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Charging management;  
5G system, charging service;  
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(3GPP TS 32.291 version 15.7.0 Release 15)**



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Keywords

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# Contents

|  |    |
|--|----|
| Intellectual Property Rights .....                     | 2  |
| Legal Notice .....                                     | 2  |
| Modal verbs terminology.....                           | 2  |
| Foreword.....  | 6  |
| 1 Scope .....  | 7  |
| 2 References .....                                     | 7  |
| 3 Definitions, symbols and abbreviations .....         | 8  |
| 3.1 Definitions .....                                  | 8  |
| 3.2 Symbols.....                                       | 8  |
| 3.3 Abbreviations .....                                | 8  |
| 4 Overview .....                                       | 9  |
| 4.1 Service architecture .....                         | 9  |
| 4.2 Network functions .....                            | 9  |
| 4.2.1 Charging Function (CHF).....                     | 9  |
| 4.2.2 NF Service Consumers .....                       | 9  |
| 5 Services offered by the CHF .....                    | 10 |
| 5.1 Introduction .....                                 | 10 |
| 5.2 Nchf_ConvergedCharging service .....               | 10 |
| 5.2.1 Service description.....                         | 10 |
| 5.2.2 Service operations.....                          | 10 |
| 5.2.2.1 Introduction .....                             | 10 |
| 5.2.2.2 Nchf_ConvergedCharging_Create Operation .....  | 11 |
| 5.2.2.3 Nchf_ConvergedCharging_Update Operation .....  | 12 |
| 5.2.2.4 Nchf_ConvergedCharging_Release Operation ..... | 12 |
| 5.2.2.5 Nchf_ConvergedCharging_Notify Operation .....  | 13 |
| 6 API definitions .....                                | 14 |
| 6.1 Nchf_ConvergedCharging Service API .....           | 14 |
| 6.1.1 Introduction.....                                | 14 |
| 6.1.2 Usage of HTTP .....                              | 14 |
| 6.1.2.1 General .....                                  | 14 |
| 6.1.2.2 HTTP standard headers .....                    | 14 |
| 6.1.2.2.1 General .....                                | 14 |
| 6.1.2.2.2 Content type .....                           | 14 |
| 6.1.2.3 HTTP custom headers .....                      | 14 |
| 6.1.2.3.1 General .....                                | 14 |
| 6.1.3 Resources.....                                   | 15 |
| 6.1.3.1 Overview .....                                 | 15 |
| 6.1.3.2 Resource: Charging Data .....                  | 16 |
| 6.1.3.2.1 Description .....                            | 16 |
| 6.1.3.2.2 Resource Definition.....                     | 16 |
| 6.1.3.2.3 Resource Standard Methods .....              | 16 |
| 6.1.3.2.3.1 POST.....                                  | 16 |
| 6.1.3.2.4 Resource Custom Operations .....             | 17 |
| 6.1.3.3 Resource: Individual Charging Data .....       | 17 |
| 6.1.3.3.1 Description .....                            | 17 |
| 6.1.3.3.2 Resource Definition.....                     | 17 |
| 6.1.3.3.3 Resource Standard Methods .....              | 18 |
| 6.1.3.3.4 Resource Custom Operations .....             | 18 |
| 6.1.3.3.4.1 Overview.....                              | 18 |
| 6.1.3.3.4.2 Operation: update.....                     | 18 |
| 6.1.3.3.4.2.1 Description .....                        | 18 |
| 6.1.3.3.4.2.2 Operation Definition .....               | 18 |

|               |  |    |
|---------------|--|----|
| 6.1.3.3.4.3   | Operation: release .....                             | 19 |
| 6.1.3.3.4.3.1 | Description .....                                    | 19 |
| 6.1.3.3.4.3.2 | Operation Definition .....                           | 19 |
| 6.1.4         | Custom Operations without associated resources ..... | 20 |
| 6.1.5         | Notifications .....                                  | 20 |
| 6.1.5.1       | General .....  | 20 |
| 6.1.5.2       | Event Notification .....                             | 20 |
| 6.1.5.2.1     | Description .....                                    | 20 |
| 6.1.5.2.2     | Target URI .....                                     | 20 |
| 6.1.5.2.3     | Standard Methods .....                               | 20 |
| 6.1.5.2.3.1   | POST .....   | 20 |
| 6.1.6         | Data Model .....                                     | 21 |
| 6.1.6.1       | General .....  | 21 |
| 6.1.6.2       | Structured data types .....                          | 24 |
| 6.1.6.2.1     | Common Data Type .....                               | 24 |
| 6.1.6.2.1.1   | Type ChargingDataRequest .....                       | 24 |
| 6.1.6.2.1.2   | Type ChargingDataResponse .....                      | 25 |
| 6.1.6.2.1.3   | Type ChargingNotifyRequest .....                     | 25 |
| 6.1.6.2.1.4   | Type NFIdentification .....                          | 26 |
| 6.1.6.2.1.5   | Type MultipleUnitUsage .....                         | 27 |
| 6.1.6.2.1.6   | Type InvocationResult .....                          | 27 |
| 6.1.6.2.1.7   | Type Trigger .....                                   | 28 |
| 6.1.6.2.1.8   | Type MultipleUnitInformation .....                   | 29 |
| 6.1.6.2.1.9   | Type RequestedUnit .....                             | 29 |
| 6.1.6.2.1.10  | Type UsedUnitContainer .....                         | 30 |
| 6.1.6.2.1.11  | Type GrantedUnit .....                               | 31 |
| 6.1.6.2.1.12  | Type FinalUnitIndication .....                       | 31 |
| 6.1.6.2.1.13  | Type RedirectServer .....                            | 31 |
| 6.1.6.2.1.14  | Type ReauthorizationDetails .....                    | 32 |
| 6.1.6.2.1.16  | Type ChargingNotifyResponse .....                    | 32 |
| 6.1.6.2.2     | 5G Data Connectivity Specified Data Type .....       | 32 |
| 6.1.6.2.2.1   | Type ChargingDataRequest .....                       | 32 |
| 6.1.6.2.2.2   | Type ChargingDataResponse .....                      | 32 |
| 6.1.6.2.2.3   | Type MultipleUnitUsage .....                         | 33 |
| 6.1.6.2.2.4   | Type MultipleUnitInformation .....                   | 33 |
| 6.1.6.2.2.5   | Type UsedUnitContainer .....                         | 33 |
| 6.1.6.2.2.6   | Type PDUSessionChargingInformation .....             | 34 |
| 6.1.6.2.2.7   | Type UserInformation .....                           | 35 |
| 6.1.6.2.2.8   | Type PDUSessionInformation .....                     | 36 |
| 6.1.6.2.2.9   | Type PDUContainerInformation .....                   | 37 |
| 6.1.6.2.2.10  | Type NetworkSlicingInfo .....                        | 37 |
| 6.1.6.2.2.11  | Type PDUAddress .....                                | 38 |
| 6.1.6.2.2.12  | Type ServingNetworkFunctionID .....                  | 38 |
| 6.1.6.2.2.13  | Type RoamingQBCInformation .....                     | 38 |
| 6.1.6.2.2.14  | Type MultipleQFIcontainer .....                      | 39 |
| 6.1.6.2.2.15  | Type RoamingChargingProfile .....                    | 39 |
| 6.1.6.2.2.16  | Type QFIContainerInformation .....                   | 40 |
| 6.1.6.2.2.17  | Type RANSecondaryRATUsageReport .....                | 40 |
| 6.1.6.2.2.18  | Type QosFlowsUsageReport .....                       | 41 |
| 6.1.6.2.3     | SMS Specified Data Type .....                        | 41 |
| 6.1.6.2.3.1   | Type ChargingDataRequest .....                       | 41 |
| 6.1.6.2.3.2   | Type SMSChargingInformation .....                    | 42 |
| 6.1.6.2.3.3   | Type OriginatorInfo .....                            | 44 |
| 6.1.6.2.3.4   | Type RecipientInfo .....                             | 45 |
| 6.1.6.2.3.5   | Type SMAddressInfo .....                             | 45 |
| 6.1.6.2.3.6   | Type RecipientAddress .....                          | 45 |
| 6.1.6.2.3.7   | Type MessageClass .....                              | 46 |
| 6.1.6.2.3.8   | Type SMAddressDomain .....                           | 46 |
| 6.1.6.2.3.9   | Type SMInterface .....                               | 46 |
| 6.1.6.3       | Simple data types and enumerations .....             | 46 |
| 6.1.6.3.1     | Introduction .....                                   | 46 |
| 6.1.6.3.2     | Simple data types .....                              | 46 |

