**3GPP TSG- Meeting # *S5-223464***

**09 - 17 May 2022, E-meeting**

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| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **0903** | **rev** | **-** | **Current version:** | **0** |  |
|  |
| *For* [***HE******LP***](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** |

|  |
| --- |
|  |
| ***Title:***  | Add Edge Computing related CHF CDR(s) definition and ASN.1 format |
|  |  |
| ***Source to WG:*** | Intel |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | EDGE\_CH |  | ***Date:*** | 28 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)**Rel-17 (Release 17)* |
|  |  |
| ***Reason for change:*** | The Edge Computing domain charging has been defined in TS 32.257, the related CDR(s) and ASN.1 format need to be defined. |
|  |  |
| ***Summary of change:*** | Added CDR(s) definition for Edge Computing domain charging;Added ASN.1 format for Edge Computing domain charging. |
|  |  |
| ***Consequences if not approved:*** | The CDR(s) cannot support Edge Computing domain charging. |
|  |  |
| ***Clauses affected:*** | 2, 5.1.5.0, 5.2.5.2 |
|  |  |
|  | **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:*** |  |

|  |
| --- |
| **Start of modification** |

# 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] - [9] Void.

[10] 3GPP TS 32.250: "Telecommunication management; Charging management; Circuit Switched (CS) domain charging".

[11] 3GPP TS 32.251: "Telecommunication management; Charging management; Packet Switched (PS) domain charging".

[12] Void.

[13] 3GPP TS 32.253: "Telecommunication management; Charging management; Control Plane (CP) data transfer domain charging".

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

[15] 3GPP TS 32.255: "Telecommunication management; Charging management; 5G Data connectivity domain charging; stage 2".

[16] 3GPP TS 32.256: "Telecommunication management; Charging management; 5G connection and mobility domain charging; stage 2".

[17] 3GPP TS 32.257: "Telecommunication management; Charging management; Edge computing domain charging; stage 2".

[18] - [19] Void.

[20] 3GPP TS 32.260: "Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging".

[21] - [29] Void.

[30] 3GPP TS 32.270: "Telecommunication management; Charging management; Multimedia Messaging Service (MMS) charging".

[31] 3GPP TS 32.271: "Telecommunication management; Charging management; Location Services (LCS) charging".

[32] 3GPP TS 32.272: "Telecommunication management; Charging management; Push-to-talk over Cellular (PoC) charging".

[33] 3GPP TS 32.273: "Telecommunication management; Charging management; Multimedia Broadcast and Multicast Service (MBMS) charging".

[34] 3GPP TS 32.274: "Telecommunication management; Charging management; Short Message Service (SMS) charging".

[35] 3GPP TS 32.275: "Telecommunication management; Charging management; MultiMedia Telephony (MMTel) charging".

[36] Void.

[37] 3GPP TS 32.277: "Telecommunication management; Charging management; Proximity-based Services (ProSe) charging".

[38] 3GPP TS 32.278: "Telecommunication management; Charging management; Monitoring Event charging".

[39] void

[40] 3GPP TS 32.280: "Telecommunication management; Charging management; Advice of Charge (AoC) service".

[41] - [49] Void.

[50] 3GPP TS 32.299: "Telecommunication management; Charging management; Diameter charging application".

[51] Void.

[52] 3GPP TS 32.297: "Telecommunication management; Charging management; Charging Data Records (CDR) file format and transfer".

[53] - [56] Void.

[57] 3GPP TS 32.290: "Telecommunication management; Charging management; 5G system; Services, operations and procedures of charging using Service Based Interface (SBI)".

[58] 3GPP TS 32.291: "Telecommunication management; Charging management; 5G system; Charging service, stage 3".

[59]- [69] Void.

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

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

[72]- [99] Void.

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

[101] 3GPP TS 22.115: "Service aspects; Charging and billing".

[102] 3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[103] 3GPP TS 22.004: "General on supplementary services".

[104] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[105] – [199] void

[200] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[201] 3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[202] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[203] 3GPP TS 23.203: "Policy and Charging control architecture".

[204] 3GPP TS 23.207: "End-to-end Quality of Service (QoS) concept and architecture".

[205] Void.

[206] 3GPP TS 23.140: "Multimedia Messaging Service (MMS); Functional description; Stage 2".

[207] 3GPP TS 23.172: "Technical realization of Circuit Switched (CS) multimedia service; UDI/RDI fallback and service modification; Stage 2".

[208] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[209] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary service specification; Formats and coding".

[210] 3GPP TS 24.229: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[211] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM); Protocol specification".

[212] 3GPP TS 25.413: "UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling".

[213] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[214] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[215] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface".

[216] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

[217] 3GPP TS 29.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification".

[218] 3GPP TS 29.140: "Multimedia Messaging Service (MMS); MM10 interface Diameter based protocol; Stage 3".

[219] 3GPP TS 29.207: "Policy control over Go interface".

[220] 3GPP TS 29.212: "Policy and Charging control over Gx reference point".

[221] 3GPP TS 29.214: "Policy and Charging Control; Reference points".

[222] 3GPP TS 29.272: "Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol".

[223] 3GPP TS 29.274: "Evolved GPRS Tunnelling Protocol for Control Plane (GTPv2-C); Stage 3".

[224] 3GPP TS 29.275: " Proxy Mobile IPv6 (PMIPv6) based Mobility and Tunnelling protocols; Stage 3".

[225] 3GPP TS 29.658: "SIP Transfer of IP Multimedia Service Tariff Information".

[226] 3GPP TS 36.413 "Evolved Universal Terrestrial Radio Access (E-UTRA); S1 Application Protocol (S1AP)".

[227] 3GPP TS 49.031: "Location Services (LCS); Base Station System Application Part LCS Extension (BSSAP-LE)".

[228] 3GPP TS 32.015: "Telecommunication management; Charging management; Charging data description for the Packet Switched (PS) domain".

[229] 3GPP TS 23.292: "IP Multimedia Subsystem (IMS) Centralized Services".

[230] 3GPP TS 29.338: "Diameter based protocols to support SMS capable MMEs".

[231] 3GPP TS 29.337: "Diameter-based T4 interface for communications with packet data networks and applications".

[232] 3GPP TS 29.229: "Cx and Dx Interfaces based on the Diameter protocol; Protocol Details".

[233] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[234] void

[235] 3GPP TS 23.303: "Proximity-based services (ProSe)".

[236] 3GPP TS 24.334: "Proximity-services (ProSe) User Equipment (UE) to ProSe function protocol aspects".

[237] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[238] - [240] Void.

[241] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[242] 3GPP TS 29.328: "IP Multimedia (IM) Subsystem Sh Interface; Signalling flows and message contents".

[243] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[244] 3GPP TS 29.128: "Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) interfaces for interworking with packet data networks and applications".

[245] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[246] 3GPP TS 23.503:"Policy and Charging Control Framework for the 5G System; Stage 2".

[247] 3GPP TS 23.501:"System Architecture for the 5G System".

[248] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[249] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[250] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[251] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[252] - [253] Void

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

[255] 3GPP TS 29.558: "Enabling Edge Applications; Application Programming Interface (API) specification; stage 3".

[256] 3GPP TS 32.538: "Management and orchestration; Edge Computing Management".

[257] - [299] Void

[300] ITU-T Recommendation X.680 | ISO/IEC 8824-1: "Information technology; Abstract Syntax Notation One (ASN.1): Specification of Basic Notation".

[301] ITU-T Recommendation X.690 | ISO/IEC 8825-1: "Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".

[302] ITU-T Recommendation X.691 | ISO/IEC 8825-2: "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".

[303] ITU-T Recommendation X.693 | ISO/IEC 8825-4: "Information technology - ASN.1 encoding rules: XML encoding rules (XER)".

[304] ITU-T Recommendation X.711 CMIP:"Information technology – Open Systems Interconnection – Common Management Information Protocol".

[305] ITU-T Recommendation X.721 ISO/IEC 10165-2: " Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[306] ITU-T Recommendation X.227 ACSE: " Information technology - Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element: Protocol specification ".

[307] ITU-T Recommendation Q.773: "Transaction capabilities formats and encoding".

[308] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[309] ITU-T Recommendation Q.767: "Application of the ISDN user part of CCITT signalling system No. 7 for international ISDN interconnections".

[310] ETS 300 196: "Digital Subscriber Signalling System No. one (DSS1) protocol".

[311] OMA Location Working Group "Mobile Location Protocol Specification", [http://www.openmobilealliance.org].

[312] ETSI GSM 05.01: "Digital Cellular Telecommunications System (Phase 2+); Physical Layer on the Radio Path; General Description".

[313] ETSI GSM 08.08: "European Digital Cellular Telecommunication System (Phase 2); Mobile-Services Switching Centre - Base Station System (MSC - BSS) Interface Layer 3 Specification".

[314] ETSI TS 283 034 v2.2.0: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Network Attachment Sub-System (NASS); e4 interface based on the DIAMETER protocol".

[315] ITU-T Recommendation X.121: " International numbering plan for public data networks ".

[316] – [399] void

[400] IETF RFC 822 (1982): "Standard for the format of arpa internet text messages".

[401] IETF RFC 3261(2002): "SIP: Session Initiation Protocol".

[402] IETF RFC 3966 (2004): "The tel URI for Telephone Numbers".

[403] IETF RFC 3265 (2002): "Session Initiation Protocol (SIP)-Specific Event Notification".

[404] IETF RFC 7315 (2014): "Private Header (P-Header) Extensions to the Session Initiation Protocol (SIP) for the 3rd-Generation Partnership Project (3GPP)".

[405] IETF RFC 2486 (1999): "The Network Access Identifier".

[406] IETF RFC 4566 (2006): "SDP: Session Description Protocol".

[407] IETF RFC 5031 (2008): "A Uniform Resource Name (URN) for Emergency and Other Well-Known Services".

