo	O_M	0..1	originator of the SM	
recipientInfo	Array(RecipientInfo)	O_C	0..N	recipient information for the SM	
userEquipmentInfo	Pei	O_C	0..1	the identification of the terminal	
roamerInOut	RoamerInOut	O_C	0..1	In-bound or Out-bound roamer	
userLocationInfo	UserLocation	O_C	0..1	provides information on the location	
uetimeZone	TimeZone	O_C	0..1	the UE Time Zone the UE is currently located	
rATType	RatType	O_C	0..1	The identification of the RAT type.	
sMSCAddress	string	O_M	0..1	the address (e.g. E.164) of the SMS-service centre sending the Charging Data Request used for producing the record. (SMSC Address)	
sMDataCodingScheme	integer	O_M	0..1	the data coding scheme used within the SM. The information to populate this field is obtained from TP-DCS header.	
sMMessageType	SMmessageType	O_M	0..1	identifies the message that triggered the generation of charging information.	
sMReplyPathRequested	ReplyPathRequested	O_C	0..1	an indication of whether a reply SM to an original SM was requested to follow the same path as identified by the TP-Reply-Path (TP-RP) flag.	
sMUserDataHeader	string	O_C	0..1	carries the user data header extracted from the user data of the SM. The user data header (TP-UDH) is specified in TS 23.040 [x].	
sMStatus	string	O_C	0..1	the information from the TP-Status field in a Status-Report TPDU. It carries the value in hexadecimal representation Pattern: '^[0-7]?[0-9a-fA-F]$'	
sMDischargeTime	DateTime	O_C	0..1	the time associated with the event being reported in the SM Status field. This information is only applicable to delivery report charging procedures.	
numberofMessagesSent	Uint32	O_C	0..1	the number of SMSs sent by the IMS application or the total number of short messages when this SM is part of concatenated short message, if applicable.	
sMServiceType	SMServiceType	O_C	0..1	the type of SM service that caused the charging interaction. It is only applicable for SM supplementary service procedures.	
sMSequenceNumber	Uint32	O_C	0..1	the sequence number of this SM within the concatenated short message	

sMSresult	Uint32	C	0..1	the result of the attempted SM transaction, if unsuccessful. This field is only for offline charging.	
submissionTime	DateTime	O_C	0..1	the timestamp of when the submitted SM arrived at the originating SMS Node	
sMpriority	SMPriority	O_C	0..1	any priority information associated with an SM	
messageReference	string	O_M	0..1	the identity used to identify an SM in the SMS node associated with entity that submitted it	
messageSize	Uint32	O_M	0..1	the total number of short messages when this SM is part of concatenated short message	
messageClass	MessageClass	O_M	0..1	implementation dependent the value selected for a specific transaction.	
deliveryReportRequested	DeliveryReportRequested	O_C	0..1	indicates whether a delivery report is requested by the SM originator	

6.1.6.2.3.3 Type OriginatorInfo

Table 6.1.6.2.3.3-1: Definition of type OriginatorInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
originatorSUPI	supi	O_M	0..1	SUPI of the originator of the SMS	
originatorGPSI	gpsi	Oc	0..1	GPSI of the originator of the SMS	
originatorOtherAddress	SMAddressInfo	O_M	0..1	the address of the recipient of the SM, when different from SUPI and GPSI	
originatorReceivedAddress	SMAddressInfo	Oc	0..1	original, unmodified address of the originator of the SM, as received by the SMS node, in case address manipulation (such as number plan corrections) have been applied in the SMS node.	
originatorSCCPAddress	string	Oc	0..1	SCCP calling address used to receive the SM at the SMS node	
sMOriginatorInterface	Interface	O_M	0..1	Provide the information describing the interface on which the SM was received by the SMS node.	
sMOriginatorProtocolId	string	Oc	0..1	the protocol used for the SM by originator	

6.1.6.2.3.4 Type RecipientInfo

Table 6.1.6.2.3.4-1: Definition of type RecipientInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
recipientSUPI	supi	O_M	0..1	SUPI of the recipient of the SM, as received by the SMS Node	
recipientGPSI	gpsi	O_C	0..1	GPSI of the recipient of the SM, as received by the SMS Node	
recipientOtherAddress	SMAddressInfo	O_C	0.. 1	the address of the recipient of the SM, as received by the SMS Node, when different from SUPI and GPSI	
recipientReceivedAddress	SMAddressInfo	O_C	0.. 1	original, unmodified address of the recipient of the SM, as received by the SMS node, in case address manipulation (such as number plan corrections) have been applied in the SMS node.	
recipientSCCPAddress	string	O_C	0..1	SCCP called address used by the SMS node to onward deliver the SM	
sMDestinationInterface	SMInterface	O_M	0..1	containing information describing the interface on which the SM was requested to be delivered	
sMRecipientProtocolId	string	O_C	0..1	holds the TP-PROTOCOL-ID (TP-PID)	

6.1.6.2.3.5 Type SMAddressInfo

Table 6.1.6.2.3.5-1: Definition of type SMAddressInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
sMaddressType	SMAddressType	O_C	0..1	the type of address carried	
sMaddressData	string	O_C	0..1	the address information and formatted according type of address	
sMaddressDomain	SMAddressDomain	O_C	0..1	the domain/network to which the associated address resides	

6.1.6.2.3.6 Type RecipientAddress

Table 6.1.6.2.3.6-1: Definition of type RecipientAddress

Attribute name	Data type	P	Cardinality	Description	Applicability
recipientAddressInfo	SMAddressInfo	O_C	0..1	indicates the type of address carried	
sMaddresseeType	SMAddresseeType	O_C	0..1	identifies the how the recipient is addressed in the header of an MM	

6.1.6.2.3.7 Type MessageClass

Table 6.1.6.2.3.7-1: Definition of type MessageClass

Attribute name	Data type	P	Cardinality	Description	Applicability
classIdentifier	ClassIdentifier	O_C	0..1	indicate the class identifier	
tokenText	string	O_C	0..1	contains extension information	

6.1.6.2.3.8 Type SMAddressDomain

Table 6.1.6.2.3.8-1: Definition of type SMAddressDomain

Attribute name	Data type	P	Cardinality	Description	Applicability
domainName	string	O_C	0..1	represents a fully qualified domain name (FQDN).	
3GPPIMSIMCCMNC	string	O_C	0..1	MCC and MNC extracted from the user's IMSI (first 5 or 6 digits, as applicable from the presented IMSI.	

6.1.6.2.3.9 Type SMInterface

Table 6.1.6.2.3.9-1: Definition of type SMInterface

Attribute name	Data type	P	Cardinality	Description	Applicability
interfaceId	string	O_C	0..1	the interface identification provided by the messaging node (originator/destination).	
interfaceText	string	O_C	0..1	It is the consolidation information about the application associated with the charging event	
interfacePort	string	O_C	0..1	the port-identification or contains information about the transport layer port used by the application associated with the charging event	
interfaceType	InterfaceType	O_C	0..1	type of interface / nature of the transaction in the messaging node for which the charging event occurs	

6.1.6.2.4 5G connection and mobility Specified Data Type

6.1.6.2.4.1 Type ChargingDataRequest

This clause specifies additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.1.1 for 5G connection and mobility described in 3GPP TS 32.256 [31].

Table 6.1.6.2.4.1-1: 5G connection and mobility Specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
registrationChargingInformation	RegistrationChargingInformation	O_M	0..1	This field holds the 5G registration specific information.	
n2ConnectionChargingInformation	N2ConnectionChargingInformation	O_M	0..1	This field holds the 5G N2 connection specific information.	
locationReportingChargingInformation	LocationReportingChargingInformation	O_M	0..1	This field holds the 5G Location reporting specific information.	

6.1.6.2.4.2 Type ChargingDataResponse

This clause specifies additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.1.2 for 5G connection and mobility described in 3GPP TS 32.256 [31].

Table 6.1.6.2.4.2-1: 5G connection and mobility Specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability
locationReportingChargingInformation	LocationReportingChargingInformation	O_C	0..1	This field holds the 5G connection and mobility location reporting specific information	AMF_subs_PRA

6.1.6.2.4.3 Type RegistrationChargingInformation

Table 6.1.6.2.4.3-1: Definition of type RegistrationChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
registrationMessagetype	RegistrationMessageType	M	1	Message type received by the AMF: registration (initial, initial, mobility, periodic, emergency), deregistration.	
userInformation	UserInformation	O_M	0..1	Includes information of user and user equipment	
userLocationinfo	UserLocation	O_C	0..1	Information on the location and location time	
pSCellInformation	PSCellInformation	O_C	0..1	Primary SCG (Secondary Cell Group) Cell	
uetimeZone	TimeZone	O_C	0..1	UE Timezone the UE is currently located	
rATType	RatType	O_C	0..1	RAT Type of the registration	
5gMMCapability	Bytes	O_C	0..1	5GMM capability IE as specified in clause 9.11.3.1 of 3GPP TS 24.501 [303]	
mICOModeIndication	MICOModeIndication	O_C	0..1	Indicates whether the requested use of MICO mode is accepted or not by the network	
smsIndication	SmsIndication	O_C	0..1	Indicates whether the SMS delivery over NAS is supported	
taiList	array(Tai)	O_C	0..N	An array of TAIs representing the set of tracking areas composing the Registration Area.	
serviceAreaRestriction	ServiceAreaRestriction	O_C	0..1	Service Area Restriction for the UE.	
requestedNSSAI	array(Snssai)	O_C	0..N	Requested NSSAI.	
allowedNssai	array(Snssai)	O_C	0..N	Allowed NSSAI.	
rejectedNSSAI	array(Snssai)	O_C	0..N	Rejected NSSAI.	
nSSAIMapList	array(NSSAIMap)	O_C	0..N	Mapping of each S-NSSAI of the Allowed NSSAI to the S-NSSAIs of the Subscribed S-NSSAIs.	
amfUeNgapId	integer	O_M	0..1	UE association over the N2 interface within the AMF.	
ranUeNgapId	integer	O_M	0..1	RAN UE NGAP ID over N2 interface	
ranNodeId	GlobalRanNodeId	O_C	0..1	Identity of the RAN node.	

6.1.6.2.4.4 Type N2ConnectionChargingInformation

Table 6.1.6.2.4.4-1: Definition of type N2ConnectionChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
n2ConnectionMessageType	N2ConnectionMessageType	M	1	N2 message type received by the AMF specified in clause 9.7 3GPP TS 24.501 [303]	
userInformation	UserInformation	O_M	0..1	Includes information of user and user equipment	
userLocationinfo	UserLocation	O_C	0..1	Information on the location and location time	
pSCellInformation	PSCellInformation	O_C	0..1	Primary SCG (Secondary Cell Group) Cell	
uetimeZone	TimeZone	O_C	0..1	UE Timezone the UE is currently located	
rATType	RatType	O_C	0..1	RAT Type of the registration	
amfUeNgapId	integer	O_M	0..1	UE association over the N2 interface within the AMF.	
ranUeNgapId	integer	O_M	0..1	RAN UE NGAP ID over N2 interface	
ranNodeId	GlobalRanNodeId	O_C	0..1	Identity of the RAN node.	
restrictedRatList	array(RatType)	O_C	0..N	List of RAT types that are restricted for the UE	
forbiddenAreaList	array(Area)	O_C	0..N	List of forbidden areas for the UE	
serviceAreaRestriction	ServiceAreaRestriction	O_C	0..1	Service Area Restriction for the UE.	
restrictedCnList	array(CoreNetworkType)	O_C	0..N	List of Core Network Types that are restricted for the UE	
allowedNssai	array(Snssai)	O_C	0..N	Allowed NSSAI.	
rrcEstCause	string	O_C	0..1	RRC Establishment Cause, if received from the 5G-AN, specified in TS 38.413 [304], clause 9.3.1.111. It carries the value in hexadecimal representation Pattern: '^[0-9a-fA-F]+$'	

6.1.6.2.4.5 Type LocationReportingChargingInformation

Table 6.1.6.2.4.5-1: Definition of type LocationReportingChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
locationReportingMessageType	LocationReportingMessageType	M	1	Includes Location reporting message type	
userInformation	UserInformation	O_M	0..1	Includes information of user and user equipment	
userLocationinfo	UserLocation	O_M	0..1	Information on the location and location time	
pSCellInformation	PSCellInformation	O_C	0..1	Primary SCG (Secondary Cell Group) Cell	
uetimeZone	TimeZone	O_C	0..1	UE Timezone the UE is currently located	
presenceReportingAreaInformation	map(PresenceInfo)	O_C	0..N	The Presence Reporting Area(s) and status of UE presence.	
rATType	RatType	O_C	0..1	RAT Type of the registration	

6.1.6.2.4.6 Type: PSCellInformation

Table 6.1.6.2.4.6-1: Definition of type PSCellInformation

Attribute name	Data type	P	Cardinality	Description
nrcgi	Ncgi	O_C	0..1	NR Cell Identity
ecgi	Ecgi	O_C	0..1	E-UTRA Cell Identity

6.1.6.2.4.7 Type: NSSAIMap

Table 6.1.6.2.4.7-1: Definition of type NSSAIMap

Attribute name	Data type	P	Cardinality	Description
servingSnssai	Snssai	M	1	S-NSSAI in the serving PLMN
homeSnssai	Snssai	M	1	S-NSSAI in home PLMN

6.1.6.2.5 Exposure Function Northbound API Specified Data Type

6.1.6.2.5.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.1.1 for Exposure Function Northbound API charging described in 3GPP TS 32.254[14].

Table 6.1.6.2.5.1-1: Exposure Function Northbound API Specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
nEFCharging Information	NEFChargingInformation	O_M	0..1	This field holds the Exposure Function Northbound API specific information.	

6.1.6.2.5.1a Type ChargingDataResponse

This clause specifies additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.1.2 for Exposure Function Northbound API charging described in 3GPP TS 32.254[14].

Table 6.1.6.2.5.2-1: Exposure Function Northbound API Specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.5.2 Type NEFChargingInformation

Table 6.1.6.2.5.3-2: Definition of type NEFChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
externalIndividualIdentifier	Gpsi	O_C	0..N	The external Identifier or the MSISDN associated to the GPSI of the individual UE.	
externalGroupIdentifier	ExternalGroupId	O_C	0.1	The external Identifier identifying a group of individual UE(s).	
groupIdentifier	GroupId	O_C	0..1	The network internal globally unique Identifier identifying a set of IMSIs.	
aPIDirection	APIDirection	M	1	The direction to indicate if it is an API invocation from an AF or notification to an AF.	
aPITargetNetworkFunction	NfInstanceId	O_C	0..1	The identifier of the network function that either is the destination of the API invocation or triggers the notification.	
aPIResultCode	Uint32	O_C	0..1	The result of API Invocation.	
aPIName	string	M	1	The name of the API invoked.	
aPIReference	Uri	O_C	0..1	The reference to the definition of the format of the API invocation.	
aPIContent	string	O_C	0..1	The actual content of the API invocation, in the format described by the aPIReference.	

6.1.6.2.6 Network Slice Management (NSM) Specified Data Type

6.1.6.2.6.1 Type ChargingDataRequest

This clause specifies additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.1.1 for Network Slice Management (NSM) charging described in 3GPP TS 28.202 [71].

Table 6.1.6.2.6.1-1: Network Slice Management (NSM) charging specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
tenantIdentifier	string	O_M	0..1	Identifier of the tenant	
mnSConsumerIdentifier	string	O_M	0..1	MnS consumer Identifier	
nSMChargingInformation	NSMChargingInformation	O_M	0..1	This field holds the Network Slice Management (NSM) specific information.	

6.1.6.2.6.2 Type ChargingDataResponse

This clause specifies additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.1.2 Network Slice Management (NSM) charging described in 3GPP TS 28.202 [71].

Table 6.1.6.2.X.2-1: Network Slice Management (NSM) charging specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.6.3 Type NSMChargingInformation

Table 6.1.6.2.6.3-1: Definition of type NSMChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
managementOperation	ManagementOperation	M	1	Management operation associated to the provisioning specified in TS 28.532 [253].	
idNetworkSliceInstance	string	O_M	0..1	Managed Object Instance (MOI) of NetworkSlice IOC.This is a full DN according to 3GPP TS 32.300 [255].	
listOfServiceProfileChargingInformation	Array (ServiceProfileChargingInformation)	O_M	0..N	List of Service profile charging information	
managementOperationStatus	ManagementOperationStatus	O_C	0..1	Status of the management operation	
operationalState	OperationalState	O_C	0..1	Operational state of the network slice instance	
administrativeState	AdministrativeState	O_C	0..1	Administrative state of the network slice instance	

6.1.6.2.6.4 Type ServiceProfileChargingInformation

Table 6.1.6.2.6.4-1: Definition of type ServiceProfileChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
serviceProfileIdentifier	string	O_M	0..1	Described in TS 28.541 [254] clause 6.4 serviceProfileId attribute	
sNSSAIList	array(Snssai)	O_M	0..N	List of S-NSSAI(s)	
sST	Sst	O_M	0..1	Described in TS 28.541 [254] clause 6.4 sST attribute	
latency	integer	O_C	0..1	Described in TS 28.541 [254] clause 6.4 latency attribute	
availability	number	O_C	0..1	Described in TS 28.541 [254] clause 6.4 availability attribute	
resourceSharingLevel	SharingLevel	O_C	0..1	Described in TS 28.541 [254] clause 6.4 serviceProfile.resourceSharingLevel attribute	
jitter	integer	O_C	0..1	Described in TS 28.541 [254] clause 6.4 jitter attribute	
reliability	string	O_C	0..1	Described in TS 28.541 [254] clause 6.4 d reliability attribute	
maxNumberofUEs	integer	O_C	0..1	Described in TS 28.541 [254] clause 6.4 maxNumberofUEs attribute	
coverageArea	String	O_C	0..1	Described in TS 28.541 [254] clause 6.4 coverageArea attribute	
uEMobilityLevel	MobilityLevel	O_C	0..1	Described in TS 28.541 [254] clause 6.4 uEMobilityLevel attribute	
delayToleranceIndicator	Support	O_C	0..1	Described in TS 28.541 [254] clause 6.4 delayTolerance.support attribute	
dLThptPerSlice	Throughput	O_C	0..1	Described in TS 28.541 [254] clause 6.4 dLThptPerSlice attribute	
dLThptPerUE	Throughput	O_C	0..1	Described in TS 28.541 [254] clause 6.4 dLThptPerUE attribute	
uLThptPerSlice	Throughput	O_C	0..1	Described in TS 28.541 [254] clause 6.4 uLThptPerSlic attribute	
uLThptPerUE	Throughput	O_C	0..1	Described in TS 28.541 [254] clause 6.4 uLThptPerUE attribute	
maxNumberofPDUsessions	integer	O_C	0..1	Described in TS 28.541 [254] clause 6.4 maxNumberofConns.nOofConn attribute	
kPIMonitoringList	string	O_C	0..1	Described in TS 28.541 [254] clause 6.4 kPIMonitoring.kPIList attribute	
supportedAccessTechnology	integer	O_C	0..1	Described in TS 28.541 [254] clause 6.4 SupportedAccessTech.accTechList attribute	
v2XCommunicationModeIndicator	Support	O_C	0..1	Described in TS 28.541 [254] clause 6.4 V2XCommMode.v2XMode attribute	
addServiceProfileChargingInfo	string	O_C	0..1	This field contains additional attributes of the service profile.	

6.1.6.2.6.5 Type Throughput

Table 6.1.6.2.6.5-1: Definition of type Throughput

Attribute name	Data type	P	Cardinality	Description	Applicability
guaranteedThpt	Float	O_C	0..1	Described in TS 28.541 [254] clause 6.4 guaThpt attribute	
maximumThpt	Float	O_C	0..1	Described in TS 28.541 [254] clause 6.4 maxThpt attribute	

6.1.6.2.7 NS performance and analytics Specified Data Type

6.1.6.2.7.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.7.1 for NS performance and analytics charging described in 3GPP TS 28.201[201].

Table 6.1.6.2.7.1-1: NS performance and analytics Specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
tenantIdentifier	string	O_M	0..1	This field contains the identification of the subscriber of the network slice	
nSPAChargingInformation	NSPAChargingInformation	O_C	0..1	This field holds the network slice information, which is reported to the CHF	

6.1.6.2.7.2 Type ChargingDataResponse

This clause is additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.7.2 for NS performance and analytics charging described in 3GPP TS 28.201[201].

Table 6.1.6.2.7.2-1: NS performance and analytics Specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.7.3 Type UsedUnitContainer

This clause is additional portion of the type UsedUnitContainer defined in clause 6.1.6.2.1.10 for NS performance and analytics charging described in 3GPP TS 28.201[201].

Table 6.1.6.2.X.3-1: NS performance and analytics charging of type UsedUnitContainer

Attribute name	Data type	P	Cardinality	Description	Applicability
nSPAContainerInformation	NSPAContainerInformation	O_C	0..1	the network slice performance and analytics container specific information.	

6.1.6.2.7.4 Type NSPAChargingInformation

Table 6.1.6.2.7.4-1: Definition of type NSPAChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
singleNSSAI	Snssai	M	0..1	This field holds single Network Slice Selection Assistance Information for performance reporting.	

6.1.6.2.7.5 Type NSPAContainerInformation

Table 6.1.6.2.7.5-1: Definition of type NSPAContainerInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
latency	integer	O_C	0..1	This field holds latency	
throughput	Throughput	O_C	0..1	This field holds throughput.	
maximumPacketLossRate	string	O_C	0..1	This field holds maximum packet loss rate.	
serviceExperienceStatisticsData	ServiceExperienceInfo	O_C	0..1	This field holds service experience statistics data.	
theNumberOfPDUSessions	integer	O_C	0..1	This field holds the number of PDU sessions.	
theNumberOfRegisteredSubscribers	integer	O_C	0..1	This field holds the number of registered subscribers.	
loadLevel	NsiLoadLevelInfo	O_C	0..1	This field holds the load level of network slice.	

6.1.6.2.8 IMS Specified Data Type

6.1.6.2.8.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.1.1 for IMS charging described in 3GPP TS 32.260 [32].

Table 6.1.6.2.8.1-1: IMS specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
iMSChargingInformation	IMSChargingInformation	O_C	0..1	This field holds the IMS specific information.	IMS

6.1.6.2.8.2 Type ChargingDataResponse

This clause is additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.1.2 for IMS charging described in 3GPP TS 32.260 [32].

Table 6.1.6.2.8.2-1: IMS specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.8.3 Type IMSChargingInformation

Table 6.1.6.2.8.3-1: Definition of type IMSChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
eventType	SIPEventType	O_C	0..1	This field holds the SIP Method, the content of the SIP "Event" header and the content of the SIP "expires" header when present in the SIP request.	
iMSNodeFunctionality	IMSNodeFunctionality	O_M	1	This field contains the function of the IMS node.	
roleOfNode	RoleOfIMSNode	O_M	1	This field specifies whether the IMS node is serving the Originating or the Terminating party.	
userInformation	UserInformation	O_M	1	Group of user information.	
userLocationInfo	UserLocation	O_C	0..1	This field indicates details of where the UE is currently located (access-specific user location information). For	
ueTimeZone	TimeZone	O_C	0..1	This field holds the Time Zone of where the UE is located, if available where the UE currently resides.	
3gppPSDataOffStatus	3GPPPSDataOffStatus	O_C	0..1	This field holds the 3GPP Data off Status when UE's 3GPP Data Off status is Activated or Deactivated.	
isupCause	ISUPCause	O_C	0..1	This indicates the reason a circuit switch call was released.	
controlPlaneAddress	IMSAddress	O_C	0..1	This identifies the control plane IP address i.e., GGSN, PGW, or SMF, that handles one or more media component(s) of a IMS session.	
vlrNumber	E164	O_C	0..1	This identifies the international E.164 address of the VLR serving the user.	
mscAddress	E164	O_C	0..1	This identifies the international E.164 address of the MSC that generated the network call reference number.	
userSessionID	string	O_M	1	This field holds the session identifier. For a SIP session the *Session-ID* contains the SIP Call ID. When the AS acts as B2BUA, the incoming session is identified.	
outgoingSessionID	string	O_C	0..1	When the AS acts as B2BUA, the outgoing side session is identified by the Outgoing Session ID which contains the SIP Call ID.	
sessionPriority	IMSSessionPriority	O_C	0..1	This field contains the priority of the session.	
callingPartyAddresses	array(Uri)	O_M	1..N	This field holds the addresses (SIP URI or Tel URI) URI of the party (Public User Identity or Public Service Identity) initiating a session or requesting a service.	

calledPartyAddress	string	O_M	1	For SIP transactions, except for registration, this field holds the address of the party (Public User ID or Public Service ID) to whom the SIP transaction is posted. For registration transactions, this field holds the Public User ID under registration.	
numberPortabilityRoutinginformation	string	O_C	0..1	This field includes information on number portability after DNS/ENUM request from IMS node in the calling user's home network.	
carrierSelectRoutingInformation	string	O_C	0..1	This field includes information on carrier select after DNS/ENUM request from IMS node in the calling user's home network.	
alternateChargedPartyAddress	string	O_C	0..1	The address of an alternate party that is identified by the AS at session initiation and is charged in place of the calling party.	
requestedPartyAddress	array(string)	O_C	1..N	For SIP transactions this field initially holds the address of the party (Public User ID or Public Service ID) to whom the SIP transaction was originally posted. This field is only present if different from the Called Party Address parameter.	
calledAssertedIdentities	array(string)	O_C	1..N	The addresses of the final asserted identity. Present if the final asserted identity is available in the SIP 2xx response.	
calledIdentityChanges	array(CalledIdentityChange)	O_C	1..N	Terminating identity address change and associated time stamp.	
associatedURI	array(Uri)	O_C	1..N	This field holds a non-barred public user identity (SIP URI or Tel URI) associated to the public user identity under registration and is present for registration transactions.	
timeStamps	DateTime	O_C	0..1	This field holds either the time of the SIP Request or the time of the response to the SIP Request.	
applicationServerInformation	array(string)	O_C	1..N	This field holds the SIP URI(s) of the AS(s) addressed during the session and the called party number (SIP URI, E.164), if an AS determines it.	
interOperatorIdentifier	array(InterOperatorIdentifier)	O_C	1..N	This field holds the identification of the network neighbours (originating and terminating) as exchanged via SIP signalling if available. This field may occur several times.	
imsChargingIdentifier	string	O_M	1	This field holds the IMS Charging Identifier (ICID) as generated by a IMS node for a SIP session.	

relatedICID	string	OC	0..1	This field holds the Related IMS charging identifier when the session is the target access leg in case of access transfer.	
relatedICIDGenerationNode	IMSAddress	OC	0..1	This field holds the identifier of the server that generated the Related IMS charging identifier.	
transitIOIList	array(string)	OC	1..N	This field holds the identification of the involved transit networks as exchanged via SIP signalling if available. This field may occur several times. When received from the AS, each occurrence of this field represents transit networks inbound to or outbound from the S-CSCF.	
earlyMediaDescription	array (EarlyMediaDescription)	OC	1..N	This field holds session and media parameters related to media components set to active during the SIP session establishment and before a final successful or unsuccessful SIP answer to the initial SIP INVITE request is received. Once a media component is set to active, subsequent status changes shall be registered. Since several SDP negotiations may occur during the SIP session establishment, this field may occur several times.	
sdpSessionDescription	array(string)	OC	1..N	This field holds the content of an "attribute-line" (i=, c=, b=, k=, a=, etc.) related to a session.	
sdpMediaComponent	array(SDPMediaComponent)	OC	1..N	This is a grouped field comprising several sub-fields associated with one media component. Since several media components may exist for a session in parallel these sub-fields may occur several times.	
servedPartyIPAddress	IMSAddress	OC	0..1	This field holds the IP address of either the calling or called party, depending on whether the P-CSCF is in touch with the calling or the called party.	
serverCapabilities	ServerCapabilities	OC	0..1	This field contains the server capabilities as described in 3GPP TS 29.229 [205].	
trunkGroupID	TrunkGroupID	OC	0..1	This field identifies the incoming and outgoing PSTN legs.	
bearerService	string	OC	0..1	This field holds the used bearer service for the PSTN leg.	
imsServiceId	string	OC	0..1	This field identifies the service the MRFC is hosting. For conferences the conference ID is used as the value of this parameter.	
messageBodies	array(MessageBody)	OC	1..N	This field holds information about the Message body, Content-Type, Content-Length, Content-Disposition and Originator if available.	
accessNetworkInformation	array(string)	OC	1..N	This field contains the content of the first P-header P-Access-Network-Info, if available.	

additionalAccessNetworkInformation	string	OC	0..1	This field contains the content of an additional SIP P-header "P-Access-Network-Info", if available.	
cellularNetworkInformation	string	OC	0..1	This field contains the content of one SIP "Cellular-Network-Info" header, when the UE supporting one or more cellular radio access technologies but using a non-cellular IP-CAN, such as untrusted WLAN access, provides this header field to relay information to its service provider about the radio cell identity of the cellular radio access network on which the UE most recently camped.	
accessTransferInformation	array(AccessTransferInformation)	OC	1..N	This field contains information related to the session transfer.	
accessNetworkInfoChange	array(AccessNetworkInfoChange)	OC	1..N	This field is a grouped field describing the subsequent SIP P-header "P-Access-Network-Info" changes and associated time stamp.	
imsCommunicationServiceID	string	OC	0..1	This field contains the IMS communication service identifier if received in the P-Asserted-Service header in the SIP request for all applicable IMS nodes downstream from the S-CSCF serving the Originating party. This field contains the IMS communication service identifier if received in the "+g.3gpp.icsi-ref" header field parameter of the Feature-Caps header in the SIP response for all applicable IMS nodes upstream from the S-CSCF serving the Originating party.	
imsApplicationReferenceID	string	OC	0..1	This field contains the IMS application reference identifier if received in the SIP Request.	
causeCode	Uint32	OC	0..1	This field contains the cause value.	
reasonHeader	array(string)	OC	1..N	This field contains SIP reason header included in BYE or CANCEL method, Reliability of this information is not guaranteed if the SIP or CANCEL is originated outside of the trust domain which is determined by the Operator on a "per parameter basis". Since several Reason Header may exist for a SIP message, these sub-fields may occur several times	
initialIMSChargingIdentifier	string	OC	0..1	This field holds the Initial IMS charging identifier (ICID) as generated by the IMS node for the initial SIP session created for IMS service continuity.	
nniInformation	array(NNIInformation)	OC	1..N	This field holds information about the NNI used for interconnection and roaming.	

fromAddress	string	O_M	1	Contains the information from the SIP From header.	
imsEmergencyIndication	boolean	O_C	0..1	This field indicates the registration is an emergency registration or the IMS session is an IMS emergency session	
imsVisitedNetworkIdentifier	string	O_C	0..1	Contains the information from the SIP P-Visited-Network-ID header.	
sipRouteHeaderReceived	string	O_C	0..1	Contains the information in the topmost route header in a received initial SIP INVITE or non-session related SIP MESSAGE request.	
sipRouteHeaderTransmitted	string	O_C	0..1	Contains the information in the route header representing the destination in a transmitted initial SIP INVITE or non-session related SIP MESSAGE request.	
tadIdentifier	TADIdentifier	O_C	0..1	This field indicates the type of access network (CS or PS) through which the session shall be terminated.	
feIdentifierList	string	O_C	0..1	This element contains one or more IM CN subsystem functional entity addresses and/or AS and application identifiers where the IM CN subsystem functional entity does create charging information for the related CDR of this IM CN subsystem functional entity.	