|                               |  |           |
|-------------------------------|--|-----------|
| 6.1.6.3.3                     | Enumeration: NotificationType .....  | 47        |
| 6.1.6.3.4                     | Enumeration: NodeFunctionality .....   | 47        |
| 6.1.6.3.5                     | Enumeration: ChargingCharacteristicsSelectionMode .....                          | 47        |
| 6.1.6.3.6                     | Enumeration: TriggerType .....   | 48        |
| 6.1.6.3.7                     | Enumeration: FinalUnitAction .....   | 50        |
| 6.1.6.3.8                     | Enumeration: RedirectAddressType .....   | 50        |
| 6.1.6.3.9                     | Enumeration: TriggerCategory .....   | 51        |
| 6.1.6.3.10                    | Enumeration: QuotaManagementIndicator .....                                      | 51        |
| 6.1.6.3.11                    | Enumeration: FailureHandling .....   | 51        |
| 6.1.6.3.12                    | Enumeration: SessionFailover .....   | 52        |
| 6.1.6.3.13                    | Enumeration: 3GPPPSDataOffStatus .....   | 52        |
| 6.1.6.3.14                    | Enumeration: ResultCode .....  | 53        |
| 6.1.6.3.15                    | Enumeration: PartialRecordMethod .....   | 54        |
| 6.1.6.3.16                    | Enumeration: RoamerInOut .....   | 54        |
| 6.1.6.3.17                    | Void .....   | 54        |
| 6.1.6.3.18                    | Enumeration: SMMessageType .....   | 54        |
| 6.1.6.3.19                    | Enumeration: SMPriority .....  | 54        |
| 6.1.6.3.20                    | Enumeration: DeliveryReportRequested .....                                       | 54        |
| 6.1.6.3.21                    | Enumeration: InterfaceType .....   | 55        |
| 6.1.6.3.22                    | Enumeration: ClassIdentifier .....   | 55        |
| 6.1.6.3.23                    | Enumeration: SMAddressType .....   | 55        |
| 6.1.6.3.24                    | Enumeration: SMAddresseeType .....   | 55        |
| 6.1.6.3.25                    | Enumeration: SMSServiceType .....  | 56        |
| 6.1.6.3.26                    | Enumeration: ReplyPathRequested .....  | 56        |
| 6.1.6.3.27                    | Enumeration: DnnSelectionMode .....  | 56        |
| 6.1.6.3.28                    | Enumeration: EventType .....   | 56        |
| 6.1.6.4                       | Data types describing alternative data types or combinations of data types ..... | 57        |
| 6.1.6.5                       | Binary data .....  | 57        |
| 6.1.7                         | Error handling .....   | 57        |
| 6.1.7.1                       | General .....  | 57        |
| 6.1.7.2                       | Protocol Errors .....  | 57        |
| 6.1.7.3                       | Application errors .....   | 57        |
| 6.1.8                         | Feature negotiation .....  | 58        |
| 7                             | Bindings of CDR field, Information Element and Resource Attribute .....          | 59        |
| 7.0                           | General .....  | 59        |
| 7.1                           | Bindings of common CDR field, Information Element and Resource Attribute .....   | 60        |
| 7.2                           | Bindings for 5G data connectivity .....  | 63        |
| 7.3                           | Bindings for SMS charging .....  | 67        |
| 8                             | Security .....   | 69        |
| <b>Annex A (normative):</b>   | <b>OpenAPI specification .....</b>   | <b>69</b> |
| A.1                           | General .....  | 69        |
| A.2                           | Nchf_ConvergedCharging API .....   | 69        |
| <b>Annex B (informative):</b> | <b>Change history .....</b>  | <b>84</b> |
| History .....                 |  | 88        |

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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 is specified in TS 32.255[30].
- The service, operations and procedures of 5G charging for service based interface is specified in TS 32.290 [58].

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# 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] - [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] - [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] - [99] Void.
- [100] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [101] - [199] Void
- [200] - [203] Void
- [204] - [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] - [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] - [499] | Void.   |
| [500]         | OpenAPI: "OpenAPI 3.0.0 Specification", <a href="https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md">https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md</a> . |
| [501] - [599] | Void.   |

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## 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 |
| CHF   | Charging Function                       |
| CTF   | Charging Trigger Function               |
| GPSI  | Generic Public Subscription Identifier  |
| GUAMI | Globally Unique AMF Identifier          |
| 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       |

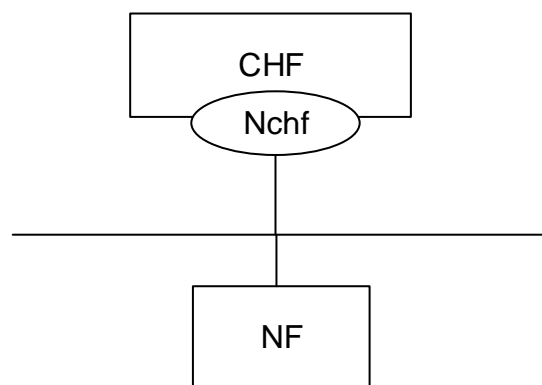
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## 4 Overview

### 4.1 Service architecture

The Converged Charging Service is provided by the CHF to the consumer and shown in the SBI representation model in figure 4. 1.1. The 5G Data connectivity domain charging is depicted in 3GPP TS 32.255 [30].

The ConvergedCharging Service (Nchf\_ConvergedCharging) is part of the Nchf service-based interface exhibited by the Charging Function (CHF) , with SMF and SMSF as the NF Service Consumer.



**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 |
| 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**

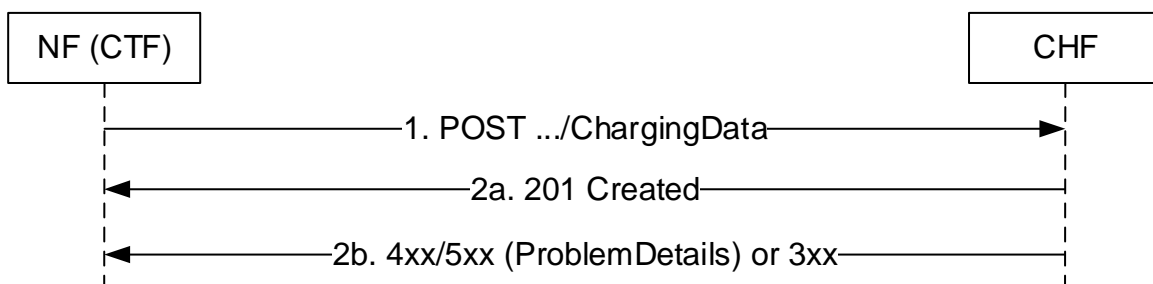
| Service Operation Name         | Description   | Initiated by | Corresponding Converged charging messages in 3GPP TS 32.290[58] |
|--------------------------------|---|--------------|---|
| Nchf_ConvergedCharging_Create  | First Interrogation of unit reservation;<br>And/or initial report of service 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: <ul style="list-style-type: none"> <li>- the granted service unit for one rating group are spent</li> <li>- expiry of granted service units validity time</li> <li>- service events occur, which might affect the rating of the current service</li> </ul> And/or Intermediate report of service usage. | NF consumer  | Charging Data Request/Response [Update]                         |
| Nchf_ConvergedCharging_Release | Final Interrogation without any unit reservation<br>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**

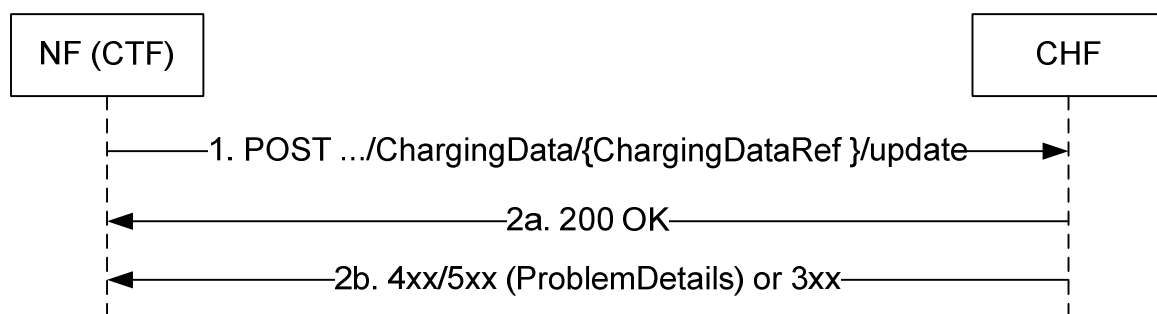
1. NF (CTF) sends a Nchf\_ConvergedCharging\_Create request to the CHF to create resource for charging. Requested quota and notification URI for Nchf\_ConvergedCharging\_Notify service operation are included in the request body.
- 2a. At successful operation, "201 Created" response is returned. In the "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.

