**3GPP TSG-SA5 Meeting #142-e *S5-222413rev1***

**e-meeting, 4th –12th April 2022** Revision of S5-20xxxx

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **32.291** | **CR** | **0** | **rev** | **1** | **Current version:** | **16.11.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Correction on the identifiers for NEF API Charging information | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16, 5GS\_Ph1\_NEFCH | | | | |  | ***Date:*** | | | 2022-04-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | As per the TS 32.254 stage2 and the TS 32.291 stage3, the externalGroupIdentifier and groupIdentifier are used for identifying one group which may includes multiple externalIndividualIdentifier.  In the clause A.2 of TS 32.291, Nchf\_ConvergedCharging API provides externalGroupIdentifier which can only support the zero or one ExternalGroupId. In order to keep alignment with the yaml, the table 6.1.6.2.5.3-2 should changed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Correct the reference of TS 29.500.  Correct the cardinality for the externalGroupIdentifier and groupIdentifier. | | | | | | | | |
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| ***Consequences if not approved:*** | | The charging specifications are not aligned. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.1.2.3.1, 6.1.6.1, 6.1.6.2.5.2, 6.1.7.1,6.1.7.2,6.1.7.3,6.2.3.3.4.3.2, 6.2.6.1, 6.2.6.2, 6.1.6.3. | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First change** |

##### 6.1.2.3.1 General

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

No specific custom headers are defined in the present document.

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 [299] also apply.  NOTE 2: Failure cases are described in subclause 6.1.7. | | | | |

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| **Next change** |

#### 6.1.6.1 General

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

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

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

Table 6.1.6.1-1: Nchf\_ ConvergedCharging specific Data Types

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

Table 6.1.6.1-2 specifies data types re-used by the Nchf\_ConvergedCharging service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nchf\_ConvergedCharging service based interface.