[408] IEEE Std 802.11-2012™: "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[409] IETF RFC 4776 (2006): "Dynamic Host Configuration Protocol (DHCPv4 and DHCPv6) Option for Civic Addresses Configuration Information".

[410] IETF RFC 4122 (200): "A Universally Unique IDentifier (UUID) URN Namespace".

[411] IETF RFC 1166: "Internet Numbers".

[412] IETF RFC 5952: "A recommendation for IPv6 address text representation".

[413] – [600] void

[601] Broadband Forum TR-134: "Broadband Policy Control Framework (BPCF)".

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| --- |
| **Next modification** |

#### 5.1.5.0 CHF record (CHF-CDR)

If enabled, CHF records shall be produced for chargeable events, with or without quota management. The generic fields in the record are specified in table 5.1.5.0.1. The NF specific parts will be concatenated to this e.g. the PDU Session Information, PDU Container Information and Roaming QBC Information are concatenated for the SMF.

Table 5.1.5.0.1: CHF record (CHF-CDR)

|  |  |  |
| --- | --- | --- |
| Field | Category | Description |
| Record Type  | M | CHF record. |
| Recording Network Function ID | OM | This field holds the name of the recording entity, i.e. the CHF id. |
| Charging Session Identifier | OC | This field holds the Session Identifier described in TS 32.290 [57]. |
| Subscriber Identifier | OM | This field holds the 5G Subscription Permanent Identifier (SUPI) of the served party as specified in TS 29.571 [249], if available. |
| Tenant Identifier | OM | This field holds the tenant identifier |
| MnS Consumer Identifier | OM | This fields holds the identifier of the MnS Consumer. |
| NF Consumer Information | M | This field holds the information of the NF consumer of the charging service. |
| NF Functionality | M | This field holds the type of functionality the NF provides. |
| NF Name | OC | This field holds the name of the NF used. |
| NF Address | OC | This field holds the IP Address of the NF used. |
| NF PLMN ID | OC | This field holds the PLMN identifier (MCC MNC) of the NF. |
| Charging Identifier | OM | Charging identifier for correlation between different records. Only applicable if not available in the service specific information. |
| Triggers | OC | This field holds the triggers that are common to all Multiple Unit Usage. Can be the same as in Used Unit Container. |
| SMF Triggers | OC | This field holds the 5G data connectivity specific triggers described in TS 32.255 [15]. |
| List of Multiple Unit Usage | OC | This field holds the parameters for the unit reporting. It may have multiple occurrences. |
| Rating Group | M | This filed holds the rating group. The parameter corresponds to the Charging Key as specified in TS 23.203 [203] |
| Used Unit Container | OC | This field holds the used units and information connected to the reported units. |
| Service Identifier | OC | This field holds the Service Identifier. |
| Quota management Indicator | OC | This field holds an indicator on whether the reported used units are with or without quota management control. If the field is not present, it indicates the used unit is without quota management applied.  |
| Local Sequence Number | OM | This field holds the container sequence number. |
| Time | OC | This field holds the amount of used time. |
| Uplink Volume  | OC | This field holds the amount of used volume in uplink direction. |
| Downlink Volume  | OC | This field holds the amount of used volume in downlink direction. |
| Total Volume | OC | This field holds the amount of used volume in both uplink and downlink directions. |
| Service Specific Units | OC | This field holds the amount of used service specific units. |
| Event Time Stamp | OC | This field holds the timestamps of the event reported in the Service Specific Units, if the reported units are event based.  |
| Rating Indicator | OC | This field indicates if the units have been rated or not. |
| Triggers | OC | This field holds the triggers that caused the Used Unit Container to be reported, independently on if they are PDU Session or RG level triggers. |
| SMF Triggers | OC | This field holds the 5G data connectivity specific triggers described in TS 32.255 [15]. |
| Trigger Time Stamp | OC | This field holds the timestamp of the trigger. |
| PDU Container Information | OC | This field holds the 5G data connectivity specific information described in TS 32.255 [15]. |
| NSPA Container Information | OC | This field holds the network slice performance and analytics container specific information described in TS 28.201 [151]. |
| UPF ID | OC | This field holds the UPF identifier used to identify the UPF when reporting the usage for the UPF. |
| Record Opening Time | OC | Time stamp when the PDU session is activated in the SMF or record opening time on subsequent partial records. |
| Duration | M | This field holds the duration of this record. |
| Record Sequence Number | C | Partial record sequence number, only present in case of partial records. |
| Cause for Record Closing  | M | The reason for the release of the record. |
| Local Record Sequence Number | OM | Consecutive record number created by the CDF. The number is allocated sequentially including all CDR types. |
| Record Extensions | OC | A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.This field can be used to capture the specific information for charging. |
| Service Specification Information | OC | 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. |
| PDU Session Charging Information | OM | This field holds the 5G data connectivity specific information described in TS 32.255 [15] |
| Roaming QBC Information | OM | This field holds the roaming 5G data connectivity specific information described in TS 32.255 [15] |
| SMS Charging Information | OC | This field holds the SMS specific information described in TS 32.274 [34]. |
| Registration Charging Information | OM | This field holds the 5G registration specific information described in TS 32.256 [16]. |
| N2 connection charging Information | OM | This field holds the N2 connection specific information described in TS 32.256 [16]. |
| Location reporting charging Information | OM | This field holds the Location reporting specific information described in TS 32.256 [16]. |
| NEF API Charging Information | OM | This field holds the NEF API specific information described in TS 32.254 [14]. |
| NSPA Charging Information | OM | This field holds the performance and analytics specific information described in TS 28.201 [151]. |
| NSM charging Information | OM | This field holds the Network Slice Management (NSM) specific information described in TS 28.202 [71]. |
| Edge Enabling Infrastructure Resource Usage Charging Information | OM | This field holds the Edge Enabling Infrastructure Resource Usage Charging Information described in TS 32.257 [17]. |
| EAS Deployment Charging Information | OM | This field holds the EAS Deployment Charging Information described in TS 32.257 [17]. |
| Direct Edge Enabling Service Charging Information | OM | This field holds the Direct Edge Enabling Service Charging Information described in TS 32.257 [17]. |
| Exposed 5G NF Service Charging Information | OM | This field holds the Exposed 5G NF Service Charging Information described in TS 32.257 [17]. |

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| **Next modification** |

5.2.5.2 CHF CDRs

This subclause contains the abstract syntax definitions that are specific to the CHF CDR types defined in this document.

.$CHFChargingDataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) charging (5) chfChargingDataTypes (15) asn1Module (0) version1 (0)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

-- EXPORTS everything

IMPORTS

CallDuration,

CauseForRecClosing,

ChargingID,

DataVolumeOctets,

Diagnostics,

Ecgi,

EnhancedDiagnostics,

DynamicAddressFlag,

InvolvedParty,

IPAddress,

LocalSequenceNumber,

ManagementExtensions,

MessageClass,

MessageReference,

MSCAddress,

MSTimeZone,

Ncgi,

Nid,

NodeAddress,

PLMN-Id,

PriorityType,

PSCellInformation,

RANNASCause,

RecordType,

ServiceSpecificInfo,

Session-Id,

SubscriberEquipmentNumber,

SubscriptionID,

ThreeGPPPSDataOffStatus,

TimeStamp

FROM GenericChargingDataTypes {itu-t (0) identified-organization (4) etsi(0) mobileDomain (0) charging (5) genericChargingDataTypes (0) asn1Module (0) version2 (1)}

AddressString

FROM MAP-CommonDataTypes {itu-t identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1) modules (3) map-CommonDataTypes (18) version18 (18) }

ChargingCharacteristics,

ChargingRuleBaseName,

ChChSelectionMode,

EventBasedChargingInformation,

PresenceReportingAreaInfo,

RatingGroupId,

ServiceIdentifier

FROM GPRSChargingDataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) charging (5) gprsChargingDataTypes (2) asn1Module (0) version2 (1)}

OriginatorInfo,

RecipientInfo,

SMMessageType,

SMSResult,

SMSStatus

FROM SMSChargingDataTypes {itu-t (0) identified-organization (4) etsi(0) mobileDomain (0) charging (5) smsChargingDataTypes (10) asn1Module (0) version2 (1)}

APIDirection

FROM ExposureFunctionAPIChargingDataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) charging (5) exposureFunctionAPIChargingDataTypes (14) asn1Module (0) version2 (1)}

SupplService

FROM MMTelChargingDataTypes {itu-t (0) identified-organization (4) etsi(0) mobileDomain (0) charging (5) mMTelChargingDataTypes (9) asn1Module (0) version2 (1)}

AccessNetworkInfoChange,

AccessTransferInformation,

ApplicationServersInformation,

CalledIdentityChange,

CarrierSelectRouting,

Early-Media-Components-List,

FEIdentifierList,

IMS-Charging-Identifier,

IMSCommunicationServiceIdentifier,

IMSNodeFunctionality,

InterOperatorIdentifiers,

InvolvedParty,

ISUPCause,

ListOfInvolvedParties,

ListOfReasonHeader,

MessageBody,

NNI-Information,

NumberPortabilityRouting,

Role-of-Node,

S-CSCF-Information,

SDP-Media-Component,

ServedPartyIPAddress,

Service-Id,

SessionPriority,

SIPEventType,

TADIdentifier,

TransitIOILists,

TransmissionMedium,

TrunkGroupID

FROM IMSChargingDataTypes {itu-t (0) identified-organization (4) etsi(0) mobileDomain (0) charging (5) imsChargingDataTypes (4) asn1Module (0) version2 (1)}

;