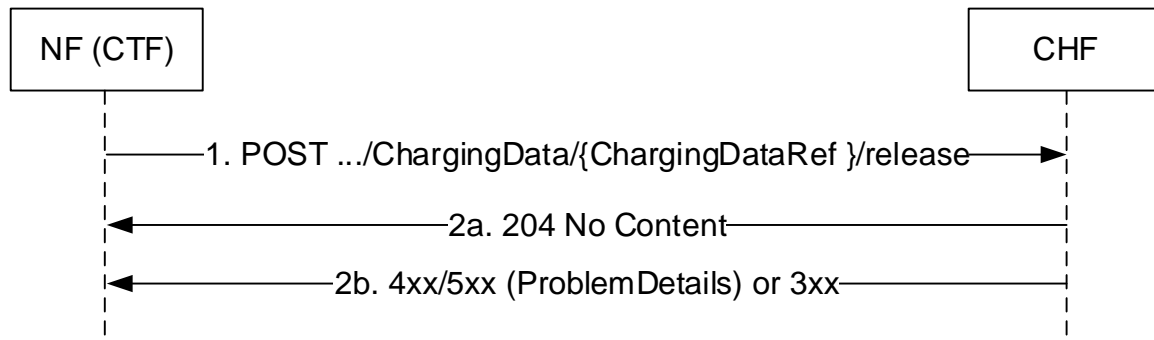
### 5.2.2.4 Nchf\_ConvergedCharging\_Release Operation

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**

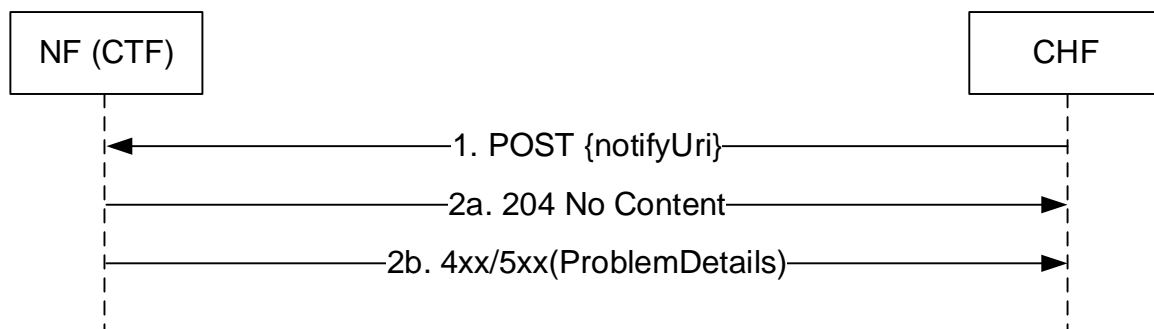
1. NF(CTF) sends a Nchf\_ConvergedCharging\_Release request to the CHF. The {ChargingDataRef} in the URI identifies the "Charging Data" to be updated and then released. The final used service unit is included in the request body.
- 2a. At successful operation, "204 No Content" response is returned.
- 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 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.

---

## 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 "v2".
- 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

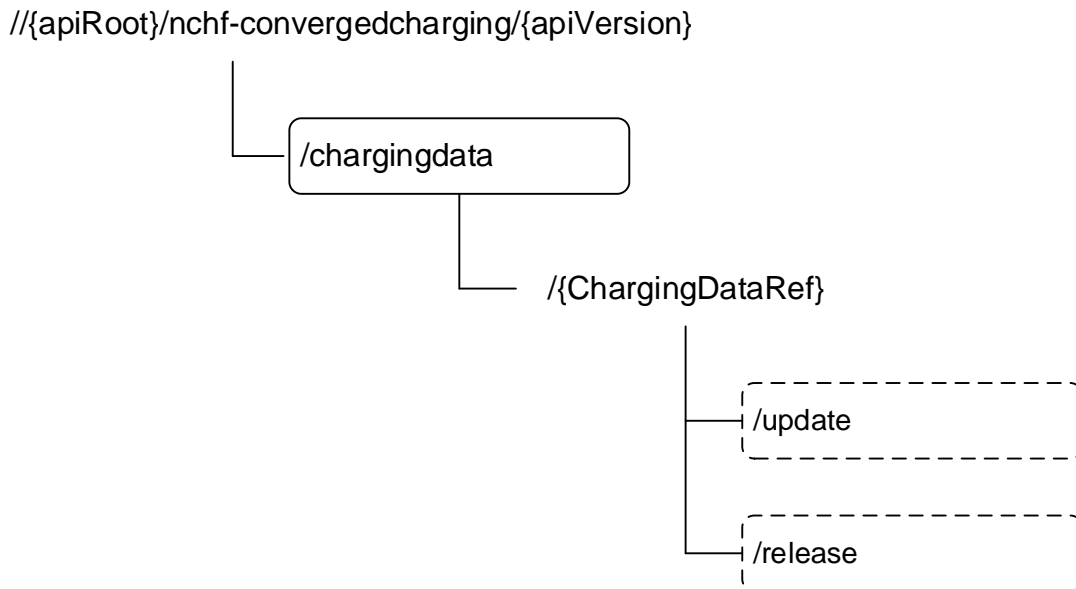
###### 6.1.2.3.1 General

HTTP custom header fields shall be supported as specified in subclause 5.2.3.2 of 3GPP TS 29.500 [299].

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

### 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 | (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)  |
| n/a  |   |             | 405 Method Not Allowed | (NOTE 2)  |
| n/a  |   |             | 408 Request Timeout    | (NOTE 2)  |
| n/a  |   |             | 410 Gone               | (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 subclause 6.1.7.  |   |             |                        |   |

#### 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 | (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)   |
| n/a  |   |             | 405 Method Not Allowed | (NOTE 2)   |
| n/a  |   |             | 408 Request Timeout    | (NOTE 2)   |
| n/a  |   |             | 410 Gone               | (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 subclause 6.1.7.  |   |             |                        |  |

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.<br>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. |
| ChargingDataResponse  | M | 1           | 404 Not Found  | (NOTE 2)  |
| n/a   |   |             | 410 Gone       | (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 [4] also apply. |   |             |                |   |
| NOTE 2: Failure cases are described in subclause 6.1.7.   |   |             |                |   |

## 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 of the subscribed events is occurs , 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 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                                      |
|--|---|-------------|-----------------|--|
| n/a  |   |             | 204 No Content  | The receipt of the Notification is acknowledged. |
| ChargingNotifyResponse   | M | 1           | 400 Bad Request | (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 subclause 6.1.7.  |   |             |                 |  |

## 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<br>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<br>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).                 |               |
| 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                           |               |
| 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".                         |  |
| Amfld        | 3GPP TS 29.571 [371] | AMF identifier   |  |
| Dnn          | 3GPP TS 29.571 [371] | Data Network Name  |  |



## 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 <sub>M</sub> | 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.  |               |
| 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.  |               |
| oneTimeEvent                    | boolean                  | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | indicates the type of the one time event, i.e. Immediate or Post event charging.  |               |
| notifyUri                       | Uri                      | O <sub>C</sub> | 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.             |               |
| serviceSpecificationInformation | String                   | O <sub>C</sub> | 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 <sub>C</sub> | 0..N        | This field contains the parameters for the quota management request and/or usage reporting.   |               |
| triggers                        | array(Trigger)           | O <sub>C</sub> | 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 <sub>C</sub> | 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.  |               |
| sessionFailover          | SessionFailover                | O <sub>C</sub> | 0..1        | This field indicates whether alternative CHF is supported for ongoing charging service failover handling by NF consumer.  |               |
| multipleUnitInformation  | array(MultipleUnitInformation) | O <sub>C</sub> | 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 <sub>C</sub> | 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 <sub>C</sub> | 0..N        | descriptors for re-authorization to determine which quota or usage reporting is 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 <sub>C</sub> | 0..1        | Identifier of NF instance. At least one of the nFName or nFIPv4Address or nFIPv6Address shall be present.  |               |
| nFIPv4Address     | Ipv4Addr          | O <sub>C</sub> | 0..1        | The IPv4 address of the NF. At least one of the nFName or nFIPv4Address or nFIPv6Address shall be present. |               |
| nFIPv6Address     | Ipv6Addr          | O <sub>C</sub> | 0..1        | The IPv6 address of the NF. At least one of the nFName or nFIPv4Address or nFIPv6Address shall be present. |               |
| nFFqdn            | string            | O <sub>C</sub> | 0..1        | FQDN of the NF   |               |
| nFPLMNID          | PlmnId            | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | This field indicates, if included, that quota management is required. It may additionally contain the amount of requested service units for a particular category. |               |
| usedUnitContainer | array(UsedUnitContainer) | O <sub>C</sub> | 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  | O <sub>C</sub> | 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 the invalid parameters which caused the rejection.  |               |
| failureHandling | FailureHandling | O <sub>C</sub> | 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.<br>In case of failure, it indicates which action to be performed by the NF consumer.<br>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     | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | Time limit if trigger type is "Expiry of data time limit"  |               |
| volumeLimit     | Uint32          | O <sub>C</sub> | 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 <sub>C</sub> | 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  |               |
| maxNumberOfcc   | Uint32          | O <sub>C</sub> | 0..1        | Maximum number if trigger type is "Max nb of number of charging condition changes"   |               |