Table 6.1.6.1-2: Nchf\_ConvergedCharging re-used Data Types

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | | Reference | | Comments | | Applicability | |
| Supi | | 3GPP TS 29.571 [371] | | The identification of the user (i.e. IMSI, NAI, GLI, GCI).  (NOTE 1) | |  | |
| Uint32 | | 3GPP TS 29.571 [371] | | Unsigned 32-bit integers | |  | |
| Uint64 | | 3GPP TS 29.571 [371] | | Unsigned 64-bit integers | |  | |
| PduSessionId | | 3GPP TS 29.571 [371] | | The identification of the PDU session. | |  | |
| PduSessionType | | 3GPP TS 29.571 [371] | | the type of a PDU session | |  | |
| Uri | | 3GPP TS 29.571 [371] | | String providing an URI | |  | |
| AccessType | | 3GPP TS 29.571 [371] | | The identification of the type of access network. | |  | |
| DateTime | | 3GPP TS 29.571 [371] | | The time. | |  | |
| ChargingId | | 3GPP TS 29.571 [371] | | Charging identifier allowing correlation of charging information | |  | |
| RatType | | 3GPP TS 29.571 [371] | | The identification of the RAT type. | |  | |
| RatingGroup | | 3GPP TS 29.571 [371] | | The identification of the rating group | |  | |
| Ipv4Addr | | 3GPP TS 29.571 [371] | | Ipv4 address. | |  | |
| Ipv6Prefix | | 3GPP TS 29.571 [371] | | The Ipv6 prefix allocated for the user. | |  | |
| Ipv6Addr | | 3GPP TS 29.571 [371] | | Ipv6 Address. | |  | |
| Pei | | 3GPP TS 29.571 [371] | | The Identification of a Permanent Equipment. | |  | |
| TimeZone | | 3GPP TS 29.571 [371] | | Time zone information | |  | |
| NfInstanceId | | 3GPP TS 29.571 [371] | | String uniquely identifying a NF instance. | |  | |
| Gpsi | | 3GPP TS 29.571 [371] | | String identifying a Gpsi | |  | |
| DefaultQosInformation | | 3GPP TS 29.571 [371] | | Identifies the information of the default QoS. | |  | |
| SubscribedDefaultQos | | 3GPP TS 29.571 [371] | | subscribed default QoS. | |  | |
| AuthorizedDefaultQos | | 3GPP TS 29.512 [302] | | Authorized default QoS. | |  | |
| Ambr | | 3GPP TS 29.571 [371] | | Aggregate Maximum Bit rate | |  | |
| QosData | | 3GPP TS 29.512 [302] | | Contains QoS parameters | |  | |
| UserLocation | | 3GPP TS 29.571 [371] | | User location information | |  | |
| PlmnId | | 3GPP TS 29.571 [371] | | PLMN id | |  | |
| Guami | | 3GPP TS 29.571 [371] | | Globally Unique AMF Identifier | |  | |
| DurationSec | | 3GPP TS 29.571 [371] | | Identifies a period of time in units of seconds. | |  | |
| Snssai | | 3GPP TS 29.571 [371] | | SNSSAI | |  | |
| ProblemDetails | | 3GPP TS 29.571 [371] | | additional details of the error | |  | |
| ServiceId | | 3GPP TS 29.571 [371] | | Identifier of service | |  | |
| SscMode | | 3GPP TS 29.571 [371] | | SSC Mode type | |  | |
| PresenceInfo | | 3GPP TS 29.571 [371] | | PRA information including PRAId, PRA element list and PRA status | |  | |
| Qfi | | 3GPP TS 29.571 [371] | | QoS flow identifier designated as "Qfi". | |  | |
| AmfId | | 3GPP TS 29.571 [371] | | AMF identifier | |  | |
| Dnn | | 3GPP TS 29.571 [371] | | Data Network Name | |  | |
| GroupId | | 3GPP TS 29.571 [371] | | Network internal Identifier for a group of IMSIs | |  | |
| ExternalGroupId | | 3GPP TS 29.571 [371] | | External Group Identifier for one or more subscriptions associated to a group of IMSIs | |  | |
| Bytes | | 3GPP TS 29.571 [371] | | String with format "byte" | |  | |
| Tai | | 3GPP TS 29.571 [371] | | Tracking Area Identifier | |  | |
| Area | | 3GPP TS 29.571 [371] | | List of TACs or Operator specific codes | |  | |
| CoreNetworkType | | 3GPP TS 29.571 [371] | | 5GC or EPC | |  | |
| ServiceAreaRestriction | | 3GPP TS 29.571 [371] | | Service Area restriction | |  | |
| GlobalRanNodeId | | 3GPP TS 29.571 [371] | | Global RAN Node Id | |  | |
| QosCharacteristics | | 3GPP TS 29.512 [302] | | Map of QoS characteristics for non standard 5QIs and non-preconfigured 5QIs. | |  | |
| SupportedFeatures | | 3GPP TS 29.571 [371] | | See 3GPP TS 29.500 [299] clause 6.6 | |  | |
| NsiLoadLevelInfo | | 3GPP TS 29.520 [306] | | Represents the load level information for an S-NSSAI and the associated network slice instance | |  | |
| ServiceExperienceInfo | | 3GPP TS 29.520 [306] | | ServiceExperience | |  | |
| ApplicationChargingId | | 3GPP TS 29.571 [371] | | Application provided charging identifier allowing correlation of charging information. | | AF\_Charging\_Identifier | |
| SharingLevel | | 3GPP TS 28.541 [254] | | Ressources sharing level | |  | |
| MobilityLevel | | 3GPP TS 28.541 [254] | | UE mobility Level | |  | |
| SsT | | 3GPP TS 28.541 [254] | | Slice Service type (SST) | |  | |
| Support | | 3GPP TS 28.541 [254] | | Supported, Not Supported indicator | |  | |
| Float | | 3GPP TS 29.571 [371] | | Number with format "float" | |  | |
| MaPduIndication | | 3GPP TS 29.512 [302] | | MA PDU session indication | | ATSSS | |
| AtsssCapability | | 3GPP TS 29.571 [371] | | ATSSS capabilities | | ATSSS | |
| SteeringFunctionality | | 3GPP TS 29.571 [371] | | Steering functionalities for MA PDU session | | ATSSS | |
| SteeringMode | | 3GPP TS 29.512 [302] | | Steering mode for MA PDU session | | ATSSS | |
| OperationalState | | 3GPP TS 28.623 [257] | | Operational state | |  | |
| AdministrativeState | | 3GPP TS 28.623 [257] | | Administrative state | |  | |
| RanNasRelCause | | 3GPP TS 29.512 [302] | | Indicates the RAN or NAS release cause code information. | | EnhancedDiagnostics | |
| Ecgi | | 3GPP TS 29.571 [371] | | E-UTRA Cell Id | |  | |
| Ncgi | | 3GPP TS 29.571 [371] | | NR Cell Id | |  | |
| NOTE 1: A SUPI containing GLI or GCI is used to support 5G-RG and FN-RG in scenarios of wireline network. | | | | | | | |

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| **Next change** |

###### 6.1.6.2.5.2 Type NEFChargingInformation

Table  6.1.6.2.5.3-2: Definition of type NEFChargingInformation

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

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| **Next change** |

#### 6.1.7.1 General

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

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 [299] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [299]. In addition, the requirements in the following subclauses shall apply.

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| **Next change** |

#### 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 [299].

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| **Next change** |

#### 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 [299] may also be used for the Nchf\_ConvergedCharging service.

Table 6.1.7.3-1: Application errors

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

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| **Next change** |

6.2.3.3.4.3.2 Operation Definition

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

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

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

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

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

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| **Next change** |

#### 6.2.6.1 General

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

For the Nchf\_OfflineOnlyCharging API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [2]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [299] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [299]. In addition, the requirements in the following clauses shall apply.

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| **Next change** |

#### 6.2.6.2 Protocol Errors

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

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| **Next change** |

#### 6.2.6.3 Application errors

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

Table 6.1.7.3-1: Application errors

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

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| **End of change** |