--

-- CHF RECORDS

--

CHFRecord ::= CHOICE

--

-- Record values 200..201 are specific

--

{

 chargingFunctionRecord [200] ChargingRecord

}

ChargingRecord ::= SET

{

 recordType [0] RecordType,

 recordingNetworkFunctionID [1] NetworkFunctionName,

 subscriberIdentifier [2] SubscriptionID OPTIONAL,

 nFunctionConsumerInformation [3] NetworkFunctionInformation,

 triggers [4] SEQUENCE OF Trigger OPTIONAL,

 listOfMultipleUnitUsage [5] SEQUENCE OF MultipleUnitUsage OPTIONAL,

 recordOpeningTime [6] TimeStamp,

 duration [7] CallDuration,

 recordSequenceNumber [8] INTEGER OPTIONAL,

 causeForRecClosing [9] CauseForRecClosing,

 diagnostics [10] Diagnostics OPTIONAL,

 localRecordSequenceNumber [11] LocalSequenceNumber OPTIONAL,

 recordExtensions [12] ManagementExtensions OPTIONAL,

 pDUSessionChargingInformation [13] PDUSessionChargingInformation OPTIONAL,

 roamingQBCInformation [14] RoamingQBCInformation OPTIONAL,

 sMSChargingInformation [15] SMSChargingInformation OPTIONAL,

 chargingSessionIdentifier [16] ChargingSessionIdentifier OPTIONAL,

 serviceSpecificationInformation [17] OCTET STRING OPTIONAL,

 exposureFunctionAPIInformation [18] ExposureFunctionAPIInformation OPTIONAL,

 registrationChargingInformation [19] RegistrationChargingInformation OPTIONAL,

 n2ConnectionChargingInformation [20] N2ConnectionChargingInformation OPTIONAL,

 locationReportingChargingInformation [21] LocationReportingChargingInformation OPTIONAL,

 incompleteCDRIndication [22] IncompleteCDRIndication OPTIONAL,

 tenantIdentifier [23] TenantIdentifier OPTIONAL,

 mnSConsumerIdentifier [24] MnSConsumerIdentifier OPTIONAL,

 nSMChargingInformation [25] NSMChargingInformation OPTIONAL,

 nSPAChargingInformation [26] NSPAChargingInformation OPTIONAL,

 chargingID [27] ChargingID OPTIONAL,

 iMSChargingInformation [28] IMSChargingInformation,

 mMTelChargingInformation [29] MMTelChargingInformation

}

--

-- PDU Session Charging Information

--

PDUSessionChargingInformation ::= SET

{

 pDUSessionChargingID [0] ChargingID,

 userIdentifier [1] InvolvedParty OPTIONAL,

 userEquipmentInfo [2] SubscriberEquipmentNumber OPTIONAL,

 userLocationInformation [3] UserLocationInformation OPTIONAL,

 userRoamerInOut [4] RoamerInOut OPTIONAL,

 presenceReportingAreaInfo [5] PresenceReportingAreaInfo OPTIONAL,

 pDUSessionId [6] PDUSessionId,

 networkSliceInstanceID [7] SingleNSSAI OPTIONAL,

 pDUType [8] PDUSessionType OPTIONAL,

 sSCMode [9] SSCMode OPTIONAL,

 sUPIPLMNIdentifier [10] PLMN-Id OPTIONAL,

 servingNetworkFunctionID [11] SEQUENCE OF ServingNetworkFunctionID OPTIONAL,

 rATType [12] RATType OPTIONAL,

 dataNetworkNameIdentifier [13] DataNetworkNameIdentifier OPTIONAL,

 pDUAddress [14] PDUAddress OPTIONAL,

 authorizedQoSInformation [15] AuthorizedQoSInformation OPTIONAL,

 uETimeZone [16] MSTimeZone OPTIONAL,

 pDUSessionstartTime [17] TimeStamp OPTIONAL,

 pDUSessionstopTime [18] TimeStamp OPTIONAL,

 diagnostics [19] Diagnostics OPTIONAL,

 chargingCharacteristics [20] ChargingCharacteristics OPTIONAL,

 chChSelectionMode [21] ChChSelectionMode OPTIONAL,

 threeGPPPSDataOffStatus [22] ThreeGPPPSDataOffStatus OPTIONAL,

 rANSecondaryRATUsageReport [23] SEQUENCE OF NGRANSecondaryRATUsageReport OPTIONAL,

 subscribedQoSInformation [24] SubscribedQoSInformation OPTIONAL,

 authorizedSessionAMBR [25] SessionAMBR OPTIONAL,

 subscribedSessionAMBR [26] SessionAMBR OPTIONAL,

 servingCNPLMNID [27] PLMN-Id OPTIONAL,

 sUPIunauthenticatedFlag [28] NULL OPTIONAL,

 dnnSelectionMode [29] DNNSelectionMode OPTIONAL,

 homeProvidedChargingID [30] ChargingID OPTIONAL,

 mAPDUNonThreeGPPUserLocationInfo[31] UserLocationInformation OPTIONAL,

 mAPDUNonThreeGPPRATType [32] RATType OPTIONAL,

 mAPDUSessionInformation [33] MAPDUSessionInformation OPTIONAL,

 enhancedDiagnostics [34] EnhancedDiagnostics5G OPTIONAL,

 userLocationInformationASN1 [35] UserLocationInformationStructured OPTIONAL,

 mAPDUNonThreeGPPUserLocationInfoASN1 [36] UserLocationInformationStructured OPTIONAL,