6.1.6.2.8.4 Type SIPEventType

Table 6.1.6.2.8.4-1: Definition of type SIPEventType

Attribute name	Data type	P		Cardinality	Description	Applicability
sIPMethod	string	O_C		0..1	This field holds holds the name of the SIP Method (INVITE, UPDATE etc.).	
eventHeader	string	O_C		0..1	This field holds the content of the "Event" header	
expiresHeader	Uint32	O_C		0..1	This field holds the content of the "Expires" header	

6.1.6.2.8.5 Type ISUPCause

Table 6.1.6.2.8.5-1: Definition of type ISUPCause

Attribute name	Data type	P	Cardinality	Description	Applicability
iSUPCauseLocation	Uint32	O_C	0..1	This field identifies the network in which the event causing the call release. Values described in TS 29.078 [259].	
iSUPCauseValue	Uint32	O_C	0..1	This field identifies the reason a voice call service is released. Values described in TS 29.078 [259].	
iSUPCauseDiagnostics	OctetString	O_C	0..1	This field holds the diagnostics field associated with the release of the voice call service. Values described in TS 29.078 [259].	

6.1.6.2.8.6 Type CalledIdentityChange

Table 6.1.6.2.8.6-1: Definition of type CalledIdentityChange

Attribute name	Data type	P	Cardinality	Description	Applicability
calledIdentity	string	O_C	0..1	This field holds the address (Public User ID: SIP URI, E.164, etc.) of the called party after a change.	
changeTime	DateTime	O_C	0..1	This field holds the time in UTC format when the change was registered.	

6.1.6.2.8.7 Type InterOperatorIdentifier

Table 6.1.6.2.8.7-1: Definition of type InterOperatorIdentifier

Attribute name	Data type	P	Cardinality	Description	Applicability
originatingIOI	string	O_C	0..1	This field holds the Inter Operator Identifier (IOI) for the originating network as generated by the IMS node as described in RFC 7315 [405] and TS 24.229 [258].	
terminatingIOI	string	O_C	0..1	This field holds the Inter Operator Identifier (IOI) for the terminating network as generated by the IMS node as described in RFC 7315 [405] and TS 24.229 [258].	

6.1.6.2.8.8 Type EarlyMediaDescription

Table 6.1.6.2.8.8-1: Definition of type EarlyMediaDescription

Attribute name	Data type	P	Cardinality	Description	Applicability
sDPTimeStamps	SDPTimeStamps	O_C	0..1	This field holds the time of the SDP offer and the SDP answer.	
sDPMediaComponent	array(SDPMediaComponent)	O_C	0..N	This field contains information about media used for a IMS session.	
sDPSessionDescription	array(string)	O_C	0..N	This field holds the content of the SDP line (i=, c=, b=, k=, a=, etc.) in the session description, as described in RFC 8866 [407].	

6.1.6.2.8.9 Type SDPMediaComponent

Table 6.1.6.2.8.9-1: Definition of type SDPMediaComponent

Attribute name	Data type	P	Cardinality	Description	Applicability
sDPMediaName	string	O_C	0..1	This field holds the content of the SDP "m=" line in a media description, as described in RFC 8866 [407].	
SDPMediaDescription	array(string)	O_C	0..N	This field holds the content of SDP lines (i=, c=, b=, k=, a=, etc.) related to a media description, as described in RFC 8866 [407].	
localGWInsertedIndication	boolean	O_C	0..1	This field indicates if the local GW (TrGW, IMS-AGW) is inserted or not for the SDP media component. Set to true if inserted.	
ipRealmDefaultIndication	boolean	O_C	0..1	This field indicates whether the IP realm used for the SDP media component is the default IP realm or not. Set to true if it is the default IP realm is used.	
transcoderInsertedIndication	boolean	O_C	0..1	This field indicates if a transcoder is inserted or not for the SDP media component. Set to true if it is inserted.	
mediaInitiatorFlag	MediaInitiatorFlag	O_C	0..1	This field indicates which party has requested the session modification.	
mediaInitiatorParty	string	O_C	0..1	This field it holds the address (SIP URI or Tel URI) of the party (Public User ID or Public Service ID) who initiates the media action.	
threeGPPChargingId	OctetString	O_C	0..1	This field contains a charging identifier.	
accessNetworkChargingIdentifierValue	OctetString	O_C	0..1	This field contains a charging identifier (e.g. GCID).	
sDPType	SDPType	O_C	0..1	This field holds information if the SDP media component was of type SDP offer or SDP answer	

6.1.6.2.8.10 Type ServerCapabilities

Table 6.1.6.2.8.10-1: Definition of type ServerCapabilities

Attribute name	Data type	P	Cardinality	Description	Applicability
mandatoryCapability	array(Uint32)	O_C	0..N	This field can represent a single determined mandatory capability or a set of capabilities of an S-CSCF, as described in TS 29.228 [260] clause 6.7.	
optionalCapability	array(Uint32)	O_C	0..N	This field can represent a single determined optional capability or a set of capabilities of an S-CSCF, as described in TS 29.228 [260] clause 6.7.	
serverName	array(string)	O_C	0..N	This field contains a SIP-URL (as defined in IETF RFC 3261 [406] and IETF RFC 3986 [404]), used to identify a SIP server (e.g. S-CSCF name).	

6.1.6.2.8.11 Type TrunkGroupID

Table 6.1.6.2.8.11-1: Definition of type TrunkGroupID

Attribute name	Data type	P	Cardinality	Description	Applicability
incomingTrunkGroupID	string	O_C	0..1	This field identifies the incoming PSTN leg.	
outgoingTrunkGroupID	string	O_C	0..1	This field identifies the outgoing PSTN leg.	

6.1.6.2.8.12 Type MessageBody

Table 6.1.6.2.8.12-1: Definition of type MessageBody

Attribute name	Data type	P	Cardinality	Description	Applicability
contentType	string	M	0..1	This field holds the media type (e.g. application/sdp, text/html) of the message-body, as described in RFC 3261 [406].	
contentLength	Uint32	M	0..1	This field holds the size of the message-body, as described in RFC 3261 [406].	
contentDisposition	string	O_C	0..1	This field indicates how the message body, or a message body part is to be interpreted (e.g. session, render), as described in RFC 3261 [406].	
originator	OriginatorPartyType	O_C	0..1	This field indicates the originating party of the message body.	

6.1.6.2.8.13 Type AccessTransferInformation

Table 6.1.6.2.8.13-1: Definition of type AccessTransferInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
accessTransferType	AccessTransferType	O_C	0..1	This field indicates which type of transfer occurred for IMS service continuity.	
accessNetworkInformation	array(OctetString)	O_C	0..N	This field indicates one instance of the SIP P-header "P-Access-Network-Info".	
cellularNetworkInformation	OctetString	O_C	0..1	This field indicates one instance of the SIP header "Cellular-Network-Info".	
interUETransfer	UETransferType	O_C	0..1	This field contains information about type of the transfer. If this AVP is not present, this means that the type of transfer is Intra-UE transfer.	
userEquipmentInfo	Pei	O_C	0..1	This field contains the identity and capability of the terminal the subscriber is using.	
instanceId	string	O_C	0..1	This field contains a URN generated by the device that uniquely identifies a specific device amongst all other devices.	
relatedIMSChargingIdentifier	string	O_C	0..1	This field holds the Related IMS Charging Identifier (ICID) as generated by the Enhanced MSC Server or the P-CSCF for the target access leg of an SRVCC access transfer.	
relatedIMSChargingIdentifierNode	IMSAddress	O_C	0..1	This field holds the identifier of the Enhanced MSC Server or the P-CSCF that generated the Related IMS Charging Identifier (ICID).	
changeTime	DateTime	O_C	0..1	This field holds the time in UTC format when the change was registered.	

6.1.6.2.8.14 Type AccessNetworkInfoChange

Table 6.1.6.2.8.14-1: Definition of type AccessNetworkInfoChange

Attribute name	Data type	P	Cardinality	Description	Applicability
accessNetworkInformation	array(OctetString)	O_C	0..N	This field indicates one instance of the SIP P-header "P-Access-Network-Info".	
cellularNetworkInformation	OctetString	O_C	0..1	This field indicates one instance of the SIP header "Cellular-Network-Info".	
changeTime	DateTime	O_C	0..1	This field holds the time in UTC format when the change was registered.	

6.1.6.2.8.15 Type NNIInformation

Table 6.1.6.2.8.15-1: Definition of type NNIInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
sessionDirection	NNISessionDirection	O_C	0..1	This field indicates whether the NNI is used for an inbound or outbound service request on the control plane in case of interconnection and roaming.	
nNIType	NNIType	O_C	0..1	This field indicates whether the type of used NNI is non-roaming, roaming without loopback routing or roaming with loopback routing	
relationshipMode	NNIRelationshipMode	O_C	0..1	This field indicates whether the other functional entity (e.g. contact point of the neighbouring network) is regarded as part of the same trust domain.	
neighbourNodeAddress	IMSAddress	O_C	0..1	This field holds the control plane IP address of the neighbouring network contact point that handles the service request in case of interconnection and roaming	

6.1.6.2.8.16 Void

6.1.6.2.8.17 Type SDPTimeStamps

Table 6.1.6.2.8.17-1: Definition of type SDPTimeStamps

Attribute name	Data type	P	Cardinality	Description	Applicability
sDPOfferTimestamp	DateTime	O_C	0..1	This field holds the time in UTC format of the SDP offer.	
sDPAnswerTimestamp	DateTime	O_C	0..1	This field holds the time in UTC format of the response to the SDP offer.	

6.1.6.2.8.18 Type IMSAddress

Table 6.1.6.2.8.18-1: Definition of type IMSAddress

Attribute name	Data type	P	Cardinality	Description	Applicability
ipv4Addr	Ipv4Addr	O_C	0..1	IPv4 address (NOTE)	
ipv6Addr	Ipv6Addr	O_C	0..1	IPv6 address (NOTE)	
e164	E164	O_C	0..1	E.164 address (NOTE)	
NOTE: At least one of these IEs shall be present.					

6.1.6.2.9 Announcement Specified Data Type

6.1.6.2.9.1 Type MultipleUnitInformation

This clause is additional attributes of the type MultipleUnitInformation defined in clause 6.1.6.2.1.8 for announcement described in 3GPP TS 32.281 [34].

Table 6.1.6.2.x.9-1: Announcement specified attribute of type MultipleUnitInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
announcementInformation	AnnouncementInformation	Oc	0..1	This field contains the announcement related information.	Announcement

6.1.6.2.9.2 Type AnnouncementInformation

Table 6.1.6.2.9.2-1: Definition of type AnnouncementInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
announcementIdentifier	Uint32	O_M	1	the announcement to be played.	
announcementReference	Uri	O_M	1	the reference to where information regarding the announcement can be found, this can be a URI or URL.	
variableParts	array(VariablePart)	O_C	0..N	the list of elements specifying each variable part to be played.	
timeToPlay	DurationSec	O_C	0..1	the announcement to be played at the specified time before granted time units are exhausted. If the value is set to zero, the announcement is to be played at time when time quota is exhausted. If the field is not present, it indicates that the announcement is to be played immediately.	
quotaConsumptionIndicator	QuotaConsumptionIndicator	O_C	0..1	an indicates whether the granted quota is to be consumed during announcement setup and played or not. If the field is not present, the quota consumption is receiver dependent.	
announcementPriority	Uint32	O_C	0..1	the priority when multiple announcement information blocks are provided in a single message with the same timeToPlay indicator, where zero is the highest priority. If the field is not present or several have the same priority, the order is receiver dependent.	
playToParty	PlayToParty	O_C	0..1	the party served or remote, to which the announcement is to be played. If the field is not present, it is to be played to served.	
announcementPrivacyIndicator	AnnouncementPrivacyIndicator	O_C	0..1	indicates if the announcement is private not. If the field is not present, it is private.	
language	Language	O_C	0..1	a language tag of the announcement to be played. If the field is not present, the language is receiver dependent.	

6.1.6.2.9.3 Type VariablePart

Table 6.1.6.2.9.3-1: Definition of type VariablePart

Attribute name	Data type	P	Cardinality	Description	Applicability
variablePartType	VariablePartType	M	1	the type of the variable part i.e., how the value is to be interpreted.	
variablePartValue	string	M	1..N	the variable part to be played.	
variablePartOrder	Uint32	O_C	0..1	The order in which the variable part shall be played, where zero is the first. If the field is not present or several have the same priority, the order is receiver dependent.	

6.1.6.2.10 MMTel Specified Data Type

6.1.6.2.10.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.4.1.2.1 for MMTel charging described in 3GPP TS 32.275 [33].

Table 6.1.6.2.10.1-1: IMS specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
mMTelChargingInformation	MMTelChargingInformation	O_C	0..1	This field holds the MMTel specific information.	IMS

6.1.6.2.10.2 Type ChargingDataResponse

This clause is additional attributes of the type ChargingDataResponse defined in clause 6.4.1.2.2 for MMTel charging described in 3GPP TS 32.275 [33].

Table 6.1.6.2.10.2-1: IMS specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.10.3 Type MMTelChargingInformation

Table 6.1.6.2.10.3-1: Definition of type MMTelChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
supplementaryServices	SupplementaryService	O_M	1..N	This field holds the associated supplementary services. It can be present multiple times as necessary to present the parallel activity of the different supplementary services.	

6.1.6.2.10.4 Type SupplementaryService

Table 6.1.6.2.10.4-1: Definition of type SupplementaryService

Attribute name	Data type	P	Cardinality	Description	Applicability
supplementaryServiceType	SupplementaryServiceType	O_M	1	This field identifies the type of supplementary service.	
supplementaryServiceMode	SupplementaryServiceMode	O_C	0..1	This field provides the mode for CDIV, CB and ECT supplementary services	
numberOfDiversions	Uint32	O_C	0..1	This field holds the and holds the number of diversions related to a CDIV service.	
associatedPartyAddress	string	O_C	0..1	This filed holds the address (SIP URI or Tel URI) of the user, the supplementary service is provided to: - the "forwarding party" for CDIV - the "transferor" for ECT - the "pilot identity" for FA - the "initiator party" for 3PTY.	
conferenceId	string	O_C	0..1	This filed holds the conference ID.	
participantActionType	ParticipantActionType	O_C	0..1	This field holds the participant's action type during the conference, see TS 24.605 [102].	
changeTime	DateTime	O_C	0..1	This filed holds the UTC time indicating the moment when the conference participant has an action (e.g., creating the conference, joining in the conference, being invited into the conference, and quitting the conference).	
numberOfParticipants	Uint32	O_C	0..1	This field holds for the - initial request the number of invited parties - interim / update request the number of parties who are currently attached in the session.	
cUGInformation	OctetString	O_C	0..1	This field holds the "CUG Interlock Code" which identifies CUG membership within the network.	

6.1.6.2.11 5G ProSe Specified Data Type

6.1.6.2.11.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.5.2.2 for 5G ProSe charging described in TS 32.277[35].

Table 6.1.6.2.11.1-1: 5G ProSe Specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
proseChargingInformation	ProSeChargingInformation	O_M	0..1	This field holds the 5G ProSe specific information.	

6.1.6.2.11.2 Type ChargingDataResponse

This clause is additional attributes of the type ChargingDataResponse defined in clause 6.5.2.2 for 5G ProSe charging described in TS 32.277[35].

Table 6.1.6.2.11.2-1: 5G ProSe Specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.11.3 Type UsedUnitContainer

Table 6.1.6.2.11.3-1: 5G ProSe Specified portion of type UsedUnitContainer

Attribute name	Data type	P	Cardinality	Description	Applicability
pC5Container Information	PC5Container Information	O_C	0..1	This field holds the PC5 container information	

6.1.6.2.11.4 Type PC5ContainerInformation

This clause is additional portion of the type PC5ContainerInformation defined in clause 6.5.2.2 for 5G ProSe charging described in TS 32.277[35].

Table 6.1.6.2.11.4-1: 5G ProSe Specified portion of type PC5ContainerInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
coverageInfoList	array (CoverageInfo)	O_C	0..N	This IE provides information on the coverage information.	
radioParameter SetInfoList	array (RadioParameter SetInfo)	O_C	0..N	This IE provides information on a radio parameter set configured in the UE for direct communication use	
transmitterInfoList	array (TransmitterInfo)	O_C	0..N	This IE provides information on a transmitter detected for direct communication	
timeOfFirstTransmission	DateTime	O_C	0..1	This IE holds the time in UTC format for the first packet transmitted	
timeOfFirstReception	DateTime	O_C	0..1	This IE holds the time in UTC format for the first packet received.	

6.1.6.2.11.5 Type CoverageInfo

Table 6.1.6.2.11.5-1: 5G ProSe Specified portion of type CoverageInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
coverageStatus	boolean	O_C	0..1	Whether the UE is served by NG-RAN or not	
changeTime	DateTime	O_C	0..1	The time when the coverage status changed to its current state.	
locationInfo	array(LocationInfo)	O_C	0..N	It provides UE location Information. When in NG-RAN coverage, additionally includes a list of location changes	

6.1.6.2.11.6 Type RadioParameterSetInfo

This clause is additional portion of the type RadioParameterSetInfo defined in clause 6.5.2.2 for 5G ProSe charging described in TS 32.277[35].

Table 6.1.6.2.11.6-1: 5G ProSe Specified portion of type RadioParameterSetInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
radioParameterSetValues	array(OctetString)	O_C	0..N	It provides the radio parameter set configured in the UE for direct communication. The format of the value is according to the SL-Preconfiguration data type.	
changeTimestamp	DateTime	O_C	0..1	The time when associated time stamp of when Radio Parameters became active.	

6.1.6.2.11.7 Type TransmitterInfo

This clause is additional portion of the type TransmitterInfo defined in clause 6.5.2.2 for 5G ProSe charging described in TS 32.277[35].

Table 6.1.6.2.11.7-1: 5G ProSe Specified portion of type TransmitterInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
proseSourceIPAddress	IpAddr	O_C	0..1	Source IP address of ProSe UE	

6.1.6.2.11.8 Type ProseChargingInformation

Table 6.1.6.2.11.8-1: Definition of type ProseChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
announcingPlmnID	PlmnId	O_C	0..1	PLMN identity of the serving PLMN which signalled the carrier frequency.	
announcingUeHplmnIdentifier	PlmnId	O_M	0..1	PLMN identity of HPLMN for announcing UE.	
announcingUeVplmnIdentifier	PlmnId	O_C	0..1	PLMN identity of VPLMN for announcing UE	
monitoringUeHplmnIdentifier	PlmnId	O_C	0..1	PLMN identity of HPLMN for monitoring UE.	
monitoringUeVplmnIdentifier	PlmnId	O_C	0..1	PLMN identity of VPLMN for monitoring UE.	
discovererUeHplmnIdentifier	PlmnId	O_M	0..1	PLMN identity of Discoverer UE HPLMN.	
discovererUeVplmnIdentifier	PlmnId	O_C	0..1	PLMN identity of Discoverer UE VPLMN.	
discovereeUeHplmnIdentifier	PlmnId	O_C	0..1	PLMN identity of Discoveree UE HPLMN.	
discovereeUeVplmnIdentifier	PlmnId	O_C	0..1	PLMN identity of Discoveree UE VPLMN.	
monitoredPlmnIdentifier	PlmnId	O_C	0..1	Monitored PLMN ID in Match_Report request	
proseApplicationID	string	O_C	0..1	The identities used for ProSe Direct Discovery, identifying application related information for the ProSe-enabled UE	
applicationID	string	O_C	0..1	The identifier a specific 3rd party application.	
applicationSpecificDataList	array(Octet String)	O_C	0..N	This IE contains a data block provided by the application in the UE as specified in clause 11.3.3 of TS 24.334 [308]	
proseFunctionality	ProseFunctionality	O_C	0..1	This IE holds the ProSe functionality UE is requesting	
proseEventType	ProseEventType	O_C	0..1	This IE holds the event which triggers the charging message delivery	
directDiscoveryModel	DirectDiscoveryModel	O_C	0..1	This IE holds the model of the Direct Discovery used by the UE.	
validityPeriod	integer	O_C	0..1	Time interval during which user is authorized for using ProSe Direct Discovery	
roleOfUE	RoleOfUE	O_C	0..1	Role of the UE using ProSe	
proseRequestTimestamp	DateTime	O_C	0..1	The time when ProSe Request is received from UE.	
pC3ProtocolCause	integer	O_C	0..1	This IE holds the particular reason why a DISCOVERY_REQUEST or Match_Report messages from the UE have been rejected by the 5G DDNMF in PC3 interface.	
monitoringUEIdentifier	Supi	O_M	0..1	Identifier of the party who initiate monitor/match report	
requestedPLMNIdentifier	PlmnId	O_C	0..1	The PLMN identifier of the user who is targeted in proximity request.	
timeWindow	integer	O_C	0..1	The time interval in minutes during which a proximity request is valid.	
rangeClass	RangeClass	O_C	0..1	A range class for the first proximity request.	
proximityAlertIndication	Boolean	O_C	0..1	Indication of whether proximity alert has been sent before proximity request cancellation.	
proximityAlertTimestamp	DateTime	O_C	0..1	The time stamp when proximity alert is sent, to indicate two UEs are in proximity.	

Attribute name	Data type	P	Cardinality	Description	Applicability
proximityCancellationTimestamp	DateTime	O_C	0..1	The time stamp when proximity request cancellation is requested.	
relayIPAddress	IpAddr	O_C	0..1	The IP address UE used as ProSe UE-to-Network Relay UE address	
proseUEToNetworkRelayUEID	string	O_C	0..1	A link layer identifier that uniquely represents the ProSe UE-to-Network Relay UE	
proseDestinationLayer2ID	string	O_C	0..1	The identifier of a link-layer that identifies a device or a group of devices that are recipients of ProSe communication frames.	
pFIContainerInformation	array(pFIContainerInformation)	O_C	0..N	This field holds the PFI data container information	
transmissionDataContainer	array(PC5DataContainer)	O_C	0..N	The container associated to a trigger conditions	
receptionDataContainer	array(PC5DataContainer)	O_C	0..N	This field holds the container associated to a trigger conditions	

6.1.6.2.11.9 Type PFIContainerInformation

This clause is additional portion of the type PFIContainerInformation defined in clause 6.5.2.2 for 5G ProSe charging described in TS 32.277[35].

Table 6.1.6.2.11.9-1: 5G ProSe Specified portion of type PFIContainerInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
pFI	Qfi	O_M	0..1	PC5 QoS flow Identifier (PFI)	
reportTime	DateTime	O_M	1	the UTC time indicating time stamp when the QFI data container was closed	
timeofFirstUsage	DateTime	O_C	0..1	the UTC time indicating time stamp for the first IP packet to be transmitted and mapped to the PFI container	
timeofLastUsage	DateTime	O_C	0..1	the UTC time indicating time stamp for the last IP packet to be transmitted and mapped to the PFI container.	
qoSInformation	QoSData	O_C	0..1	the PC5 QoS applied to PFI container. In case gbrUl or gbrDl are present for GBR QoS flow, the GBR targets are "GUARANTEED", otherwise, are " NOT_GUARANTEED".	
qoSCharacteristics	QosCharacteristics	O_C	0..1	Map of PC5 QoS characteristics for non standard PQIs and non-preconfigured PQIs.	
userLocationInformation	UserLocation	O_C	0..1	provides information on the location	
uetimeZone	TimeZone	O_C	0..1	UE Time Zone the UE is currently located	
presenceReportingAreaInformation	map(PresenceInfo)	O_C	0..N	the Presence Reporting Area status of UE during the PFI container interval.	

6.1.6.2.11.10 Type PC5DataContainer

Table 6.1.6.2.11.10-1: 5G ProSe Specified portion of type PC5DataContainer

Attribute name	Data type	P	Cardinality	Description	Applicability
localSequenceNumber	string	O_C	0..1	The sequence number of the Direct Communication data container	
changeTime	DateTime	O_C	0..1	The time when the container is closed and reported due to ProSe charging condition change.	
coverageStatus	boolean	O_C	0..1	Whether UE is served by NG-RAN or not	
userLocationInformation	UserLocation	O_C	0..1	The location of the UE	
dataVolume	Uint64	O_C	0..1	This field holds the amount of volume transmitted or received	
changeCondition	string	O_C	0..1	ProSe specific reason for closing the container	
usageInfoReportSN	string	O_C	0..1	The sequence number of usage information report, which is used to generate the container.	
radioResourcesId	RadioResourcesIndicator	O_C	0..1	This IE identifies whether the operator-provided radio resources or the configured radio resources were used for ProSe direct communication.	
radioFrequency	string	O_C	0..1	This IE identifies the radio frequency used for ProSe direct communication as specified in clause 9.3 of TS 38.331 [307]	
pC5RadioTechnology	string	O_M	0..1	The PC5 radio technology used by UE	

6.1.6.2.12 Edge computing domain charging specified data type

6.1.6.2.12.1 Type ChargingDataRequest

This clause is additional attributes of the type ChargingDataRequest defined in clause 6.1.6.2.1.1 for edge computing domain charging described in TS 32.257 [36].

Table 6.1.6.2.12.1-1: Edge computing domain specified attribute of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
eASID	string	O_M	0..1	This field holds the EAS ID.	EdgeComputing
eDNID	string	O_M	0..1	This field holds the DN of EdgeDataNetwork MOI.	EdgeComputing
eASProvider Identifier	string	O_M	0..1	This field holds the identifier of the ASP that provides the EAS.	EdgeComputing
edgeInfrastructur eUsageChargingI nformation	EdgeInfrastructureU sageChargingInform ation	O_M	0..1	This field holds the edge enabling infrastructure resource usage charging specific information.	EdgeComputing
eASDeployment ChargingInformat ion	EASDeploymentCha rgingInformatio	O_M	0..1	This field holds the EAS deployment charging specific information.	EdgeComputing
directEdgeEnabli ngServiceChargi ngInformation	NEFChargingInform ation	O_M	0..1	This field holds the charging information the edge enabling services directly provided by EES, only used if structured charging information is required.	EdgeComputing
exposedEdgeEn ablingServiceCha rgingInformation	NEFChargingInform ation	O_M	0..1	This field may hold the charging information of the edge enabling services exposed.	EdgeComputing

Editor's note: all attribute names and data types are FFS dependent TS 24.558 [311] and TS 29.558 [309] release.

6.1.6.2.12.2 Type ChargingDataResponse

This clause specifies additional attributes of the type ChargingDataResponse defined in clause 6.1.6.2.1.2 for edge computing domain charging described in TS 32.257 [36].

Table 6.1.6.2.12.2-1: Edge computing domain specified attribute of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability

6.1.6.2.12.3 Type EdgeInfrastructureUsageChargingInformation

Table 6.1.6.2.12.3-2: Definition of type EdgeInfrastructureUsageChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
meanVirtualCPUUsage	Float	O_C	0..1	This field holds the information of mean virtual CPU usage for the EAS, see VR.VCpuUsageMean in clause 5.7.1.1.1 of T TS 28.552 [263].	
meanVirtualMemoryUsage	Float	O_C	0..1	This field holds the information of mean virtual memory usage for the EAS, see VR.VMemoryUsageMean in clause 5.7.1.2.1 of TS 28.552 [263].	
meanVirtualDiskUsage	Float	O_C	0..1	This field holds the information of mean virtual disk usage for the EAS, see VR.VDiskUsageMean in clause 5.7.1.2.1 of TS 28.552 [263].	
durationStartTime	DateTime	O_C	0..1	This field holds the start time of the collection period, see TS 28.550 [262].	
durationEndTime	DateTime	O_C	0..1	This field holds the end time of the collection period, see TS 28.550 [262].	

6.1.6.2.12.4 Type EASDeploymentChargingInformation

Table 6.1.6.2.12.4-2: Definition of type DirectEdgeEnablingServiceChargingInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
eEASDeploymentRequirements	EASRequirements	O_C	0..1	This field holds the EAS Deployment Requirements, see TS 28.538 [310], including the Required EAS Serving Location, Software Image Info, Affinity Anti Affinity and Service Continuity.	
lCMEventType	ManagementOperation	O_C	0..1	This field holds the management operation notification for LCM event. See clause 11.1.1 in TS 28.532 [253]	
lCMStartTime	DateTime	O_M	0..1	This field holds the start time of the EAS LCM process, see Start Time in clause 8.3.6.5 Type measJobInfo-ResourceType in TS 28.550 [262].	
lCMEndTime	DateTime	O_M	0..1	This field holds the end time of the EAS LCM process, see Stop Time in clause 8.3.6.5 Type measJobInfo-ResourceType in TS 28.550 [262].	

6.1.6.2.12.5 Type EASRequirements

Table 6.1.6.2.12.5-1: Definition of type EASRequirements

Attribute name	Data type	P	Cardinality	Description	Applicability
requiredEASservingLocation	ServingLocation	OC	1	The location where the EAS service should be available (see clause 6.3.2 of TS 28.538 [310]).	
softwareImageInfo	SoftwareImageInfo	OC	1	The software image information.	
affinityAntiAffinity	AffinityAntiAffinity	OC	1	The affinity and anti-requirements of the EAS with other EAS on the same EDN.	
serviceContinuity	Boolean	OC	1	Indicates if the service continuity is required by the EAS. If the value is TRUE, the EAS will be deployed with an EES supporting service continuity.	
virtualResource	VirtualResource	OC	1	The virtual resource requirements of an EAS.	

6.1.6.3 Simple data types and enumerations

6.1.6.3.1 Introduction

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

6.1.6.3.2 Simple data types

The simple data types defined in table 6.1.6.3.2-1 shall be supported.