## 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          | O <sub>C</sub> | 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         | O <sub>C</sub> | 0..1        | This field holds the granted quota.  |               |
| triggers             | array(Trigger)      | O <sub>C</sub> | 0..N        | This field holds triggers for usage reporting associated to the rating group, which is supplied from the CHF.<br><br>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         | O <sub>C</sub> | 0..1        | This field defines the time in order to limit the validity of the granted quota for a given category instance.   |               |
| quotaHoldingTime     | DurationSec         | O <sub>C</sub> | 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.<br>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 | O <sub>C</sub> | 0..1        | This field indicates the granted final units for the service.  |               |
| timeQuotaThreshold   | integer             | O <sub>C</sub> | 0..1        | indicates the threshold in seconds for the granted time quota.   |               |
| volumeQuotaThreshold | Uint64              | O <sub>C</sub> | 0..1        | indicates the threshold in octets when the granted quota is volume   |               |
| unitQuotaThreshold   | integer             | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | This field holds the amount of requested time.  |               |
| totalVolume  | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of requested volume in both uplink and downlink directions. |               |
| uplinkVolume   | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of requested volume in uplink direction.                    |               |
| downlinkVolume   | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of requested volume in downlink direction.                  |               |
| serviceSpecificUnits   | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of requested service specific units.                        |               |
| NOTE 1: If none of them is included, "RequestedUnit": {}, the category and amount is determined by CHF for online charging scenario 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 <sub>C</sub> | 0..1        | This field identity of the used service  |               |
| quotaManagementIndicator | QuotaManagementIndicator | O <sub>C</sub> | 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 <sub>C</sub> | 0..N        | This field specifies the reason for usage reporting for one or more types of unit associated to the rating group.  |               |
| triggerTimestamp         | DateTime                 | O <sub>C</sub> | 0..1        | This field holds the timestamp when the reporting trigger occur.   |               |
| time                     | Uint32                   | O <sub>C</sub> | 0..1        | This field holds the amount of used time.  |               |
| totalVolume              | Uint64                   | O <sub>C</sub> | 0..1        | This field holds the amount of used volume in both uplink and downlink directions.   |               |
| uplinkVolume             | Uint64                   | O <sub>C</sub> | 0..1        | This field holds the amount of used volume in uplink direction.  |               |
| downlinkVolume           | Uint64                   | O <sub>C</sub> | 0..1        | This field holds the amount of used volume in downlink direction.  |               |
| serviceSpecificUnits     | Uint64                   | O <sub>C</sub> | 0..1        | This field holds the amount of used service specific units.  |               |
| eventTimestamps          | DateTime                 | O <sub>C</sub> | 0..1        | This field holds the timestamps of the event reported in the Service Specific Units, 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 <sub>C</sub> | 0..1        | This field contains the switch time when the tariff will be changed.                  |               |
| time                 | Uint32    | O <sub>C</sub> | 0..1        | This field holds the amount of granted time.  |               |
| totalVolume          | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of granted volume in both uplink and downlink directions. |               |
| uplinkVolume         | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of granted volume in uplink direction.                    |               |
| downlinkVolume       | Uint64    | O <sub>C</sub> | 0..1        | This field holds the amount of granted volume in downlink direction.                  |               |
| serviceSpecificUnits | Uint64    | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | filter rules corresponding to services that are to remain accessible even if there are no more service units granted.                     |               |
| filterId              | string          | O <sub>C</sub> | 0..1        | the IP packet filters corresponding to services that are to remain accessible even if there are no more service units granted.            |               |
| redirectServer        | RedirectServer  | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | identifier for a service   |               |
| ratingGroup              | RatingGroup              | O <sub>C</sub> | 0..1        | identifier of a rating group. This attribute shall be present if serviceIdentifier attribute is present. |               |
| quotaManagementIndicator | QuotaManagementIndicator | O <sub>C</sub> | 0..1        | an indicator on whether the re-authorization notification is for quota management control or not.        |               |

## 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 <sub>C</sub> | 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 |
|--------------------------------|--------------------------------|----------------|-------------|---|---------------|
| pDUSSessionChargingInformation | PDUSSessionChargingInformation | O <sub>M</sub> | 0..1        | This field holds the 5G data connectivity specific information.             |               |
| roamingQBCInformation          | RoamingQBCInformation          | O <sub>M</sub> | 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 |
|--------------------------------|--------------------------------|----------------|-------------|---|---------------|
| pDUSSessionChargingInformation | PDUSSessionChargingInformation | O <sub>M</sub> | 0..1        | This field holds the 5G data connectivity specific information.             |               |
| roamingQBCInformation          | RoamingQBCInformation          | O <sub>M</sub> | 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          | NfInstanceld | O <sub>C</sub> | 0..1        | identifier of UPF |               |

## 6.1.6.2.2.4 Type MultipleUnitInformation

This clause is additional attributes of the type MultipleUnitInformation defined 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          | NfInstanceld | O <sub>C</sub> | 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 <sub>C</sub> | 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 <sub>M</sub> | 0..1        | Charging identifier for correlation between different records of a single PDU session  |               |
| userInformation                  | UserInformation            | O <sub>M</sub> | 0..1        | including information of user and user equipment,  |               |
| userLocationInfo                 | UserLocation               | O <sub>C</sub> | 0..1        | provides information on the location   |               |
| userLocationTime                 | DateTime                   | O <sub>C</sub> | 0..1        | the time at which the UE was last known to be in the location.   |               |
| presenceReportingAreaInformation | map(PresenceInfo)          | O <sub>C</sub> | 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.<br>The prald attribute within the PresenceInfo data type shall be the key of the map. |               |
| ueTimeZone                       | TimeZone                   | O <sub>C</sub> | 0..1        | the UE Timezone the UE is currently located  |               |
| pduSessionInformation            | PDUSessionInformation      | M              | 1           | PDU session level information, including PDU session ID, PDU type, SSC Mode, QoS, network slicing etc.   |               |
| unitCountInactivityTimer         | DurationSec                | O <sub>C</sub> | 0..1        | threshold for the time period resource idle<br>Upon the initial interaction with the CHF, the SMF use this attribute to provide pre-configured threshold to CHF.<br>when present in response message, it contains the threshold supplied by CHF in response of initial request to override existing threshold in SMF.<br>It's only present when unit count inactivity timer trigger is active.                   |               |
| rANSecondaryRATUsageReport       | RANSecondaryRATUsageReport | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | the Generic Public Subscription Identifier (GPSI) of the served party, if available. |               |
| servedPEI           | Pei         | O <sub>C</sub> | 0..1        | the identification of Permanent Equipment Identifier.                                |               |
| unauthenticatedFlag | boolean     | O <sub>C</sub> | 0..1        | indicates the served SUPI is not authenticated                                       |               |
| roamerInOut         | RoamerInOut | O <sub>C</sub> | 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 <sub>M</sub> | 0..1        | information of network slice serving the PDU session  |               |
| pduSessionID                         | PduSessionId                         | M              | 1           |   |               |
| pduType                              | PduSessionType                       | O <sub>M</sub> | 0..1        | type of the PDU session   |               |
| sscMode                              | SscMode                              | O <sub>C</sub> | 0..1        | information of SSC Mode type.   |               |
| hPlmnId                              | PlmnId                               | O <sub>C</sub> | 0..1        | PLMN identifier of the home network   |               |
| servingNetworkFunctionID             | ServingNetworkFunctionID             | O <sub>C</sub> | 0..1        | This field holds serving Network Function identifier.   |               |
| servingCNPlmnId                      | PlmnId                               | O <sub>C</sub> | 0..1        | Serving Core Network Operator PLMN ID selected by the UE in shared networks.                          |               |
| ratType                              | RatType                              | O <sub>C</sub> | 0..1        | the RAT Type of the PDU session   |               |
| dnnId                                | Dnn                                  | M              | 1           | a Data Network Name   |               |
| dnnSelectionMode                     | DnnSelectionMode                     | O <sub>C</sub> | 0..1        | This field indicates how the DNN was selected.  |               |
| chargingCharacteristics              | string                               | O <sub>C</sub> | 0..1        | the Charging Characteristics for this PDU session.  |               |
| chargingCharacteristicsSelectionMode | ChargingCharacteristicsSelectionMode | O <sub>C</sub> | 0..1        | information about how the "Charging Characteristics" was selected.                                    |               |
| startTime                            | DateTime                             | O <sub>C</sub> | 0..1        | the time in UTC format which represents the start of a PDU session at the SMF                         |               |
| stopTime                             | DateTime                             | O <sub>C</sub> | 0..1        | the time in UTC format which represents the stop of a PDU session at the SMF                          |               |
| 3gppPSDataOffStatus                  | 3GPPPSDataOffStatus                  | O <sub>C</sub> | 0..1        | This field holds the 3GPP Data off Status when UE's 3GPP Data Off status is Activated or Deactivated. |               |
| sessionStopIndicator                 | boolean                              | O <sub>C</sub> | 0..1        | This field indicates to the CHF that the PDU session has been terminated.                             |               |
| pduAddress                           | PDUAddress                           | O <sub>C</sub> | 0..1        | Group of user ip address/prefix   |               |
| diagnostics                          | Diagnostics                          | O <sub>C</sub> | 0..1        | provides a more detailed cause value from SMF.  |               |
| authorizedQoSInformation             | AuthorizedDefaultQoS                 | O <sub>C</sub> | 0..1        | This field holds the authorized QoS applied to PDU session.   |               |
| subscribedQoSInformation             | SubscribedDefaultQoS                 | O <sub>C</sub> | 0..1        | This field holds the subscribed Default QoS   |               |
| authorizedSessionAMBR                | Ambr                                 | O <sub>C</sub> | 0..1        | This field holds the authorized session-AMBR.   |               |
| subscribedSessionAMBR                | Ambr                                 | O <sub>C</sub> | 0..1        | This field holds the subscribed session-AMBR.   |               |