 redundantTransmissionType [37] RedundantTransmissionType OPTIONAL,

 pDUSessionPairID [38] PDUSessionPairID OPTIONAL,

 userLocationTime [39] TimeStamp OPTIONAL,

 mAPDUNonThreeGPPUserLocationTime [40] TimeStamp OPTIONAL,

 qosMonitoringReport [41] QosMonitoringReport OPTIONAL

}

--

-- Roaming QBC Information

--

RoamingQBCInformation ::= SET

{

 multipleQFIcontainer [0] SEQUENCE OF MultipleQFIContainer OPTIONAL,

 uPFID [1] NetworkFunctionName OPTIONAL,

 roamingChargingProfile [2] RoamingChargingProfile OPTIONAL

}

--

-- SMS Charging Information

--

SMSChargingInformation ::= SET

{

 originatorInfo [1] OriginatorInfo OPTIONAL,

 recipientInfos [2] SEQUENCE OF RecipientInfo OPTIONAL,

 userEquipmentInfo [3] SubscriberEquipmentNumber OPTIONAL,

 userLocationInformation [4] UserLocationInformation OPTIONAL,

 uETimeZone [5] MSTimeZone OPTIONAL,

 rATType [6] RATType OPTIONAL,

 sMSCAddress [7] AddressString OPTIONAL,

 eventtimestamp [8] TimeStamp,

-- 9 to 19 is for future use

 sMDataCodingScheme [20] INTEGER OPTIONAL,

 sMMessageType [21] SMMessageType OPTIONAL,

 sMReplyPathRequested [22] SMReplyPathRequested OPTIONAL,

 sMUserDataHeader [23] OCTET STRING OPTIONAL,

 sMSStatus [24] SMSStatus OPTIONAL,

 sMDischargeTime [25] TimeStamp OPTIONAL,

 sMTotalNumber [26] INTEGER OPTIONAL,

 sMServiceType [27] SMServiceType OPTIONAL,

 sMSequenceNumber [28] INTEGER OPTIONAL,

 sMSResult [29] SMSResult OPTIONAL,

 submissionTime [30] TimeStamp OPTIONAL,

 sMPriority [31] PriorityType OPTIONAL,

 messageReference [32] MessageReference OPTIONAL,

 messageSize [33] INTEGER OPTIONAL,

 messageClass [34] MessageClass OPTIONAL,

 sMdeliveryReportRequested [35] SMdeliveryReportRequested OPTIONAL,

 messageClassTokenText [36] UTF8String OPTIONAL,

 userRoamerInOut [37] RoamerInOut OPTIONAL,

 userLocationInformationASN1 [38] UserLocationInformationStructured OPTIONAL

}

--

-- Exposure Function API Information corresponds to NEF API Charging information

--

ExposureFunctionAPIInformation ::= SET

{

 groupIdentifier [0] AddressString OPTIONAL,

 aPIDirection [1] APIDirection OPTIONAL,

 aPITargetNetworkFunction [2] NetworkFunctionInformation OPTIONAL,

 aPIResultCode [3] APIResultCode OPTIONAL,

 aPIName [4] IA5String,

 aPIReference [5] IA5String OPTIONAL,

 aPIContent [6] OCTET STRING OPTIONAL,

 externalIndividualIdentifier [7] InvolvedParty OPTIONAL,

 externalGroupIdentifier [8] ExternalGroupIdentifier OPTIONAL

}

--

-- Registration Charging Information

--

RegistrationChargingInformation ::= SET

{

 registrationMessagetype [0] RegistrationMessageType,

 userIdentifier [1] InvolvedParty OPTIONAL,

 userEquipmentInfo [2] SubscriberEquipmentNumber OPTIONAL,

 sUPIunauthenticatedFlag [3] NULL OPTIONAL,

 userRoamerInOut [4] RoamerInOut OPTIONAL,

 userLocationInformation [5] UserLocationInformation OPTIONAL,

 userLocationInfoTime [6] TimeStamp OPTIONAL, -- This field is not used

-- user location info time is included under UserLocationInformation

 uETimeZone [7] MSTimeZone OPTIONAL,

 rATType [8] RATType OPTIONAL,

 mICOModeIndication [9] MICOModeIndication OPTIONAL,

 smsIndication [10] SmsIndication OPTIONAL,

 taiList [11] SEQUENCE OF TAI OPTIONAL,

 serviceAreaRestriction [12] ServiceAreaRestriction OPTIONAL,

 requestedNSSAI [13] SEQUENCE OF SingleNSSAI OPTIONAL,

 allowedNSSAI [14] SEQUENCE OF SingleNSSAI OPTIONAL,

 rejectedNSSAI [15] SEQUENCE OF SingleNSSAI OPTIONAL,

 pSCellInformation [16] PSCellInformation OPTIONAL,

 fiveGMMCapability [17] FiveGMMCapability OPTIONAL,

 nSSAIMapList [18] SEQUENCE OF NSSAIMap OPTIONAL,

 amfUeNgapId [19] AmfUeNgapId OPTIONAL,

 ranUeNgapId [20] RanUeNgapId OPTIONAL,

 ranNodeId [21] GlobalRanNodeId OPTIONAL,

 userLocationInformationASN1 [22] UserLocationInformationStructured OPTIONAL

}

--

-- N2 connection charging Information

--

N2ConnectionChargingInformation ::= SET

{

 n2ConnectionMessageType [0] N2ConnectionMessageType,

 userIdentifier [1] InvolvedParty OPTIONAL,

 userEquipmentInfo [2] SubscriberEquipmentNumber OPTIONAL,

 sUPIunauthenticatedFlag [3] NULL OPTIONAL,

 userRoamerInOut [4] RoamerInOut OPTIONAL,

 userLocationInformation [5] UserLocationInformation OPTIONAL,

 userLocationInfoTime [6] TimeStamp OPTIONAL, -- This field is not used

-- user location info time is included under UserLocationInformation

 uETimeZone [7] MSTimeZone OPTIONAL,

 rATType [8] RATType OPTIONAL,

 ranUeNgapId [9] RanUeNgapId OPTIONAL,

 ranNodeId [10] GlobalRanNodeId OPTIONAL,

 restrictedRatList [11] SEQUENCE OF RATType OPTIONAL,

 forbiddenAreaList [12] SEQUENCE OF Area OPTIONAL,

 serviceAreaRestriction [13] ServiceAreaRestriction OPTIONAL,

 restrictedCnList [14] SEQUENCE OF CoreNetworkType OPTIONAL,

 allowedNSSAI [15] SEQUENCE OF SingleNSSAI OPTIONAL,

 rrcEstablishmentCause [16] RrcEstablishmentCause OPTIONAL,

 pSCellInformation [17] PSCellInformation OPTIONAL,

 amfUeNgapId [18] AmfUeNgapId OPTIONAL,

 userLocationInformationASN1 [19] UserLocationInformationStructured OPTIONAL

}

--

-- Location reporting charging Information

--

LocationReportingChargingInformation ::= SET

{

 locationReportingMessagetype [0] LocationReportingMessageType,

 userIdentifier [1] InvolvedParty OPTIONAL,

 userEquipmentInfo [2] SubscriberEquipmentNumber OPTIONAL,

 sUPIunauthenticatedFlag [3] NULL OPTIONAL,

 userRoamerInOut [4] RoamerInOut OPTIONAL,

 userLocationInformation [5] UserLocationInformation OPTIONAL,

 userLocationInfoTime [6] TimeStamp OPTIONAL, -- This field is not used

-- user location info time is included under UserLocationInformation

 uETimeZone [7] MSTimeZone OPTIONAL,

 presenceReportingAreaInfo [8] PresenceReportingAreaInfo OPTIONAL,

 rATType [9] RATType OPTIONAL,

 pSCellInformation [10] PSCellInformation OPTIONAL,

 userLocationInformationASN1 [11] UserLocationInformationStructured OPTIONAL

}

--

-- Network Slice Performance and Analytics charging Information

--

NSPAChargingInformation ::= SET

{

 singelNSSAI [0] SingleNSSAI

}

--

-- PDU Container Information

--

PDUContainerInformation ::= SEQUENCE

{

 chargingRuleBaseName [0] ChargingRuleBaseName OPTIONAL,

 -- aFCorrelationInformation [1] is replaced by afChargingIdentifier [14]

 timeOfFirstUsage [2] TimeStamp OPTIONAL,

 timeOfLastUsage [3] TimeStamp OPTIONAL,

 qoSInformation [4] FiveGQoSInformation OPTIONAL,

 userLocationInformation [5] UserLocationInformation OPTIONAL,

 presenceReportingAreaInfo [6] PresenceReportingAreaInfo OPTIONAL,

 rATType [7] RATType OPTIONAL,

 sponsorIdentity [8] OCTET STRING OPTIONAL,

 applicationServiceProviderIdentity [9] OCTET STRING OPTIONAL,

 servingNetworkFunctionID [10] SEQUENCE OF ServingNetworkFunctionID OPTIONAL,

 uETimeZone [11] MSTimeZone OPTIONAL,

 threeGPPPSDataOffStatus [12] ThreeGPPPSDataOffStatus OPTIONAL,

 qoSCharacteristics [13] QoSCharacteristics OPTIONAL,

 afChargingIdentifier [14] ChargingID OPTIONAL,

 afChargingIdString [15] AFChargingID OPTIONAL,

 mAPDUSteeringFunctionality [16] MAPDUSteeringFunctionality OPTIONAL,

 mAPDUSteeringMode [17] MAPDUSteeringMode OPTIONAL,

 userLocationInformationASN1 [18] UserLocationInformationStructured OPTIONAL,

 listOfPresenceReportingAreaInformation [19] SEQUENCE OF PresenceReportingAreaInfo OPTIONAL

}

--

-- NSM charging Information

--

--

-- See TS 28.541 [254] for more information

--

NSMChargingInformation ::= SET

{

 managementOperation [0] ManagementOperation OPTIONAL,

 iDnetworkSliceInstance [1] OCTET STRING OPTIONAL,

 listOfserviceProfileChargingInformation [2] SEQUENCE OF ServiceProfileChargingInformation OPTIONAL,

 managementOperationStatus [3] ManagementOperationStatus OPTIONAL,

 operationalState [4] OperationalState OPTIONAL,

 administrativeState [5] AdministrativeState OPTIONAL

}

--

-- MMTel charging Information

--

--

-- See TS 32.275 [35] for more information

--

MMTelChargingInformation ::= SET

{

 supplementaryServices [0] SEQUENCE OF SupplService OPTIONAL

}

--

-- IMS charging Information

--

--

-- See TS 32.260 [20] for more information

--

IMSChargingInformation ::= SET

{

 eventType [0] SIPEventType OPTIONAL,

 iMSNodeFunctionality [1] IMSNodeFunctionality OPTIONAL,

 roleOfNode [2] Role-of-Node OPTIONAL,

 userIdentifier [3] InvolvedParty OPTIONAL,

 userEquipmentInfo [4] SubscriberEquipmentNumber OPTIONAL,

 userLocationInfo [5] UserLocationInformation OPTIONAL,

 ueTimeZone [6] MSTimeZone OPTIONAL,

 threeGPPPSDataOffStatus [7] ThreeGPPPSDataOffStatus OPTIONAL,

 iSUPCause [8] ISUPCause OPTIONAL,

 controlPlaneAddress [9] NodeAddress OPTIONAL,

 vlrNumber [10] MSCAddress OPTIONAL,

 mscAddress [11] MSCAddress OPTIONAL,

 userSessionID [12] Session-Id OPTIONAL,

 outgoingSessionID [13] Session-Id OPTIONAL,

 sessionPriority [14] SessionPriority OPTIONAL,

 callingPartyAddresses [15] ListOfInvolvedParties OPTIONAL,

 calledPartyAddress [16] InvolvedParty OPTIONAL,

 numberPortabilityRouting [17] NumberPortabilityRouting OPTIONAL,

 carrierSelectRoutingInformation [18] CarrierSelectRouting OPTIONAL,

 alternateChargedPartyAddress [19] UTF8String OPTIONAL,

 requestedPartyAddresses [20] ListOfInvolvedParties OPTIONAL,

 calledAssertedIdentities [21] ListOfInvolvedParties OPTIONAL,

 calledIdentityChanges [22] CalledIdentityChange OPTIONAL,

 associatedURIs [23] ListOfInvolvedParties OPTIONAL,

 timeStamps [24] TimeStamp OPTIONAL,

 applicationServerInformation [25] SEQUENCE OF ApplicationServersInformation OPTIONAL,