Table 6.1.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability
Diagnostics	integer	A more detailed cause value from SMF	
IPFilterRule	string	Filter rules corresponding to services	
N2ConnectionMessageType	integer	N2 message type received by the AMF	
LocationReportingMessageType	integer	Location reporting message type	
Language	string	Language tag as defined in RFC 5646 [408].	
OctetString	string	This field is encoded as a octet string in hexadecimal representation. Each character in the string shall take a value of "0" to "9", "a" to "f" or "A" to "F". The most significant character representing the most significant bits shall appear first in the string. Pattern: '^[A-Fa-f0-9]+$'	
E164	string	This field is encoded as a TBCD-string, see TS 29.002 [261]. Pattern: '^[A-Fa-f0-9]+$'	

6.1.6.3.3 Enumeration: NotificationType

Table 6.1.6.3.3-1: Enumeration NotificationType

Enumeration value	Description	Applicability
REAUTHORIZATION	This value is used to indicate re-authorization.	
ABORT_CHARGING	This value is used to indicate termination of charging for PDU session.	

6.1.6.3.4 Enumeration: NodeFunctionality

Table 6.1.6.3.4-1: Enumeration NodeFunctionality

Enumeration value	Description	Applicability
SMF	This field identifies that NF is a SMF.	
AMF	This field identifies that NF is a AMF.	
SMSF	This field identifies that NF service consumer is a SMSF.	
PGW_C_SMF	This field identifies that NF is a SMF+PGW-C.	
NEF	This field identifies that NF is a NEF.	
SGW	This field identifies that node is an SGW, only applicable for interworking with EPC.	
I_SMF	This field identifies that node is an I-SMF, only applicable for PDU session served by SMF + I-SMF.	ETSUN
ePDG	This field identifies that node is an ePDG, only applicable for interworking with EPC/ePDG.	5GIEPC_CH
CEF	This field identifies that NF is a CEF.	
MnS_Producer	This field identifies that NF is a MnS Producer	
SGSN	This field identifies that node is an SGSN, only applicable when SMF+PGW-C serves GERAN/UTRAN access.	TEI17_NIESGU
V_SMF	This field identifies that node is a V-SMF, may be used instead of SMF in roaming scenarios.	
5G_DDNMF	This field identifies that NF is a 5G DDNMF	5G ProSe
IMS_Node	This field identifies that NF is an IMS Node. A further breakdown of IMS Node type may be available in IMS Charging Information	IMS
EES	This field identifies that NF is an EES.	EdgeComputing

6.1.6.3.5 Enumeration: ChargingCharacteristicsSelectionMode

Table 6.1.6.3.5-1: Enumeration ChargingCharacteristicsSelectionMode

Enumeration value	Description	Applicability
HOME_DEFAULT	the subscriber belongs to the same PLMN as the SMF	
ROAMING_DEFAULT	the subscriber belongs to same PLMN and the AMF belongs to a different PLMN	
VISITING_DEFAULT	the subscriber belongs to a different PLMN	

6.1.6.3.6 Enumeration: TriggerType

Table 6.1.6.3.6-1: Enumeration TriggerType

Enumeration value	Description	Applicability
QUOTA_THRESHOLD	the quota threshold has been reached	
QHT	the quota holding time specified in a previous response has been hit (i.e. the quota has been unused for that period of time)	
FINAL	a service normal termination has occurred.	
QUOTA_EXHAUSTED	the quota has been exhausted	
VALIDITY_TIME	the credit authorization lifetime provided from CHF has expired	
OTHER_QUOTA_TYPE	usage reporting of the particular quota type indicated in the used unit container where it appears is that, for a multi-dimensional quota, one reached a trigger condition and the other quota is being reported.	
FORCED_REAUTHORISATION	a Server initiated re-authorization procedure, i.e. receipt of notify service operation	
UNIT_COUNT_INACTIVITY_TIMER	the unit count inactivity timer has expired	
ABNORMAL_RELEASE	a service abnormal termination has occurred.	
QOS_CHANGE	In request message, this value is used to indicate that QoS change has happened. Any of elements of QoSData may result in QoS change. In response message, this value is used to indicate that a change of authorized QoS shall cause the service consumer to ask for a re-authorization of the associated quota.	
VOLUME_LIMIT	Volume limit has been reached.	
TIME_LIMIT	Time limit has been reached	
EVENT_LIMIT	Event limit has been reached	
PLMN_CHANGE	PLMN has been changed. For IMS this could be indicated by a SIP MESSAGE with a change of PLMN ID during an ongoing call.	
USER_LOCATION_CHANGE	In request message, this value is used to indicate that User location has been changed. The change in location information that triggered reporting is included. In response message, this value is used to indicate that a change in the end user location shall cause the service consumer to ask for a re-authorization of the associated quota	
RAT_CHANGE	In request message, this value is used to indicate that RAT type has been changed. In response message, this value is used to indicate that a change in the radio access technology shall cause the service consumer to ask for a re-authorization of the associated quota	
SESSION_AMBR_CHANGE	In request message, this value is used to indicate that Session AMBR has been changed. In response message, this value is used to indicate that a change in the session AMBR shall cause the service consumer to ask for a re-authorization of the associated quota.	

GFBR_GUARANTEED_STATUS_CHANGE	In request message,thisvalue is used to indicate that GFBR targets for the indicated SDFs are changed ("NOT_GUARANTEED" or "GUARANTEED" again). In response message, this value is used to indicate that a NF Consumer (CTF) needs to ensure requesting the notification from the access network and that a change in the GFBR targets shall cause the service consumer to ask for a re-authorization of the associated quota.	
UE_TIMEZONE_CHANGE	In request message, this value is used to indicate that UE timezone has been changed. In response message, this value is used to indicate that a change in the time zone where the end user is located shall cause the service consumer to ask for a re-authorization of the associated quota.	
TARIFF_TIME_CHANGE	Tariff time change has happened.	
MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS	Max number of change has been reached	
MANAGEMENT_INTERVENTION	Management intervention	
CHANGE_OF_UE_PRESENCE_IN_PRESENCE_REPORTING_AREA	In request message, this value is used to indicate that Change of UE presence in PRA has happened. In response message, this value is used to indicate a request of reporting the event that the user enters/leaves the area(s) as indicated in the presenceReportingArea Attribute	
CHANGE_OF_3GPP_PS_DATA_OFF_STATUS	In request message, this value is used to indicate that Change of 3GPP PS Data off status has happened. In response message, this value is used to indicate that a change in the 3GPP PS Data off status shall cause the service consumer to ask for a re-authorization of the associated quota	
SERVING_NODE_CHANGE	A serving node (e.g., AMF) change in the NF Consumer	
REMOVAL_OF_UPF	A used UPF is removed	
ADDITION_OF_UPF	A new UPF is added.	
INSERTION_OF_ISMF	A new I-SMF is inserted	ETSUN
REMOVAL_OF_ISMF	A used I-SMF is removed	ETSUN
CHANGE_OF_ISMF	A used I-SMF is removed, and a new I-SMF is inserted	ETSUN
START_OF_SERVICE_DATA_FLOW	A Service Data Flow has started	
HANDOVER_CANCEL	The handover is cancelled.	
HANDOVER_START	The handover is start.	
HANDOVER_COMPLETE	The handover is completed.	
ECGI_CHANGE	In request message, this value is used to indicate that ECGI has been changed. In response message, this value is used to indicate that a change in the end user location shall cause the service consumer to ask for a re-authorization of the associated quota	5GIEPC_CH
TAI_CHANGE	In request message, this value is used to indicate that TAI has been changed. In response message, this value is used to indicate that a change in the end user location shall cause the service consumer to ask for a re-authorization of the associated quota	5GIEPC_CH
ADDITION_OF_ACCESS	Addition of access to the MA PDU session	ATSSS
REMOVAL_OF_ACCESS	Removal of access to the MA PDU session	ATSSS

START_OF_SDF_ADDITIONAL_ACCESS	Start of service data flow on additional access in a MA PDU session	ATSSS
REDUNDANT_TRANSMISSION_CHANGE	In request message, this value is used to indicate whether redundant transmission has been activated or not. In response message, this value is used to indicate that a change for the redendant transmission shall cause the service consumer to ask for a re-authorization and reporting.	URLLC
CGI_SAI_CHANGE	In request message, this value is used to indicate that CGI-SAI has been changed. In response message, this value is used to indicate that a change in the end user location shall cause the service consumer to ask for a re-authorization of the associated quota	TEI17_NIESGU
RAI_CHANGE	In request message, this value is used to indicate that RAI has been changed. In response message, this value is used to indicate that a change in the end user location shall cause the service consumer to ask for a re-authorization of the associated quota	TEI17_NIESGU

6.1.6.3.7 Enumeration: FinalUnitAction

Table 6.1.6.3.7-1: Enumeration FinalUnitAction

Enumeration value	Description	Applicability
TERMINATE	The service consumer should terminate the service session.	
REDIRECT	The service consumer should redirect the user to the address specified in the redirectServerAddress attribute.	
RESTRICT_ACCESS	The service consumer should restrict the user access according to the IP packet filters defined in the restrictionFilterRule attribute or according to the IP packet filters identified by the filterId attribute.	

6.1.6.3.8 Enumeration: RedirectAddressType

Table 6.1.6.3.8-1: Enumeration RedirectAddressType

Enumeration value	Description	Applicability
IPV4	the redirect server address is IPV4.	
IPV6	the redirect server address is IPV6.	
URL	the redirect server address is URL.	
URI	the redirect server address is URI. String providing an URI formatted according to IETF RFC 3261 [406].	

6.1.6.3.9 Enumeration: TriggerCategory

Table 6.1.6.3.9-1: Enumeration TriggerCategory

Enumeration value	Description	Applicability
IMMEDIATE_REPORT	chargeable events for which, when occurring, the charging data generated by the NF Consumer triggers a Charging Event towards the CHF.	
DEFERRED_REPORT	chargeable events for which, when occurring, the charging data generated by the NF Consumer, does not trigger a Charging Event towards the CHF .	

6.1.6.3.10 Enumeration: QuotaManagementIndicator

Table 6.1.6.3.10-1: Enumeration QuotaManagementIndicator

Enumeration value	Description	Applicability
ONLINE_CHARGING	quota management control	
OFFLINE_CHARGING	without quota management control	
QUOTA_MANAGEMENT_SUSPENDED	quota management control suspended	CHFCQM

6.1.6.3.11 Enumeration: FailureHandling

Table 6.1.6.3.11-1: Enumeration FailureHandling

Enumeration value	Description	Applicability
TERMINATE	the service shall only be granted for as long as there is a connection between NF consumer and the CHF.	
CONTINUE	the NF consumer should re-send and continue the request to an alternative server in the case of transport temporary failures, provided that a failover procedure is supported in the CHF and the NF consumer, and that an alternative server is available. Otherwise, the service SHOULD be granted, even if charging data request can't be delivered.	
RETRY_AND_TERMINATE	the NF consumer should re-send the request to an alternative server in the case of transport temporary failures, provided that a failover procedure is supported in the CHF and NF consumer, and that an alternative server is available. Otherwise, the service should not be granted when the charging data request can't be delivered.	

6.1.6.3.12 Enumeration: SessionFailover

Table 6.1.6.3.12-1: Enumeration SessionFailover

Enumeration value	Description	Applicability
FAILOVER_NOT_SUPPORTED	The Nchf_ConvergedCharging messages could not be moved to an alternative destination in the case of communication failure. This is the default behaviour if the attribute is not present in the response.	
FAILOVER_SUPPORTED	The Nchf_ ConvergedCharging messages should be moved to an alternative destination in the case of communication failure.	

6.1.6.3.13 Enumeration: 3GPPPSDataOffStatus

Table 6.1.6.3.13-1: Enumeration 3GPPPSDataOffStatus

Enumeration value	Description	Applicability
ACTIVE	3GPP PS data off status is active.	
INACTIVE	3GPP PS data off status is inactive.	

6.1.6.3.14 Enumeration: ResultCode

Table 6.1.6.3.14-1: Enumeration ResultCode

Enumeration value	Description	Applicability
SUCCESS	The CHF grants the service to the end-user. This applies to the rating group.	
END_USER_SERVICE_DENIED	The CHF denies the service request due to end-user service restrictions or limitations related to the end-user. If the request contained used units they shall be deducted, if applicable. This applies to the rating group.	
QUOTA_MANAGEMENT_NOT_APPLICABLE	The CHF determines that the service can be granted to the end user without quota management control and used units shall be reported. This applies to the rating group.	
QUOTA_LIMIT_REACHED	The CHF denies the service request since the end user's account could not cover the requested service. If the request contained used units they shall be deducted, if applicable. This applies to the rating group.	
END_USER_SERVICE_REJECTED	The CHF denies the service request in order to terminate the service for which credit is requested. This applies to the rating group.	
RATING_FAILED	The CHF determines that the service cannot be rated due to insufficient rating input, incorrect parameter combination or unrecognized parameter, or parameter value. This applies to the rating group.	
QUOTA_MANAGEMENT	The CHF determines that the quota management control can temporarily be suspended. This applies to the rating group.	CHFCQM

6.1.6.3.15 Enumeration: PartialRecordMethod

Table 6.1.6.3.15-1: Enumeration PartialRecordMethod

Enumeration value	Description	Applicability
DEFAULT	Default method used for partial records	
INDIVIDUAL	Individual methods used for partial records	

6.1.6.3.16 Enumeration: RoamerInOut

The enumeration RoamerInOut indicates whether the user is an in-bound or out-bound roamer.

Table 6.1.6.3.16-1: Enumeration RoamerInOut

Enumeration value	Description	Applicability
IN_BOUND	In-bound roamer.	
OUT_BOUND	Out-bound roamer.	

6.1.6.3.17 Void

6.1.6.3.18 Enumeration: SMMessageType

Table 6.1.6.3.18-1: Enumeration SMMessageType

Enumeration value	Description	Applicability
SUBMISSION	The SMS message type is submission.	
DELIVERY_REPORT	The SMS message type is delivery report.	
SM_SERVICE_REQUEST	The SMS message type is SMS service request.	
DELIVERY	The SMS message type is delivery or “to deliver”	

6.1.6.3.19 Enumeration: SMPriority

Table 6.1.6.3.19-1: Enumeration SMPriority

Enumeration value	Description	Applicability
LOW	low priority	
NORMAL	normal priority	
HIGH	high priority	

6.1.6.3.20 Enumeration: DeliveryReportRequested

Table 6.1.6.3.20-1: Enumeration DeliveryReportRequested

Enumeration value	Description	Applicability
YES	Delivey report is requested.	
NO	The delivery report is not requested.	

6.1.6.3.21 Enumeration: InterfaceType

Table 6.1.6.3.21-1: Enumeration InterfaceType

Enumeration value	Description	Applicability
UNKNOWN	Interface type is unknown,	
MOBILE_ORIGINATING	Interface type is mobile originated.	
MOBILE_TERMINATING	Interface type is mobile terminated.	
APPLICATION_ORIGINATING	Interface type is application originated.	
APPLICATION_TERMINATION	Interface type is application terminated.	

6.1.6.3.22 Enumeration: ClassIdentifier

Table 6.1.6.3.22-1: Enumeration ClassIdentifier

Enumeration value	Description	Applicability
PERSONAL	The class identifier is personal.	
ADVERTISEMENT	The class identifier is advertisement.	
INFORMATIONAL	The class identifier is informational.	
AUTO	The class identifier is auto.	

6.1.6.3.23 Enumeration: SMAddressType

Table 6.1.6.3.23-1: Enumeration SMAddressType

Enumeration value	Description	Applicability
EMAIL_ADDRESS	The carried address type is EMAIL.	
MSISDN	The carried address type is MSISDN.	
IPV4_ ADDRESS	The carried address type is IPv4.	
IPV6_ ADDRESS	The carried address type is IPv6.	
NUMERIC_SHORTCODE	The carried address type is numeric shortcode.	
ALPHANUMERIC_SHORTCODE	The carried address type is alphanumeric shortcode.	
OTHER	The carried address type is other.	
IMSI	The carried address type is IMSI	

6.1.6.3.24 Enumeration: SMAddresseeType

Table 6.1.6.3.24-1: Enumeration SMAddresseeType

Enumeration value	Description	Applicability
TO	The addressee type is TO.	
CC	The addressee type is CC.	
BCC	The addressee type is BCC.	

6.1.6.3.25 Enumeration: SMServiceType

Table 6.1.6.3.25-1: Enumeration SMServiceType

Enumeration value	Description	Applicability
VAS4SMS_SHORT_MESSAGE_CONTENT_PROCESSING	The type of SM service is VAS4SMS short message content processing.	
VAS4SMS_SHORT_MESSAGE_FORWARDING	The type of SM service is VAS4SMS short message forwarding.	
VAS4SMS_SHORT_MESSAGE_FORWARDING _MULTIPLE_SUBSCRIPTIONS	The type of SM service is VAS4SMS short message forwarding multiple subscriptions.	
VAS4SMS_SHORT_MESSAGE_FILTERING	The type of SM service is VAS4SMS short message filtering.	
VAS4SMS_SHORT_MESSAGE_RECEIPT	The type of SM service is VAS4SMS short message receipt.	
VAS4SMS_SHORT_MESSAGE_NETWORK_STORAGE	The type of SM service is VAS4SMS short message network storage.	
VAS4SMS_SHORT_MESSAGE_TO_MULTIPLE_DESTINATIONS	The type of SM service is VAS4SMS short message to multiple destinations.	
VAS4SMS_SHORT_MESSAGE_VIRTUAL_PRIVATE_NETWORK(VPN)	The type of SM service is VAS4SMS short message virtual private network.	
VAS4SMS_SHORT_MESSAGE_AUTO_REPLY	The type of SM service is VAS4SMS short message auto reply.	
VAS4SMS_SHORT_MESSAGE_PERSONAL_SIGNATURE	The type of SM service is VAS4SMS short message personal signature.	
VAS4SMS_SHORT_MESSAGE_DEFERRED_DELIVERY	The type of SM service is VAS4SMS short message deferred delivery.	

6.1.6.3.26 Enumeration: ReplyPathRequested

Table 6.1.6.3.26-1: Enumeration ReplyPathRequested

Enumeration value	Description	Applicability
NO_REPLY_PATH_SET	The reply SM to an original SM was requested to follow the same path.	
REPLY_PATH_SET	The reply SM to an original SM was not requested to follow the same path.	

6.1.6.3.27 Enumeration: DnnSelectionMode

Table 6.1.6.3.27-1: Enumeration DnnSelectionMode

Enumeration value	Description
"VERIFIED"	UE or network provided DNN, subscription verified
"UE_DNN_NOT_VERIFIED"	UE provided DNN, subscription not verified
"NW_DNN_NOT_VERIFIED"	Network provided DNN, subscription not verified

6.1.6.3.28 Enumeration: EventType

Table 6.1.6.3.28-1: Enumeration EventType

Enumeration value	Description	Applicability
IEC	This value is used to indicate immediate event charging.	
PEC	This value is used to indicate post event charging.	

6.1.6.3.29 Enumeration: MICOModeIndication

Table 6.1.6.3.29-1: Enumeration MICOModeIndication

Enumeration value	Description	Applicability
"MICO_MODE"	MICO Mode used	
"NO_MICO_MODE"	MICO Mode not used	

6.1.6.3.30 Enumeration: RegistrationMessageType

Table 6.1.6.3.30-1: Enumeration RegistrationMessageType

Enumeration value	Description	Applicability
"INITIAL"	Initial registration	
"MOBILITY"	Mobility registration update	
"PERIODIC"	Periodic registration update	
"EMERGENCY"	Emergency registration	
"DEREGISTRATION"	Deregistration	

6.1.6.3.31 Enumeration: SmsIndication

Table 6.1.6.3.31-1: Enumeration SmsIndication

Enumeration value	Description	Applicability
"SMS_SUPPORTED"	SMS over NAS is supported	
"SMS_NOT_SUPPORTED"	SMS over NAS is Not supported	

6.1.6.3.32 Enumeration: APIDirection

Table 6.1.6.3.32-1: Enumeration APIDirection

Enumeration value	Description	Applicability
INVOCATION	Indicates an API invocation from an AF.	
NOTIFICATION	Indicates a notification to an AF.	

6.1.6.3.33 Enumeration: ManagementOperation

Table 6.1.6.3.33-1: Enumeration ManagementOperation

Enumeration value	Description	Applicability
CREATE_MOI	createMOI management operation	
MODIFY_MOI_ATTR	modifyMOIAttributes management operation	
DELETE_MOI	deleteMOI management operation	
NOTIFY_MOI_CREATION	notifyMOICreation management operation notification	
NOTIFY_MOI_ATTR_CHANGE	notifyMOIAttributeValueChanges management operation notification	
NOTIFY_MOI_DELETION	notifyMOIDeletion management operation notification	

6.1.6.3.34 Enumeration: ManagementOperationStatus

Table 6.1.6.3.34-1: Enumeration ManagementOperationStatus

Enumeration value	Description	Applicability
OPERATION_SUCCEEDED	Management operation succeeded	
OPERATION_FAILED	Management operation failed	

6.1.6.3.35 Enumeration: IMSNodeFunctionality

Table 6.1.6.3.35-1: Enumeration IMSNodeFunctionality

Enumeration value	Description	Applicability
AS	This field identifies that NF is a AS.	
MRFC	This field identifies that NF is a MRFC.	
IMS_GWF	This field identifies that NF is a IMS-GWF.	

6.1.6.3.36 Enumeration: RedundantTransmissionType

Table 6.1.6.3.36-1: Enumeration RedundantTransmissionType

Enumeration value	Description	Applicability
NON_TRANSMISSION	Transmission without redundancy	
END_TO_END_USER_PLANE_PATHS	Dual Connectivity based end to end Redundant User Plane Paths	
N3/N9	Redundant transmission on N3/N9 interfaces	
TRANSPORT_LAYER	Redundant transmission at transport layer	

6.1.6.3.37 Enumeration: RoleOfIMSNode

Table 6.1.6.3.37-1: Enumeration RoleOfIMSNode

Enumeration value	Description	Applicability
ORIGINATING	The node is applying an originating role, serving the calling party.	
TERMINATING	The node is applying a terminating role, serving the called party.	
FORWARDING	The node is applying a originating role, serving the forwarding party.	

6.1.6.3.38 Enumeration: IMSSessionPriority

Table 6.1.6.3.38-1: Enumeration IMSSessionPriority

Enumeration value	Description	Applicability
PRIORITY_0	Mapped from the value received by the CSCF. (NOTE 1)	
PRIORITY_1	Mapped from the value received by the CSCF. (NOTE 1)	
PRIORITY_2	Mapped from the value received by the CSCF. (NOTE 1)	
PRIORITY_3	Mapped from the value received by the CSCF. (NOTE 1)	
PRIORITY_4	Mapped from the value received by the CSCF. (NOTE 1)	
NOTE 1: The mapping from TS 24.229 [258] table A.162 is operator specific. NOTE 2: PRIORITY_0 is the highest priority.		

6.1.6.3.39 Enumeration: MediaInitiatorFlag

Table 6.1.6.3.39-1: Enumeration MediaInitiatorFlag

Enumeration value	Description	Applicability
CALLED_PARTY	The called party initiated the modification. (NOTE 1)	
CALLING_PARTY	The calling party initiated the modification.	
UNKNOWN	It's unkown who initiated the modification.	
NOTE 1: The default is called party.		

6.1.6.3.40 Enumeration: SDPType

Table 6.1.6.3.40-1: Enumeration LocalGWInsertedIndication

Enumeration value	Description	Applicability
OFFER	The SDP media component was of type SDP offer.	
ANSWER	The SDP media component was of type SDP answer.	

6.1.6.3.41 Enumeration: OriginatorPartyType

Table 6.1.6.3.41-1: Enumeration OriginatorPartyType

Enumeration value	Description	Applicability
CALLING	The calling party is the originator.	
CALLED	The called party is the originator	

6.1.6.3.42 Enumeration: AccessTransferType

Table 6.1.6.3.42-1: Enumeration AccessTransferType

Enumeration value	Description	Applicability
PS_TO_CS	Transferred from packet switched to circuit switched.	
CS_TO_PS	Transferred from circuit switched to packet switched	
PS_TO_PS	Transferred from packet switched to packet switched	
CS_TO_CS	Transferred from circuit switched to circuit switched	

6.1.6.3.43 Enumeration: UETransferType

Table 6.1.6.3.43-1: Enumeration UETransferType

Enumeration value	Description	Applicability
INTRA_UE	The type of transfer is intra-UE.	
INTER_UE	The type of transfer is inter-UE.	

6.1.6.3.44 Enumeration: NNISessionDirection

Table 6.1.6.3.44-1: Enumeration NNISessionDirection

Enumeration value	Description	Applicability
INBOUND	NNI is used for an inbound service request.	
OUTBOUND	NNI is used for an outbound service request.	

6.1.6.3.45 Enumeration: NNIType

Table 6.1.6.3.45-1: Enumeration NNIType

Enumeration value	Description	Applicability
NON_ROAMING	Type of used NNI is non-roaming.	
ROAMING_NO_LOOPBACK	Type of used NNI is roaming without loopback routing.	
ROAMING_LOOPBACK	Type of used NNI is roaming with loopback routing.	

6.1.6.3.46 Enumeration: NNIRelationshipMode

Table 6.1.6.3.46-1: Enumeration NNIRelationshipMode

Enumeration value	Description	Applicability
TRUSTED	Is regarded as part of the same trust domain.	
NON_TRUSTED	Is not regarded as part of the same trust domain.	

6.1.6.3.47 Enumeration: TADIdentifier

Table 6.1.6.3.47-1: Enumeration TADIdentifier

Enumeration value	Description	Applicability
CS	The session shall be terminated in a circuit switched access network.	
PS	The session shall be terminated in a packet switched access network.	

6.1.6.3.48 Enumeration: VariablePartType

Table 6.1.6.3.48-1: Enumeration VariablePartType

Enumeration value	Description	Applicability
INTEGER	Indicates that the value are digits, which shall be announced as a single number, up to 10 digits.	
NUMBER	Indicates that the value are digits, which shall be announced as individual digits, up to 24 digits	
TIME	Indicates that the value is a time of day in the form of HHMM.	
DATE	Indicates that the value is a date in the form of YYYYMMDD.	
CURRENCY	Indicates that the value is monetary in the form of AAAAAABB, where AAAAAA is the inter part and BB is the decimal part.	

6.1.6.3.49 Enumeration: QuotaConsumptionIndicator

Table 6.1.6.3.49-1: Enumeration QuotaConsumptionIndicator

Enumeration value	Description	Applicability
QUOTA_NOT_USED	Indicates that the granted quota is not to be consumed during announcement setup and played.	
QUOTA_IS_USED	Indicates that the granted quota is to be consumed during announcement setup and played.	

6.1.6.3.50 Enumeration: PlayToParty

Table 6.1.6.3.50-1: Enumeration PlayToParty

Enumeration value	Description	Applicability
SERVED	Indicates that the announcement is to be played to the served party.	
REMOTE	Indicates that the announcement is to be played to the remote party.	

6.1.6.3.51 Enumeration: AnnouncementPrivacyIndicator

Table 6.1.6.3.51-1: Enumeration AnnouncementPrivacyIndicator

Enumeration value	Description	Applicability
NOT_PRIVATE	Indicates that the announcement can be all parties i.e., not only the PlayToParty.	
PRIVATE	Indicates that the announcement is to be played only to the PlayToParty.	

6.1.6.3.52 Enumeration: SupplementaryServiceType

Table 6.1.6.3.52-1: Enumeration SupplementaryServiceType

Enumeration value	Description	Applicability
OIP	Indicates originating identification presentation.	
OIR	Indicates originating identification restriction.	
TIP	Indicates terminating identification presentation.	
TIR	Indicates terminating identification restriction.	
HOLD	Indicates communication hold.	
CB	Indicates communication barring.	
CDIV	Indicates communication diversion.	
CW	Indicates communication waiting.	
MWI	Indicates message waiting indicator.	
CONF	Indicates conference.	
FA	Indicates flexible alerting.	
CCBS	Indicates completion of communication to busy subscriber.	
CCNR	Indicates completion of communications on no reply.	
MCID	Indicates malicious communication identification.	
CAT	Indicates customized alerting tone.	
CUG	Indicates closed user group.	
PNM	Indicates personal network management.	
CRS	Indicates customized ringing signal.	
ECT	Indicates explicit communication transfer,	

6.1.6.3.53 Enumeration: SupplementaryServiceMode

Table 6.1.6.3.53-1: Enumeration SupplementaryServiceMode

Enumeration value	Description	Applicability
CFU	Indicates communication forwarding unconditional.	
CFB	Indicates communication forwarding busy.	
CFNR	Indicates communication forwarding no reply.	
CFNL	Indicates communication forwarding not logged in.	
CD	Indicates communication deflection.	
CFNRC	Indicates communication forwarding on subscriber not reachable.	
ICB	Indicates incoming call barring.	
OCB	Indicates outgoing call barring.	
ACR	Indicates anonymous communication rejection.	
BLIND_TRANFER	Indicates blind transfer.	
CONSULTATIVE_TRANFER	Indicates consultative transfer.	

6.1.6.3.54 Enumeration: ParticipantActionType

Table 6.1.6.3.54-1: Enumeration ParticipantActionType

Enumeration value	Description	Applicability
CREATE	Indicates creating the conference.	
JOIN	Indicates joining in the conference.	
INVITE_INTO	Indicates being invited into the conference.	
QUIT	Indicates quitting the conference.	

6.1.6.3.55 Enumeration: TrafficForwardingWay

Table 6.1.6.3.55-1: Enumeration TrafficForwardingWay

Enumeration value	Description	Applicability
N6	Indicates the traffic is forwarded via N6.	
N19	Indicates the traffic is forwarded via N19.	
LOCAL_SWITCH	Indicates the traffic is forwarded via local switching way.	

6.1.6.3.56 Enumeration: ProseFunctionality

Table 6.1.6.3.56 -1: Enumeration ProseFunctionality

Enumeration value	Description	Applicability
DIRECT_DISCOVERY	Indicates the UE is requesting for ProSe direct discovery.	
DIRECT_COMMUNICATION	Indicates the UE is requesting for ProSe direct communication.	

6.1.6.3.57 Enumeration: ProseEventType

Table 6.1.6.3.57 -1: Enumeration ProseEventType

Enumeration value	Description	Applicability
ANNOUNCING	Indicates the ProSe ProSe charging announcing event.	
MONITORING	Indicates the ProSe ProSe charging monitoring event.	
MATCH_REPORT	Indicates the ProSe ProSe charging match report event.	

6.1.6.3.58 Enumeration: DirectDiscoveryModel

Table 6.1.6.3.58 -1: Enumeration DirectDiscoveryModel

Enumeration value	Description	Applicability
MODEL_A	Indicates model A of the Direct Discovery used by the UE	
MODEL_B	Indicates model B of the Direct Discovery used by the UE.	

6.1.6.3.59 Enumeration: RoleOfUE

Table 6.1.6.3.59 -1: Enumeration RoleOfUE

Enumeration value	Description	Applicability
ANNOUNCING_UE	Indicates role of the UE using ProSe for announcing.	
MONITORING_UE	Indicates role of the UE using ProSe for monitoring.	
REQUESTOR_UE	Indicates role of the UE using ProSe for sending requst.	
REQUESTED_UE	Indicates role of the UE using ProSe for receive requst.	