## 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                        | O <sub>C</sub> | 0..1        | the time stamp for the first IP packet to be transmitted and mapped to the reporting used unit.   |               |
| timeofLastUsage                    | DateTime                        | O <sub>C</sub> | 0..1        | the time stamp for the last IP packet to be transmitted and mapped to the reporting used unit.  |               |
| qoSInformation                     | QoSData                         | O <sub>C</sub> | 0..1        | the QoS applied for the reporting used unit.<br>In case gbrUI or gbrDI are present for GBR flow, the GBR targets are "GUARANTEED", otherwise, are "NOT_GUARANTEED". |               |
| aFCorrelationInformation           | string                          | O <sub>C</sub> | 0..1        | An identifier, provided from the AF, correlating the measurement for the Charging key/Service identifier values in this PCC rule with application level reports.    |               |
| userLocationInformation            | UserLocation                    | O <sub>C</sub> | 0..1        | provides information on the location  |               |
| uetimeZone                         | TimeZone                        | O <sub>C</sub> | 0..1        | the UE Time Zone during the used unit container interval.   |               |
| rATType                            | RatType                         | O <sub>C</sub> | 0..1        | the RAT Type of the used unit   |               |
| servingNodeID                      | array(ServingNetworkFunctionID) | O <sub>C</sub> | 0..N        | the list of serving node identifiers during the used unit container interval.   |               |
| presenceReportingAreaInformation   | map(PresenceInfo)               | O <sub>C</sub> | 0..N        | the Presence Reporting Area status of UE during the used unit container interval.   |               |
| 3gppPSDataOffStatus                | 3GPPPSDataOffStatus             | O <sub>C</sub> | 0..1        | the 3GPP Data off Status during the used unit container interval.   |               |
| sponsorIdentity                    | string                          | O <sub>C</sub> | 0..1        | an identifier of the sponsor.   |               |
| applicationServiceProviderIdentity | string                          | O <sub>C</sub> | 0..1        | an identifier of the application service provider   |               |
| chargingRuleBaseName               | string                          | O <sub>C</sub> | 0..1        | the reference to group of PCC rules predefined at the SMF.  |               |

## 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         | Snsai     | 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 <sub>C</sub> | 0..1        | the IPv4 address of the served SUPI allocated for the PDU session   |               |
| pduIPv6Address withPrefix | IPv6Addr  | O <sub>C</sub> | 0..1        | the IPv6 address with prefix of the served SUPI allocated for the PDU session   |               |
| pduAddressprefix length   | integer   | O <sub>C</sub> | 0..1        | PDU Address prefix length of an IPv6 typed Served PDU Address. The field needs not available for prefix length of 64 bits.    |               |
| IPv4dynamicAddressFlag    | boolean   | O <sub>C</sub> | 0..1        | This field indicates whether served IPv4 address is dynamically allocated. This field is missing if address is static.        |               |
| IPv6dynamicPrefixFlag     | boolean   | O <sub>C</sub> | 0..1        | This field indicates whether served IPv6 address prefix is dynamically allocated. This field is missing if address is static. |               |

## 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 |
|-----------------------------------|------------------|----------------|-------------|--|---------------|
| servingNetworkFunctionInformation | NFIdentification | M              | 0..1        | Serving Network Function information: i.e. AMF or V-SMF. |               |
| amfId                             | AmfId            | O <sub>C</sub> | 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) | O <sub>C</sub> | 0..N        | list of QFI containers  |               |
| uPFID                  | NfInstanceId                | O <sub>C</sub> | 0..1        | identifier of UPF   |               |
| roamingChargingProfile | RoamingChargingProfile      | O <sub>C</sub> | 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)         | O <sub>C</sub> | 0..N        | This field holds reason for closing the QFI unit container.   |               |
| triggerTimestamp        | DateTime                | O <sub>C</sub> | 0..1        | This field holds the timestamp when the reporting trigger occur.                                      |               |
| time                    | Uint32                  | O <sub>C</sub> | 0..1        | This field holds the amount of time.  |               |
| totalVolume             | Uint64                  | O <sub>C</sub> | 0..1        | This field holds the amount of volume in both uplink and downlink directions.                         |               |
| uplinkVolume            | Uint64                  | O <sub>C</sub> | 0..1        | This field holds the amount of volume in uplink direction.  |               |
| downlinkVolume          | Uint64                  | O <sub>C</sub> | 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 <sub>C</sub> | 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 <sub>C</sub> | 0..N        | Trigger for roaming QBC                |               |
| partialRecordMethod | PartialRecordMethod | O <sub>C</sub> | 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 <sub>M</sub> | 0..1        | QoS Flow Identifier (QFI)   |               |
| reportTime                       | DateTime                        | O <sub>C</sub> | 0..1        | the time stamp when the QFI data container was closed   |               |
| timeofFirstUsage                 | DateTime                        | O <sub>C</sub> | 0..1        | the time stamp for the first IP packet to be transmitted and mapped to the QFI container  |               |
| timeofLastUsage                  | DateTime                        | O <sub>C</sub> | 0..1        | the time stamp for the last IP packet to be transmitted and mapped to the QFI container.  |               |
| qoSInformation                   | QoSData                         | O <sub>C</sub> | 0..1        | the QoS applied to QFI container. In case gbrUI or gbrDI are present for GBR QoS flow, the GBR targets are "GUARANTEED", otherwise, are "NOT_GUARANTEED". |               |
| userLocationInformation          | UserLocation                    | O <sub>C</sub> | 0..1        | provides information on the location  |               |
| uetimeZone                       | TimeZone                        | O <sub>C</sub> | 0..1        | UE Time Zone the UE is currently located  |               |
| presenceReportingAreaInformation | map(PresenceInfo)               | O <sub>C</sub> | 0..N        | the Presence Reporting Area status of UE during the used unit container interval.   |               |
| rATType                          | RatType                         | O <sub>C</sub> | 0..1        | the RAT Type of the used unit   |               |
| servingNetworkFunctionID         | array(ServingNetworkFunctionID) | O <sub>C</sub> | 0..N        | the list of serving Node Identifiers during the used unit container interval.   |               |
| 3gppPSDataOffStatus              | 3GPPPSDataOffStatus             | O <sub>C</sub> | 0..1        | the 3GPP Data off Status during the used unit container interval.   |               |