 interOperatorIdentifiers [26] SEQUENCE OF InterOperatorIdentifiers OPTIONAL,

 imsChargingIdentifier [27] IMS-Charging-Identifier OPTIONAL,

 relatedICID [28] IMS-Charging-Identifier OPTIONAL,

 relatedICIDGenerationNode [29] NodeAddress OPTIONAL,

 transitIOIList [30] TransitIOILists OPTIONAL,

 earlyMediaDescription [31] SEQUENCE OF Early-Media-Components-List OPTIONAL,

 sdpSessionDescription [32] SEQUENCE OF UTF8String OPTIONAL,

 sdpMediaComponent [33] SEQUENCE OF SDP-Media-Component OPTIONAL,

 servedPartyIPAddress [34] ServedPartyIPAddress OPTIONAL,

 serverCapabilities [35] S-CSCF-Information OPTIONAL,

 trunkGroupID [36] TrunkGroupID OPTIONAL,

 bearerService [37] TransmissionMedium OPTIONAL,

 imsServiceId [38] Service-Id OPTIONAL,

 messageBodies [39] SEQUENCE OF MessageBody OPTIONAL,

 accessNetworkInformation [40] SEQUENCE OF UTF8String OPTIONAL,

 additionalAccessNetworkInformation [41] UTF8String OPTIONAL,

 cellularNetworkInformation [42] UTF8String OPTIONAL,

 accessTransferInformation [43] SEQUENCE OF AccessTransferInformation OPTIONAL,

 accessNetworkInfoChange [44] SEQUENCE OF AccessNetworkInfoChange OPTIONAL,

 imsCommunicationServiceID [45] IMSCommunicationServiceIdentifier OPTIONAL,

 imsApplicationReferenceID [46] UTF8String OPTIONAL,

 causeCode [47] INTEGER OPTIONAL,

 reasonHeaders [48] ListOfReasonHeader OPTIONAL,

 initialIMSChargingIdentifier [49] IMS-Charging-Identifier OPTIONAL,

 nniInformation [50] SEQUENCE OF NNI-Information OPTIONAL,

 fromAddress [51] UTF8String OPTIONAL,

 imsEmergencyIndicator [52] NULL OPTIONAL,

 imsVisitedNetworkIdentifier [53] UTF8String OPTIONAL,

 sipRouteHeaderReceived [54] UTF8String OPTIONAL,

 sipRouteHeaderTransmitted [55] UTF8String OPTIONAL,

 tadIdentifier [56] TADIdentifier OPTIONAL,

 feIdentifierList [57] FEIdentifierList OPTIONAL

}

--

-- QFI Container Information

--

MultipleQFIContainer ::= SEQUENCE

{

 qosFlowId [0] QoSFlowId OPTIONAL,

 triggers [1] SEQUENCE OF Trigger OPTIONAL,

 triggerTimeStamp [2] TimeStamp OPTIONAL,

 dataTotalVolume [3] DataVolumeOctets OPTIONAL,

 dataVolumeUplink [4] DataVolumeOctets OPTIONAL,

 dataVolumeDownlink [5] DataVolumeOctets OPTIONAL,

 localSequenceNumber [6] LocalSequenceNumber OPTIONAL,

 timeOfFirstUsage [8] TimeStamp OPTIONAL,

 timeOfLastUsage [9] TimeStamp OPTIONAL,

 qoSInformation [10] FiveGQoSInformation OPTIONAL,

 userLocationInformation [11] UserLocationInformation OPTIONAL,

 uETimeZone [12] MSTimeZone OPTIONAL,

 presenceReportingAreaInfo [13] PresenceReportingAreaInfo OPTIONAL,

 rATType [14] RATType OPTIONAL,

 reportTime [15] TimeStamp,

 servingNetworkFunctionID [16] SEQUENCE OF ServingNetworkFunctionID OPTIONAL,

 threeGPPPSDataOffStatus [17] ThreeGPPPSDataOffStatus OPTIONAL,

 threeGPPChargingID [18] ChargingID OPTIONAL,

 diagnostics [19] Diagnostics OPTIONAL,

 extensionDiagnostics [20] EnhancedDiagnostics OPTIONAL,

 qoSCharacteristics [21] QoSCharacteristics OPTIONAL,

 time [22] CallDuration OPTIONAL,

 userLocationInformationASN1 [23] UserLocationInformationStructured OPTIONAL

}

--

-- Edge Enabling Infrastructure Resource Usage Charging Information

--

EdgeInfrastructureUsageChargingInformation ::= SET

{

 meanVirtualCPUUsage [0] REAL OPTIONAL,

 meanVirtualMemoryUsage [1] REAL OPTIONAL,

 meanVirtualDiskUsage [2] REAL OPTIONAL,

 durationStartTime [3] TimeStamp,

 durationEndTime [4] TimeStamp

}

--

-- EAS Deployment Charging Information

--

EASDeploymentChargingInformation ::= SET

{

 eASDeploymentRequirements [0] EASDeploymentRequirements,

 lCMStartTime [1] TimeStamp,

 lCMEndTime [2] TimeStamp

}

--

-- Direct Edge Enabling Service Charging Information

--

DirectEdgeEnablingServiceChargingInformation ::= SET

{

 eASType [0] EASCategory,

 eASGeographicalServiceArea [1] SEQUENCE OF GeographicalLocation,

 eASTopologicalServiceArea [2] TopologicalLocation,

 eASSchedule [3] SEQUENCE OF Schedule,

 eASServiceKPIs [4] EASServiceKPIs,

 eASDNAIList [5] SEQUENCE OF STRING,

 eASFeatures [6] SEQUENCE OF STRING,

 eASServiceContinuitySupport [7] SEQUENCE OF ACRScenario,

 eECServiceContinuitySupport [8] SEQUENCE OF ACRScenario,

 eESServiceContinuitySupport [9] SEQUENCE OF ACRScenario,

 uEIdentifier [10] STRING,

 uELocation [11] ServingLocation,

 aCRAction [12] ACRAction,

 aCRInitiationData [13] ACRInitiationData,

 tEASDNAI [14] STRING,

 eECContextID [15] STRING,

 sEESID [16] STRING,

 tEESID [17] STRING,

 aCTResult [18] ACTResult

}

}

--

-- CHF CHARGING TYPES

--

--

-- A

--

ACRAction ::= ENUMERATED

{

 Initiation (1),

 determination (2)

}

ACRInitiationData ::= SEQUENCE

{

 requestorId [1] STRING,

 ueId [2] STRING,

 acId [3] STRING,

 easId [3] STRING,

 tEasEndpoint [4] Endpoint,

 sEasEndpoint [5] Endpoint,

 prevTEasEndpoint [6] Endpoint,

 routeReq [7] RouteToLocation,

 easNotifInd [8] BOOLEAN,

 prevEasNotifInd [9] BOOLEAN,

 eecCtxtReloc [10] EEcCtxtReloc

}

ACTResult ::= SEQUENCE

{

 aCTResultEnum [0] ACTResultEnum,

 aCTResultString [1] String

}

ACTResultEnum ::= ENUMERATED

{

 successful (1),

 failed (2)

}

ACRScenario ::= CHOICE

{

 aCRScenarioEnum [0] ACRScenarioEnum,

 aCRScenarioString [1] String

}

ACRScenarioEnum ::= ENUMERATED

{

 eec\_initiated (1),

 eec\_executed\_via\_source\_ees (2),

 eec\_executed\_via\_target\_ees (3),

 source\_eas\_decided (4),

 source\_eas\_executed (5),

 eel\_managed\_acr (6)

}

AFChargingID ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details.

--

AffinityAntiAffinity ::= SEQUENCE

{

 affinityEAS [0] SEQUENCE OF STRING OPTIONAL,

 antiAffinityEAS [1] SEQUENCE OF STRING OPTIONAL

}

AgeOfLocationInformation ::= INTEGER

AdministrativeState ::= ENUMERATED

{

 lOCKED (0),

 uNLOCKED (1),

 sHUTTINGDOWN (2)

}

AccessType ::= ENUMERATED

{

 threeGPPAccess (0),

 nonThreeGPPAccess (1)

}

AllocationRetentionPriority ::= SEQUENCE

{

 priorityLevel [1] INTEGER,

 preemptionCapability [2] PreemptionCapability,

 preemptionVulnerability [3] PreemptionVulnerability

}

AMFID ::= OCTET STRING (SIZE(3..6))

-- See subclause 2.10.1 of 3GPP TS 23.003 [7] for encoding.

-- Any byte following the 3 first shall be set to ”F”

AmfUeNgapId ::= INTEGER

APIResultCode ::= INTEGER

--

-- See specific API for more information

--

Area ::= SEQUENCE

{

 tacs [0] SEQUENCE OF TAC OPTIONAL,

 areaCode [1] OCTET STRING OPTIONAL

}

ATSSSCapability ::= ENUMERATED

{

 aTSSS-LL (0),

 mPTCP-ATSS-LL (1),

 mPTCP-ATSS-LL-ASModeUL (2),

 mPTCP-ATSS-LL-ExSDModeUL (3),

 mPTCP-ATSS-LL-ASModeDLUL (4)

}

AuthorizedQoSInformation ::= SEQUENCE

--

-- See TS 32.291 [58] for more information

--

{

 fiveQi [1] INTEGER OPTIONAL,

 aRP [2] AllocationRetentionPriority OPTIONAL,

 priorityLevel [3] INTEGER OPTIONAL,

 averWindow [4] INTEGER OPTIONAL,

 maxDataBurstVol [5] INTEGER OPTIONAL

}

--

-- B

--

Bitrate ::= OCTET STRING

--

-- See 3GPP TS 29.571 [249] Bitrate data type.

--

--

-- C

--

CellGlobalId ::= SEQUENCE

{

 plmnId [0] PLMN-Id,

 lac [1] Lac,

 cellId [2] CellId

}

CellId ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

ChargingSessionIdentifier ::= OCTET STRING

-- See 3GPP TS 32.290 [57] for details.

CoreNetworkType ::= ENUMERATED

{

 fiveGC (0),

 ePC (1)

}

--

-- D

--

DataNetworkNameIdentifier ::= IA5String (SIZE(1..63))

--

-- Network Identifier part of DNN in dot representation.

-- For example, if the complete DNN is 'apn1a.apn1b.apn1c.mnc022.mcc111.gprs'

-- The Identifier is 'apn1a.apn1b.apn1c' and is presented in this form in the CDR.

--

DayOfWeek ::= ENUMERATED

{

 monday (1),

 tuesday (2),

 wednesday (3),

 thursday (4),

 friday (5),

 saturday (6),

 sunday (7)

}

DelayToleranceIndicator ::= ENUMERATED

{

 dTSupported (0),

 dTNotSupported (1)

}

DNNSelectionMode ::= ENUMERATED

--

-- See Information Elements TS 29.502 [250] for more information

--

{

 uEorNetworkProvidedSubscriptionVerified (0),

 uEProvidedSubscriptionNotVerified (1),

 networkProvidedSubscriptionNotVerified (2)

}

--

-- E

--

EASCategory ::= ENUMERATED

{

 uax (0),

 v2x (1),

 other (2)