6.1.6.3.60 Enumeration: RangeClass

Table 6.1.6.3.60 -1: Enumeration RangeClass

Enumeration value	Description	Applicability
RESERVED	This value is reserved	
50_METER	Indicates a range class for a specific proximity request in 50m	
100_METER	Indicates a range class for a specific proximity request in 100m	
200_METER	Indicates a range class for a specific proximity request in 200m	
500_METER	Indicates a range class for a specific proximity request in 500m	
1000_METER	Indicates a range class for a specific proximity request in 1000m	
UNUSED	Indicates a range class not used.	

6.1.6.3.61 Enumeration: RadioResourcesIndicator

Table 6.1.6.3.61 -1: Enumeration RadioResourcesIndicator

Enumeration value	Description	Applicability
OPERATOR_PROVIDED	Indicates the operator-provided radio resources for direct communication.	
CONFIGURED	Indicates the configured radio resources for direct communication.	

6.1.6.4 Data types describing alternative data types or combinations of data types

None.

6.1.6.5 Binary data

None.

6.1.7 Error handling

6.1.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [299].

For the Nchf_ConvergedCharging API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [2]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [299] 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 [299]. In addition, the requirements in the following clauses shall apply.

6.1.7.2 Protocol Errors

There are no additional protocol errors applicable for the Nchf_ConvergedCharging API compared to the Protocol Error Handling specified in clause5.2.7.2 of 3GPP TS 29.500 [299].

6.1.7.3 Application errors

The application errors defined for the Nchf_ConvergedCharging API are listed in table 6.1.7.3-1. The CHF shall include in the HTTP status code a "ProblemDetails" data structure with the "cause" attribute indicating the application error as listed in table 6.1.7.3-1. The common application errors defined in the table 5.2.7.2-1 in 3GPP TS 29.500 [7] may also be used for the Nchf_ConvergedCharging service.

Table 6.1.7.3-1: Application errors

Application Error	HTTP status code	Description
CHARGING_FAILED	400 Bad Request	The HTTP request is rejected because the set of session or subscriber information needed by the CHF for charging or CDR creation is incomplete or erroneous or not available e.g., rating group, subscriber information.
RE_AUTHORIZATION_FAILED	400 Bad Request	The HTTP request is rejected because the set of information needed by the CTF to report the usage is incomplete or erroneous or not available.
CHARGING_NOT_APPLICABLE	403 Forbidden	The HTTP request is rejected by the CHF since it has been determined that the service can be allowed to the end user without any charging or CDR creation.
USER_UNKNOWN	404 Not Found	The HTTP request is rejected because the end user specified in the request cannot be served by the CHF.
END_USER REQUEST_DENIED	403 Forbidden	The HTTP request denied by the CHF due to restrictions or limitations related to the end-user.
QUOTA_LIMIT_REACHED	403 Forbidden	The HTTP request denied by the CHF because the end user's account could not cover the requested service. If the request contained used units they are deducted, if applicable.
END_USER_REQUEST_REJECTED	403 Forbidden	The HTTP request rejected by the CHF due to end-user restrictions or limitations.

6.1.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the Nchf_ConvergedCharging API. They shall be negotiated using the extensibility mechanism defined in subclause 6.6 of 3GPP TS 29.500 [299].

Table 6.1.8-1: Supported Features

Feature number	Feature Name	Description
1	CHFCQM	CHF-controlled quota management i.e. support for temporary offline
2	AF_Charging_Identifier	Indicates the support of long character strings as charging identifiers.
3	5GIEPC_CH	5GS interworking with EPC
4	ATSSS	This feature indicates support of Access Traffic Steering, Switching, Splitting (ATSSS).
5	ETSUN	This feature indicates support of Enhancing Topology of SMF and UPF in 5G Networks (ETSUN).
6	EnhancedDiagnostics	Support the enhanced diagnostics
7	AMF_subs_PRA	PRA(s) subscription by CHF in AMF
8	FilterRuleList	Support of multiple filter rules in the final unit indication
9	TEI17_NIESGU	This feature indicates support of GERAN/UTRAN access
10	IMS	This feature indicates support of IMS.
11	QoSMonitoring	This feature indicates support of QoS Monitoring
12	Announcement	This feature indicates support of announcements.
13	5GLAN	This feature indicates support of 5G LAN-type services.
14	URLLC	This feature indicates support of URLLC.
15	NotifyInfoResponse	This feature indicates support of response with information for a notification.
16	ES4xx	Extended Support of HTTP 400, 403, 404 allowing use of either ChargingDataResponse or ProblemDetails in the response.
17	ES3xx	Extended Support of HTTP 307 and 308 redirections, an NF that does not support this feature does only support HTTP redirection as specified for 3GPP Release 15 and 16.
18	EdgeComputing	This feature indicates support of edge computing domain charging.
19	5GSCIoT	This featute indicates support of 5GS control plane CIoT optimization
20	SMF_Charging_Id	Indicates the support of strings as SMF charging identifiers.

6.1.9 Usage of general functionalities in SBA

6.1.9.1 General

The functionalities specified for Service Based Architecture in clause 6 of TS 29.500 [299], may be supported. Any deviation from or special usage of the specified functionalities are described in this clause.

6.1.9.2 Extensibility Mechanisms

The information elements sent on the Nchf_ConvergedCharging API can be extensible with vendor-specific data.

The only JSON data types that can be extended, by defining additional members, are JSON objects; simple data types (and arrays of items of simple data types) cannot be extended in this way. The charging vendor-specific extensions use the extensibility mechanism defined in clause 6.6 of TS 29.500 [299].

6.2 Nchf_ OfflineOnlyCharging Service API

6.2.1 Introduction

The APIs defined in this clause implement the service operation defined in clause 5.3.2.

The Nchf_OfflineOnlyCharging service shall use the Nchf_OfflineOnlyCharging API.

The request URI used in each HTTP request from the NF service consumer towards the CHF shall have the 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 "Nchf_OfflineOnlyCharging".
- The {apiVersion} shall be "v1".
- The {apiSpecificResourceUriPart} shall be set as described in clause 6.2.3.

6.2.2 Usage of HTTP

See clause 6.1.2 in this document.

6.2.3 Resources

6.2.3.1 Overview

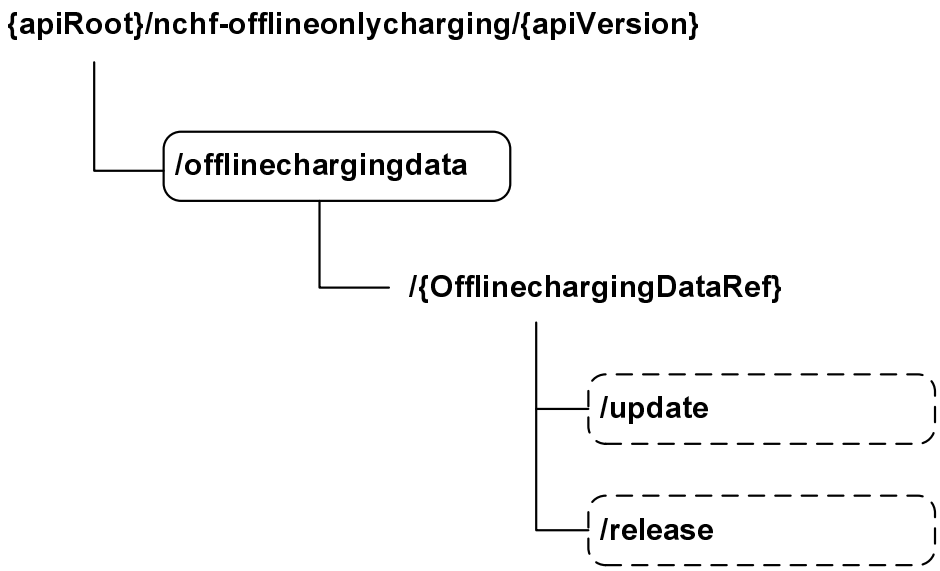

Figure 6.2.3.1-1: Resource URI structure of the Nchf_OfflineOnlyCharging API

Offline Only Charging Data Ref is a unique identifier for an offline only charging data resource in a PLMN. It's created in CHF when CHF receives a Nchf_ OfflineOnlyCharging_Create request and provided to NF (CTF) in the Location header field in the Nchf_ OfflineOnlyCharging_Create response. The NF (CTF) shall use the Offline Only Charging Data Ref received in subsequent requests to the CHF for the same charging data resource.

Table 6.2.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.2.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description	Corresponding service operation
Offline Only Charging Data	{apiRoot}/ nchf-offlineonlycharging/ {apiVersion}/offlinechargingdata	POST	Create a new Offline Only Charging Data resource	Nchf_OfflineOnlyCharging_Create
Individual Offline Only Charging Data	{apiRoot}/ nchf-offlineonlycharging/{apiVersion}/ offlinechargingdata/{OfflineChargingDataRef }/update	update (POST)	Update an existing Offline Only Charging Data resource.	Nchf_OfflineOnlyCharging_Update
	{apiRoot}/ nchfofflineonlycharging/v1/ offlinechargingdata /{OfflineChargingDataRef}/release	release (POST)	Update and release an existing Offline Only Charging Data resource.	Nchf_OfflineOnlyCharging_Release

6.2.3.2 Resource: Charging Data

6.2.3.2.1 Description

Offline Only Charging Data resource represents a collection of the different offline only charging data resources created by the CHF for offline only charging as defined in 3GPP TS 32.290 [58].

6.2.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nchf-offlineonlycharging/v1/offlinechargingdata**

This resource shall support the resource URI variables defined in table 6.2.3.2.2-1.

Table 6.2.3.2.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 6.2.1

6.2.3.2.3 Resource Standard Methods

6.2.3.2.3.1 POST

This method shall support the URI query parameters specified in table 6.2.3.2.3.1-1.

Table 6.2.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.2.3.1-2 and the response data structures and response codes specified in table 6.2.3.2.3.1-3.

Table 6.2.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingDataRequest	M	1	Parameters to create a new Offline Only Charging Data resource.

Table 6.2.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ChargingDataResponse	M	1	201 Created	The creation of an Offline Only Charging Data resource is confirmed and a representation of that resource is returned. The Offline Only Charging Data resource which is created and returned successfully. The representation of created resource is identified via Location header field in the 201 response.
			307 Temporary Redirect	(NOTE 2)
ChargingDataResponse	M	1	400 Bad Request	(NOTE 2)
ChargingDataResponse	M	1	403 Forbidden	(NOTE 2)
ChargingDataResponse	M	1	404 Not Found	(NOTE 2)
	M	1	405 Method Not Allowed	(NOTE 2)
	M	1	408 Request Timeout	(NOTE 2)
	M	1	500 Internal Server Error	(NOTE 2)
	M	1	503 Service Unavailable	(NOTE 2)
	M	1	508 Gateway Timeout	(NOTE 2)
NOTE 1: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [299] for the POST method also apply. NOTE 2: Failure cases are described in clause 6.2.7.				

6.2.3.2.4 Resource Custom Operations

None.

6.2.3.3 Resource: Individual Offline Only Charging Data

6.2.3.3.1 Description

Individual Offline Only Charging Data resource represents an offline only charging data resource created in the CHF.

6.2.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nchf-offlineonlycharging/v1/offlinechargingdata/{OfflineChargingDataRef}**

This resource shall support the resource URI variables defined in table 6.2.3.3.2-1.

Table 6.2.3.3.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 6.2.1
OfflineChargingDataRef	Offline only charging data resource reference assigned by the CHF during the Nchf_ OfflineOnlyCharging_Create operation,

6.2.3.3.3 Resource Standard Methods

None.

6.2.3.3.4 Resource Custom Operations

6.2.3.3.4.1 Overview

Table 6.2.3.3.4.1-1: Custom operations

Custom operation URI	Mapped HTTP method	Description
{apiRoot}/ nchf-offlineonlyncharging/v1/ offlinechargingdata/{OfflineChargingDataRef }/update	POST	Update an existing Offline Only Charging Data resource.
{apiRoot}/ nchf-offlinecharging/v1/ offlinechargingdata /{OfflineChargingDataRef}/release	POST	Update and release an existing Offline Only Charging Data resource.

6.2.3.3.4.2 Operation: update

6.2.3.3.4.2.1 Description

This operation updates an existing Offline Only Charging Data resource.

6.2.3.3.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.2.3.3.4.2.2-1 and the response data structures and response codes specified in table 6.2.3.3.4.2.2-2.

Table 6.2.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingDataRequest	M	1	Parameters to modify an existing Offline Only Charging Data resource matching the OfflineChargingDataRef according to the representation in the OfflineChargingData. The request URI is the representation in the Location header field in the 201 response of resource creation.

Table 6.2.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ChargingDataResponse	M	1	200 OK	The modification of an Offline Only Charging Data resource is confirmed and a representation of that resource is returned. The Offline Only Charging Data resource which is modified and returned successfully.
			307 Temporary Redirect	(NOTE 2)
ChargingDataResponse	M	1	400 Bad Request	(NOTE 2)
ChargingDataResponse	M	1	403 Forbidden	(NOTE 2)
ChargingDataResponse	M	1	404 Not Found	(NOTE 2)
	M	1	405 Method Not Allowed	(NOTE 2)
	M	1	408 Request Timeout	(NOTE 2)
	M	1	500 Internal Server Error	(NOTE 2)
	M	1	503 Service Unavailable	(NOTE 2)
	M	1	508 Gateway Timeout	(NOTE 2)
NOTE 1: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [299] for the POST method also apply. NOTE 2: Failure cases are described in clause 6.2.7.				

6.2.3.3.4.3 Operation: release

6.2.3.3.4.3.1 Description

This operation update and release an existing charging session

6.2.3.3.4.3.2 Operation Definition

This operation shall support the request data structures specified in table 6.2.3.3.4.3.2-1 and the response data structures and response codes specified in table 6.2.3.3.4.3.2-2.

Table 6.2.3.3.4.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ChargingDataRequest	M	1	Parameters to modify and then release the Offline Only Charging Data resource matching the OfflineChargingDataRef according to the representation in the OfflineChargingData. The request URI is the representation in the Location header field in the 201 response of resource creation.

Table 6.2.3.3.4.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a	M	1	204 No Content	Successful case: The Offline Only Charging Data resource matching the OfflineChargingDataRef is modified and then released.
ChargingDataResponse	M	1	404 Not Found	(NOTE 2)
NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [299] also apply. NOTE 2: Failure cases are described in clause 6.2.7.				

6.2.4 Custom Operations without associated resources

None.

6.2.5 Data Model

6.2.5.1 General

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

The Nchf_OfflineOnlyCharging Service API allows the NF consumer to consume the offline only charging service from the CHF as defined in 3GPP TS 32.290 [58].

Table 6.2.5.1-1 specifies the data types defined for the OfflineOlnyCharging service based interface protocol.

Table 6.2.5.1-1: Nchf_ OfflineOnlyCharging specific Data Types

Data type	Clause defined	Description	Applicability
ChargingDataRequest	6.2.5.2.1.1 6.2.5.2.2.1	Describes the attributes of Charging Data Request to CHF for initial, update and termination of the charging session.	
ChargingDataResponse	6.2.5.2.1.2 6.2.5.2.2.2	Describes the attributes of Charging Data Response from CHF on charging session initial, update and termination.	

The data types specified in Table 6.1.6.1-2 of this document are applied and re-used by the Nchf_OfflineOnlyCharging service based interface protocol.

6.2.5.2 Structured data types

6.2.5.2.1 Common Data Type

6.2.5.2.1.1 Type ChargingDataRequest

Table 6.2.5.2.1.1-1: Definition of type ChargingDataRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
subscriberIdentifier	SubscriberIdentifier	O_M	0..1	Identifier of the subscriber that uses the requested service.	
nfConsumerIdentification	NFConsumerIdentification	M	1	This is a grouped field which contains a set of information identifying the NF consumer of the charging service.	
invocationTimeStamp	DateTime	M	1	The time at which the request is send	
invocationSequenceNumber	Uint32	M	1	This field contains the sequence number of the charging service invocation by the NF consumer ,i.e. the order of charging data requests. The sequence number in charging data request [initial] starts from 1, and increased by 1 for subsequent charging data request. It is allowed to start from 0 for backwards compatibility.	
serviceSpecificationInformation	String	O_C	0..1	Identifies service specific document that applies to the request, e.g. the service specific document ('middle tier' TS) and 3GPP release the service specific document is based upon.	
multipleUnitUsage	array(MultipleUnitUsage)	O_C	0..N	This field contains the parameters for usage reporting.	
triggers	array(Trigger)	O_C	0..N	This field identifies the event(s) triggering the request.	

6.2.5.2.1.2 Type ChargingDataResponse

Table 6.2.5.2.1.2-1: Definition of type ChargingDataResponse

Attribute name	Data type	P	Cardinality	Description	Applicability
invocationTimestamp	DateTime	M	1	This field holds the timestamp of the charging service response from the CHF.	
invocationResult	InvocationResult	O_C	1	This field holds the result code in case of unsuccessful charging service invocation by the NF consumer	
invocationSequenceNumber	Uint32	M	1	This field contains the sequence number of the charging service invocation by the NF consumer.The same value of the sequence number received in the request should be used in the response	
sessionFailover	SessionFailover	O_C	0..1	This field indicates whether alternative CHF is supported for ongoing charging service failover handling by NF consumer.	
triggers	array(Trigger)	O_C	0..N	This field identifies the chargeable event(s) supplied by CHF to override/activate the existing chargeable event(s) in NF consumer. The presence of the triggers attribute without any triggerType is used by CHF to disable all the triggers.	

6.2.5.2.1.3 Type MultipleUnitUsage

Table 6.2.5.2.1.3-1: Definition of type MultipleUnitUsage

Attribute name	Data type	P	Cardinality	Description	Applicability
ratingGroup	RatingGroup	M	1	The identifier of a rating group.	
usedUnitContainer	array(UsedUnitContainer)	O_C	0..N	This field contains the amount of used non-monetary service units measured.	

6.2.5.2.1.4 Type UsedUnitContainer

Table 6.2.5.2.1.4-1: Definition of type UsedUnitContainer

Attribute name	Data type	P	Cardinality	Description	Applicability
serviceId	ServiceId	O_C	0..1	This field identity of the used service	
triggers	array (Trigger)	O_C	0..N	This field specifies the reason for usage reporting for one or more types of unit associated to the rating group.	
triggerTimestamp	DateTime	Oc	0..1	This field holds the timestamp when the reporting trigger occur.	
time	Uint32	O_C	0..1	This field holds the amount of requested time.	
totalVolume	Uint64	O_C	0..1	This field holds the amount of requested volume in both uplink and downlink directions.	
uplinkVolume	Uint64	O_C	0..1	This field holds the amount of requested volume in uplink direction.	
downlinkVolume	Uint64	O_C	0..1	This field holds the amount of requested volume in downlink direction.	
serviceSpecificUnits	Uint64	O_C	0..1	This field holds the amount of used service specific units.	
eventTimeStamps	Array(DateTime)	O_C	0..N	This field holds the timestamps of the event reported in the Service Specific Unit s, if the reported units are event based	
localSequenceNumber	integer	M	1	holds the Used Unit sequence number, i.e. the order when charging event occurs. It increased by 1 for each Used Unit generation.	

6.2.5.2.1.5 Type Trigger

Table 6.2.5.2.1.5-1: Definition of type Trigger

Attribute name	Data type	P	Cardinality	Description	Applicability
triggerType	TriggerType	Oc	0..1	the events whose occurrence lead to charging event is issued towards the CHF	
triggerCategory	TriggerCategory	M	1	This field indicates whether the charging data generated by the NF consumer for the trigger lead to a Charging Event towards the CHF immediately or not.	
timeLimit	DurationSec	O_C	0..1	Time limit if trigger type is "Expiry of data time limit"	
volumeLimit64	Uint64	O_C	0..1	Volume limit if trigger type is "Expiry of data volume limit".	
eventLimit	Uint32	O_C	0..1	Event limit if trigger type is "Expiry of data event limit"	
maxNumberOfccc	Uint32	O_C	0..1	Maximum number if trigger type is "Max nb of number of charging condition changes"	

6.2.5.2.2 5G Data Connectivity Specified Data Type

6.2.5.2.2.1 Type ChargingDataRequest

The additional attributes of the type ChargingDataRequest defined in clause 6.2.5.2.1.1 for 5G data connectivity charging see table 6.1.6.2.2.1-1.

6.2.5.2.2.2 Type ChargingDataResponse

The additional attributes of the type ChargingDataResponse defined in clause 6.2.5.2.1.2 for 5G data connectivity charging see table 6.1.6.2.2.2-1.

6.2.5.2.2.3 Type MultipleUnitUsage

The additional attributes of the type MultipleUnitUsage defined in clause 6.2.5.2.1.3 for 5G data connectivity charging see table 6.1.6.2.2.3-1.

6.2.5.2.2.4 Type UsedUnitContainer

The additional attributes of the type UsedUnitContainer defined in clause 6.2.5.2.1.4 for 5G data connectivity charging see table 6.1.6.2.2.5-1.

6.2.5.2.2.5 Type PDUSessionChargingInformation

The additional attributes of the Type PDUSessionChargingInformation for 5G data connectivity charging see table 6.1.6.2.2.6-1.

6.2.5.2.2.6 Type UserInformation

The additional attributes of the Type UserInformation for 5G data connectivity charging see table 6.1.6.2.2.7-1.

6.2.5.2.2.7 Type PDUSessionInformation

The additional attributes of the Type PDUSessionInformation for 5G data connectivity charging see table 6.1.6.2.2.8-1.

6.2.5.2.2.8 Type PDUContainerInformation

The additional attributes of the Type PDUContainerInformation for 5G data connectivity charging see table 6.1.6.2.2.9-1.

6.2.5.2.2.9 Type NetworkSlicingInfo

The additional attributes of the Type NetworkSlicingInfo for 5G data connectivity charging see table 6.1.6.2.2.10-1.

6.2.5.2.2.10 Type PDUAddress

The additional attributes of the Type PDUAddress for 5G data connectivity charging see table 6.1.6.2.2.11-1.

6.2.5.2.2.11 Type ServingNetworkFunctionID

The additional attributes of the Type ServingNetworkFunctionID for 5G data connectivity charging see table 6.1.6.2.2.12-1.

6.2.5.2.2.12 Type RoamingQBCInformation

The additional attributes of the Type RoamingQBCInformation for 5G data connectivity charging see table 6.1.6.2.2.13-1.

6.2.5.2.2.13 Type MultipleQFIcontainer

The additional attributes of the Type MultipleQFIcontainer for 5G data connectivity charging see table 6.1.6.2.2.14-1.

6.2.5.2.2.14 Type RoamingChargingProfile

The additional attributes of the Type RoamingChargingProfile for 5G data connectivity charging see table 6.1.6.2.2.15-1.

6.2.5.2.2.15 Type QFIContainerInformation

The additional attributes of the Type QFIContainerInformation for 5G data connectivity charging see table 6.1.6.2.2.16-1.

6.2.5.2.2.16 Type RANSecondaryRATUsageReport

The additional attributes of the Type RANSecondaryRATUsageReport for 5G data connectivity charging see table 6.1.6.2.2.17-1.

6.2.5.2.2.17 Type QosFlowsUsageReport

The additional attributes of the Type QosFlowsUsageReport for 5G data connectivity charging see table 6.1.6.2.2.18-1.

6.2.5.3 Simple data types and enumerations

6.2.5.3.1 Introduction

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

6.2.5.3.2 Simple data types

The simple data types are the same as definitions in table 6.1.6.3.2-1.

6.2.5.3.3 Enumeration: ChargingCharacteristicsSelectionMode

The Enumeration ChargingCharacteristicsSelectionMode is the same as definition in table 6.1.6.3.5-1.

6.2.5.3.4 Enumeration: NodeFunctionality

Table 6.2.5.3.4-1: Enumeration NodeFunctionality

Enumeration value	Description	Applicability
SMF	This field identifies that NF is a SMF.	
I_SMF	This field identifies that node is an I-SMF, only applicable for PDU session served by SMF + I-SMF.	

6.2.5.3.5 Enumeration: TriggerType

Table 6.2.5.3.5-1: Enumeration TriggerType

Enumeration value	Description	Applicability
FINAL	a service termination has happened	
ABNORMAL_RELEASE	PDU session has abnormal released.	
QOS_CHANGE	In request message, this value is used to indicate that QoS change has happened. Any of elements of QoSData may result in QoS change.	
VOLUME_LIMIT	Volume limit has been reached.	
TIME_LIMIT	Time limit has been reached	
EVENT_LIMIT	Event limit has been reached	
PLMN_CHANGE	PLMN has been changed.	
USER_LOCATION_CHANGE	In request message, this value is used to indicate that User location has been changed. The change in location information that triggered reporting is included.	
RAT_CHANGE	In request message, this value is used to indicate that RAT type has been changed.	
SESSION_AMBR_CHANGE	In request message, this value is used to indicate that Session AMBR has been changed.	
UE_TIMEZONE_CHANGE	In request message, this value is used to indicate that UE timezone has been changed.	
TARIFF_TIME_CHANGE	Tariff time change has happened.	
MAX_NUMBER_OF_CHANGES_IN CHARGING_CONDITIONS	Max number of change has been reached	
MANAGEMENT_INTERVENTION	Management intervention	
CHANGE_OF_UE_PRESENCE_IN PRESENCE_REPORTING_AREA	In request message, this value is used to indicate that Change of UE presence in PRA has happened. In response message, this value is used to indicate a request of reporting the event that the user enters/leaves the area(s) as indicated in the presenceReportingArea Attribute	
CHANGE_OF_3GPP_PS_DATA_OFF _STATUS	In request message, this value is used to indicate that Change of 3GPP PS Data off status has happened.	
SERVING_NODE_CHANGE	A serving node (e.g., AMF) change in the NF Consumer	
REMOVAL_OF_UPF	A used UPF is removed	
ADDITION_OF_UPF	A new UPF is added.	
INSERTION_OF_ISMF	A new I-SMF is inserted	
REMOVAL_OF_ISMF	A used I-SMF is removed	
CHANGE_OF_ISMF	A used I-SMF is removed, and a new I-SMF is inserted	
START_OF_SERVICE_DATA_FLOW	A service data flow has started	
GFBR_GUARANTEED_STATUS_CH ANGE	In request message,thisvalue is used to indicate that GFBR targets for the indicated SDFs are changed ("NOT_GUARANTEED" or "GUARANTEED" again). In response message, this value is used to indicate that a NF Consumer (CTF) needs to ensure requesting the notification from the access network and that a change in the GFBR targets shall cause the service consumer to ask for a re-authorization of the associated quota.	
HANDOVER_CANCEL	The handover is cancelled.	
HANDOVER_START	The handover is started.	
HANDOVER_COMPLETE	The handover is complete.	
ADDITION_OF_ACCESS	Addition of access to the MA PDU session	ATSSS
REMOVAL_OF_ACCESS	Removal of access to the MA PDU session	ATSSS
START_OF_SDF_ADDITIONAL_ACC ESS	Start of service data flow on additional access in a MA PDU session	ATSSS

6.2.5.3.6 Enumeration: ResultCode

Table 6.2.5.3.6-1: Enumeration ResultCode

Enumeration value	Description	Applicability
SUCCESS	The CHF opens or updates CDR.	

6.2.5.3.7 Enumeration: 3GPPPSDataOffStatus

The Enumeration 3GPPPSDataOffStatus is the same as definition in table 6.1.6.3.13-1.

6.2.5.3.8 Enumeration: PartialRecordMethod

The Enumeration PartialRecordMethod is the same as definition in table 6.1.6.3.15-1.

6.2.5.3.9 Enumeration: RoamerInOut

The Enumeration RoamerInOut is the same as definition in table 6.1.6.3.16-1.

6.2.5.3.10 Void

6.2.6 Error handling

6.2.6.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [299].

For the Nchf_OfflineOnlyCharging API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [2]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [299] 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 [299]. In addition, the requirements in the following clauses shall apply.

6.2.6.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the Nchf_OfflineOnlyCharging API compared to the Protocol Error Handling specified in clause 5.2.7.2 of 3GPP TS 29.500 [299].

6.2.6.3 Application errors

The application errors defined for the Nchf_OfflineOnlyCharging API are listed in table 6.2.6.3-1. The CHF shall include in the HTTP status code a "ProblemDetails" data structure with the "cause" attribute indicating the application error as listed in table 6.2.6.3-1. The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [299] may also be used for the Nchf_OfflineOnlyCharging service.

Table 6.1.7.3-1: Application errors

Application Error	HTTP status code	Description
CHARGING_FAILED	400 Bad Request	The HTTP request is rejected because the set of session or subscriber information needed by the CHF for charging or CDR creation is incomplete, erroneous, or not available. (E.g. Rating Group, subscriber information)

6.2.7 Feature negotiation

The optional features in table 6.2.7-1 are defined for the Nchf_OfflineOnlyCharging API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [299].

Table 6.2.7-1: Supported Features

Feature number	Feature Name	Description
4	ATSSS	This feature indicates support of Access Traffic Steering, Switching, Splitting (ATSSS).
20	SMF_Charging_Id	Indicates the support of strings as SMF charging Identifiers

7 Bindings of CDR field, Information Element and Resource Attribute

7.0 General

This clause aims to describe the mapping between the Service Charging Information element, Resource Attribute and CDR field for 5G charging.

Table 7.1-1 and 7.2-1 describes the mapping of the Information Element, Resource Attribute and CDR field of CHF-CDR for 5G charging.