## 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 <sub>M</sub> | 0..1        | RAT type associated to the reported usage on secondary RAT.<br>The following values are applicable:<br>- "NR"<br>- "EUTRA" |               |
| qosFlowsUsageReports | Array(QosFlowsUsageReport) | O <sub>M</sub> | 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 <sub>M</sub> | 0..1        | QoS Flow Identifier (QFI)               |               |
| startTimestamp | DateTime  | O <sub>C</sub> | 0..1        | Start time of the reported usage        |               |
| endTimestamp   | DateTime  | O <sub>C</sub> | 0..1        | End time of the reported usage          |               |
| downlinkVolume | Uint64    | O <sub>C</sub> | 0..1        | Amount of volume in downlink direction. |               |
| uplinkVolume   | Uint64    | O <sub>C</sub> | 0..1        | Amount of volume in uplink direction.   |               |

## 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 <sub>M</sub> | 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 <sub>M</sub> | 0..1        | originator of the SM  |               |
| recipientInfo        | Array(RecipientInfo) | O <sub>C</sub> | 0..N        | recipient information for the SM  |               |
| userEquipmentInfo    | Pei                  | O <sub>C</sub> | 0..1        | the identification of the terminal  |               |
| userLocationInfo     | UserLocation         | O <sub>C</sub> | 0..1        | provides information on the location  |               |
| uetimeZone           | TimeZone             | O <sub>C</sub> | 0..1        | the UE Time Zone the UE is currently located  |               |
| rATType              | RatType              | O <sub>C</sub> | 0..1        | The identification of the RAT type.   |               |
| sMSCAddress          | string               | O <sub>M</sub> | 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 <sub>M</sub> | 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 <sub>M</sub> | 0..1        | identifies the message that triggered the generation of charging information.   |               |
| sMReplyPathRequested | ReplyPathRequested   | O <sub>C</sub> | 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 <sub>C</sub> | 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 <sub>C</sub> | 0..1        | the information from the TP-Status field in a Status-Report TPDU  |               |
| sMDischargeTime      | DateTime             | O <sub>C</sub> | 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 <sub>C</sub> | 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        | SMSserviceType       | O <sub>C</sub> | 0..1        | the type of SM service that caused the charging interaction. It is only applicable for SM supplementary service procedures.                             |               |
| sMSequenceNumber     | Uint32               | O <sub>C</sub> | 0..1        | the sequence number of this SM within the concatenated short message  |               |
| sMResult             | Uint32               | C              | 0..1        | the result of the attempted SM transaction, if unsuccessful. This field is only for offline charging.   |               |
| submissionTime       | DateTime             | O <sub>C</sub> | 0..1        | the timestamp of when the submitted SM arrived at the originating SMS Node  |               |

|                         |                         |                |      |  |  |
|-------------------------|-------------------------|----------------|------|--|--|
| sMpriority              | SMPriority              | O <sub>C</sub> | 0..1 | any priority information associated with an SM   |  |
| messageReference        | string                  | O <sub>M</sub> | 0..1 | the identity used to identify an SM in the SMS node associated with entity that submitted it |  |
| messageSize             | Uint32                  | O <sub>M</sub> | 0..1 | the total number of short messages when this SM is part of concatenated short message        |  |
| messageClass            | MessageClass            | O <sub>M</sub> | 0..1 | implementation dependent the value selected for a specific transaction.                      |  |
| deliveryReportRequested | DeliveryReportRequested | O <sub>C</sub> | 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 <sub>M</sub> | 0..1        | SUPI of the originator of the SMS  |               |
| originatorGPSI            | gpsi          | O <sub>C</sub> | 0..1        | GPSI of the originator of the SMS  |               |
| originatorOtherAddress    | SMAddressInfo | O <sub>M</sub> | 0..1        | the address of the recipient of the SM, when different from SUPI and GPSI  |               |
| originatorReceivedAddress | SMAddressInfo | O <sub>C</sub> | 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        | O <sub>C</sub> | 0..1        | SCCP calling address used to receive the SM at the SMS node  |               |
| sMOriginatorInterface     | Interface     | O <sub>M</sub> | 0..1        | Provide the information describing the interface on which the SM was received by the SMS node.   |               |
| sMOriginatorProtocolId    | string        | O <sub>C</sub> | 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 <sub>M</sub> | 0..1        | SUPI of the recipient of the SM, as received by the SMS Node  |               |
| recipientGPSI            | gpsi                    | O <sub>C</sub> | 0..1        | GPSI of the recipient of the SM, as received by the SMS Node  |               |
| recipientOtherAddress    | Array(recipientAddress) | O <sub>C</sub> | 0..N        | the address of the recipient of the SM, as received by the SMS Node, when different from SUPI and GPSI  |               |
| recipientReceivedAddress | Array(SMAddressInfo)    | O <sub>C</sub> | 0..N        | 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 <sub>C</sub> | 0..1        | SCCP called address used by the SMS node to onward deliver the SM   |               |
| sMDestinationInterface   | SMInterface             | O <sub>M</sub> | 0..1        | containing information describing the interface on which the SM was requested to be delivered   |               |
| sMRecipientProtocolId    | string                  | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | the type of address carried                                     |               |
| sMAddressData   | string          | O <sub>C</sub> | 0..1        | the address information and formatted according type of address |               |
| sMAddressDomain | SMAddressDomain | O <sub>C</sub> | 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 <sub>C</sub> | 0..1        | indicates the type of address carried                                |               |
| sMAddresseeType      | SMAddresseeType | O <sub>C</sub> | 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 <sub>c</sub> | 0..1        | indicate the class identifier  |               |
| tokenText       | string          | O <sub>c</sub> | 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 <sub>c</sub> | 0..1        | represents a fully qualified domain name (FQDN).   |               |
| 3GPPIMSIMCCMNC | string    | O <sub>c</sub> | 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 <sub>c</sub> | 0..1        | the interface identification provided by the messaging node (originator/destination).   |               |
| interfaceText  | string        | O <sub>c</sub> | 0..1        | It is the consolidation information about the application associated with the charging event  |               |
| interfacePort  | string        | O <sub>c</sub> | 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 <sub>c</sub> | 0..1        | type of interface / nature of the transaction in the messaging node for which the charging event occurs                                   |               |

## 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 |               |

## 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. |               |

## 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 termination has happened  |               |
| 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              | 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.<br>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.  |               |
| USER_LOCATION_CHANGE          | In request message, this value is used to indicate that User location has been changed.<br>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.<br>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.<br>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 | this value is used to indicate that GBR targets for the indicated SDFs are changed ("NOT_GUARANTEED" or "GUARANTEED" again).  |               |
| UE_TIMEZONE_CHANGE            | In request message, this value is used to indicate that UE timezone has been changed.<br>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.<br>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.<br>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.  |  |
| START_OF_SERVICE_DATA_FLOW                       | A Service Data Flow has started  |  |

## 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.  |               |

## 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 |               |

## 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.<br>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.<br>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.<br>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, and used units shall be reported.<br>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.<br>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.<br>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.<br>This applies to the rating group.                       |               |

## 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. |               |

## 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: SMSServiceType

**Table 6.1.6.3.25-1: Enumeration SMSServiceType**

| 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.      |               |

#### 6.1.6.4 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 subclause 5.2.4 of 3GPP TS 29.500 [4].

For the Nchf\_ConvergedCharging API, HTTP error responses shall be supported as specified in subclause 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 [4] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [4]. In addition, the requirements in the following subclauses shall apply.

#### 6.1.7.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the Nchf\_ConvergedCharging API compared to the Protocol Error Handling specified in subclause 5.2.7.2 of 3GPP TS 29.500 [7].