}

--

-- See 3GPP TS 28.538 [256] for details

--

EASDeploymentRequirements ::= SEQUENCE

{

 requiredEASservingLocation [0] UserLocationInformationStructured OPTIONAL,

 softwareImageInfo [1] SoftwareImageInfo OPTIONAL,

 affinityAntiAffinity [2] AffinityAntiAffinity OPTIONAL,

 serviceContinuity [3] BOOLEAN OPTIONAL,

 virtualResource [4] VirtualResource OPTIONAL

}

--

-- See 3GPP TS 29.558 [255] for details

--

EASServiceKPIs ::= SEQUENCE

{

 maxReqRate [0] INTEGER,

 maxRespTime [1] INTEGER,

 avail [2] INTEGER,

 avlComp [3] INTEGER,

 avlGraComp [4] INTEGER,

 avlMem [2] INTEGER,

 avlStrg [3] INTEGER,

 connBand [4] INTEGER

}

EEcCtxtReloc ::= SEQUENCE

{

 eecCtxtId [0] STRING,

 sEesId [1] STRING,

 sEecEndpoint [2] EndPoint,

 tEesId [3] STRING,

 tEecEndpoint [4] EndPoint

}

--

-- See 3GPP TS 29.571 [249] for details

--

ENbId ::= UTF8String

Endpoint ::= SEQUENCE

{

 fqdn [0] STRING,

 ipv4Addrs [1] STRING,

 ipv6Addrs [2] STRING,

 uri [3] STRING

}

--

-- See 3GPP TS 29.571 [249] for details

--

ExternalGroupIdentifier ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

EutraLocation ::= SEQUENCE

{

 tai [0] TAI OPTIONAL,

 ecgi [1] Ecgi OPTIONAL,

 ageOfLocationInformation [3] AgeOfLocationInformation OPTIONAL,

 ueLocationTimestamp [4] TimeStamp OPTIONAL,

 geographicalInformation [5] GeographicalInformation OPTIONAL,

 geodeticInformation [6] GeodeticInformation OPTIONAL,

 globalNgenbId [7] GlobalRanNodeId OPTIONAL,

 globalENbId [8] GlobalRanNodeId OPTIONAL

}

EnhancedDiagnostics5G ::= SEQUENCE

{

 rANNASRelCause [0] SEQUENCE OF RANNASRelCause

}

--

-- F

--

FiveGMMCapability ::= OCTET STRING

--

-- See 3GPP TS 29.571 [249] for details

--

FiveGMmCause ::= INTEGER

--

-- See 3GPP TS 29.571 [249] for details

--

FiveGQoSInformation ::= SEQUENCE

--

-- See TS 32.291 [58] for more information

--

{

 fiveQi [1] INTEGER OPTIONAL,

 aRP [2] AllocationRetentionPriority OPTIONAL,

 qoSNotificationControl [3] BOOLEAN OPTIONAL,

 reflectiveQos [4] BOOLEAN OPTIONAL,

 maxbitrateUL [5] Bitrate OPTIONAL,

 maxbitrateDL [6] Bitrate OPTIONAL,

 guaranteedbitrateUL [7] Bitrate OPTIONAL,

 guaranteedbitrateDL [8] Bitrate OPTIONAL,

 priorityLevel [9] INTEGER OPTIONAL,

 averWindow [10] INTEGER OPTIONAL,

 maxDataBurstVol [11] INTEGER OPTIONAL,

 maxPacketLossRateDL [12] INTEGER OPTIONAL,

 maxPacketLossRateUL [13] INTEGER OPTIONAL

}

FiveGSmCause ::= INTEGER

--

-- See 3GPP TS 29.571 [249] for details

--

--

-- G

--

GCI ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

GeodeticInformation ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

GeographicalInformation ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

GeographicalLocation ::= SEQUENCE

{

 geographicalCoordinates [0] GeographicalCoordinates

 civicLocation [1] STRING

}

GeographicalCoordinates::= SEQUENCE

{

 latitude [0] INTEGER,

 longitude [1] INTEGER

}

GeraLocation ::= SEQUENCE

{

 locationNumber [0] LocationNumber OPTIONAL,

 cgi [1] CellGlobalId OPTIONAL,

 sai [2] ServiceAreaId OPTIONAL,

 lai [3] LocationAreaId OPTIONAL,

 rai [4] RoutingAreaId OPTIONAL,

 vlrNumber [5] VlrNumber OPTIONAL,

 mscNumber [6] MscNumber OPTIONAL,

 ageOfLocationInformation [7] AgeOfLocationInformation OPTIONAL,

 ueLocationTimestamp [8] TimeStamp OPTIONAL,

 geographicalInformation [9] GeographicalInformation OPTIONAL,

 geodeticInformation [10] GeodeticInformation OPTIONAL

}

GLI ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

GlobalRanNodeId ::= SEQUENCE

{

 pLMNId [0] PLMN-Id OPTIONAL,

 n3IwfId [1] N3IwFId OPTIONAL,

 gNbId [2] GNbId OPTIONAL,

 ngeNbId [3] NgeNbId OPTIONAL,

 wagfId [4] WAgfId OPTIONAL,

 tngfId [5] TngfId OPTIONAL,

 nid [6] Nid OPTIONAL,

 eNbId [7] ENbId OPTIONAL

}

GNbId ::= SEQUENCE

{

 bitLength [0] INTEGER,

 gNbValue [1] IA5String (SIZE(10))

}

--

-- H

--

HFCNodeId ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

--

-- I

--

IncompleteCDRIndication ::= SEQUENCE

-- The values are TRUE if the corresponding message was lost, FALSE if it is not lost

-- and not included if the status is unknown

{

 initialLost [0] BOOLEAN OPTIONAL, -- Initial was lost

 updateLost [1] BOOLEAN OPTIONAL, -- An Update was lost,

 terminationLost [2] BOOLEAN OPTIONAL -- Termination was lost

}

--

-- L

--

Lac ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

LineType ::= ENUMERATED

{

 dSL (0),

 pON (1)

}

LocationAreaId ::= SEQUENCE

{

 plmnId [0] PLMN-Id,

 lac [1] Lac

}

LocationNumber ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

LocationReportingMessageType ::= INTEGER

--

-- M

--

ManagementOperation ::= ENUMERATED

{

 createMOI (0),

 modifyMOIAttributes (1),

 deleteMOI (2)

}

ManagementOperationStatus ::= ENUMERATED

{

 oPERATION-SUCCEEDED (0),

 oPERATION-FAILED (1)

}

MnSConsumerIdentifier ::= OCTET STRING

MAPDUSessionIndicator ::= ENUMERATED

{

 mAPDURequest (0),

 mAPDUNetworkUpgradeAllowed (1)

}

MAPDUSessionInformation ::= SEQUENCE

{

 mAPDUSessionIndicator [0] MAPDUSessionIndicator OPTIONAL,

 aTSSSCapability [1] ATSSSCapability OPTIONAL

}

MAPDUSteeringFunctionality ::= ENUMERATED

{

 mPTCP (0),

 aTSSSLL (1)

}

MAPDUSteeringMode ::= SEQUENCE

{

 steerModeValue [0] SteerModeValue OPTIONAL,

 active [1] AccessType OPTIONAL,

 standby [2] AccessType OPTIONAL,

 threegLoad [3] INTEGER OPTIONAL,

 prioAcc [4] AccessType OPTIONAL

}

MICOModeIndication ::= ENUMERATED

{

 mICOMode (0),

 noMICOMode (1)

}

MobilityLevel ::= ENUMERATED

{

 stationary (0),

 nomadic (1),

 restrictedMobility (2),

 fullyMobility (3)

}

MscNumber ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

MultipleUnitUsage ::= SEQUENCE

{

 ratingGroup [0] RatingGroupId,

 usedUnitContainers [1] SEQUENCE OF UsedUnitContainer OPTIONAL,

 uPFID [2] NetworkFunctionName OPTIONAL,

 multihomedPDUAddress [3] PDUAddress OPTIONAL

}

--

-- N

--

N2ConnectionMessageType ::= INTEGER

N3IwFId ::= IA5String (SIZE(1..16))

--

-- See 3GPP TS 29.571 [249] for details.

--

N3gaLocation ::= SEQUENCE

{

 n3gppTai [0] TAI OPTIONAL,

 n3IwfId [1] N3IwFId OPTIONAL,

 ueIpv4Addr [2] IPAddress OPTIONAL,

 ueIpv6Addr [3] IPAddress OPTIONAL,

 portNumber [4] INTEGER OPTIONAL,

 tnapId [5] TNAPId OPTIONAL,

 twapId [6] TWAPId OPTIONAL,

 hfcNodeId [7] HFCNodeId OPTIONAL,

 w5gbanLineType [8] LineType OPTIONAL,

 gli [9] GLI OPTIONAL,

 gci [10] GCI OPTIONAL

}

NrLocation ::= SEQUENCE

{

 tai [0] TAI OPTIONAL,

 ncgi [1] Ncgi OPTIONAL,

 ageOfLocationInformation [2] AgeOfLocationInformation OPTIONAL,

 ueLocationTimestamp [3] TimeStamp OPTIONAL,

 geographicalInformation [4] GeographicalInformation OPTIONAL,

 geodeticInformation [5] GeodeticInformation OPTIONAL,

 globalGnbId [6] GlobalRanNodeId OPTIONAL

}

--

-- See 3GPP TS 29.571 [249] for details

--

NetworkAreaInfo ::= SEQUENCE

{

 ecgis [0] SEQUENCE OF Ecgi OPTIONAL,

 ncgis [1] SEQUENCE OF Ncgi OPTIONAL,

 gRanNodeIds [2] SEQUENCE OF GlobalRanNodeId OPTIONAL,

 tais [3] SEQUENCE OF TAI OPTIONAL

}

NetworkFunctionInformation ::= SEQUENCE

{

 networkFunctionality [0] NetworkFunctionality,

 networkFunctionName [1] NetworkFunctionName OPTIONAL,

 networkFunctionIPv4Address [2] IPAddress OPTIONAL,

 networkFunctionPLMNIdentifier [3] PLMN-Id OPTIONAL,

 networkFunctionIPv6Address [4] IPAddress OPTIONAL,

 networkFunctionFQDN [5] NodeAddress OPTIONAL

}

NetworkFunctionName ::= IA5String (SIZE(1..36))

-- Shall be a Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122 [410]

NetworkFunctionality ::= ENUMERATED

{

 cHF (0),

 -- CHF may only to be used in failure cases

 sMF (1),

 aMF (2),

 sMSF (3),

sGW (4),

-- SGW is only applicable for interworking with EPC scenario

-- when UE is connected to P-GW+SMF via EPC

 iSMF (5),

 ePDG (6),

-- ePDG is only applicable for interworking with EPC scenario

-- when UE is connected to P-GW+SMF via EPC/ePDG

 cEF (7),

 nEF (8),

 pGWCSMF (9),

 mnS-Producer (10),

 sGSN (11)

-- SGSN is only applicable when UE is connected to SMF+PGW-C via GERAN/UTRAN

}

NgApCause ::= SEQUENCE

-- See 3GPP TS 29.571 [249] for details.