7.1 Bindings of common CDR field, Information Element and Resource Attribute

Table 7.1-1: Bindings of common CDR field, Information Element and Resource Attribute

Information Element	CDR Field	Resource Attribute
Session Identifier	Charging Session Identifier	/{ChargingDataRef }/ or /{OfflineChargingDataRef}/
		ChargingDataRequest
Subscriber Identifier	Subscriber Identifier	/subscriberIdentifier
Charging Id	Charging Id	/chargingId
Invocation Timestamp	-	/invocationTimeStamp
Invocation Sequence Number	-	/invocationSequenceNumber
Retransmission Indicator	-	/retransmissionIndicator
One-time Event	-	/oneTimeEvent
NF Consumer Identification	NF Information	/nfConsumerIdentification
NF Name	NF Name	/nfConsumerIdentification/nFName
NF Address	NF Address	/nfConsumerIdentification/nFIPv4Address /nfConsumerIdentification/nFIPv6Address /nfConsumerIdentification/nFFqdn
NF PLMN ID	NF PLMN ID	/nfConsumerIdentification/nFPLMNID
NF Functionality	NF Functionality	/nfConsumerIdentification/nodeFunctionality
Notify URI		/notifyUri
Service Specification Information	Service Specification Information	/serviceSpecificationInfo
Multiple Unit Usage	List of Multiple Unit Usage	/multipleUnitUsage
Rating Group	Rating Group	/multipleUnitUsage/ratingGroup
Requested Unit	-	/multipleUnitUsage/requestedUnit
Time	-	/multipleUnitUsage/requestedUnit/time
Total Volume	-	/multipleUnitUsage/requestedUnit/totalVolume
Uplink Volume	-	/multipleUnitUsage/requestedUnit/uplinkVolume
Downlink Volume	-	/multipleUnitUsage/requestedUnit/downlinkVolume
Service Specific Units	-	/multipleUnitUsage/requestedUnit/serviceSpecificUnits
Used Unit Container	Used Unit Container	/multipleUnitUsage/usedUnitContainer
Service Identifier	Service Identifier	/multipleUnitUsage/usedUnitContainer/serviceId
Quota management Indicator	Quota management Indicator Quota management Indicator Ext	/multipleUnitUsage/usedUnitContainer/quotaManagementIndicator
Triggers	Triggers	/multipleUnitUsage/usedUnitContainer/triggers
Trigger Timestamp	Trigger Timestamp	/multipleUnitUsage/usedUnitContainer/triggerTimestamp
Time	Time	/multipleUnitUsage/usedUnitContainer/time
Total Volume	Total Volume	/multipleUnitUsage/usedUnitContainer/totalVolume
Uplink Volume	Uplink Volume	/multipleUnitUsage/usedUnitContainer/uplinkVolume
Downlink Volume	Downlink Volume	/multipleUnitUsage/usedUnitContainer/downlinkVolume
Service Specific Unit	Service Specific Unit	/multipleUnitUsage/usedUnitContainer/serviceSpecificUnits
Event Time Stamps	Event Time Stamps	/multipleUnitUsage/usedUnitContainer/eventTimeStamps
Local Sequence Number	Local Sequence Number	/multipleUnitUsage/usedUnitContainer/localSequenceNumber
Triggers	Triggers	/triggers
		ChargingDataResponse
Invocation Timestamp		/invocationTimeStamp
Invocation Sequence Number		/invocationSequenceNumber
Session Failover	-	/sessionFailover
Triggers	-	/triggers
Multiple Unit Information	-	/multipleUnitInformation
Result Code	-	/multipleUnitInformation
Rating Group	-	/multipleUnitInformation/ratingGroup
Granted Unit	-	/multipleUnitInformation/grantedUnit
Tariff Time Change	-	/multipleUnitInformation/grantedUnit/tariffTimeChange
Time	-	/multipleUnitInformation/grantedUnit/time

Total Volume	-	/multipleUnitInformation/grantedUnit/totalVolume
Uplink Volume	-	/multipleUnitInformation/grantedUnit/uplinkVolume
Downlink Volume	-	/multipleUnitInformation/grantedUnit/downlinkVolume
Service Specific Units	-	/multipleUnitInformation/grantedUnit/serviceSpecificUnits
Triggers	-	/multipleUnitInformation/triggers
Validity Time	-	/multipleUnitInformation/validityTime
Quota Holding Time	-	/multipleUnitInformation/quotaHoldingTime
Final Unit Indication	-	/multipleUnitInformation/finalUnitIndication
Time Quota Threshold	-	/multipleUnitInformation/timeQuotaThreshold
Volume Quota Threshold	-	/multipleUnitInformation/volumeQuotaThreshold
Unit Quota Threshold	-	/multipleUnitInformation/unitQuotaThreshold
Invocation Result	-	/invocationResult
Invocation Result code	-	/invocationResult/error/cause
Failed parameter	-	/invocationResult/error/invalidParams
Failure Handling	-	/invocationResult/failureHandling

7.2 Bindings for 5G data connectivity

Table 7.2-1: Bindings of 5G data connectivity CDR field, Information Element and Resource Attribute

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Supported Features	-	/supportedFeatures
Multiple Unit Usage	List of Multiple Unit Usage	/multipleUnitUsage
UPF ID	UPF ID	/multipleUnitUsage/uPFID
Multi-homed PDU address	Multi-homed PDU address	/multipleUnitUsage/multihomedPDUAddress
Used Unit Container	Used Unit Container	/multipleUnitUsage/usedUnitContainer
PDU Container Information	PDU Container Information	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation
Time of First Usage	Time of First Usage	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/timeofFirstUsage
Time of Last Usage	Time of Last Usage	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/timeofLastUsage
QoS Information	QoS Information	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/qoSInformation
QoS Characteristics	QoS Characteristics	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/qoSCharacteristics
AF Charging Identifier	AF Charging Identifier	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/afChargingIdentifier
AF Charging Id String	AF Charging Id String	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/afChargingIdString
User Location Information	User Location Information	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/userLocationInformation
UE Time Zone	UE Time Zone	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/uetimeZone
RAT Type	RAT Type	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/rATType
Serving Network Function ID	Serving Network Function ID	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/servingNodeID
Presence Reporting Area Information	Presence Reporting Area Information	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/ presenceReportingAreaInformation
3GPP PS Data Off Status	3GPP PS Data Off Status	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/3gppPSDataOffStatus
MA PDU Steering functionality	MA PDU Steering functionality	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/mAPDUSteeringFunctionality
MA PDU Steering mode	MA PDU Steering mode	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/mAPDUSteeringMode
Sponsor Identity	Sponsor Identity	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/sponsorIdentity
Application Service Provider Identity	Application Service Provider Identity	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/applicationserviceProviderIdentity
Charging Rule Base Name	Charging Rule Base Name	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/chargingRuleBaseName
Traffic Forwarding Way	Traffic Forwarding Way	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/trafficForwardingWay
Qos Monitoring Report	Qos Monitoring Report	/multipleUnitUsage/usedUnitContainer/pDUContainerInformation/qosMonitoringReport
PDU Session Charging Information	PDU Session Charging Information	/pDUSessionChargingInformation
Charging Id	Charging Id	/pDUSessionChargingInformation/chargingId
SMF Charging Id	SMF Charging Id	/pDUSessionChargingInformation/sMFchargingId
Home Provided ChargingId	Home Provided ChargingId	/pDUSessionChargingInformation/ homeProvidedChargingId
SMF Home Provided ChargingId	SMF Home Provided ChargingId	/pDUSessionChargingInformation/ sMFHomeProvidedChargingId
User Information	User Information	/pDUSessionChargingInformation/ userInformation
User Identifier	User Identifier	/pDUSessionChargingInformation/userInformation/servedGPSI
User Equipment Info	User Equipment Info	/pDUSessionChargingInformation/userInformation/ servedPEI
Unauthenticated Flag	Unauthenticated Flag	/pDUSessionChargingInformation/userInformation/ unauthenticatedFlag

Roamer In Out	Roamer In Out	/pDUSessionChargingInformation/userInformation/ roamerInOut
User Location Info	User Location Info	/pDUSessionChargingInformation/ userLocationinfo
User Location Time		
MA PDU Non 3GPP User Location info	MA PDU Non 3GPP User Location info	/pDUSessionChargingInformation/mAPDUNon3GPPUserLocationInfo
Non 3GPP User Location Time	Non 3GPP User Location Time	/pDUSessionChargingInformation/non3GPPUserLocationTime
MA PDU Non 3GPP User Location Time	MA PDU Non 3GPP User Location Time	/pDUSessionChargingInformation/mAPDUNon3GPPUserLocationTime
UE Time Zone	UE Time Zone	/pDUSessionChargingInformation/uEtimeZone
Presence Reporting Area Information	Presence Reporting Area Information	/pDUSessionChargingInformation/ presenceReportingAreaInformation
PDU Session Information	PDU Session Information	/pDUSessionChargingInformation/pduSessionInformation
PDU Session ID	PDU Session ID	/pDUSessionChargingInformation/pduSessionInformation/pduSessionID
Network Slice Instance Identifier	Network Slice Instance Identifier	/pDUSessionChargingInformation/pduSessionInformation/networkSlicingInfo
PDU Type	PDU Type	/pDUSessionChargingInformation /pduSessionInformation/pduType
PDU Address	PDU Address	/pDUSessionChargingInformation /pduSessionInformation/pduAddress
PDU IPv4 Address	PDU IPv4 Address	/pDUSessionChargingInformation/pduSessionInformation/pduAddress/pduIPv4Address
PDU IPv6 Address with prefix	PDU IPv6 Address with prefix	/pDUSessionChargingInformation/pduSessionInformation/pduAddress/pduIPv6Addresswithprefix
PDU Address prefix length	PDU Address prefix length	/pDUSessionChargingInformation /pduSessionInformation/pduAddress/pduAddressprefixlength
IPv4 Dynamic Address Flag	IPv4 Dynamic Address Flag	/pDUSessionChargingInformation /pduSessionInformation/pduAddress/ iPv4dynamicAddressFlag
IPv6 Dynamic Address Flag	IPv6 Dynamic Prefix Flag	pDUSessionChargingInformation /pduSessionInformation/pduAddress/ iPv6dynamicPrefixFlag
		pDUSessionChargingInformation /pduSessionInformation/pduAddress/ addIpv6AddrPrefixList
Additional PDU IPv6 Prefixes	Additional PDU IPv6 Prefixes	pDUSessionChargingInformation /pduSessionInformation/pduAddress/ addIpv6AddrPrefixes
SSC Mode	SSC Mode	/pDUSessionChargingInformation /pduSessionInformation/sscMode
MA PDU session information	MA PDU session information	/pDUSessionChargingInformation /pduSessionInformation/mAPDUSessionInformation
MA PDU session indicator	MA PDU session indicator	/pDUSessionChargingInformation /pduSessionInformation/mAPDUSessionInformation/mAPDUSessionIndicator
ATSSS capability	ATSSS capability	/pDUSessionChargingInformation /pduSessionInformation/mAPDUSessionInformation/aTSSSCapability
SUPI PLMN ID	SUPI PLMN ID	/pDUSessionChargingInformation /pduSessionInformation/hPlmnId
Serving Network Function ID	Serving Network Function ID	/pDUSessionChargingInformation /pduSessionInformation/ servingNetworkFunctionID
Serving CN PLMN ID	Serving CN PLMN ID	/pDUSessionChargingInformation/pduSessionInformation/servingCNPlmnId
RAT Type	RAT Type	/pDUSessionChargingInformation /pduSessionInformation/ratType
MA PDU Non 3GPP RAT Type	MA PDU Non 3GPP RAT Type	/pDUSessionChargingInformation /pduSessionInformation/mAPDUNon3GPPRATType

Data Network Name Identifier	Data Network Name Identifier	/pDUSessionChargingInformation /pduSessionInformation/dnnid
DNN Selection Mode	DNN Selection Mode	/pDUSessionChargingInformation /pduSessionInformation/dNNselectionMode
Authorized QoS information	Authorized Qos Information	/pDUSessionChargingInformation /pduSessionInformation/authorized qoSInformation
Subscribed QoS Information	Subscribed QoS Information	/pDUSessionChargingInformation /pduSessionInformation/subscribedQoSInformation
Authorized Session-AMBR	Authorized Session-AMBR	/pDUSessionChargingInformation /pduSessionInformation/authorizedSessionAMBR
Subscribed Session-AMBR	Subscribed Session-AMBR	/pDUSessionChargingInformation /pduSessionInformation/subscribedSessionAMBR
Charging Characteristics	Charging Characteristics	/pDUSessionChargingInformation /pduSessionInformation/ chargingCharacteristics
Charging Characteristics Selection Mode	Charging Characteristics Selection Mode	/pDUSessionChargingInformation /pduSessionInformation/chargingCharacteristics SelectionMode
PDU session start Time	PDU session start Time	/pDUSessionChargingInformation /pduSessionInformation/startTime
PDU session stop Time	PDU session stop Time	/pDUSessionChargingInformation /pduSessionInformation/stopTime
Diagnostics	Diagnostics	/pDUSessionChargingInformation /pduSessionInformation/diagnostics
Enhanced Diagnostics	Enhanced Diagnostics	/pDUSessionChargingInformation /pduSessionInformation/enhancedDiagnostics
3GPP PS Data Off Status	3GPP PS Data Off Status	/pDUSessionChargingInformation /pduSessionInformation/3gppPSDataOffStatus
Session Stop Indicator	Session Stop Indicator	/pDUSessionChargingInformation /pduSessionInformation/sessionStopIndicator
Redundant Transmission Type	Redundant Transmission Type	/pDUSessionChargingInformation /pduSessionInformation/redundantTransmissionType
PDU Session Pair ID	PDU Session Pair ID	/pDUSessionChargingInformation /pduSessionInformation/pDUSessionPairID
5G LAN Type Service	5G LAN Type Service	/pDUSessionChargingInformation /pduSessionInformation/5GLANTypeService
Internal Group Identifier	Internal Group Identifier	/pDUSessionChargingInformation /pduSessionInformation/5GLANTypeService/internalGroupIdentifier
Unit Count Inactivity Timer	-	/pDUSessionChargingInformation/unitCountInactivityTimer
RAN Secondary RAT Usage Report	RAN Secondary RAT Usage Report	/pDUSessionChargingInformation/rANSecondaryRATUsageReport
NG RAN Secondary RAT Type	NG RAN Secondary RAT Type	/pDUSessionChargingInformation/rANSecondaryRATUsageReport/rANSecondaryRATType
Qos Flows Usage Reports	Qos Flows Usage Reports	/pDUSessionChargingInformation/rANSecondaryRATUsageReport/qosFlowsUsageReports
Roaming QBC information	Roaming QBC information	/roamingQBCInformation
Multiple QFI container	Multiple QFI container	/roamingQBCInformation/multipleQFIcontainer
Triggers	Triggers	/roamingQBCInformation/multipleQFIcontainer/triggers
Trigger Timestamp	Trigger Timestamp	/roamingQBCInformation/multipleQFIcontainer/triggerTimestamp
Time	Time	/roamingQBCInformation/multipleQFIcontainer/time
Total Volume	Total Volume	/roamingQBCInformation/multipleQFIcontainer/totalVolume
Uplink Volume	Uplink Volume	/roamingQBCInformation/multipleQFIcontainer/ uplinkVolume
Downlink Volume	Downlink Volume	/roamingQBCInformation/multipleQFIcontainer/ downlinkVolume

Local Sequence Number	Local Sequence Number	/roamingQBCInformation/multipleQFIcontainer/localSequenceNumber
QFI Container information	QFI Container information	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation
QoS Flow Id	QoS Flow Id	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/qFI
Time of First Usage	Time of First Usage	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/ timeofFirstUsage
Time of Last Usage	Time of Last Usage	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/timeofLastUsage
QoS Information	QoS Information	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/qoSInformation
QoS Characteristics	QoS Characteristics	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/qoSCharacteristics
User Location Information	User Location Information	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/ userLocationInformation
UE Time Zone	UE Time Zone	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/uetimeZone
Presence Reporting Area Information	Presence Reporting Area Information	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/presenceReportingAreaInformation
RAT Type	RAT Type	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/rATType
Report Time	Report Time	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/reportTime
Serving Network Function ID	Serving Network Function ID	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/ servingNetworkFunctionID
3GPP PS Data Off Status	3GPP PS Data Off Status	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/3gppPSDataOffStatus
EPS bearer Charging Id	EPS bearer Charging Id	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/3gppChargingId
Diagnostics	Diagnostics	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/diagnostics
Enhanced Diagnostics	Enhanced Diagnostics	/roamingQBCInformation/multipleQFIcontainer/qFIContainerInformation/enhancedDiagnostics
UPF ID	UPF ID	/roamingQBCInformation/uPFID
Roaming Charging Profile	Roaming Charging Profile	/roamingQBCInformation/roamingChargingProfile
Trigger	Trigger	/roamingQBCInformationroamingChargingProfile/trigger
Partial record method	Partial record method	/roamingQBCInformation/roamingChargingProfile/partialRecordMethod
		ChargingDataResponse
Supported Features	-	**/**supportedFeatures
Multiple Unit information	-	/multipleUnitInformation
UPF ID	-	/multipleUnitInformation/uPFID
PDU Session Charging Information	-	/pDUSessionChargingInformation
Presence Reporting Area Information	-	/pDUSessionChargingInformation/ presenceReportingAreaInformation
Unit Count Inactivity Timer	-	/pDUSessionChargingInformation/unitCountInactivityTimer
Roaming QBC information	-	/roamingQBCInformation
Roaming Charging Profile	-	/roamingQBCInformation/roamingChargingProfile

7.3 Bindings for SMS charging

Table 7.3-1: Bindings of CDR field, Information Element and Resource Attribute for SMS charging

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Invocation Timestamp	Event Timestamp	/invocationTimeStamp
SMS Charging Information	SMS Charging Information	/sMSChargingInformation
Originator Info	Originator Info	/sMSChargingInformation/originatorInfo
Originator SUPI	Originator SUPI	/sMSChargingInformation/originatorInfo/originatorSUPI
Originator GPSI	Originator GPSI	/sMSChargingInformation/originatorInfo/originatorGPSI
Originator Other Address	Originator Other Address	/sMSChargingInformation/originatorInfo/originatorOtherAddress
Originator Received Address	Originator Received Address	/sMSChargingInformation/originatorInfo/originatorReceivedAddress
Originator SCCP Address	Originator SCCP Address	/sMSChargingInformation/originatorInfo/originatorSCCPAddress
SM Originator Interface	SM Originator Interface	/sMSChargingInformation/originatorInfo/sMOriginatorInterface
SM Originator Protocol Id	SM Originator Protocol Id	/sMSChargingInformation/originatorInfo/sMOriginatorProtocolId
Recipient Info	Recipient Info	/sMSChargingInformation/recipientInfo
Recipient SUPI	Recipient SUPI	/sMSChargingInformation/recipientInfo/recipientSUPI
Recipient GPSI	Recipient GPSI	/sMSChargingInformation/recipientInfo/recipientGPSI
Recipient Other Address	Recipient Other Address	/sMSChargingInformation/recipientInfo/recipientOtherAddress
Recipient Received Address	Recipient Received Address	/sMSChargingInformation/recipientInfo/recipientReceivedAddress
Recipient SCCP Address	Recipient SCCP Address	/sMSChargingInformation/recipientInfo/recipientSCCPAddress
SM Destination Interface	SM Destination Interface	/sMSChargingInformation/recipientInfo/sMDestinationInterface
SM Recipient Protocol Id	SM Recipient Protocol Id	/sMSChargingInformation/recipientInfo/sMrecipientProtocolId
User Equipment Info	User Equipment Info	/sMSChargingInformation/userEquipmentInfo
Roamer In Out	Roamer In Out	/sMSChargingInformation/userEquipmentInfo/roamerInOut
User Location Info	User Location Info	/sMSChargingInformation/userLocationinfo
UE Time Zone	UE Time Zone	/sMSChargingInformation/uetimeZone
RAT Type	RAT Type	/sMSChargingInformation/rATType
SMSC Address	SMSC Address	/sMSChargingInformation/sMSCAddress
SM Data Coding Scheme	SM Data Coding Scheme	/sMSChargingInformation/sMDataCodingScheme
SM Message Type	SM Message Type	/sMSChargingInformation/sMMessageType
SM Reply Path Requested	SM Reply Path Requested	/sMSChargingInformation/sMReplyPathRequested
SM User Data Header	SM User Data Header	/sMSChargingInformation/sMUserDataHeader
SM Status	SM Status	/sMSChargingInformation/sMStatus
SM Discharge Time	SM Discharge Time	/sMSChargingInformation/sMDischargeTime
Number of Messages Sent	Number of Messages Sent	/sMSChargingInformation/numberofMessagesSent
SM Service Type	SM Service Type	/sMSChargingInformation/sMServiceType
SM Sequence Number	SM Sequence Number	/sMSChargingInformation/sMSequenceNumber
SMS result	SMS result	/sMSChargingInformation/sMSresult
Submission Time	Submission Time	/sMSChargingInformation/submissionTime
SM Priority	SM Priority	/sMSChargingInformation/sMPriority
Message Reference	Message Reference	/sMSChargingInformation/messageReference
Message Size	Message Size	/sMSChargingInformation/messageSize
Message Class	Message Class	/sMSChargingInformation/messageClass
Delivery Report Requested	Delivery Report Requested	/sMSChargingInformation/deliveryReportRequested

Information Element	CDR Field	Resource Attribute
		ChargingDataResponse
-	-	-

7.4 Bindings for 5G connection and mobility

Table 7.4-1: Bindings of 5G 5G connection and mobility CDR field, Information Element and Resource Attribute

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Registration Charging Information	Registration Charging Information	/registrationChargingInformation
Registration message type	Registration message type	/registrationChargingInformation/registrationMessagetype
User Information	User Information	/registrationChargingInformation/userInformation
User Identifier	User Identifier	/registrationChargingInformation/userInformation/servedGPSI
User Equipment Info	User Equipment Info	/registrationChargingInformation/userInformation/servedPEI
unauthenticatedFlag	unauthenticatedFlag	/registrationChargingInformation/userInformation/unauthenticatedFlag
Roamer In Out	Roamer In Out	/registrationChargingInformation/userInformation/roamerInOut
User Location Information	User Location Information	/registrationChargingInformation/userLocationinfo
PSCell Information	PSCell Information	/registrationChargingInformation/pSCellInformation
UE Time Zone	UE Time Zone	/registrationChargingInformation/uetimeZone
RAT Type	RAT Type	/registrationChargingInformation/rATType
5GMM Capability	5GMM Capability	/registrationChargingInformation/5gMMCapability
MICO Mode Indication	MICO Mode Indication	/registrationChargingInformation/mICOModeIndication
SMS Supported Indication	SMS Supported Indication	/registrationChargingInformation/smsIndication
TAI List	TAI List	/registrationChargingInformation/taiList
Service Area Restrictions	Service Area Restrictions	/registrationChargingInformation/serviceAreaRestriction
Requested NSSAI	Requested NSSAI	/registrationChargingInformation/requestedNSSAI
Allowed NSSAI	Allowed NSSAI	/registrationChargingInformation/allowedNssai
Rejected NSSAI	Rejected NSSAI	/registrationChargingInformation/rejectedNSSAI
NSSAI mapping list	NSSAI mapping list	/registrationChargingInformation/nSSAIMapList
AMF UE NGAP ID	AMF UE NGAP ID	/registrationChargingInformation/amfUeNgapId
RAN UE NGAP ID	RAN UE NGAP ID	/registrationChargingInformation/ranUeNgapId
RAN Node Id	RAN Node Id	/registrationChargingInformation/ranNodeId
N2 Connection Charging Information	N2 Connection Charging Information	/n2ConnectionChargingInformation
N2 Connection message type	N2 Connection message type	/n2ConnectionChargingInformation/n2ConnectionMessageType
User Information	User Information	/registrationChargingInformation/userInformation
User Identifier	User Identifier	/n2ConnectionChargingInformation/userInformation/servedGPSI
User Equipment Info	User Equipment Info	/n2ConnectionChargingInformation/userInformation/servedPEI
unauthenticatedFlag	unauthenticatedFlag	/n2ConnectionChargingInformation/userInformation/unauthenticatedFlag
Roamer In Out	Roamer In Out	/n2ConnectionChargingInformation/userInformation/roamerInOut
User Location Information	User Location Information	/n2ConnectionChargingInformation/userLocationinfo
PSCell Information	PSCell Information	/n2ConnectionChargingInformation/pSCellInformation
UE Time Zone	UE Time Zone	/n2ConnectionChargingInformation/uetimeZone
RAT Type	RAT Type	/n2ConnectionChargingInformation/rATType
AMF UE NGAP ID	AMF UE NGAP ID	/n2ConnectionChargingInformation/amfUeNgapId
RAN UE NGAP ID	RAN UE NGAP ID	/n2ConnectionChargingInformation/ranUeNgapId
RAN Node Id	RAN Node Id	/n2ConnectionChargingInformation/ranNodeId

Mobility Restrictions	Mobility Restrictions	/n2ConnectionChargingInformation/restrictedRatList /n2ConnectionChargingInformation/forbiddenAreaList /n2ConnectionChargingInformation/serviceAreaRestriction /n2ConnectionChargingInformation/restrictedCnList
Allowed NSSAI	Allowed NSSAI	/n2ConnectionChargingInformation/allowedNssai
RRC Establishment Cause	RRC Establishment Cause	/n2ConnectionChargingInformation/rrcEstCause
Location Reporting Charging Information	Location Reporting Charging Information	/locationReportingChargingInformation
N2 Connection message type	N2 Connection message type	/locationReportingChargingInformation/n2ConnectionMessageType
User Information	User Information	/locationReportingChargingInformation/userInformation
User Identifier	User Identifier	/locationReportingChargingInformation/userInformation/servedGPSI
User Equipment Info	User Equipment Info	/locationReportingChargingInformation/userInformation/servedPEI
unauthenticatedFlag	unauthenticatedFlag	/locationReportingChargingInformation/userInformation/unauthenticatedFlag
Roamer In Out	Roamer In Out	/locationReportingChargingInformation/userInformation/roamerInOut
User Location Information	User Location Information	/locationReportingChargingInformation/userLocationinfo
PSCell Information	PSCell Information	locationReportingChargingInformation/pSCellInformation
UE Time Zone	UE Time Zone	/locationReportingChargingInformation/uetimeZone
Presence Reporting Area Information	Presence Reporting Area Information	/locationReportingChargingInformation/presenceReportingAreaInformation
RAT Type	RAT Type	/locationReportingChargingInformation/rATType
		ChargingDataResponse
Supported Features	-	**/**supportedFeatures-
Location Reporting Charging Information	-	/locationReportingChargingInformation
Location reporting message type	-	/locationReportingChargingInformation/locationReportingMessageType
Presence Reporting Area Information	-	/locationReportingChargingInformation /presenceReportingAreaInformation

7.5 Bindings for Exposure Function Northbound API charging

Table 7.5-1: Bindings of CDR field, Information Element and Resource Attribute for Exposure Function Northbound API charging

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Exposure Function API Information	Exposure Function API Information	/nEFChargingInformation
External Individual Identifier	External Individual Identifier	/nEFChargingInformation/externalIndividualIdentifier
External Group Identifier	External Group Identifier	/nEFChargingInformation/externalGroupIdentifier
Internal Group Identifier	Internal Group Identifier	/nEFChargingInformation/groupIdentifier
API Direction	API Direction	/nEFChargingInformation/aPIDirection
API Target Network Function	API Target Network Function	/nEFChargingInformation/aPITargetNetworkFunction
API Result Code	API Result Code	/nEFChargingInformation/aPIResultCode
API Name	API Name	/nEFChargingInformation/aPIName
API Reference	API Reference	/nEFChargingInformation/aPIReference
API Content	API Content	/nEFChargingInformation/aPIContent
		ChargingDataResponse
-	-	-

7.6 Bindings for NS performance and Analytics charging

Table 7.6-1: Bindings of CDR field, Information Element and Resource Attribute for NS performance and Analytics charging

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Tenant Identifier	Tenant Identifier	/tenantIdentifier
Multiple Unit Usage	List of Multiple Unit Usage	/multipleUnitUsage
Used Unit Container	Used Unit Container	/multipleUnitUsage/usedUnitContainer
NSPA Container Information	NSPA Container Information	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation
Latency	Latency	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/latency
Throughput	Throughput	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/throughput
Maximum utilized bandwidth	Maximum utilized bandwidth	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/maximumUtilizedBandwidth
Maximum packet loss rate	Maximum packet loss rate	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/maximumPacketLossRate
Service Experience statistics data	Service Experience statistics data	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/serviceExperienceStatisticsData
The number of PDU sessions	The number of PDU sessions	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/theNumberOfPDUSessions
The number of Registered Subscribers	The number of Registered Subscribers	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/theNumberOfRegisteredSubscribers
Load level	Load level	/multipleUnitUsage/usedUnitContainer/nSPAContainerInformation/loadLevel
NSPA Charging Information	NSPA Charging Information	/nSPAChargingInformation
Single NSSAI	Single NSSAI	/nSPAChargingInformation/singleNSSAI
		ChargingDataResponse
-	-	-

7.7 Bindings for NS Management charging

Table 7.7-1: Bindings of CDR field, Information Element and Resource Attribute for NS Management charging

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Tenant Identifier	Tenant Identifier	/tenantIdentifier
MnS Consumer Identifier	MnS Consumer Identifier	/mnSConsumerIdentifier
NSM Charging information	NSM Charging information	/nSMChargingInformation
Management operation	Management operation	/nSMChargingInformation/managementOperation
Identifier of NetworkSlice Instance	Identifier of NetworkSlice Instance	/nSMChargingInformation/idNetworkSliceInstance
List of Service profile charging information	List of Service profile charging information	/nSMChargingInformation/listOfserviceProfileChargingInformation
Service Profile Id	Service Profile Id	/nSMChargingInformation/serviceProfileIdentifier
S-NSSAIs List	S-NSSAIs List	/nSMChargingInformation/sNSSAIList
SST	SST	/nSMChargingInformation/sST
Latency	Latency	/nSMChargingInformation/latency
Availability	Availability	/nSMChargingInformation/availability
Resource Sharing Level	Resource Sharing Level	/nSMChargingInformation/resourceSharingLevel
Jitter	Jitter	/nSMChargingInformation/jitter
Reliability	Reliability	/nSMChargingInformation/reliability
Maximum Number of UEs	Maximum Number of UEs	/nSMChargingInformation/maxNumberofUEs
Coverage Area	Coverage Area	/nSMChargingInformation/coverageArea
UE Mobility Level	UE Mobility Level	/nSMChargingInformation/uEMobilityLevel
Delay Tolerance	Delay Tolerance	/nSMChargingInformation/delayToleranceIndicator
DL Throughput Per Slice	DL Throughput Per Slice	/nSMChargingInformation/dLThptPerSlice
DL Throughput Per UE	DL Throughput Per UE	/nSMChargingInformation/dLThptPerUE
UL Throughput Per Slice	UL Throughput Per Slice	/nSMChargingInformation/uLThptPerSlice
UL Throughput Per UE	UL Throughput Per UE	/nSMChargingInformation/uLThptPerUE
Max Number of PDU sessions	Max Number of PDU sessions	/nSMChargingInformation/maxNumberofPDUsessions
KPIs Monitoring list	KPIs Monitoring list	/nSMChargingInformation/kPIMonitoringList
Supported Access Technology	Supported Access Technology	/nSMChargingInformation/supportedAccessTechnology
V2X Communication Mode	V2X Communication Mode	/nSMChargingInformation/v2XCommunicationModeIndicator
Additional service profile charging information	Additional service profile charging information	/nSMChargingInformation/addServiceProfileInfo
Management operation status	Management operation status	/nSMChargingInformation/managementOperationStatus
Operational state	Operational state	/nSMChargingInformation/managementOperationalState
Administrative state	Administrative state	/nSMChargingInformation/managementAdministrativeState
		ChargingDataResponse
-	-	-