#### 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 Npcf\_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 NF Consumer (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 |
|----------------|--------------|-------------|
|                |              |             |

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## 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 }/   |
|                                   |                                   | <b>ChargingDataRequest</b>   |
| Subscriber Identifier             | Subscriber Identifier             | /subscriberIdentifier  |
| Invocation Timestamp              | -                                 | /invocationTimeStamp   |
| Invocation Sequence Number        | -                                 | /invocationSequenceNumber  |
| One-time Event                    | -                                 | /oneTimeEvent  |
| NF Consumer Identification        | NF Information                    | /nfConsumerIdentification  |
| NF Name                           | NF Name                           | /nfConsumerIdentification/nFName   |
| NF Address                        | NF Address                        | /nfConsumerIdentification/nFIPV4Address<br>/nfConsumerIdentification/nFIPV6Address<br>/nfConsumerIdentification/nFFqdn |
| NF PLMN ID                        | NF PLMN ID                        | /nfConsumerIdentification/nFPLMNID   |
| NF Functionality                  | Record Type                       | /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        | /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  |
|                                   |                                   | <b>ChargingDataResponse</b>  |
| Invocation Timestamp              |                                   | /invocationTimeStamp   |
| Invocation Sequence Number        |                                   | /invocationSequenceNumber  |
| Session Failover                  | -                                 | /sessionFailover   |
| Triggers                          | -                                 | /triggers  |
| Multiple Unit Information         | -                                 | /multipleUnitInformation   |
| Result Code                       | -                                 | /multipleUnitInformation/resultCode  |
| 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  |
|---------------------------------------|---------------------------------------|---|
|                                       |                                       | <b>ChargingDataRequest</b>  |
| Multiple Unit Usage                   | List of Multiple Unit Usage           | /multipleUnitUsage  |
| UPF ID                                | UPF ID                                | /multipleUnitUsage/upfID  |
| 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                     |
| AF Correlation Information            | AF Correlation Information            | /multipleUnitUsage/usedUnitContainer/pDUContainerInformation/afCorrelationInformation           |
| 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                |
| 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               |
| PDU Session Charging Information      | PDU Session Charging Information      | /pDUSessionChargingInformation  |
| Charging Id                           | Charging Id                           | /pDUSessionChargingInformation/chargingId   |
| 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                    | User Location Time                    | /pDUSessionChargingInformation/userLocationTime   |
| 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 IP Address                          | PDU IP Address                          | /pDUSessionChargingInformation/pduSessionInformation/pduAddress/pduIPv4Address<br>/pDUSessionChargingInformation/pduSessionInformation/pduAddress/pduIPv6Addresswithprefix      |
| PDU Address prefix length               | PDU Address prefix length               | /pDUSessionChargingInformation/pduSessionInformation/pduAddress/pduAddressprefixlength  |
| Dynamic Address Flag                    | Dynamic Address Flag                    | /pDUSessionChargingInformation/pduSessionInformation/pduAddress/iPv4dynamicAddressFlag<br>pDUSessionChargingInformation/pduSessionInformation/pduAddress/iPv6dynamicAddressFlag |
| SSC Mode                                | SSC Mode                                | /pDUSessionChargingInformation/pduSessionInformation/sscMode  |
| 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  |
| 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/authorizedqoSInformation   |
| 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/chargingCharacteristicsSelectionMode   |
| 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  |
| 3GPP PS Data Off Status                 | 3GPP PS Data Off Status                 | /pDUSessionChargingInformation/pduSessionInformation/3gppPSDataOffStatus  |
| Session Stop Indicator                  | Session Stop Indicator                  | /pDUSessionChargingInformation/pduSessionInformation/sessionStopIndicator   |
| 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                   |
| 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              |
| UPF ID                              | UPF ID                              | /roamingQBCInformation/uPFID   |
| Roaming Charging Profile            | Roaming Charging Profile            | /roamingQBCInformation/roamingChargingProfile  |
| Trigger                             | Trigger                             | /roamingQBCInformation/roamingChargingProfile/trigger  |
| Partial record method               | Partial record method               | /roamingQBCInformation/roamingChargingProfile/partialRecordMethod                                    |
|                                     |                                     | <b>ChargingDataResponse</b>  |
| Multiple Unit information           | -                                   | /multipleUnitInformation   |
| UPF ID                              | -                                   | /multipleUnitInformation/uPFID   |

## 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   |
|-----------------------------|-----------------------------|--|
|                             |                             | <b>ChargingDataRequest</b>                                       |
| 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                        |
| 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                  |
|                             |                             | <b>ChargingDataResponse</b>                                      |
| -                           | -                           | -  |

---

## 8 Security

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

# Annex A (normative): OpenAPI specification

## A.1 General

The present Annex contains an OpenAPI [500] specification of HTTP messages and content bodies used by the Nchf\_ConvergedCharging 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 3GPP Technical Specification are available on the public 3GPP file server in the following locations (see clause 5B of the 3GPP TR 21.900 [7] for further information):

- <https://www.3gpp.org/ftp/Specs/archive/OpenAPI/<Release>/>, and
- <https://www.3gpp.org/ftp/Specs/<Plenary>/<Release>/OpenAPI/>.

## A.2 Nchf\_ConvergedCharging API

```

openapi: 3.0.0
info:
  title: Nchf_ConvergedCharging
  version: 2.0.5
  description: ConvergedCharging Service
    © 2019, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
  description: >
    3GPP TS 32.291 V15.7.0: 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/v2'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in subclause 4.4 of 3GPP TS 29.501.
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/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:
    $ref: 'TS29571_CommonData.yaml#/components/responses/default'
callbacks:
  myNotification:
    '{$request.body#/notifyUri}':
      post:
        requestBody:
          required: true
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/ChargingNotifyRequest'
        responses:
          '204':
            description: 'No Content, Notification was succesfull'
          '400':
            description: Bad request
            content:
              application/json:
                schema:
                  $ref: >-
                    TS29571_CommonData.yaml#/components/schemas/ProblemDetails
          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'
    '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'
'/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.
      '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:
  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'
        oneTimeEvent:
          type: boolean
        oneTimeEventType:
          $ref: '#/components/schemas/oneTimeEventType'
        notifyUri:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'

```

```

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'
SMSChargingInformation:
  $ref: '#/components/schemas/SMSChargingInformation'
required:
- 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'
    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'
  required:
- nfConsumerIdentification
- 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'
  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'
    maxNumberOfccc:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
  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'
  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:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  localSequenceNumber:
    type: integer
  pduContainerInformation:
    $ref: '#/components/schemas/PDUContainerInformation'
  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'
    filterId:
      type: string
    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'
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationInfo:
        $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/ScsMode'
      hPlmnId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      servingNetworkFunctionID:
        $ref: '#/components/schemas/ServingNetworkFunctionID'
      ratType:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      dnnId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      dnnSelectionMode:
        $ref: '#/components/schemas/dnnSelectionMode'
      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'
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'
    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
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'
    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'
    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'
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'
    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
    smDischargeTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    numberOfMessagesSent:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
    smServiceType:
      $ref: '#/components/schemas/SMSServiceType'
    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'
  recipientGPSSI:
    $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'
  NotificationType:
    anyOf:
      - type: string
        enum:
          - REAUTHORIZATION
          - ABORT_CHARGING
      - type: string
  NodeFunctionality:
    anyOf:
      - type: string
        enum:
          - AMF
          - SMF
          - SMSF
      - 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
          - 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
          - START_OF_SERVICE_DATA_FLOW
          - GFBR_GUARANTEED_STATUS_CHANGE
      - type: string
  FinalUnitAction:
    anyOf:
      - type: string
        enum:
          - TERMINATE
          - REDIRECT
          - RESTRICT_ACCESS
      - type: string
  RedirectAddressType:
    anyOf:
      - type: string
        enum:
          - IPV4
          - IPV6
          - URL
      - type: string
  TriggerCategory:
    anyOf:
      - type: string
        enum:

```

```
    - IMMEDIATE_REPORT
    - DEFERRED_REPORT
  - type: string
QuotaManagementIndicator:
  anyOf:
    - type: string
    enum:
      - ONLINE_CHARGING
      - OFFLINE_CHARGING
    - 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
      - RATING_FAILED
    - 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
    - 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
SMSServiceType:
  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

## 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      |
| 2018-12        | SA#82   | SP-181059 | 0023 | 1   | F   | Correction on Charging Notification message                                 | 15.1.0      |
| 2018-12        | SA#82   | SP-181059 | 0024 | 1   | F   | Correction on Charging ID data type   | 15.1.0      |
| 2018-12        | SA#82   | SP-181059 | 0025 | 1   | F   | Correction on Reauthorizationdetails  | 15.1.0      |
| 2018-12        | SA#82   | SP-181052 | 0026 | 2   | B   | Data Type for SMS   | 15.1.0      |
| 2018-12        | SA#82   | SP-181052 | 0027 | 1   | B   | Introduce Binding for SMS charging  | 15.1.0      |
| 2018-12        | SA#82   | SP-181052 | 0028 | 1   | B   | Introduce OpenAPI extension for SMS charging                                | 15.1.0      |
| 2018-12        | SA#82   | SP-181059 | 0029 | -   | F   | Failure Handling Mechanism Clarification                                    | 15.1.0      |
| 2018-12        | SA#82   | SP-181059 | 0030 | -   | F   | Correction of Serving Network Function ID definition                        | 15.1.0      |
| 2019-03        | SA#83   | SP-190116 | 0031 | 1   | F   | Correction of create operation description for event                        | 15.2.0      |
| 2019-03        | SA#83   | SP-190115 | 0032 | 1   | F   | Correction of data type associated to volume                                | 15.2.0      |
| 2019-03        | SA#83   | SP-190214 | 0033 | 3   | F   | Correction on reference for common data types                               | 15.2.0      |
| 2019-03        | SA#83   | SP-190116 | 0034 | 1   | F   | Correction of inconsistencies in data types                                 | 15.2.0      |
| 2019-03        | SA#83   | SP-190116 | 0035 | 1   | F   | Correction of NF Consumer Information                                       | 15.2.0      |

|         |       |           |      |   |   |   |        |
|---------|-------|-----------|------|---|---|---|--------|
| 2019-03 | SA#83 | SP-190117 | 0036 | - | F | Correction of SMSF as NF Consumer                               | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0037 | - | F | Correction of validityTime data type                            | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0038 | 1 | F | Correction of API versioning and externalDocs field             | 15.2.0 |
| 2019-03 | SA#83 | SP-190212 | 0039 | 4 | F | Correction of Qos Information                                   | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0040 | 1 | F | Correct missing Session Identifier                              | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0041 | 1 | F | Correct faults in yaml part                                     | 15.2.0 |
| 2019-03 | SA#83 | SP-190115 | 0042 | 1 | F | Correction of User Information                                  | 15.2.0 |
| 2019-03 | SA#83 | SP-190115 | 0043 | - | F | Correction of dnn data type                                     | 15.2.0 |
| 2019-03 | SA#83 | SP-190213 | 0044 | 3 | F | Correction of serving Network Function                          | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0045 | 1 | F | Correction of Multiple Unit Information in ChargingDataResponse | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0046 | 1 | F | Correction of trigger in ChargingDataResponse                   | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0048 | 1 | F | Correction of RANSecondaryRATUsageReport occurrence             | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0052 | - | F | Correcting of table for bindings                                | 15.2.0 |
| 2019-03 | SA#83 | SP-190115 | 0054 | 1 | F | Correction of UE IP Addresses                                   | 15.2.0 |
| 2019-03 | SA#83 | SP-190116 | 0055 | - | F | Correction on local sequence nb                                 | 15.2.0 |
| 2019-03 | SA#83 |           |      |   |   | Editorial corrections in the OPENAPI (MCC)                      | 15.2.1 |
| 2019-06 | SA#84 | SP-190384 | 0057 | - | F | Add the reference for SMS charging                              | 15.3.0 |
| 2019-06 | SA#84 | SP-190384 | 0058 | 1 | F | Correct the failure handling                                    | 15.3.0 |
| 2019-06 | SA#84 | SP-190384 | 0063 | 1 | F | Correction on errors description                                | 15.3.0 |
| 2019-06 | SA#84 | SP-190384 | 0064 | - | F | Correction on Gateway timeout code                              | 15.3.0 |
| 2019-06 | SA#84 | SP-190384 | 0065 | - | F | Correction of used unit container attributes                    | 15.3.0 |
| 2019-06 | SA#84 | SP-190383 | 0066 | 1 | F | Correction on binding   | 15.3.0 |
| 2019-06 | SA#84 | SP-190383 | 0067 | - | F | Correction of trigger type for start of service data flow       | 15.3.0 |
| 2019-06 | SA#84 | SP-190383 | 0068 | 1 | F | Correction of trigger type unit count inactivity timer          | 15.3.0 |
| 2019-06 | SA#84 | SP-190383 | 0069 | 1 | F | Correction of Nchf_ConvergedCharging release usage              | 15.3.0 |
| 2019-06 | SA#84 | SP-190383 | 0070 | 1 | F | Correction of missing http status codes                         | 15.3.0 |
| 2019-06 | SA#84 | SP-190522 | 0072 | - | F | Correction on the OpenAPI version                               | 15.3.0 |
| 2019-09 | SA#85 | SP-190761 | 0081 | 1 | F | Correction of nfConsumerIdentification and usedUnitContainer    | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0083 | - | F | Correction of TriggerCategory and Triggers                      | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0085 | 1 | F | Correction of Report Time in QFI Container Information          | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0087 | 1 | F | Correction of SubscriptionIdentificationType                    | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0091 | 1 | F | Correction of multipleQuotaInformation                          | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0093 | 1 | F | Correction of HTTP Status Codes                                 | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0097 | 1 | F | Correction of version numbering                                 | 15.4.0 |
| 2019-09 | SA#85 | SP-190762 | 0098 | - | F | Correct the QoS change trigger                                  | 15.4.0 |



|         |         |           |      |   |   |  |        |
|---------|---------|-----------|------|---|---|--|--------|
| 2019-09 | SA#85   | SP-190762 | 0099 | 1 | F | Add the selection mode in PDU session information            | 15.4.0 |
| 2019-09 | SA#85   | SP-190762 | 0102 | 1 | F | Event based charging mechanism                               | 15.4.0 |
| 2019-09 | SA#85   | SP-190840 | 0103 | 1 | F | Bindings of common field correction                          | 15.4.0 |
| 2019-09 | SA#85   | SP-190840 | 0104 | 1 | F | Coordination of attribute Presence condition                 | 15.4.0 |
| 2019-09 | SA#85   | SP-190840 | 0105 | 1 | F | Bindings for 5G data connectivity correction                 | 15.4.0 |
| 2019-09 | SA#85   | SP-190840 | 0106 | 1 | F | Correction of data structure of response body                | 15.4.0 |
| 2019-09 | SA#85   | SP-190840 | 0107 | - | F | Correction of serving Network Function identifier            | 15.4.0 |
| 2019-09 | SA#85   | SP-190840 | 0123 | - | F | Corrections on OpenAPI                                       | 15.4.0 |
| 2019-09 | SA#85   | SP-190752 | 0125 | - | F | Correction on OpenAPI version                                | 15.4.0 |
| 2019-12 | SA#86   | SP-191160 | 0128 | 1 | F | Add the Service Specification Information                    | 15.5.0 |
| 2019-12 | SA#86   | SP-191160 | 0130 | 1 | F | Add the QNC support  | 15.5.0 |
| 2019-12 | SA#86   | SP-191160 | 0131 | 3 | F | Clarify the QoS change trigger                               | 15.5.0 |
| 2019-12 | SA#86   | SP-191160 | 0134 | 1 | F | Correction of Nchf_ConvergedCharging_Release operation       | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0142 | - | F | Correction of subscriberIdentifier                           | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0155 | 1 | F | Correction InvocationResult description and binding          | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0161 | 1 | F | Correction of nfIdentification in yaml                       | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0162 | 1 | F | Alignment with TS 29.501 template                            | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0165 | 1 | F | Correction of Notify Response                                | 15.5.0 |
| 2019-12 | SA#86   | SP-191204 | 0167 | 2 | F | Correction of ChargingNotifyResponse description             | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0169 | 1 | F | Correction on the Resource URI                               | 15.5.0 |
| 2019-12 | SA#86   | SP-191202 | 0182 | 2 | F | Add Session-AMBR change trigger                              | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0188 | - | F | Correction to NF consumer identification                     | 15.5.0 |
| 2019-12 | SA#86   | SP-191161 | 0190 | 1 | F | Correction of binding for 5G data connectivity               | 15.5.0 |
| 2019-12 | SA#86   | SP-191206 | 0197 | - | F | Update OpenAPI version                                       | 15.5.0 |
| 2020-07 | SA#88-e | SP-200510 | 0215 | - | F | Missing AMF as network function                              | 15.6.0 |
| 2020-07 | SA#88-e | SP-200486 | 0243 | - | F | Open API version Update                                      | 15.6.0 |
| 2020-07 | SA#88-e |           |      |   |   | Adding yaml files to the zip                                 | 15.6.1 |
| 2020-09 | SA#89e  | SP-200725 | 0253 | - | F | Correction of nfConsumerIdentification in response           | 15.7.0 |
| 2020-09 | SA#89e  | SP-200817 | 0264 | 1 | F | Correction on Converged Charging and Requested Unit handling | 15.7.0 |
| 2020-09 | SA#89e  | SP-200817 | 0269 | - | F | Update OpenAPI version                                       | 15.7.0 |

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# History

| <b>Document history</b> |               |             |
|-------------------------|---------------|-------------|
| V15.0.0                 | October 2018  | Publication |
| V15.1.0                 | April 2019    | Publication |
| V15.2.1                 | May 2019      | Publication |
| V15.3.0                 | June 2019     | Publication |
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| V15.5.0                 | January 2020  | Publication |
| V15.6.1                 | August 2020   | Publication |
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