{

 group [0] INTEGER,

 value [1] INTEGER

}

NgeNbId ::= IA5String (SIZE(1..21))

--

-- See 3GPP TS 29.571 [249] for details.

--

NGRANSecondaryRATType ::= OCTET STRING

--

-- "NR" or "EUTRA"

--

NGRANSecondaryRATUsageReport ::= SEQUENCE

{

 nGRANSecondaryRATType [0] NGRANSecondaryRATType OPTIONAL,

 qosFlowsUsageReports [1] SEQUENCE OF QosFlowsUsageReport OPTIONAL

}

NsiLoadLevelInfo ::= SEQUENCE

--

-- See 3GPP TS 29.520 [233] for details

--

{

 loadLevelInformation [0] INTEGER OPTIONAL,

 snssai [1] SingleNSSAI OPTIONAL,

 nsiId [2] OCTET STRING OPTIONAL

}

NSPAContainerInformation ::= SEQUENCE

{

 latency [0] INTEGER OPTIONAL,

 throughput [1] Throughput OPTIONAL,

 maximumPacketLossRate [3] UTF8String OPTIONAL,

 serviceExperienceStatisticsData [4] ServiceExperienceInfo OPTIONAL,

 numberOfPDUSessions [5] INTEGER OPTIONAL,

 numberOfRegisteredSubscribers [6] INTEGER OPTIONAL,

 loadLevel [7] NsiLoadLevelInfo OPTIONAL

}

NSSAIMap ::= SEQUENCE

{

 servingSnssai [0] SingleNSSAI,

 homeSnssai [1] SingleNSSAI

}

--

-- O

--

OperationalState ::= ENUMERATED

{

 eNABLED (0),

 dISABLED(1)

}

--

-- P

--

PartialRecordMethod ::= ENUMERATED

{

 default (0),

 individual (1)

}

PDUAddress ::= SEQUENCE

{

 pDUIPv4Address [0] IPAddress OPTIONAL,

 pDUIPv6AddresswithPrefix [1] IPAddress OPTIONAL,

 iPV4dynamicAddressFlag [2] DynamicAddressFlag OPTIONAL,

 iPV6dynamicPrefixFlag [3] DynamicAddressFlag OPTIONAL,

 additionalPDUIPv6Prefixes [4] SEQUENCE OF IPAddress OPTIONAL

}

PDUSessionPairID ::= INTEGER

PDUSessionId ::= INTEGER (0..255)

--

-- See 3GPP TS 29.571 [249] for details

--

PDUSessionType ::= ENUMERATED

{

 iPv4v6 (0),

 iPv4 (1),

 iPv6 (2),

 unstructured (3),

 ethernet (4)

}

-- See 3GPP TS 29.571 [249] for details.

PreemptionCapability ::= ENUMERATED

{

 nOT-PREEMPT (0),

 mAY-PREEMPT (1)

}

PreemptionVulnerability ::= ENUMERATED

{

 nOT-PREEMPTABLE (0),

 pREEMPTABLE (1)

}

--

-- Q

--

QoSCharacteristics ::= OCTET STRING

--

-- This data is converted from JSON format of the QoSCharacteristics as described in TS 29.512

-- [251].

--

QoSFlowId ::= INTEGER

QosFlowsUsageReport ::= SEQUENCE

{

 qosFlowId [0] QoSFlowId OPTIONAL,

 startTime [1] TimeStamp,

 endTime [2] TimeStamp,

 dataVolumeDownlink [3] DataVolumeOctets,

 dataVolumeUplink [4] DataVolumeOctets

}

QuotaManagementIndicator ::= ENUMERATED

{

 onlineCharging (0),

 offlineCharging (1),

 quotaManagementSuspended (2)

}

QosMonitoringReport ::= SEQUENCE

-- The maximum number of elements in the SEQUENCE of ulDelays,dlDelays and rtDelays is 2.

{

 ulDelays [0] SEQUENCE OF INTEGER OPTIONAL,

 dlDelays [1] SEQUENCE OF INTEGER OPTIONAL,

 rtDelays [2] SEQUENCE OF INTEGER OPTIONAL

}

--

-- R

--

Rac ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

RanUeNgapId ::= INTEGER

RANNASRelCause ::= SEQUENCE

-- Mode details are described in TS 29.512[251].

{

 ngApCause [0] NgApCause OPTIONAL,

 fivegMmCause [1] FiveGMmCause OPTIONAL,

 fivegSmCause [2] FiveGSmCause OPTIONAL,

 epsCause [3] RANNASCause OPTIONAL

}

RatingIndicator ::= BOOLEAN

-- Included if the units have been rated.

RATType ::= INTEGER

--

-- This integer is based on the RatType specified in TS 29.571 [249]

-- with 3GPP RAT Type specified in TS 29.061 [216] added for backwards compatibility.

--

{

-- 0 reserved

 uTRAN (1), gERAN (2), wLAN (3),

-- 4 reserved for GAN

-- 5 reserved for HSPA Evolution

 eUTRAN (6),

 virtual (7),

-- 8 reserved for nBIoT

-- 9 reserved for lTEM

 nR (51),

-- 51 is used for NG-RAN

 wIRELINE (55),

 wIRELINE-CABLE (56),

 wIRELINE-BBF (57),

 tRUSTED-N3GA (65)

-- 101 reserved for IEEE 802.16e

-- 102 reserved for 3GPP2 eHRPD

-- 103 reserved for 3GPP2 HRPD

-- 104 reserved for 3GPP2 1xRTT

-- 105 reserved for 3GPP2 UMB

}

RegistrationMessageType ::= ENUMERATED

{

 initial (0),

 mobility (1),

 periodic (2),

 emergency (3),

 deregistration (4)

}

RestrictionType ::= ENUMERATED

{

 allowedAreas (0),

 notAllowedAreas (1)

}

RoamingChargingProfile ::= SEQUENCE

{

 roamingTriggers [0] SEQUENCE OF RoamingTrigger OPTIONAL,

 partialRecordMethod [1] PartialRecordMethod OPTIONAL

}

RoamerInOut ::= ENUMERATED

{

 roamerInBound (0),

 roamerOutBound (1)

}

RoamingTrigger ::= SEQUENCE

{

 trigger [0] SMFTrigger OPTIONAL,

 triggerCategory [1] TriggerCategory OPTIONAL,

 timeLimit [2] CallDuration OPTIONAL,

 volumeLimit [3] DataVolumeOctets OPTIONAL,

 maxNbChargingConditions [4] INTEGER OPTIONAL

}

RoutingAreaId ::= SEQUENCE

{

 plmnId [0] PLMN-Id,

 lac [1] Lac,

 rac [2] Rac

}

RouteInformation ::= SEQUENCE

{

 ipv4Addr [0] STRING,

 ipv6Addr [1] STRING,

 portNumber [2] INTEGER

}

RouteToLocation ::= SEQUENCE

{

 dnai [0] STRING,

 routeInfo [1] RouteInformation,

 routeProfId [2] STRING

}

RrcEstablishmentCause ::= OCTET STRING

RedundantTransmissionType ::= ENUMERATED

{

 nonTransmission (0),

 endToEndUserPlanePaths (1),

 n3N9 (2),

 transportLayer (3)

}

--

-- S

--

Sac ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

Schedule ::= SEQUENCE

{

 daysOfWeek [0] SEQUENCE OF DayOfWeek,

 timeOfDayStart [1] TimeStamp,

 timeOfDayEnd [2] TimeStamp

}

ServiceAreaId ::= SEQUENCE

{

 plmnId [0] PLMN-Id,

 lac [1] Lac,

 sac [2] Sac

}

ServiceAreaRestriction ::= SEQUENCE

{

 restrictionType [0] RestrictionType OPTIONAL,

 areas [1] SEQUENCE OF Area OPTIONAL,

 maxNumOfTAs [2] INTEGER OPTIONAL,

 maxNumOfTAsForNotAllowedAreas [3] INTEGER OPTIONAL

}

-- See 3GPP TS 29.571 [249] for details.

ServiceExperienceInfo ::= SEQUENCE

--

-- See 3GPP TS 29.520 [233] for details

--

{

 svcExprc [0] SvcExperience OPTIONAL,

 svcExprcVariance [1] INTEGER OPTIONAL,

 snssai [2] SingleNSSAI OPTIONAL,

 appId [3] OCTET STRING OPTIONAL,

 confidence [4] INTEGER OPTIONAL,

 dnn [5] DataNetworkNameIdentifier OPTIONAL,

 networkArea [6] NetworkAreaInfo OPTIONAL,

 nsiId [7] OCTET STRING OPTIONAL,

 ratio [8] INTEGER OPTIONAL

}

ServiceProfileChargingInformation ::= SET

{

--

-- attributes of the service profile: see TS 28.541 [254]

--

 serviceProfileIdentifier [0] OCTET STRING OPTIONAL,

 sNSSAIList [1] SEQUENCE OF SingleNSSAI OPTIONAL,

 sST [2] SliceServiceType OPTIONAL,

 latency [3] INTEGER OPTIONAL,

 availability [4] INTEGER OPTIONAL,

 resourceSharingLevel [5] SharingLevel OPTIONAL,

 jitter [6] INTEGER OPTIONAL,

 reliability [7] OCTET STRING OPTIONAL,

 maxNumberofUEs [8] INTEGER OPTIONAL,

 coverageArea [9] OCTET STRING OPTIONAL,

 uEMobilityLevel [10] MobilityLevel OPTIONAL,

 delayToleranceIndicator [11] DelayToleranceIndicator OPTIONAL,

 dLThroughtputPerSlice [12] Throughput OPTIONAL,

 dLThroughtputPerUE [13] Throughput OPTIONAL,

 uLThroughtputPerSlice [14] Throughput OPTIONAL,

 uLThroughtputPerUE [15] Throughput OPTIONAL,

 maxNumberofPDUsessions [16] INTEGER OPTIONAL,

 kPIsMonitoringList [17] OCTET STRING OPTIONAL,

 supportedAccessTechnology [18] INTEGER OPTIONAL,

 v2XCommunicationMode [19] V2XCommunicationModeIndicator OPTIONAL,

 addServiceProfileChargingInfo [100] OCTET STRING OPTIONAL

}

ServingLocation ::= SEQUENCE

{

 geographicalLocation [0] SEQUENCE OF GeographicalLocation,

 topologicalLocation [1] TopologicalLocation

}

ServingNetworkFunctionID ::= SEQUENCE

{

 servingNetworkFunctionInformation [0] NetworkFunctionInformation,

 aMFIdentifier [1] AMFID OPTIONAL

}

SessionAMBR ::= SEQUENCE

{

 ambrUL [1] Bitrate,

 ambrDL [2] Bitrate

}

SharingLevel ::= ENUMERATED

{

 sHARED (0),

 nON-SHARED (1)

}

SingleNSSAI ::= SEQUENCE

-- See S-NSSAI subclause 28.4.2 of TS 23.003 [200] for encoding.