7.8 Bindings for IMS charging

Table 7.8-1: Bindings of CDR field, Information Element and Resource Attribute for IMS charging

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
IMS Charging Information	IMS Charging Information	/iMSChargingInformation
Event Type	Event Type	/iMSChargingInformation/eventType
IMS Node Functionality	IMS Node Functionality	/iMSChargingInformation/iMSNodeFunctionality
Role of Node	Role of Node	/iMSChargingInformation/roleOfNode
User Information	-	/iMSChargingInformation/userInformation
User Identifier	User Identifier	/iMSChargingInformation/userInformation/servedGPSI
User Equipment Info	User Equipment Info	/iMSChargingInformation/userInformation/servedPEI
User Location Info	User Location Info	/iMSChargingInformation/userLocationInfo
UE Time Zone	UE Time Zone	/iMSChargingInformation/ueTimeZone
3GPP PS Data Off Status	3GPP PS Data Off Status	/iMSChargingInformation/3gppPSDataOffStatus
ISUP Cause	ISUP Cause	/iMSChargingInformation/isupCause
Serving Node Address	Control Plane Address	/iMSChargingInformation/controlPlaneAddress
VLR Number	VLR Number	/iMSChargingInformation/vlrNumber
MSC Address	MSC Address	/iMSChargingInformation/mscAddress
User Session ID	User Session ID	/iMSChargingInformation/userSessionID
Outgoing Session ID	Outgoing Session ID	/iMSChargingInformation/outgoingSessionID
Session Priority	Session Priority	/iMSChargingInformation/sessionPriority
Calling Party Addresses	Calling Party Addresses	/iMSChargingInformation/callingPartyAddresses
Called Party Address	Called Party Address	/iMSChargingInformation/calledPartyAddress
Number Portability Routing Information	Number Portability Routing	/iMSChargingInformation/numberPortabilityRoutinginformation
Carrier Select Routing Information	Carrier Select routing information	/iMSChargingInformation/carrierSelectRoutingInformation
Alternate Charged Party Address	Alternate Charged Party Address	/iMSChargingInformation/alternateChargedPartyAddress
Requested Party Address	Requested Party Addresses	/iMSChargingInformation/requestedPartyAddress
Called Asserted Identities	Called Asserted Identities	/iMSChargingInformation/calledAssertedIdentities
Called Identity Change	Called Identity Changes	/iMSChargingInformation/calledIdentityChange/calledIdentityChanges
Called Identity	Called Identity	/iMSChargingInformation/calledIdentityChange/changeTime
Called Identity Change Time Stamp	Change Time	/iMSChargingInformation/calledIdentityChange
Associated URI	Associated URI	/iMSChargingInformation/associatedURI
Time Stamps	Time Stamps	/iMSChargingInformation/timeStamps
Application Server Information	Application Server Information	/iMSChargingInformation/applicationServerInformation
Inter Operator Identifier	Inter Operator Identifier	/iMSChargingInformation/interOperatorIdentifier
IMS Charging Identifier	IMS Charging Identifier	/iMSChargingInformation/imsChargingIdentifier
Related IMS Charging Identifier	Related ICID	/iMSChargingInformation/relatedICID
Related IMS Charging Identifier Generation Node	Related ICID Generation Node	/iMSChargingInformation/relatedICIDGenerationNode
Transit IOI List	Transit IOI List	/iMSChargingInformation/transitIOIList
Early Media Description	Early Media Description	/iMSChargingInformation/earlyMediaDescription
SDP Session Description	SDP Session Description	/iMSChargingInformation/sdpSessionDescription
SDP Media Component	SDP Media Component	/iMSChargingInformation/sdpMediaComponent
Served Party IP Address	Served Party IP Address	/iMSChargingInformation/servedPartyIPAddress
Server Capabilities	Server Capabilities	/iMSChargingInformation/serverCapabilities
Trunk Group ID	Trunk Group ID	/iMSChargingInformation/trunkGroupID

Information Element	CDR Field	Resource Attribute
Bearer Service	Bearer Service	/iMSChargingInformation/bearerService
Service Id	Service Id	/iMSChargingInformation/imsServiceId
Message Bodies	Message Bodies	/iMSChargingInformation/messageBodies
Access Network Information	Access Network Information	/iMSChargingInformation/accessNetworkInformation
Additional Access Network Information	Additional Access Network Information	/iMSChargingInformation/additionalAccessNetworkInformation
Cellular Network Information	Cellular Network Information	/iMSChargingInformation/cellularNetworkInformation
Access Transfer Information	Access Transfer Information	/iMSChargingInformation/accessTransferInformation
Access Network Info Change	Access Network Info Change	/iMSChargingInformation/accessNetworkInfoChange
IMS Communication Service ID	IMS Communication Service ID	/iMSChargingInformation/imsCommunicationServiceID
IMS Application Reference ID	IMS Application Reference ID	/iMSChargingInformation/imsApplicationReferenceID
Cause Code	Cause Code	/iMSChargingInformation/causeCode
Reason Header	Reason Header	/iMSChargingInformation/reasonHeader
Initial IMS Charging Identifier	Initial IMS Charging Identifier	/iMSChargingInformation/initialIMSChargingIdentifier
NNI Information	NNI Information	/iMSChargingInformation/nniInformation
From Address	From Address	/iMSChargingInformation/fromAddress
IMS Emergency Indication	IMS Emergency Indication	/iMSChargingInformation/imsEmergencyIndication
IMS Visited Network Identifier	IMS Visited Network Identifier	/iMSChargingInformation/imsVisitedNetworkIdentifier
SIP Route Header Received	SIP Route Header Received	/iMSChargingInformation/sipRouteHeaderReceived
SIP Route Header Transmitted	SIP Route Header Transmitted	/iMSChargingInformation/sipRouteHeaderTransmitted
TAD Identifier	TAD Identifier	/iMSChargingInformation/tadIdentifier
FE Identifier List	FE Identifier List	/iMSChargingInformation/feIdentifierList
		ChargingDataResponse

7.9 Bindings for 5G ProSe charging

Table 7.9-1: Bindings of 5G ProSe charging CDR field, Information Element and Resource Attribute

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
Supported Features	-	/supportedFeatures
Multiple Unit Usage	List of Multiple Unit Usage	/multipleUnitUsage
Used Unit Container	Used Unit Container	/multipleUnitUsage/usedUnitContainer
PC5 Container Information	PC5 Container Information	/multipleUnitUsage/usedUnitContainer/pC5ContainerInformation
Coverage Info	Coverage Info	/multipleUnitUsage/usedUnitContainer/pC5ContainerInformation/coverage Info
Radio Parameter Set Info	Radio Parameter Set Info	/multipleUnitUsage/usedUnitContainer/pC5ContainerInformation/radioParameterSet Info
Transmitter Info	Transmitter Info	/multipleUnitUsage/usedUnitContainer/pC5ContainerInformation/transmitterInfo
Time of First Transmission	Time of First Transmission	/multipleUnitUsage/usedUnitContainer/pC5ContainerInformation/timeOfFirst Transmission
Time of First Reception	Time of First Reception	/multipleUnitUsage/usedUnitContainer/pC5ContainerInformation/TimeOfFirstReception
ProSe Information	ProSe Information	/proSeInformation
Announcing PLMN ID	Announcing PLMN ID	/proSeInformation/announcingPlmnId
Announcing UE HPLMN Identifier	Announcing UE HPLMN Identifier	/proSeInformation/announcingUeHplmnId
Announcing UE VPLMN Identifier	Announcing UE VPLMN Identifier	/proSeInformation/announcingUeVplmnId
Monitoring UE HPLMN Identifier	Monitoring UE HPLMN Identifier	/proSeInformation/monitoringUeHplmnId
Monitoring UE VPLMN Identifier	Monitoring UE VPLMN Identifier	/proSeInformation/monitoringUeVplmnId
Discoverer UE HPLMN Identifier	Discoverer UE HPLMN Identifier	/proSeInformation/discovererUeHplmnId
Discoverer UE VPLMN Identifier	Discoverer UE VPLMN Identifier	/proSeInformation/discovererUeVplmnId
Discoveree UE HPLMjN Identifier	Discoveree UE HPLMN Identifier	/proSeInformation/discovereeUeHplmnId
Discoveree UE VPLMN Identifier	Discoveree UE VPLMN Identifier	/proSeInformation/discovereeUeVplmnId
Monitored PLMN Identifier	Monitored PLMN Identifier	/proSeInformation/monitoredPlmnIdentifier
ProSe Application ID	ProSe Application ID	/proSeInformation/proseApplicationId
Application ID	Application ID	/proSeInformation/applicationId
Application Specific Data	Application Specific Data	/proSeInformation/applicationSpecificData
ProSe functionality	ProSe functionality	/proSeInformation/proSeFunctionality
ProSe Event Type	ProSe Event Type	/proSeInformation/proSeEventType
Direct Discovery Model	Direct Discovery Model	/proSeInformation/directDiscoveryModel
Validity Period	Validity Period	/proSeInformation/validityPeriod
Role of UE	Role of UE	/proSeInformation/roleOfUe
ProSe Request Timestamp	ProSe Request Timestamp	/proSeInformation/proSeRequestTimestamp
PC3 Protocol Cause	PC3 Protocol Cause	/proSeInformation/pC3ProtocolCause
Monitoring UE Identifier	Monitoring UE Identifier	/proSeInformation/monitoringUEIdentifier
Requestor PLMN Identifier	Requestor PLMN Identifier	/proSeInformation/requestorPlmnIdentifier
Requested Application Layer User ID	Requested Application Layer User ID	/proSeInformation/requestedApplicationLayerUserId
Requested PLMN Identifier	Requested PLMN Identifier	/proSeInformation/requestedPlmnIdentifier
Time Window	Time Window	/proSeInformation/timeWindow
Range Class	Range Class	/proSeInformation/rangeClass
Proximity Alert Indication	Proximity Alert Indication	/proSeInformation/proximityAlertIndication
Proximity Alert Timestamp	Proximity Alert Timestamp	/proSeInformation/proximityAlertTimestamp
Proximity Cancellation Timestamp	Proximity Cancellation Timestamp	/proSeInformation/proximityCancellationTimestamp
Relay IP address	Relay IP address	/proSeInformation/relayIpAddress
ProSe UE-to-Network Relay UE ID	ProSe UE-to-Network Relay UE ID	/proSeInformation/proSeUeToNetworkRelayUeId
ProSe Destination Layer-2 ID	ProSe Destination Layer-2 ID	/proSeInformation/proSeDestinationLayer2Id
PFI Container Information	PFI Container Information	/proSeInformation/pFIContainerInformation
PC5 QoS Flow ID	PC5 QoS Flow ID	/proSeInformation/pFIContainerInformation/pC5QosFlowId
Time of First Usage	Time of First Usage	/proSeInformation/pFIContainerInformation/timeOfFirstUsage

Time of Last Usage	Time of Last Usage	/proSeInformation/pFIContainerInformation/timeOfLastUsage
QoS Information	QoS Information	/proSeInformation/pFIContainerInformation/qosInformation
QoS Characteristics	QoS Characteristics	/proSeInformation/pFIContainerInformation/qoSCharacteristics
User Location Information	User Location Information	/proSeInformation/pFIContainerInformation/userLocationInformation
UE Time Zone	UE Time Zone	/proSeInformation/pFIContainerInformation/ueTimeZone
Presence Reporting Area Information	Presence Reporting Area Information	/proSeInformation/pFIContainerInformation/presenceReportingAreaInformation
Report Time	Report Time	/proSeInformation/pFIContainerInformation/reportTime
Transmission Data Container	Transmission Data Container	/proSeInformation/transmissionDataContainer
Local Sequence Number	Local Sequence Number	/proSeInformation/transmissionDataContainer/localSequenceNumber
Change Time	Change Time	/proSeInformation/transmissionDataContainer/changeTime
Coverage status	Coverage status	/proSeInformation/transmissionDataContainer/coverageStatus
User Location Information	User Location Information	/proSeInformation/transmissionDataContainer/userLocationInformation
Data Volume Transmitted	Data Volume Transmitted	/proSeInformation/transmissionDataContainer/dataVolumeTransmitted
Change Condition	Change Condition	/proSeInformation/transmissionDataContainer/changeCondition
VPLMN Identifier	VPLMN Identifier	/proSeInformation/transmissionDataContainer/vplmnIdentifier
Usage Information Report Sequence Number	Usage Information Report Sequence Number	/proSeInformation/transmissionDataContainer/usageInformationReportSequenceNumber
Radio Resources Indicator	Radio Resources Indicator	/proSeInformation/transmissionDataContainer/radioResourcesIndicator
Radio Frequency	Radio Frequency	/proSeInformation/transmissionDataContainer/radioFrequency
PC5 Radio Technology	PC5 Radio Technology	/proSeInformation/transmissionDataContainer/pC5RadioTechnology
Reception Data Container	Reception Data Container	/proSeInformation/receptionDataContainer
Local Sequence Number	Local Sequence Number	/proSeInformation/receptionDataContainer/localSequenceNumber
Change Time	Change Time	/proSeInformation/receptionDataContainer/changeTime
Coverage Status	Coverage Status	/proSeInformation/receptionDataContainer/coverageStatus
User Location Information	User Location Information	/proSeInformation/receptionDataContainer/userLocationInformation
Data Volume Received	Data Volume Received	/proSeInformation/receptionDataContainer/dataReceived
Change Condition	Change Condition	/proSeInformation/receptionDataContainer/changeCondition
VPLMN Identifier	VPLMN Identifier	/proSeInformation/receptionDataContainer/vplmnIdentifier
Usage Information Report Sequence Number	Usage Information Report Sequence Number	/proSeInformation/receptionDataContainer/usageInformationReportSequenceNumber
Radio Resources Indicator	Radio Resources Indicator	/proSeInformation/receptionDataContainer/radioResourcesIndicator
Radio Frequency	Radio Frequency	/proSeInformation/receptionDataContainer/radioFrequency
PC5 Radio Technology	PC5 Radio Technology	/proSeInformation/receptionDataContainer/pC5RadioTechnology
		ChargingDataResponse

7.10 Bindings for Edge Computing domain charging

Table 7.10-1: Bindings of Edge Computing domain charging CDR field, Information Element and Resource Attribute

Information Element	CDR Field	Resource Attribute
		ChargingDataRequest
EAS ID	EAS ID	/eASID
EDN ID	EDN ID	/eDNID
EAS Provider Identifier	EAS Provider Identifier	/eASProviderIdentifier
Edge Enabling Infrastructure Resource Usage Charging Information	Edge Enabling Infrastructure Resource Usage Charging Information	/edgeInfrastructureUsageChargingInformation
Mean Virtual CPU Usage	Mean Virtual CPU Usage	/edgeInfrastructureUsageChargingInformation/meanVirtualCPUUsage
Mean Virtual Memory Usage	Mean Virtual Memory Usage	/edgeInfrastructureUsageChargingInformation/meanVirtualMemoryUsage
Mean Virtual Disk Usage	Mean Virtual Disk Usage	/edgeInfrastructureUsageChargingInformation/meanVirtualDiskUsage
Duration Start Time	Duration Start Time	/edgeInfrastructureUsageChargingInformation/durationStartTime
Duration End Time	Duration End Time	/edgeInfrastructureUsageChargingInformation/durationEndTime
EAS Deployment Charging Information	EAS Deployment Charging Information	/eASDeploymentChargingInformation
EAS Deployment Requirements	EAS Deployment Requirements	/eASDeploymentChargingInformation/eASDeploymentRequirements
LCM Event Type	LCM Event Type	/eASDeploymentChargingInformation/lCMEventType
LCM Start Time	LCM Start Time	/eASDeploymentChargingInformation/lCMStartTime
LCM End Time	LCM End Time	/eASDeploymentChargingInformation/lCMEndTime
Direct Edge Enabling Service Charging Information	Exposure Function API Information	/nEFChargingInformation
Exposed Edge Enabling Service Charging Information	Exposure Function API Information	/nEFChargingInformation
		ChargingDataResponse

8 Security

Security aspects for service based interface shall be supported as specified in subclause 13 of 3GPP TS 33.501 [390].

As indicated in 3GPP TS 33.501 [390] and 3GPP TS 29.500 [299], the access to the Nchf_ ConvergedCharging API and to the Nchf_OfflineOnlyCharging API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [403]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [305]) plays the role of the authorization server.

If OAuth2 authorization is used, an NF Service Consumer, prior to consuming services offered by the Nchf_ ConvergedCharging API and by the Nchf_OfflineOnlyCharging API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [305], 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 Nchf_ ConvergedCharging service. The same principle applies for Nchf_OfflineOnlyCharging API.

The Nchf_ ConvergedCharging API defines a single scope "nchf-convergedcharging" for the entire service, and it does not define any additional scopes at resource and operation level.

The Nchf_OfflineOnlyCharging API defines a single scope "nchf-offlineonlycharging" for the entire service, and it does not define any additional scopes at resource and operation level.

Annex A (normative): OpenAPI specification

A.1 General

The present Annex contains two OpenAPIs [500] specification of HTTP messages and content bodies used by the Nchf_ConvergedCharging API and Nchf_OfflineOnlyCharging API.

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 1: 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 document are available on a repository (see 3GPP TS 29.501 [300] clause 5.3.1 and 3GPP TR 21.900 [101] clause 5B)).