{

 sST [0] SliceServiceType,

 sD [1] SliceDifferentiator OPTIONAL

}

SliceServiceType ::= INTEGER (0..255)

--

-- See subclause 28.4.2 TS 23.003 [200]

--

SliceDifferentiator ::= OCTET STRING (SIZE(3))

--

-- See subclause 28.4.2 TS 23.003 [200]

--

SMdeliveryReportRequested ::= ENUMERATED

{

 yes (0),

 no (1)

}

SMFTrigger ::= INTEGER

{

 startOfPDUSession (1),

 startOfServiceDataFlowNoSession (2),

-- Change of Charging conditions

 qoSChange (100),

 userLocationChange (101),

 servingNodeChange (102),

 presenceReportingAreaChange (103),

 threeGPPPSDataOffStatusChange (104),

 tariffTimeChange (105),

 uETimeZoneChange (106),

 pLMNChange (107),

 rATTypeChange (108),

 sessionAMBRChange (109),

 additionOfUPF (110),

 removalOfUPF (111),

 insertionOfISMF (112),

 removalOfISMF (113),

 changeOfISMF (114),

 gFBRGuaranteedStatusChange (115),

 additionOfAccess (116),

 removalOfAccess (117),

 redundantTransmissionChange (118),

-- Limit per PDU session

 pDUSessionExpiryDataTimeLimit (200),

 pDUSessionExpiryDataVolumeLimit (201),

 pDUSessionExpiryDataEventLimit (202),

 pDUSessionExpiryChargingConditionChanges (203),

-- Limit per Rating group

 ratingGroupDataTimeLimit (300),

 ratingGroupDataVolumeLimit (301),

 ratingGroupDataEventLimit (302),

-- Quota management

 timeThresholdReached (400),

 volumeThresholdReached (401),

 unitThresholdReached (402),

 timeQuotaExhausted (403),

 volumeQuotaExhausted (404),

 unitQuotaExhausted (405),

 expiryOfQuotaValidityTime (406),

 reAuthorizationRequest (407),

 startOfServiceDataFlowNoValidQuota (408),

 otherQuotaType (409),

 expiryOfQuotaHoldingTime (410),

 startOfSDFAdditionalAccessNoValidQuota (411),

-- Others

 terminationOfServiceDataFlow (500),

 managementIntervention (501),

 unitCountInactivityTime (502),

 endOfPDUSession (503),

 cHFResponseWithSessionTermination (504),

 cHFAbortRequest (505),

 abnormalRelease (506),

 notProvidedBySMF (507), -- used if not provided by SMF

-- Limit per QoS Flow

 qoSFlowExpiryDataTimeLimit (600),

 qoSFlowExpiryDataVolumeLimit (601),

-- interworking with EPC

 eCGIChange (700),

 tAIChange (701),

 handoverCancel (702),

 handoverStart (703),

 handoverComplete (704),

-- GERAN/UTRAN access

 cGI-SAIChange (705),

 rAIChange (706)

}

-- See TS 32.255 [15] for details.

SMReplyPathRequested ::= ENUMERATED

{

 noReplyPathSet (0),

 replyPathSet (1)

}

SMServiceType ::= INTEGER

{

-- 0 to 10 VAS4SMS Short Message, see TS TS 22.142 [x] for details

 contentProcessing (0),

 forwarding (1),

 forwardingMultipleSubscriptions (2),

 filtering (3),

 receipt (4),

 networkStorage (5),

 toMultipleDestinations (6),

 virtualPrivateNetwork (7),

 autoreply (8),

 personalSignature (9),

 deferredDelivery (10)

-- 11 to 99 Reserved for 3GPP defined SM services

-- 100 to 199 Vendor specific SM services

}

SmsIndication ::= ENUMERATED

{

 sMSSupported (0),

 sMSNotSupported (1)

}

SoftwareImageInfo ::= SEQUENCE

{

 minimumDisk [0] INTEGER OPTIONAL,

 minimumRAM [1] INTEGER OPTIONAL,

 swImageRef [2] UTF8String OPTIONAL

}

SSCMode ::= INTEGER

{

 sSCMode1 (1),

 sSCMode2 (2),

 sSCMode3 (3)

}

-- See 3GPP TS 23.501 [247] for details.

SteerModeValue ::= ENUMERATED

{

 activeStandby (0),

 loadBalancing (1),

 smallestDelay (2),

 priorityBased (3)

}

SubscribedQoSInformation ::= SEQUENCE

--

-- See TS 32.291 [58] for more information

--

{

 fiveQi [1] INTEGER OPTIONAL,

 aRP [2] AllocationRetentionPriority OPTIONAL,

 priorityLevel [3] INTEGER OPTIONAL

}

SvcExperience ::= SEQUENCE

{

 mos [0] INTEGER OPTIONAL,

 upperRange [1] INTEGER OPTIONAL,

 lowerRange [2] INTEGER OPTIONAL

}

--

-- T

--

TAC ::= OCTET STRING (SIZE(3))

TAI ::= SEQUENCE

{

 pLMNId [0] PLMN-Id,

 tac [1] TAC

}

TenantIdentifier ::= OCTET STRING

Throughput ::= SEQUENCE

{

 guaranteedThpt [0] Bitrate,

 maximumThpt [1] Bitrate

}

TNAPId ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

TngfId ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

Trigger ::= CHOICE

{

 sMFTrigger [0] SMFTrigger

}

TriggerCategory ::= ENUMERATED

{

 immediateReport (0),

 deferredReport (1)

}

TWAPId ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

--

-- U

--

TopologicalLocation ::= SEQUENCE

{

 cellIdList [0] SEQUENCE OF NrCellId,

 trackingAreaIdList [1] SEQUENCE OF TAI,

 servingPLMN [2] SEQUENCE OF PLMN-Id

}

UsedUnitContainer ::= SEQUENCE

{

 serviceIdentifier [0] ServiceIdentifier OPTIONAL,

 time [1] CallDuration OPTIONAL,

 triggers [2] SEQUENCE OF Trigger OPTIONAL,

 triggerTimeStamp [3] TimeStamp OPTIONAL,

 dataTotalVolume [4] DataVolumeOctets OPTIONAL,

 dataVolumeUplink [5] DataVolumeOctets OPTIONAL,

 dataVolumeDownlink [6] DataVolumeOctets OPTIONAL,

 serviceSpecificUnits [7] INTEGER OPTIONAL,

 eventTimeStamp [8] TimeStamp OPTIONAL,

 localSequenceNumber [9] LocalSequenceNumber OPTIONAL,

 ratingIndicator [10] RatingIndicator OPTIONAL,

 pDUContainerInformation [11] PDUContainerInformation OPTIONAL,

 quotaManagementIndicator [12] BOOLEAN OPTIONAL,

 quotaManagementIndicatorExt [13] QuotaManagementIndicator OPTIONAL,

 nSPAContainerInformation [14] NSPAContainerInformation OPTIONAL,

 eventTimeStampExt [15] SEQUENCE OF TimeStamp OPTIONAL

}

--

-- UserLocationInformationStructured is an alternative ASN.1 format to UserLocationInformation

--

UserLocationInformation ::= OCTET STRING

UserLocationInformationStructured ::= SEQUENCE

{

 eutraLocation [0] EutraLocation OPTIONAL,

 nrLocation [1] NrLocation OPTIONAL,

 n3gaLocation [2] N3gaLocation OPTIONAL,

 utraLocation [3] UtraLocation OPTIONAL,

 geraLocation [4] GeraLocation OPTIONAL

}

UtraLocation ::= SEQUENCE

{

 cgi [0] CellGlobalId OPTIONAL,

 sai [1] ServiceAreaId OPTIONAL,

 lai [2] LocationAreaId OPTIONAL,

 rai [3] RoutingAreaId OPTIONAL,

 ageOfLocationInformation [4] AgeOfLocationInformation OPTIONAL,

 ueLocationTimestamp [5] TimeStamp OPTIONAL,

 geographicalInformation [6] GeographicalInformation OPTIONAL,

 geodeticInformation [7] GeodeticInformation OPTIONAL

}

--

-- This data is converted from JSON format of the User Location as described in TS 29.571 [249].

--

--

-- V

--

VirtualResource ::= SEQUENCE

{

 virtualMemory [0] INTEGER OPTIONAL,

 virtualDisk [1] INTEGE OPTIONALR

}

VlrNumber ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

V2XCommunicationModeIndicator ::= ENUMERATED

{

 v2XComSupported (0),

 v2XComNotSupported (1)

}

--

-- W

--

WAgfId ::= UTF8String

--

-- See 3GPP TS 29.571 [249] for details

--

.#END

|  |
| --- |
| **End of modifications** |