A.2 Nchf_ConvergedCharging API

```
openapi: 3.0.0
info:
  title: Nchf_ConvergedCharging
  version: 3.1.4
  description: |
    ConvergedCharging Service    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI,
TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
  description: >
    3GPP TS 32.291 V17.7.0: Telecommunication management; Charging management;
    5G system, charging service; Stage 3.
  url: 'http://www.3gpp.org/ftp/Specs/archive/32_series/32.291/'
servers:
  - url: '{apiRoot}/nchf-convergedcharging/v3'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in subclause 4.4 of 3GPP TS 29.501.
security:
  - {}
  - oAuth2ClientCredentials:
    - nchf-convergedcharging
paths:
  /chargingdata:
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ChargingDataRequest'
      responses:
        '201':
          description: Created
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/ChargingDataResponse'
        '400':
          description: Bad request
          content:
            application/problem+json:
              schema:
                oneOf:
                  - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  - $ref: '#/components/schemas/ChargingDataResponse'
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
```

```
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          description: Forbidden
          content:
            application/problem+json:
              schema:
                oneOf:
                  - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  - $ref: '#/components/schemas/ChargingDataResponse'
        '404':
          description: Not Found
          content:
            application/problem+json:
              schema:
                oneOf:
                  - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  - $ref: '#/components/schemas/ChargingDataResponse'
        '405':
          $ref: 'TS29571_CommonData.yaml#/components/responses/405'
        '408':
          $ref: 'TS29571_CommonData.yaml#/components/responses/408'
        '410':
          $ref: 'TS29571_CommonData.yaml#/components/responses/410'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
      callbacks:
        chargingNotification:
          '{$request.body#/notifyUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/ChargingNotifyRequest'
              responses:
                '200':
                  description: OK.
                  content:
                    application/ json:
                      schema:
                        $ref: '#/components/schemas/ChargingNotifyResponse'
                '204':
                  description: 'No Content, Notification was succesfull'
                '307':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/307'
                '308':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/308'
                '400':
                  description: Bad request
                  content:
                    application/problem+json:
                      schema:
                        oneOf:
                          - $ref: TS29571_CommonData.yaml#/components/schemas/ProblemDetails
                          - $ref: '#/components/schemas/ChargingNotifyResponse'
                default:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  '/chargingdata/{ChargingDataRef}/update':
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ChargingDataRequest'
      parameters:
```

```
      - name: ChargingDataRef
        in: path
        description: a unique identifier for a charging data resource in a PLMN
        required: true
        schema:
          type: string
    responses:
      '200':
        description: OK. Updated Charging Data resource is returned
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ChargingDataResponse'
      '307':
        $ref: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29571_CommonData.yaml#/components/responses/308'
      '400':
        description: Bad request
        content:
          application/problem+json:
            schema:
              oneOf:
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                - $ref: '#/components/schemas/ChargingDataResponse'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        description: Forbidden
        content:
          application/problem+json:
            schema:
              oneOf:
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                - $ref: '#/components/schemas/ChargingDataResponse'
      '404':
        description: Not Found
        content:
          application/problem+json:
            schema:
              oneOf:
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                - $ref: '#/components/schemas/ChargingDataResponse'
      '405':
        $ref: 'TS29571_CommonData.yaml#/components/responses/405'
      '408':
        $ref: 'TS29571_CommonData.yaml#/components/responses/408'
      '410':
        $ref: 'TS29571_CommonData.yaml#/components/responses/410'
      '411':
        $ref: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29571_CommonData.yaml#/components/responses/413'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29571_CommonData.yaml#/components/responses/default'
'/chargingdata/{ChargingDataRef}/release':
  post:
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ChargingDataRequest'
    parameters:
      - name: ChargingDataRef
        in: path
        description: a unique identifier for a charging data resource in a PLMN
        required: true
        schema:
          type: string
    responses:
      '204':
        description: No Content.
      '307':
```

```
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '404':
          description: Not Found
          content:
            application/problem+json:
              schema:
                oneOf:
                  - $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  - $ref: '#/components/schemas/ChargingDataResponse'
        '410':
          $ref: 'TS29571_CommonData.yaml#/components/responses/410'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '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: '{nrfApiRoot}/oauth2/token'
          scopes:
            nchf-convergedcharging: Access to the Nchf_ConvergedCharging API
  schemas:
    ChargingDataRequest:
      type: object
      properties:
        subscriberIdentifier:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        tenantIdentifier:
          type: string
        chargingId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
        mnSConsumerIdentifier:
          type: string
        nfConsumerIdentification:
          $ref: '#/components/schemas/NFIdentification'
        invocationTimeStamp:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        invocationSequenceNumber:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
        retransmissionIndicator:
          type: boolean
        oneTimeEvent:
          type: boolean
        oneTimeEventType:
          $ref: '#/components/schemas/oneTimeEventType'
        notifyUri:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        supportedFeatures:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        serviceSpecificationInfo:
          type: string
        multipleUnitUsage:
          type: array
          items:
            $ref: '#/components/schemas/MultipleUnitUsage'
          minItems: 0
        triggers:
          type: array
          items:
            $ref: '#/components/schemas/Trigger'
          minItems: 0
        easid:
          type: string
        ednid:
          type: string
```

```
      eASProviderIdentifier:
        type: string
      pDUSessionChargingInformation:
        $ref: '#/components/schemas/PDUSessionChargingInformation'
      roamingQBCInformation:
        $ref: '#/components/schemas/RoamingQBCInformation'
      sMSChargingInformation:
        $ref: '#/components/schemas/SMSChargingInformation'
      nEFChargingInformation:
        $ref: '#/components/schemas/NEFChargingInformation'
      registrationChargingInformation:
        $ref: '#/components/schemas/RegistrationChargingInformation'
      n2ConnectionChargingInformation:
        $ref: '#/components/schemas/N2ConnectionChargingInformation'
      locationReportingChargingInformation:
        $ref: '#/components/schemas/LocationReportingChargingInformation'
      nSPAChargingInformation:
        $ref: '#/components/schemas/NSPAChargingInformation'
      nSMChargingInformation:
        $ref: '#/components/schemas/NSMChargingInformation'
      mMTelChargingInformation:
        $ref: '#/components/schemas/MMTelChargingInformation'
      iMSChargingInformation:
        $ref: '#/components/schemas/IMSChargingInformation'
      edgeInfrastructureUsageChargingInformation':
        $ref: '#/components/schemas/EdgeInfrastructureUsageChargingInformation'
      eASDeploymentChargingInformation:
        $ref: '#/components/schemas/EASDeploymentChargingInformation'
      directEdgeEnablingServiceChargingInformation:
        $ref: '#/components/schemas/NEFChargingInformation'
      exposedEdgeEnablingServiceChargingInformation:
        $ref: '#/components/schemas/NEFChargingInformation'
      proSeChargingInformation:
        $ref: '#/components/schemas/ProseChargingInformation'
    required:
      - nfConsumerIdentification
      - invocationTimeStamp
      - invocationSequenceNumber
  ChargingDataResponse:
    type: object
    properties:
      invocationTimeStamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      invocationSequenceNumber:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      invocationResult:
        $ref: '#/components/schemas/InvocationResult'
      sessionFailover:
        $ref: '#/components/schemas/SessionFailover'
      supportedFeatures:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      multipleUnitInformation:
        type: array
        items:
          $ref: '#/components/schemas/MultipleUnitInformation'
        minItems: 0
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      pDUSessionChargingInformation:
        $ref: '#/components/schemas/PDUSessionChargingInformation'
      roamingQBCInformation:
        $ref: '#/components/schemas/RoamingQBCInformation'
      locationReportingChargingInformation:
        $ref: '#/components/schemas/LocationReportingChargingInformation'
    required:
      - invocationTimeStamp
      - invocationSequenceNumber
  ChargingNotifyRequest:
    type: object
    properties:
      notificationType:
        $ref: '#/components/schemas/NotificationType'
      reauthorizationDetails:
        type: array
        items:
```

```
        $ref: '#/components/schemas/ReauthorizationDetails'
      minItems: 0
  required:
    - notificationType
ChargingNotifyResponse:
  type: object
  properties:
    invocationResult:
      $ref: '#/components/schemas/InvocationResult'
NFIdentification:
  type: object
  properties:
    nFName:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    nFIPv4Address:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    nFIPv6Address:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
    nFPLMNID:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    nodeFunctionality:
      $ref: '#/components/schemas/NodeFunctionality'
    nFFqdn:
      type: string
  required:
    - nodeFunctionality
MultipleUnitUsage:
  type: object
  properties:
    ratingGroup:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/RatingGroup'
    requestedUnit:
      $ref: '#/components/schemas/RequestedUnit'
    usedUnitContainer:
      type: array
      items:
        $ref: '#/components/schemas/UsedUnitContainer'
      minItems: 0
    uPFID:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    multihomedPDUAddress:
      $ref: '#/components/schemas/PDUAddress'
  required:
    - ratingGroup
InvocationResult:
  type: object
  properties:
    error:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
    failureHandling:
      $ref: '#/components/schemas/FailureHandling'
Trigger:
  type: object
  properties:
    triggerType:
      $ref: '#/components/schemas/TriggerType'
    triggerCategory:
      $ref: '#/components/schemas/TriggerCategory'
    timeLimit:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    volumeLimit:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    volumeLimit64:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
    eventLimit:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    maxNumberOfccc:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    tariffTimeChange:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  required:
    - triggerType
    - triggerCategory
MultipleUnitInformation:
  type: object
  properties:
    resultCode:
      $ref: '#/components/schemas/ResultCode'
```

```
      ratingGroup:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatingGroup'
      grantedUnit:
        $ref: '#/components/schemas/GrantedUnit'
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      validityTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
      quotaHoldingTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
      finalUnitIndication:
        $ref: '#/components/schemas/FinalUnitIndication'
      timeQuotaThreshold:
        type: integer
      volumeQuotaThreshold:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      unitQuotaThreshold:
        type: integer
      uPFID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      announcementInformation:
        $ref: '#/components/schemas/AnnouncementInformation'
    required:
      - ratingGroup
  RequestedUnit:
    type: object
    properties:
      time:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      totalVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      uplinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      downlinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      serviceSpecificUnits:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
  UsedUnitContainer:
    type: object
    properties:
      serviceId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceId'
      quotaManagementIndicator:
        $ref: '#/components/schemas/QuotaManagementIndicator'
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      triggerTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      time:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      totalVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      uplinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      downlinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      serviceSpecificUnits:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      eventTimeStamps:

        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        minItems: 0
      localSequenceNumber:
        type: integer
      pDUContainerInformation:
        $ref: '#/components/schemas/PDUContainerInformation'
      nSPAContainerInformation:
        $ref: '#/components/schemas/NSPAContainerInformation'
      pC5ContainerInformation:
        $ref: '#/components/schemas/PC5ContainerInformation'
```

```
    required:
      - localSequenceNumber
  GrantedUnit:
    type: object
    properties:
      tariffTimeChange:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      time:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      totalVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      uplinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      downlinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      serviceSpecificUnits:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
  FinalUnitIndication:
    type: object
    properties:
      finalUnitAction:
        $ref: '#/components/schemas/FinalUnitAction'
      restrictionFilterRule:
        $ref: '#/components/schemas/IPFilterRule'
      restrictionFilterRuleList:
        type: array
        items:
          $ref: '#/components/schemas/IPFilterRule'
        minItems: 1
      filterId:
        type: string
      filterIdList:
        type: array
        items:
          type: string
        minItems: 1
      redirectServer:
        $ref: '#/components/schemas/RedirectServer'
    required:
      - finalUnitAction
  RedirectServer:
    type: object
    properties:
      redirectAddressType:
        $ref: '#/components/schemas/RedirectAddressType'
      redirectServerAddress:
        type: string
    required:
      - redirectAddressType
      - redirectServerAddress
  ReauthorizationDetails:
    type: object
    properties:
      serviceId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceId'
      ratingGroup:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatingGroup'
      quotaManagementIndicator:
        $ref: '#/components/schemas/QuotaManagementIndicator'
  PDUSessionChargingInformation:
    type: object
    properties:
      chargingId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
      sMFchargingId:
        type: string
      homeProvidedChargingId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
      sMFHomeProvidedChargingId:
        type: string
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationinfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      mAPDUNon3GPPUserLocationInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      non3GPPUserLocationTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
```

```
      mAPDUNon3GPPUserLocationTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      pduSessionInformation:
        $ref: '#/components/schemas/PDUSessionInformation'
      unitCountInactivityTimer:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
      rANSecondaryRATUsageReport:
        $ref: '#/components/schemas/RANSecondaryRATUsageReport'
  UserInformation:
    type: object
    properties:
      servedGPSI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      servedPEI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
      unauthenticatedFlag:
        type: boolean
      roamerInOut:
        $ref: '#/components/schemas/RoamerInOut'
  PDUSessionInformation:
    type: object
    properties:
      networkSlicingInfo:
        $ref: '#/components/schemas/NetworkSlicingInfo'
      pduSessionID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
      pduType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
      sscMode:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SscMode'
      hPlmnId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      servingNetworkFunctionID:
        $ref: '#/components/schemas/ServingNetworkFunctionID'
      ratType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      mAPDUNon3GPPRATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      dnnId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      dnnSelectionMode:
        $ref: '#/components/schemas/dnnSelectionMode'
      chargingCharacteristics:
        type: string
        pattern: '^[0-9a-fA-F]{1,4}$'
      chargingCharacteristicsSelectionMode:
        $ref: '#/components/schemas/ChargingCharacteristicsSelectionMode'
      startTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      stopTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      3gppPSDataOffStatus:
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
      sessionStopIndicator:
        type: boolean
      pduAddress:
        $ref: '#/components/schemas/PDUAddress'
      diagnostics:
        $ref: '#/components/schemas/Diagnostics'
      authorizedQoSInformation:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/AuthorizedDefaultQos'
      subscribedQoSInformation:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SubscribedDefaultQos'
      authorizedSessionAMBR:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
      subscribedSessionAMBR:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
      servingCNPlmnId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      mAPDUSessionInformation:
        $ref: '#/components/schemas/MAPDUSessionInformation'
```

```
      enhancedDiagnostics:
        $ref: '#/components/schemas/EnhancedDiagnostics5G'
      redundantTransmissionType:
        $ref: '#/components/schemas/RedundantTransmissionType'
      pDUSessionPairID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      cpCIoTOptimisationIndicator:
        type: boolean
      5GSControlPlaneOnlyIndicator:
        type: boolean
      smallDataRateControlIndicator:
        type: boolean
      5GLANTypeService:
          $ref: '#/components/schemas/5GLANTypeService'
    required:
      - pduSessionID
      - dnnId
  PDUContainerInformation:
    type: object
    properties:
      timeofFirstUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeofLastUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      qoSInformation:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosData'
      qoSCharacteristics:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosCharacteristics'
      afChargingIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
      afChargingIdString:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ApplicationChargingId'
      userLocationInformation:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      servingNodeID:
        type: array
        items:
          $ref: '#/components/schemas/ServingNetworkFunctionID'
        minItems: 0
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0
      3gppPSDataOffStatus:
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
      sponsorIdentity:
        type: string
      applicationserviceProviderIdentity:
        type: string
      chargingRuleBaseName:
        type: string
      mAPDUSteeringFunctionality:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/SteeringFunctionality'
      mAPDUSteeringMode:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/SteeringMode'
      trafficForwardingWay:
        $ref: '#/components/schemas/TrafficForwardingWay'
      qosMonitoringReport:
        type: array
        items:
          $ref: '#/components/schemas/QosMonitoringReport'
        minItems: 0
  NSPAContainerInformation:
    type: object
    properties:
      latency:
        type: integer
      throughput:
        $ref: '#/components/schemas/Throughput'
      maximumPacketLossRate:
        type: string
      serviceExperienceStatisticsData:
        $ref: 'TS29520_Nnwdaf_EventsSubscription.yaml#/components/schemas/ServiceExperienceInfo'
```

```
        theNumberOfPDUSessions:
          type: integer
        theNumberOfRegisteredSubscribers:
          type: integer
        loadLevel:
          $ref: 'TS29520_Nnwdaf_EventsSubscription.yaml#/components/schemas/NsiLoadLevelInfo'
    NSPAChargingInformation:
      type: object
      properties:
        singleNSSAI:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      required:
        - singleNSSAI
    NetworkSlicingInfo:
      type: object
      properties:
        sNSSAI:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      required:
        - sNSSAI
    PDUAddress:
      type: object
      properties:
        pduIPv4Address:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        pduIPv6AddresswithPrefix:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        pduAddressprefixlength:
          type: integer
        iPv4dynamicAddressFlag:
          type: boolean
        iPv6dynamicPrefixFlag:
          type: boolean
        addIpv6AddrPrefixes:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
        addIpv6AddrPrefixList:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
    ServingNetworkFunctionID:
      type: object
      properties:
        servingNetworkFunctionInformation:
          $ref: '#/components/schemas/NFIdentification'
        aMFId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/AmfId'
      required:
        - servingNetworkFunctionInformation
    RoamingQBCInformation:
      type: object
      properties:
        multipleQFIcontainer:
          type: array
          items:
            $ref: '#/components/schemas/MultipleQFIcontainer'
          minItems: 0
        uPFID:
# Included for backwards compatibility and
              # can be included based on operators requirement
          $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        roamingChargingProfile:
          $ref: '#/components/schemas/RoamingChargingProfile'
    MultipleQFIcontainer:
      type: object
      properties:
        triggers:
          type: array
          items:
            $ref: '#/components/schemas/Trigger'
          minItems: 0
        triggerTimestamp:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        time:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
        totalVolume:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
        uplinkVolume:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
```

```
      downlinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      localSequenceNumber:
        type: integer
      qFIContainerInformation:
        $ref: '#/components/schemas/QFIContainerInformation'
    required:
      - localSequenceNumber
  QFIContainerInformation:
    type: object
    properties:
      qFI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Qfi'
      reportTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeofFirstUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeofLastUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      qoSInformation:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosData'
      qoSCharacteristics:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosCharacteristics'
      userLocationInformation:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      servingNetworkFunctionID:
        type: array
        items:
          $ref: '#/components/schemas/ServingNetworkFunctionID'
        minItems: 0
      3gppPSDataOffStatus:
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
      3gppChargingId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
      diagnostics:
        $ref: '#/components/schemas/Diagnostics'
      enhancedDiagnostics:
        type: array
        items:
          type: string
    required:
      - reportTime
  RoamingChargingProfile:
    type: object
    properties:
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      partialRecordMethod:
        $ref: '#/components/schemas/PartialRecordMethod'
  SMSChargingInformation:
    type: object
    properties:
      originatorInfo:
        $ref: '#/components/schemas/OriginatorInfo'
      recipientInfo:
        type: array
        items:
          $ref: '#/components/schemas/RecipientInfo'
        minItems: 0
      userEquipmentInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
      roamerInOut:
        $ref: '#/components/schemas/RoamerInOut'
      userLocationinfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      uetimeZone:
```

```
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      sMSCAddress:
        type: string
      sMDataCodingScheme:
        type: integer
      sMMessageType:
        $ref: '#/components/schemas/SMMessageType'
      sMReplyPathRequested:
        $ref: '#/components/schemas/ReplyPathRequested'
      sMUserDataHeader:
        type: string
      sMStatus:
        type: string
        pattern: '^[0-7]?[0-9a-fA-F]$'
      sMDischargeTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      numberofMessagesSent:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      sMServiceType:
        $ref: '#/components/schemas/SMServiceType'
      sMSequenceNumber:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      sMSresult:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      submissionTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      sMPriority:
        $ref: '#/components/schemas/SMPriority'
      messageReference:
        type: string
      messageSize:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      messageClass:
        $ref: '#/components/schemas/MessageClass'
      deliveryReportRequested:
        $ref: '#/components/schemas/DeliveryReportRequested'
  OriginatorInfo:
    type: object
    properties:
      originatorSUPI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      originatorGPSI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      originatorOtherAddress:
        $ref: '#/components/schemas/SMAddressInfo'
      originatorReceivedAddress:
        $ref: '#/components/schemas/SMAddressInfo'
      originatorSCCPAddress:
        type: string
      sMOriginatorInterface:
        $ref: '#/components/schemas/SMInterface'
      sMOriginatorProtocolId:
        type: string
  RecipientInfo:
    type: object
    properties:
      recipientSUPI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      recipientGPSI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      recipientOtherAddress:
        $ref: '#/components/schemas/SMAddressInfo'
      recipientReceivedAddress:
        $ref: '#/components/schemas/SMAddressInfo'
      recipientSCCPAddress:
        type: string
      sMDestinationInterface:
        $ref: '#/components/schemas/SMInterface'
      sMrecipientProtocolId:
        type: string
  SMAddressInfo:
    type: object
    properties:
      sMaddressType:
        $ref: '#/components/schemas/SMAddressType'
      sMaddressData:
```

```
      type: string
    sMaddressDomain:
      $ref: '#/components/schemas/SMAddressDomain'
RecipientAddress:
  type: object
  properties:
    recipientAddressInfo:
      $ref: '#/components/schemas/SMAddressInfo'
    sMaddresseeType:
      $ref: '#/components/schemas/SMAddresseeType'
MessageClass:
  type: object
  properties:
    classIdentifier:
      $ref: '#/components/schemas/ClassIdentifier'
    tokenText:
      type: string
SMAddressDomain:
  type: object
  properties:
    domainName:
      type: string
    3GPPIMSIMCCMNC:
      type: string
SMInterface:
  type: object
  properties:
    interfaceId:
      type: string
    interfaceText:
      type: string
    interfacePort:
      type: string
    interfaceType:
      $ref: '#/components/schemas/InterfaceType'
RANSecondaryRATUsageReport:
  type: object
  properties:
    rANSecondaryRATType:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    qosFlowsUsageReports:
      type: array
      items:
        $ref: '#/components/schemas/QosFlowsUsageReport'
Diagnostics:
  type: integer
IPFilterRule:
  type: string
QosFlowsUsageReport:
  type: object
  properties:
    qFI:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Qfi'
    startTimestamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    endTimestamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    uplinkVolume:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
    downlinkVolume:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
5GLANTypeService:
  type: object
  properties:
    internalGroupIdentifier:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
NEFChargingInformation:
  type: object
  properties:
    externalIndividualIdentifier:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    externalGroupIdentifier:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/ExternalGroupId'
    groupIdentifier:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
    aPIDirection:
      $ref: '#/components/schemas/APIDirection'
    aPITargetNetworkFunction:
```

```
        $ref: '#/components/schemas/NFIdentification'
      aPIResultCode:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      aPIName:
        type: string
      aPIReference:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      aPIContent:
        type: string
    required:
      - aPIName
  RegistrationChargingInformation:
    type: object
    properties:
      registrationMessagetype:
        $ref: '#/components/schemas/RegistrationMessageType'
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationinfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      pSCellInformation:
        $ref: '#/components/schemas/PSCellInformation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      5GMMCapability:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Bytes'
      mICOModeIndication:
        $ref: '#/components/schemas/MICOModeIndication'
      smsIndication:
        $ref: '#/components/schemas/SmsIndication'
      taiList:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Tai'
        minItems: 0
      serviceAreaRestriction:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
        minItems: 0
      requestedNSSAI:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        minItems: 0
      allowedNSSAI:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        minItems: 0
      rejectedNSSAI:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        minItems: 0
      nSSAIMapList:
        type: array
        items:
          $ref: '#/components/schemas/NSSAIMap'
        minItems: 0
      amfUeNgapId:
        type: integer
      ranUeNgapId:
        type: integer
      ranNodeId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/GlobalRanNodeId'
    required:
      - registrationMessagetype
  PSCellInformation:
    type: object
    properties:
      nrcgi:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ncgi'
      ecgi:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ecgi'
  NSSAIMap:
```

```
    type: object
    properties:
      servingSnssai:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      homeSnssai:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    required:
      - servingSnssai
      - homeSnssai
  N2ConnectionChargingInformation:
    type: object
    properties:
      n2ConnectionMessageType:
        $ref: '#/components/schemas/N2ConnectionMessageType'
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationinfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      pSCellInformation:
        $ref: '#/components/schemas/PSCellInformation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      amfUeNgapId:
        type: integer
      ranUeNgapId:
        type: integer
      ranNodeId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/GlobalRanNodeId'
      restrictedRatList:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
        minItems: 0
      forbiddenAreaList:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Area'
        minItems: 0
      serviceAreaRestriction:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
        minItems: 0
      restrictedCnList:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/CoreNetworkType'
        minItems: 0
      allowedNSSAI:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        minItems: 0
      rrcEstCause:
        type: string
        pattern: '^[0-9a-fA-F]+$'
    required:
      - n2ConnectionMessageType
  LocationReportingChargingInformation:
    type: object
    properties:
      locationReportingMessageType:
        $ref: '#/components/schemas/LocationReportingMessageType'
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationinfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      pSCellInformation:
        $ref: '#/components/schemas/PSCellInformation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
```

```
            $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
          minProperties: 0
      required:
        - locationReportingMessageType
    N2ConnectionMessageType:
      type: integer
    LocationReportingMessageType:
      type: integer
    NSMChargingInformation:
      type: object
      properties:
        managementOperation:
          $ref: '#/components/schemas/ManagementOperation'
        idNetworkSliceInstance:
          type: string
        listOfserviceProfileChargingInformation:
          type: array
          items:
            $ref: '#/components/schemas/ServiceProfileChargingInformation'
          minItems: 0
        managementOperationStatus:
          $ref: '#/components/schemas/ManagementOperationStatus'
# To be introduced once the reference to 'generic.yaml is resolved
#         managementOperationalState:
#           $ref: 'genericNrm.yaml#/components/schemas/OperationalState'
#         managementAdministrativeState:
#           $ref: 'genericNrm.yaml#/components/schemas/AdministrativeState'
      required:
        - managementOperation
    ServiceProfileChargingInformation:
      type: object
      properties:
        serviceProfileIdentifier:
            type: string
        sNSSAIList:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
          minItems: 0
# To be introduced once the reference to 'nrNrm.yaml is resolved
#         sST:
#           $ref: 'nrNrm.yaml#/components/schemas/Sst'
        latency:
          type: integer
        availability:
          type: number
# To be introduced once the reference to sliceNrm.yaml is resolved
#         resourceSharingLevel:
#           $ref: 'sliceNrm.yaml#/components/schemas/SharingLevel'
        jitter:
          type: integer
        reliability:
          type: string
        maxNumberofUEs:
          type: integer
        coverageArea:
          type: string
# To be introduced once the reference to sliceNrm.yaml is resolved
#         uEMobilityLevel:
#           $ref: 'sliceNrm.yaml#/components/schemas/MobilityLevel'
#         delayToleranceIndicator:
#           $ref: 'sliceNrm.yaml#/components/schemas/Support'
        dLThptPerSlice:
          $ref: '#/components/schemas/Throughput'
        dLThptPerUE:
          $ref: '#/components/schemas/Throughput'
        uLThptPerSlice:
          $ref: '#/components/schemas/Throughput'
        uLThptPerUE:
          $ref: '#/components/schemas/Throughput'
        maxNumberofPDUsessions:
          type: integer
        kPIMonitoringList:
          type: string
        supportedAccessTechnology:
          type: integer
# To be introduced once the reference to sliceNrm.yaml is resolved
#         v2XCommunicationModeIndicator:
```

```
#          $ref: 'sliceNrm.yaml#/components/schemas/Support'
        addServiceProfileInfo:
          type: string
    Throughput:
      type: object
      properties:
        guaranteedThpt:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
        maximumThpt:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
    MAPDUSessionInformation:
      type: object
      properties:
        mAPDUSessionIndicator:
          $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/MaPduIndication'
        aTSSSCapability:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/AtsssCapability'
    EnhancedDiagnostics5G:
      $ref: '#/components/schemas/RanNasCauseList'
    RanNasCauseList:
      type: array
      items:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/RanNasRelCause'
    QosMonitoringReport:
      description: Contains reporting information on QoS monitoring.
      type: object
      properties:
        ulDelays:
          type: array
          items:
            type: integer
          minItems: 0
        dlDelays:
          type: array
          items:
            type: integer
          minItems: 0
        rtDelays:
          type: array
          items:
            type: integer
          minItems: 0
    AnnouncementInformation:
      type: object
      properties:
        announcementIdentifier:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
        announcementReference:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        variableParts:
          type: array
          items:
            $ref: '#/components/schemas/VariablePart'
          minItems: 0
        timeToPlay:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
        quotaConsumptionIndicator:
          $ref: '#/components/schemas/QuotaConsumptionIndicator'
        announcementPriority:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
        playToParty:
          $ref: '#/components/schemas/PlayToParty'
        announcementPrivacyIndicator:
          $ref: '#/components/schemas/AnnouncementPrivacyIndicator'
        Language:
          $ref: '#/components/schemas/Language'
    VariablePart:
      type: object
      properties:
        variablePartType:
          $ref: '#/components/schemas/VariablePartType'
        variablePartValue:
          type: array
          items:
            type: string
          minItems: 1
        variablePartOrder:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
```

```
    required:
      - variablePartType
      - variablePartValue
  Language:
    type: string
  MMTelChargingInformation:
    type: object
    properties:
      supplementaryServices:
        type: array
        items:
          $ref: '#/components/schemas/SupplementaryService'
        minItems: 1
  SupplementaryService:
    type: object
    properties:
      supplementaryServiceType:
        $ref: '#/components/schemas/SupplementaryServiceType'
      supplementaryServiceMode:
        $ref: '#/components/schemas/SupplementaryServiceMode'
      numberOfDiversions:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      associatedPartyAddress:
        type: string
      conferenceId:
        type: string
      participantActionType:
        $ref: '#/components/schemas/ParticipantActionType'
      changeTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      numberOfParticipants:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      cUGInformation:
        $ref: '#/components/schemas/OctetString'
  IMSChargingInformation:
    type: object
    properties:
      eventType:
        $ref: '#/components/schemas/SIPEventType'
      iMSNodeFunctionality:
        $ref: '#/components/schemas/IMSNodeFunctionality'
      roleOfNode:
        $ref: '#/components/schemas/RoleOfIMSNode'
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      ueTimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      3gppPSDataOffStatus:
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
      isupCause:
        $ref: '#/components/schemas/ISUPCause'
      controlPlaneAddress:
        $ref: '#/components/schemas/IMSAddress'
      vlrNumber:
        $ref: '#/components/schemas/E164'
      mscAddress:
        $ref: '#/components/schemas/E164'
      userSessionID:
        type: string
      outgoingSessionID:
        type: string
      sessionPriority:
        $ref: '#/components/schemas/IMSSessionPriority'
      callingPartyAddresses:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        minItems: 1
      calledPartyAddress:
        type: string
      numberPortabilityRoutinginformation:
        type: string
      carrierSelectRoutingInformation:
        type: string
      alternateChargedPartyAddress:
        type: string
```

```
requestedPartyAddress:
  type: array
  items:
    type: string
  minItems: 1
calledAssertedIdentities:
  type: array
  items:
    type: string
  minItems: 1
calledIdentityChanges:
  type: array
  items:
    $ref: '#/components/schemas/CalledIdentityChange'
  minItems: 1
associatedURI:
  type: array
  items:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
  minItems: 1
timeStamps:
  $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
applicationServerInformation:
  type: array
  items:
    type: string
  minItems: 1
interOperatorIdentifier:
  type: array
  items:
    $ref: '#/components/schemas/InterOperatorIdentifier'
  minItems: 1
imsChargingIdentifier:
  type: string
relatedICID:
  type: string
relatedICIDGenerationNode:
  type: string
transitIOIList:
  type: array
  items:
    type: string
  minItems: 1
earlyMediaDescription:
  type: array
  items:
    $ref: '#/components/schemas/EarlyMediaDescription'
  minItems: 1
sdpSessionDescription:
  type: array
  items:
    type: string
  minItems: 1
sdpMediaComponent:
  type: array
  items:
    $ref: '#/components/schemas/SDPMediaComponent'
  minItems: 1
servedPartyIPAddress:
  $ref: '#/components/schemas/IMSAddress'
serverCapabilities:
  $ref: '#/components/schemas/ServerCapabilities'
trunkGroupID:
  $ref: '#/components/schemas/TrunkGroupID'
bearerService:
  type: string
imsServiceId:
  type: string
messageBodies:
  type: array
  items:
    $ref: '#/components/schemas/MessageBody'
  minItems: 1
accessNetworkInformation:
  type: array
  items:
    type: string
  minItems: 1
```

```
      additionalAccessNetworkInformation:
        type: string
      cellularNetworkInformation:
        type: string
      accessTransferInformation:
        type: array
        items:
          $ref: '#/components/schemas/AccessTransferInformation'
        minItems: 1
      accessNetworkInfoChange:
        type: array
        items:
          $ref: '#/components/schemas/AccessNetworkInfoChange'
        minItems: 1
      imsCommunicationServiceID:
        type: string
      imsApplicationReferenceID:
        type: string
      causeCode:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      reasonHeader:
        type: array
        items:
          type: string
        minItems: 1
      initialIMSChargingIdentifier:
        type: string
      nniInformation:
        type: array
        items:
          $ref: '#/components/schemas/NNIInformation'
        minItems: 1
      fromAddress:
        type: string
      imsEmergencyIndication:
        type: boolean
      imsVisitedNetworkIdentifier:
        type: string
      sipRouteHeaderReceived:
        type: string
      sipRouteHeaderTransmitted:
        type: string
      tadIdentifier:
        $ref: '#/components/schemas/TADIdentifier'
      feIdentifierList:
        type: string
  EdgeInfrastructureUsageChargingInformation:
    type: object
    properties:
      meanVirtualCPUUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
      meanVirtualMemoryUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
      meanVirtualDiskUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
      durationStartTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      durationEndTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  EASDeploymentChargingInformation:
    type: object
    properties:
      eEASDeploymentRequirements:
        $ref: '#/components/schemas/EASRequirements'
      lCMEventType:
        $ref: '#/components/schemas/ManagementOperation'
      lCMStartTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      lCMEndTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'

  PC5ContainerInformation:
    type: object
    properties:
      coverageInfoList:
        type: array
        items:
          $ref: '#/components/schemas/CoverageInfo'
```

```
      radioParameterSetInfoList:
        type: array
        items:
          $ref: '#/components/schemas/RadioParameterSetInfo'
      transmitterInfoList:
        type: array
        items:
          $ref: '#/components/schemas/TransmitterInfo'
        minItems: 0
      timeOfFirst Transmission:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeOfFirst Reception:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  CoverageInfo:
    type: object
    properties:
      coverageStatus:
        type: boolean
      changeTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      locationInfo:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
        minItems: 0

  RadioParameterSetInfo:
    type: object
    properties:
      radioParameterSetValues:
        type: array
        items:
          $ref: '#/components/schemas/OctetString'
        minItems: 0
      changeTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  TransmitterInfo:
    type: object
    properties:
      proseSourceIPAddress:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
      proseSourceL2Id:
        type: string
  ProseChargingInformation:
    type: object
    properties:
      announcingPlmnID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      announcingUeHplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      announcingUeVplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      monitoringUeHplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      monitoringUeVplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      discovererUeHplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      discovererUeVplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      discovereeUeHplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      discovereeUeVplmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      monitoredPlmnIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      proseApplicationID:
        type: string
      ApplicationId:
        type: string
      applicationSpecificDataList:
        type: array
        items:
          type: string
        minItems: 0
      proseFunctionality:
        $ref: '#/components/schemas/ProseFunctionality'
      proseEventType:
```

```
        $ref: '#/components/schemas/ProseEventType'
      directDiscoveryModel:
        $ref: '#/components/schemas/DirectDiscoveryModel'
      validityPeriod:
        type: integer
      roleOfUE:
        $ref: '#/components/schemas/RoleOfUE'
      proseRequestTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      pC3ProtocolCause:
        type: integer
      monitoringUEIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestedPLMNIdentifier:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      timeWindow:
        type: integer
      rangeClass:
        $ref: '#/components/schemas/RangeClass'
      proximityAlertIndication:
        type: boolean
      proximityAlertTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      proximityCancellationTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      relayIPAddress:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
      proseUEToNetworkRelayUEID :
        type: string
      proseDestinationLayer2ID:
        type: string
      pFIContainerInformation:
        type: array
        items:
          $ref: '#/components/schemas/PFIContainerInformation'
        minItems: 0
      transmissionDataContainer:
        type: array
        items:
          $ref: '#/components/schemas/PC5DataContainer'
        minItems: 0
      receptionDataContainer:
        type: array
        items:
          $ref: '#/components/schemas/PC5DataContainer'
        minItems: 0
    required:
      - aPIName

  PFIContainerInformation:
    type: object
    properties:
      pFI:
        type: string
      reportTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeofFirstUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeofLastUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      qoSInformation:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosData'
      qoSCharacteristics:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosCharacteristics'
      userLocationInformation:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0

  PC5DataContainer:
    type: object
    properties:
      localSequenceNumber:
```

```
      type: string
    changeTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    coverageStatus:
      type: boolean
    userLocationInformation:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
    dataVolume:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
    changeCondition:
      type: string
    radioResourcesId:
      $ref: '#/components/schemas/RadioResourcesId'
    radioFrequency:
      type: string
    pC5RadioTechnology:
      type: string

OctetString:
  type: string
  pattern: '^[0-9a-fA-F]+$'
E164:
  type: string
  pattern: '^[0-9a-fA-F]+$'
IMSAddress:
  type: object
  properties:
    ipv4Addr:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    ipv6Addr:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
    e164:
      $ref: '#/components/schemas/E164'
  anyOf:
    - required: [ ipv4Addr ]
    - required: [ ipv6Addr ]
    - required: [ e164 ]
ServingNodeAddress:
  type: object
  properties:
    ipv4Addr:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    ipv6Addr:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
  anyOf:
    - required: [ ipv4Addr ]
    - required: [ ipv6Addr ]
SIPEventType:
  type: object
  properties:
    sIPMethod:
      type: string
    eventHeader:
      type: string
    expiresHeader:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
ISUPCause:
  type: object
  properties:
    iSUPCauseLocation:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    iSUPCauseValue:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    iSUPCauseDiagnostics:
      $ref: '#/components/schemas/OctetString'
CalledIdentityChange:
  type: object
  properties:
    calledIdentity:
      type: string
    changeTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
InterOperatorIdentifier:
  type: object
  properties:
    originatingIOI:
      type: string
    terminatingIOI:
```

```
      type: string
EarlyMediaDescription:
  type: object
  properties:
    sDPTimeStamps:
      $ref: '#/components/schemas/SDPTimeStamps'
    sDPMediaComponent:
      type: array
      items:
        $ref: '#/components/schemas/SDPMediaComponent'
      minItems: 0
    sDPSessionDescription:
      type: array
      items:
        type: string
      minItems: 0
SDPTimeStamps:
  type: object
  properties:
    sDPOfferTimestamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    sDPAnswerTimestamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
SDPMediaComponent:
  type: object
  properties:
    sDPMediaName:
      type: string
    SDPMediaDescription:
      type: array
      items:
        type: string
      minItems: 0
    localGWInsertedIndication:
      type: boolean
    ipRealmDefaultIndication:
      type: boolean
    transcoderInsertedIndication:
      type: boolean
    mediaInitiatorFlag:
      $ref: '#/components/schemas/MediaInitiatorFlag'
    mediaInitiatorParty:
      type: string
    threeGPPChargingId:
      $ref: '#/components/schemas/OctetString'
    accessNetworkChargingIdentifierValue:
      $ref: '#/components/schemas/OctetString'
    sDPType:
      $ref: '#/components/schemas/SDPType'
ServerCapabilities:
  type: object
  properties:
    mandatoryCapability:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      minItems: 0
    optionalCapability :
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      minItems: 0
    serverName:
      type: array
      items:
        type: string
      minItems: 0
TrunkGroupID:
  type: object
  properties:
    incomingTrunkGroupID:
      type: string
    outgoingTrunkGroupID:
      type: string
MessageBody:
  type: object
  properties:
    contentType:
```

```
        type: string
      contentLength:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      contentDisposition:
        type: string
      originator:
        $ref: '#/components/schemas/OriginatorPartyType'
    required:
      - contentType
      - contentLength
  AccessTransferInformation:
    type: object
    properties:
      accessTransferType:
        $ref: '#/components/schemas/AccessTransferType'
      accessNetworkInformation:
        type: array
        items:
          $ref: '#/components/schemas/OctetString'
        minItems: 0
      cellularNetworkInformation:
        $ref: '#/components/schemas/OctetString'
      interUETransfer:
        $ref: '#/components/schemas/UETransferType'
      userEquipmentInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
      instanceId:
        type: string
      relatedIMSChargingIdentifier:
        type: string
      relatedIMSChargingIdentifierNode:
        $ref: '#/components/schemas/IMSAddress'
      changeTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  AccessNetworkInfoChange:
    type: object
    properties:
      accessNetworkInformation:
        type: array
        items:
          $ref: '#/components/schemas/OctetString'
        minItems: 0
      cellularNetworkInformation:
        $ref: '#/components/schemas/OctetString'
      changeTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  NNIInformation:
    type: object
    properties:
      sessionDirection:
        $ref: '#/components/schemas/NNISessionDirection'
      nNIType:
        $ref: '#/components/schemas/NNIType'
      relationshipMode:
        $ref: '#/components/schemas/NNIRelationshipMode'
      neighbourNodeAddress:
        $ref: '#/components/schemas/IMSAddress'
  EASRequirements:
    type: object
    properties:
      requiredEASservingLocation:
        $ref: 'TS28538_EdgeNrm.yaml#/components/schemas/ServingLocation'
      softwareImageInfo:
        $ref: 'TS28538_EdgeNrm.yaml#/components/schemas/SoftwareImageInfo'
      affinityAntiAffinity:
        $ref: 'TS28538_EdgeNrm.yaml#/components/schemas/AffinityAntiAffinity'
      serviceContinuity:
        type: boolean
      virtualResource:
        $ref: 'TS28538_EdgeNrm.yaml#/components/schemas/VirtualResource'
  NotificationType:
    anyOf:
      - type: string
        enum:
          - REAUTHORIZATION
          - ABORT_CHARGING
      - type: string
  NodeFunctionality:
```

```
      anyOf:
        - type: string
          enum:
            - AMF
            - SMF
            - SMS # Included for backwards compatibility, shall not be used
            - SMSF
            - PGW_C_SMF
            - NEFF # Included for backwards compatibility, shall not be used
            - SGW
            - I_SMF
            - ePDG
            - CEF
            - NEF
            - MnS_Producer
            - SGSN
            - V_SMF
            - 5G_DDNMF
            - IMS_Node
            - EES
        - type: string
    ChargingCharacteristicsSelectionMode:
      anyOf:
        - type: string
          enum:
            - HOME_DEFAULT
            - ROAMING_DEFAULT
            - VISITING_DEFAULT
        - type: string
    TriggerType:
      anyOf:
        - type: string
          enum:
            - QUOTA_THRESHOLD
            - QHT
            - FINAL
            - QUOTA_EXHAUSTED
            - VALIDITY_TIME
            - OTHER_QUOTA_TYPE
            - FORCED_REAUTHORISATION
            - UNUSED_QUOTA_TIMER # Included for backwards compatibility, shall not be used
            - UNIT_COUNT_INACTIVITY_TIMER
            - ABNORMAL_RELEASE
            - QOS_CHANGE
            - VOLUME_LIMIT
            - TIME_LIMIT
            - EVENT_LIMIT
            - PLMN_CHANGE
            - USER_LOCATION_CHANGE
            - RAT_CHANGE
            - SESSION_AMBR_CHANGE
            - UE_TIMEZONE_CHANGE
            - TARIFF_TIME_CHANGE
            - MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS
            - MANAGEMENT_INTERVENTION
            - CHANGE_OF_UE_PRESENCE_IN_PRESENCE_REPORTING_AREA
            - CHANGE_OF_3GPP_PS_DATA_OFF_STATUS
            - SERVING_NODE_CHANGE
            - REMOVAL_OF_UPF
            - ADDITION_OF_UPF
            - INSERTION_OF_ISMF
            - REMOVAL_OF_ISMF
            - CHANGE_OF_ISMF
            - START_OF_SERVICE_DATA_FLOW
            - ECGI_CHANGE
            - TAI_CHANGE
            - HANDOVER_CANCEL
            - HANDOVER_START
            - HANDOVER_COMPLETE
            - GFBR_GUARANTEED_STATUS_CHANGE
            - ADDITION_OF_ACCESS
            - REMOVAL_OF_ACCESS
            - START_OF_SDF_ADDITIONAL_ACCESS
            - REDUNDANT_TRANSMISSION_CHANGE
            - CGI_SAI_CHANGE
            - RAI_CHANGE
        - type: string
    FinalUnitAction:
```

```
    anyOf:
      - type: string
        enum:
          - TERMINATE
          - REDIRECT
          - RESTRICT_ACCESS
      - type: string
  RedirectAddressType:
    anyOf:
      - type: string
        enum:
          - IPV4
          - IPV6
          - URL
          - URI
      - type: string
  TriggerCategory:
    anyOf:
      - type: string
        enum:
          - IMMEDIATE_REPORT
          - DEFERRED_REPORT
      - type: string
  QuotaManagementIndicator:
    anyOf:
      - type: string
        enum:
          - ONLINE_CHARGING
          - OFFLINE_CHARGING
          - QUOTA_MANAGEMENT_SUSPENDED
      - type: string
  FailureHandling:
    anyOf:
      - type: string
        enum:
          - TERMINATE
          - CONTINUE
          - RETRY_AND_TERMINATE
      - type: string
  SessionFailover:
    anyOf:
      - type: string
        enum:
          - FAILOVER_NOT_SUPPORTED
          - FAILOVER_SUPPORTED
      - type: string
  3GPPPSDataOffStatus:
    anyOf:
      - type: string
        enum:
          - ACTIVE
          - INACTIVE
      - type: string
  ResultCode:
    anyOf:
      - type: string
        enum:
          - SUCCESS
          - END_USER_SERVICE_DENIED
          - QUOTA_MANAGEMENT_NOT_APPLICABLE
          - QUOTA_LIMIT_REACHED
          - END_USER_SERVICE_REJECTED
          - USER_UNKNOWN  #Included for backwards compatibility, shall not be used
          - RATING_FAILED
          - QUOTA_MANAGEMENT
      - type: string
  PartialRecordMethod:
    anyOf:
      - type: string
        enum:
          - DEFAULT
          - INDIVIDUAL
      - type: string
  RoamerInOut:
    anyOf:
      - type: string
        enum:
          - IN_BOUND
```

```
        - OUT_BOUND
    - type: string
SMMessageType:
  anyOf:
    - type: string
      enum:
        - SUBMISSION
        - DELIVERY_REPORT
        - SM_SERVICE_REQUEST
        - DELIVERY
    - type: string
SMPriority:
  anyOf:
    - type: string
      enum:
        - LOW
        - NORMAL
        - HIGH
    - type: string
DeliveryReportRequested:
  anyOf:
    - type: string
      enum:
        - YES
        - NO
    - type: string
InterfaceType:
  anyOf:
    - type: string
      enum:
        - UNKNOWN
        - MOBILE_ORIGINATING
        - MOBILE_TERMINATING
        - APPLICATION_ORIGINATING
        - APPLICATION_TERMINATING
    - type: string
ClassIdentifier:
  anyOf:
    - type: string
      enum:
        - PERSONAL
        - ADVERTISEMENT
        - INFORMATIONAL
        - AUTO
    - type: string
SMAddressType:
  anyOf:
    - type: string
      enum:
        - EMAIL_ADDRESS
        - MSISDN
        - IPV4_ADDRESS
        - IPV6_ADDRESS
        - NUMERIC_SHORTCODE
        - ALPHANUMERIC_SHORTCODE
        - OTHER
        - IMSI
    - type: string
SMAddresseeType:
  anyOf:
    - type: string
      enum:
        - TO
        - CC
        - BCC
    - type: string
SMServiceType:
  anyOf:
    - type: string
      enum:
        - VAS4SMS_SHORT_MESSAGE_CONTENT_PROCESSING
        - VAS4SMS_SHORT_MESSAGE_FORWARDING
        - VAS4SMS_SHORT_MESSAGE_FORWARDING_MULTIPLE_SUBSCRIPTIONS
        - VAS4SMS_SHORT_MESSAGE_FILTERING
        - VAS4SMS_SHORT_MESSAGE_RECEIPT
        - VAS4SMS_SHORT_MESSAGE_NETWORK_STORAGE
        - VAS4SMS_SHORT_MESSAGE_TO_MULTIPLE_DESTINATIONS
        - VAS4SMS_SHORT_MESSAGE_VIRTUAL_PRIVATE_NETWORK(VPN)
```

```
        - VAS4SMS_SHORT_MESSAGE_AUTO_REPLY
        - VAS4SMS_SHORT_MESSAGE_PERSONAL_SIGNATURE
        - VAS4SMS_SHORT_MESSAGE_DEFERRED_DELIVERY
    - type: string
ReplyPathRequested:
  anyOf:
    - type: string
      enum:
        - NO_REPLY_PATH_SET
        - REPLY_PATH_SET
    - type: string
oneTimeEventType:
  anyOf:
    - type: string
      enum:
        - IEC
        - PEC
    - type: string
dnnSelectionMode:
  anyOf:
    - type: string
      enum:
        - VERIFIED
        - UE_DNN_NOT_VERIFIED
        - NW_DNN_NOT_VERIFIED
    - type: string
APIDirection:
  anyOf:
    - type: string
      enum:
        - INVOCATION
        - NOTIFICATION
    - type: string
RegistrationMessageType:
  anyOf:
    - type: string
      enum:
        - INITIAL
        - MOBILITY
        - PERIODIC
        - EMERGENCY
        - DEREGISTRATION
    - type: string
MICOModeIndication:
  anyOf:
    - type: string
      enum:
        - MICO_MODE
        - NO_MICO_MODE
    - type: string
SmsIndication:
  anyOf:
    - type: string
      enum:
        - SMS_SUPPORTED
        - SMS_NOT_SUPPORTED
    - type: string
ManagementOperation:
  anyOf:
    - type: string
      enum:
        - CreateMOI       #Included for backwards compatibility, shall not be used
        - ModifyMOIAttributes #Included for backwards compatibility, shall not be used
        - DeleteMOI       #Included for backwards compatibility, shall not be used
        - CREATE_MOI
        - MODIFY_MOI_ATTR
        - DELETE_MOI
        - NOTIFY_MOI_CREATION
        - NOTIFY_MOI_ATTR_CHANGE
        - NOTIFY_MOI_DELETION
    - type: string
ManagementOperationStatus:
  anyOf:
    - type: string
      enum:
        - OPERATION_SUCCEEDED
        - OPERATION_FAILED
    - type: string
```

```
    RedundantTransmissionType:
      anyOf:
        - type: string
          enum:
            - NON_TRANSMISSION
            - END_TO_END_USER_PLANE_PATHS
            - N3/N9
            - TRANSPORT_LAYER
        - type: string
    VariablePartType:
      anyOf:
        - type: string
          enum:
            - INTEGER
            - NUMBER
            - TIME
            - DATE
            - CURRENCY
        - type: string
    QuotaConsumptionIndicator:
      anyOf:
        - type: string
          enum:
            - QUOTA_NOT_USED
            - QUOTA_IS_USED
        - type: string
    PlayToParty:
      anyOf:
        - type: string
          enum:
            - SERVED
            - REMOTE
        - type: string
    AnnouncementPrivacyIndicator:
      anyOf:
        - type: string
          enum:
            - NOT_PRIVATE
            - PRIVATE
        - type: string
    SupplementaryServiceType:
      anyOf:
        - type: string
          enum:
            - OIP
            - OIR
            - TIP
            - TIR
            - HOLD
            - CB
            - CDIV
            - CW
            - MWI
            - CONF
            - FA
            - CCBS
            - CCNR
            - MCID
            - CAT
            - CUG
            - PNM
            - CRS
            - ECT
        - type: string
    SupplementaryServiceMode:
      anyOf:
        - type: string
          enum:
            - CFU
            - CFB
            - CFNR
            - CFNL
            - CD
            - CFNRC
            - ICB
            - OCB
            - ACR
            - BLIND_TRANFER
```

```
            - CONSULTATIVE_TRANFER
        - type: string
    ParticipantActionType:
      anyOf:
        - type: string
          enum:
            - CREATE
            - JOIN
            - INVITE_INTO
            - QUIT
        - type: string
    TrafficForwardingWay:
      anyOf:
        - type: string
          enum:
            - N6
            - N19
            - LOCAL_SWITCH
        - type: string
    IMSNodeFunctionality:
      anyOf:
        - type: string
          enum:
# The applicable IMS Nodes are MRFC, IMS-GWF (connected to S-CSCF using ISC) and SIP AS.
            - S_CSCF
            - P_CSCF
            - I_CSCF
            - MRFC
            - MGCF
            - BGCF
            - AS
            - IBCF
            - S-GW
            - P-GW
            - HSGW
            - E-CSCF
            - MME
            - TRF
            - TF
            - ATCF
            - PROXY
            - EPDG
            - TDF
            - TWAG
            - SCEF
            - IWK_SCEF
            - IMS_GWF
        - type: string
    RoleOfIMSNode:
      anyOf:
        - type: string
          enum:
            - ORIGINATING
            - TERMINATING
            - FORWARDING
        - type: string
    IMSSessionPriority:
      anyOf:
        - type: string
          enum:
            - PRIORITY_0
            - PRIORITY_1
            - PRIORITY_2
            - PRIORITY_3
            - PRIORITY_4
        - type: string
    MediaInitiatorFlag:
      anyOf:
        - type: string
          enum:
            - CALLED_PARTY
            - CALLING_PARTY
            - UNKNOWN
        - type: string
    SDPType:
      anyOf:
        - type: string
          enum:
```

```
        - OFFER
        - ANSWER
    - type: string
OriginatorPartyType:
  anyOf:
    - type: string
      enum:
        - CALLING
        - CALLED
    - type: string
AccessTransferType:
  anyOf:
    - type: string
      enum:
        - PS_TO_CS
        - CS_TO_PS
        - PS_TO_PS
        - CS_TO_CS
    - type: string
UETransferType:
  anyOf:
    - type: string
      enum:
        - INTRA_UE
        - INTER_UE
    - type: string
NNISessionDirection:
  anyOf:
    - type: string
      enum:
        - INBOUND
        - OUTBOUND
    - type: string
NNIType:
  anyOf:
    - type: string
      enum:
        - NON_ROAMING
        - ROAMING_NO_LOOPBACK
        - ROAMING_LOOPBACK
    - type: string
NNIRelationshipMode:
  anyOf:
    - type: string
      enum:
        - TRUSTED
        - NON_TRUSTED
    - type: string
TADIdentifier:
  anyOf:
    - type: string
      enum:
        - CS
        - PS
    - type: string
ProseFunctionality:
  anyOf:
    - type: string
      enum:
        - DIRECT_DISCOVERY
        - DIRECT_COMMUNICATION
    - type: string
ProseEventType:
  anyOf:
    - type: string
      enum:
        - ANNOUNCING
        - MONITORING
        - MATCH_REPORT
    - type: string
DirectDiscoveryModel:
  anyOf:
    - type: string
      enum:
        - MODEL_A
        - MODEL_B
    - type: string
RoleOfUE:
```

```
      anyOf:
        - type: string
          enum:
            - ANNOUNCING_UE
            - MONITORING_UE
            - REQUESTOR_UE
            - REQUESTED_UE
        - type: string
    RangeClass:
      anyOf:
        - type: string
          enum:
            - RESERVED
            - 50_METER
            - 100_METER
            - 200_METER
            - 500_METER
            - 1000_METER
            - UNUSED
        - type: string
    RadioResourcesId:
      anyOf:
        - type: string
          enum:
            - OPERATOR_PROVIDED
            - CONFIGURED
        - type: string
```

A.3 Nchf_OfflineOnlyCharging API

```
openapi: 3.0.0
info:
  title: Nchf_OfflineOnlyCharging
  version: 1.0.2
  description: |
    OfflineOnlyCharging Service
    © 2022, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
  description: >
    3GPP TS 32.291  V17.0.0: Telecommunication management; Charging management;
    5G system, charging service; Stage 3.
  url: 'http://www.3gpp.org/ftp/Specs/archive/32_series/32.291/'
servers:
  - url: '{apiRoot}/nchf-offlineonlycharging/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in subclause 4.4 of 3GPP TS 29.501.
security:
  - {}
  - oAuth2ClientCredentials:
    - nchf-offlineonlycharging
paths:
  /offlinechargingdata:
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ChargingDataRequest'
      responses:
        '201':
          description: Created
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/ChargingDataResponse'
        '400':
          description: Bad request
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
        '403':
```

```
        description: Forbidden
        content:
          application/json:
            schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      '404':
        description: Not Found
        content:
          application/json:
            schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '410':
        $ref: 'TS29571_CommonData.yaml#/components/responses/410'
      '411':
        $ref: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29571_CommonData.yaml#/components/responses/413'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29571_CommonData.yaml#/components/responses/default'
'/offlinechargingdata/{OfflineChargingDataRef}/update':
  post:
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ChargingDataRequest'
    parameters:
      - name: OfflineChargingDataRef
        in: path
        description: a unique identifier for a charging data resource in a PLMN
        required: true
        schema:
          type: string
    responses:
      '200':
        description: OK. Updated Charging Data resource is returned
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ChargingDataResponse'
      '400':
        description: Bad request
        content:
          application/json:
            schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      '403':
        description: Forbidden
        content:
          application/json:
            schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      '404':
        description: Not Found
        content:
          application/json:
            schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '410':
        $ref: 'TS29571_CommonData.yaml#/components/responses/410'
      '411':
        $ref: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29571_CommonData.yaml#/components/responses/413'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
```

```
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  '/offlinechargingdata/{OfflineChargingDataRef}/release':
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ChargingDataRequest'
      parameters:
        - name: OfflineChargingDataRef
          in: path
          description: a unique identifier for a charging data resource in a PLMN
          required: true
          schema:
            type: string
      responses:
        '204':
          description: No Content.
        '404':
          description: Not Found
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '410':
          $ref: 'TS29571_CommonData.yaml#/components/responses/410'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '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: '{nrfApiRoot}/oauth2/token'
          scopes:
            nchf-offlineonlycharging: Access to the Nchf_OfflineOnlyCharging API
  schemas:
    ChargingDataRequest:
      type: object
      properties:
        subscriberIdentifier:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        nfConsumerIdentification:
          $ref: '#/components/schemas/NFIdentification'
        invocationTimeStamp:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        invocationSequenceNumber:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
        retransmissionIndicator:
          type: boolean
        serviceSpecificationInfo:
          type: string
        multipleUnitUsage:
          type: array
          items:
            $ref: '#/components/schemas/MultipleUnitUsage'
          minItems: 0
        triggers:
          type: array
          items:
            $ref: '#/components/schemas/Trigger'
          minItems: 0
        pDUSessionChargingInformation:
          $ref: '#/components/schemas/PDUSessionChargingInformation'
        roamingQBCInformation:
          $ref: '#/components/schemas/RoamingQBCInformation'
```

```
    required:
      - nfConsumerIdentification
      - invocationTimeStamp
      - invocationSequenceNumber
  ChargingDataResponse:
    type: object
    properties:
      invocationTimeStamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      invocationSequenceNumber:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      invocationResult:
        $ref: '#/components/schemas/InvocationResult'
      sessionFailover:
        $ref: '#/components/schemas/SessionFailover'
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      pDUSessionChargingInformation:
        $ref: '#/components/schemas/PDUSessionChargingInformation'
      roamingQBCInformation:
        $ref: '#/components/schemas/RoamingQBCInformation'
    required:
      - invocationTimeStamp
      - invocationSequenceNumber
  NFIdentification:
    type: object
    properties:
      nFName:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      nFIPv4Address:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      nFIPv6Address:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      nFPLMNID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      nodeFunctionality:
        $ref: '#/components/schemas/NodeFunctionality'
      nFFqdn:
        type: string
    required:
      - nodeFunctionality
  MultipleUnitUsage:
    type: object
    properties:
      ratingGroup:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatingGroup'
      usedUnitContainer:
        type: array
        items:
          $ref: '#/components/schemas/UsedUnitContainer'
        minItems: 0
      uPFID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      multihomedPDUAddress:
        $ref: '#/components/schemas/PDUAddress'
    required:
      - ratingGroup
  InvocationResult:
    type: object
    properties:
      error:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      failureHandling:
        $ref: '#/components/schemas/FailureHandling'
  Trigger:
    type: object
    properties:
      triggerType:
        $ref: '#/components/schemas/TriggerType'
      triggerCategory:
        $ref: '#/components/schemas/TriggerCategory'
      timeLimit:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
      volumeLimit:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
```

```
      volumeLimit64:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      eventLimit:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      maxNumberOfccc:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    required:
      - triggerType
      - triggerCategory
  UsedUnitContainer:
    type: object
    properties:
      serviceId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceId'
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      triggerTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      time:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      totalVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      uplinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      downlinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      serviceSpecificUnits:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      eventTimeStamps:
        type: array

        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        minItems: 0
      localSequenceNumber:
        type: integer
      pDUContainerInformation:
        $ref: '#/components/schemas/PDUContainerInformation'
    required:
      - localSequenceNumber
  PDUSessionChargingInformation:
    type: object
    properties:
      chargingId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
      sMFChargingId:
        type: string
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationinfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      mAPDUNon3GPPUserLocationInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      userLocationTime:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      pduSessionInformation:
        $ref: '#/components/schemas/PDUSessionInformation'
      unitCountInactivityTimer:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
      rANSecondaryRATUsageReport:
        $ref: '#/components/schemas/RANSecondaryRATUsageReport'
    required:
      - pduSessionInformation
  UserInformation:
    type: object
    properties:
      servedGPSI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
```

```
      servedPEI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
      unauthenticatedFlag:
        type: boolean
      roamerInOut:
        $ref: '#/components/schemas/RoamerInOut'
    PDUSessionInformation:
      type: object
      properties:
        networkSlicingInfo:
          $ref: '#/components/schemas/NetworkSlicingInfo'
        pduSessionID:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
        pduType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
        sscMode:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SscMode'
        hPlmnId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        servingNetworkFunctionID:
          $ref: '#/components/schemas/ServingNetworkFunctionID'
        ratType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
        mAPDUNon3GPPRATType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
        dnnId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        chargingCharacteristics:
          type: string
        chargingCharacteristicsSelectionMode:
          $ref: '#/components/schemas/ChargingCharacteristicsSelectionMode'
        startTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        stopTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        3gppPSDataOffStatus:
          $ref: '#/components/schemas/3GPPPSDataOffStatus'
        sessionStopIndicator:
          type: boolean
        pduAddress:
          $ref: '#/components/schemas/PDUAddress'
        diagnostics:
          $ref: '#/components/schemas/Diagnostics'
        authorizedQoSInformation:
          $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/AuthorizedDefaultQos'
        subscribedQoSInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SubscribedDefaultQos'
        authorizedSessionAMBR:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
        subscribedSessionAMBR:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
        servingCNPlmnId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        mAPDUSessionInformation:
          $ref: '#/components/schemas/MAPDUSessionInformation'
        enhancedDiagnostics:
          $ref: '#/components/schemas/EnhancedDiagnostics5G'
      required:
        - pduSessionID
        - dnnId
    PDUContainerInformation:
      type: object
      properties:
        timeofFirstUsage:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        timeofLastUsage:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        qoSInformation:
          $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosData'
        qoSCharacteristics:
          $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosCharacteristics'
        aFCorrelationInformation:
          type: string
        userLocationInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
        uetimeZone:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
        rATType:
```

```
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      servingNodeID:
        type: array
        items:
          $ref: '#/components/schemas/ServingNetworkFunctionID'
        minItems: 0
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0
      3gppPSDataOffStatus:
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
      sponsorIdentity:
        type: string
      applicationserviceProviderIdentity:
        type: string
      chargingRuleBaseName:
        type: string
      mAPDUSteeringFunctionality:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/SteeringFunctionality'
      mAPDUSteeringMode:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/SteeringMode'
  NetworkSlicingInfo:
    type: object
    properties:
      sNSSAI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    required:
      - sNSSAI
  PDUAddress:
    type: object
    properties:
      pduIPv4Address:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      pduIPv6AddresswithPrefix:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      pduAddressprefixlength:
        type: integer
      iPv4dynamicAddressFlag:
        type: boolean
      iPv6dynamicPrefixFlag:
        type: boolean
  ServingNetworkFunctionID:
    type: object
    properties:
      servingNetworkFunctionInformation:
        $ref: '#/components/schemas/NFIdentification'
      aMFId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/AmfId'
    required:
      - servingNetworkFunctionInformation
  RoamingQBCInformation:
    type: object
    properties:
      multipleQFIcontainer:
        type: array
        items:
          $ref: '#/components/schemas/MultipleQFIcontainer'
        minItems: 0
      uPFID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      roamingChargingProfile:
        $ref: '#/components/schemas/RoamingChargingProfile'
  MultipleQFIcontainer:
    type: object
    properties:
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      triggerTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      time:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
      totalVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
```

```
      uplinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      localSequenceNumber:
        type: integer
      qFIContainerInformation:
        $ref: '#/components/schemas/QFIContainerInformation'
    required:
      - localSequenceNumber
  QFIContainerInformation:
    type: object
    properties:
      qFI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Qfi'
      timeofFirstUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      timeofLastUsage:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      qoSInformation:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosData'
      qoSCharacteristics:
        $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/QosCharacteristics'
      userLocationInformation:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      uetimeZone:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      presenceReportingAreaInformation:
        type: object
        additionalProperties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 0
      rATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      servingNetworkFunctionID:
        type: array
        items:
          $ref: '#/components/schemas/ServingNetworkFunctionID'
        minItems: 0
      3gppPSDataOffStatus:
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
  RoamingChargingProfile:
    type: object
    properties:
      triggers:
        type: array
        items:
          $ref: '#/components/schemas/Trigger'
        minItems: 0
      partialRecordMethod:
        $ref: '#/components/schemas/PartialRecordMethod'
  RANSecondaryRATUsageReport:
    type: object
    properties:
      rANSecondaryRATType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      qosFlowsUsageReports:
        type: array
        items:
          $ref: '#/components/schemas/QosFlowsUsageReport'
  Diagnostics:
    type: integer
  IPFilterRule:
    type: string
  QosFlowsUsageReport:
    type: object
    properties:
      qFI:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Qfi'
      startTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      endTimestamp:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      uplinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
      downlinkVolume:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
  MAPDUSessionInformation:
    type: object
    properties:
```

```
    mAPDUSessionIndicator:
      $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/MaPduIndication'
    aTSSSCapability:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/AtsssCapability'
EnhancedDiagnostics5G:
  $ref: '#/components/schemas/RanNasCauseList'
RanNasCauseList:
  type: array
  items:
    $ref: 'TS29512_Npcf_SMPolicyControl.yaml#/components/schemas/RanNasRelCause'
NodeFunctionality:
  anyOf:
    - type: string
      enum:
        - SMF
        - SMSF # Included for backwards compatibility, shall not be used
        - I-SMF
    - type: string
ChargingCharacteristicsSelectionMode:
  anyOf:
    - type: string
      enum:
        - HOME_DEFAULT
        - ROAMING_DEFAULT
        - VISITING_DEFAULT
    - type: string
TriggerType:
  anyOf:
    - type: string
      enum:
        - FINAL
        - ABNORMAL_RELEASE
        - QOS_CHANGE
        - VOLUME_LIMIT
        - TIME_LIMIT
        - EVENT_LIMIT
        - PLMN_CHANGE
        - USER_LOCATION_CHANGE
        - RAT_CHANGE
        - SESSION_AMBR_CHANGE
        - UE_TIMEZONE_CHANGE
        - TARIFF_TIME_CHANGE
        - MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS
        - MANAGEMENT_INTERVENTION
        - CHANGE_OF_UE_PRESENCE_IN_PRESENCE_REPORTING_AREA
        - CHANGE_OF_3GPP_PS_DATA_OFF_STATUS
        - SERVING_NODE_CHANGE
        - REMOVAL_OF_UPF
        - ADDITION_OF_UPF
        - INSERTION_OF_ISMF
        - REMOVAL_OF_ISMF
        - CHANGE_OF_ISMF
        - START_OF_SERVICE_DATA_FLOW
        - GFBR_GUARANTEED_STATUS_CHANGE
        - HANDOVER_CANCEL
        - HANDOVER_START
        - HANDOVER_COMPLETE
        - ADDITION_OF_ACCESS
        - REMOVAL_OF_ACCESS
        - START_OF_SDF_ADDITIONAL_ACCESS
    - type: string
TriggerCategory:
  anyOf:
    - type: string
      enum:
        - IMMEDIATE_REPORT
        - DEFERRED_REPORT
    - type: string
FailureHandling:
  anyOf:
    - type: string
      enum:
        - TERMINATE
        - CONTINUE
        - RETRY_AND_TERMINATE
    - type: string
SessionFailover:
  anyOf:
```

```
      - type: string
        enum:
          - FAILOVER_NOT_SUPPORTED
          - FAILOVER_SUPPORTED
      - type: string
  3GPPPSDataOffStatus:
    anyOf:
      - type: string
        enum:
          - ACTIVE
          - INACTIVE
      - type: string
  ResultCode:
    anyOf:
      - type: string
        enum:
          - SUCCESS
          - END_USER_SERVICE_DENIED
      - type: string
  PartialRecordMethod:
    anyOf:
      - type: string
        enum:
          - DEFAULT
          - INDIVIDUAL
      - type: string
  RoamerInOut:
    anyOf:
      - type: string
        enum:
          - IN_BOUND
          - OUT_BOUND
      - type: string
```

Annex B (informative):Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2018-09	SA#81					Upgrade to change control version	15.0.0
2018-12	SA#82	SP-181157	0001	1	F	Correction on the Reference and Resource name	15.1.0
2018-12	SA#82	SP-181157	0002	1	F	Editorial Correction	15.1.0
2018-12	SA#82	SP-181157	0003	1	F	Data Type Applicability Correction	15.1.0
2018-12	SA#82	SP-181059	0004	1	F	Serving Node ID Correction	15.1.0
2018-12	SA#82	SP-181059	0006	1	F	Correction of Common Data reference in Nchf_ConvergedCharging API	15.1.0
2018-12	SA#82	SP-181059	0007	1	F	Correction of references to TS 29.512, TS 29.514 and data types	15.1.0
2018-12	SA#82	SP-181059	0008	1	F	Clarification of requested units handling	15.1.0
2018-12	SA#82	SP-181059	0009	1	F	Remove of underscore in the API name	15.1.0
2018-12	SA#82	SP-181059	0010	1	F	Correction of data type for subscriber identifier	15.1.0
2018-12	SA#82	SP-181059	0011	-	F	Correction of response code in flow for Notify	15.1.0
2018-12	SA#82	SP-181059	0012	1	F	Allow updating of Notify URI	15.1.0
2018-12	SA#82	SP-181059	0013	1	F	Correction of overlapping results between Invocation result and Result code	15.1.0
2018-12	SA#82	SP-181059	0014	1	F	Correction of Invocation result at http ok	15.1.0
2018-12	SA#82	SP-181059	0015	1	F	Correction of Rating Group Id and Service Id to Uint32	15.1.0
2018-12	SA#82	SP-181059	0016	1	F	Correction of name for Multiple Unit Information	15.1.0
2018-12	SA#82	SP-181059	0018	1	F	Correction of name for Multiple Unit Information	15.1.0
2018-12	SA#82	SP-181059	0019	1	F	Correction of missing http status code	15.1.0
2018-12	SA#82	SP-181052	0020	1	B	Addition of event based charging	15.1.0
2018-12	SA#82	SP-181057	0021	1	B	Introduction Data Volume Reporting for Option 4&7	15.1.0
2018-12	SA#82	SP-181059	0022	1	F	Alignment for session identifier	15.1.0
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2022-09	SA#97e	SP-220850	0414	1	F	Correction of use QMI in notify	17.4.0
2022-09	SA#97e	SP-220850	0415	1	F	Correcting missing user location mapping to ASN.1	17.4.0
2022-09	SA#97e	SP-220850	0416	1	F	Correcting missing CIoT indicators in yaml	17.4.0
2022-09	SA#97e	SP-220850	0418	-	F	Correcting missing V-SMF	17.4.0
2022-09	SA#97e	SP-220850	0423	1	F	Correction on the Charging Identifier Uniqueness	17.4.0

2022-09	SA#97e	SP-220868	0425	-	F	Correction on the EASRequirement	17.4.0
2022-09	SA#97e	SP-220868	0426	-	F	Correction on the mapping between EC and NEF	17.4.0
2022-09	SA#97e	SP-220868	0427	-	F	Add the EAS ID for EC charging	17.4.0
2022-09	SA#97e	SP-220853	0429	-	A	Update Open API version	17.4.0
2022-12	SA#98e	SP-221168	0430	1	F	Handling of Retry Correction	17.5.0
2022-12	SA#98e	SP-221193	0431	1	F	SIP Request/Answer with different Timestamps	17.5.0
2022-12	SA#98e	SP-221168	0432	1	F	Add SMF Charging Id in Offline Charging	17.5.0
2022-12	SA#98e	SP-221171	0434	1	A	Correcting SMSF as Node Functionality	17.5.0
2022-12	SA#98e	SP-221171	0436	1	A	Case Mismatch for Management Operation	17.5.0
2022-12	SA#98e	SP-221168	0437	1	F	Add Missing Consumers in Converged Charging	17.5.0
2022-12	SA#98e	SP-221168	0440	1	F	Correction of Result Code	17.5.0
2022-12	SA#98e	SP-221168	0445	1	F	Correction on Charging notification	17.5.0
2022-12	SA#98e	SP-221168	0446	-	F	Addition of the NodeFunctionality for EC	17.5.0
2022-12	SA#98e	SP-221195	0448	1	A	Correction on the Nchf_OfflineOnlyCharging	17.5.0
2022-12	SA#98e	SP-221168	0450	-	F	Update Open API version	17.5.0
2023-03	SA#99	SP-230213	0454	1	F	Add EAS Deployment Requirements	17.6.0
2023-03	SA#99	SP-230197	0456	1	F	Correction on the YAML for Edge Charging	17.6.0
2023-03	SA#99	SP-230197	0459	1	F	Correction of UPFId in QBC	17.6.0
2023-03	SA#99	SP-230197	0463	-	F	Update OpenAPI version	17.6.0
2023-06	SA#100	SP-230652	0466	1	F	Add LCM Event Type in EAS Deployment Charging Info	17.7.0
2023-06	SA#100	SP-230650	0470	2	F	Correction of requested units	17.7.0
2023-06	SA#100	SP-230650	0475	1	F	Update OpenAPI version	17.7.0
2023-06	SA#100	SP-230650	0478	1	F	Correction of QFIContainerInformation	17.7.0

History

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