**3GPP TSG-SA5 Meeting #133e *S5-205080r2***

**e-meeting 12th Oct-21st Oct 2020** Revision of S5-205080

|  |
| --- |
| *CR-Form-v11.4* |
| **CHANGE REQUEST** |
|  |
|  | **32.298** | **CR** | **0830** | **rev** | **1** | **Current version:** | **16.6.1** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Add the enhanced Diagnostics for 5G Charging |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | TEI16, 5GS\_Ph1-DCH |  | ***Date:*** | 2020-10-15 |
|  |  |  |  |  |
| ***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 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)* |
|  |  |
| ***Reason for change:*** | As per the TS 32.291 for 5G charging in Rel16, the attribute of diagnostics is integer.The enhanced Diagnostics for other data type is required. |
|  |  |
| ***Summary of change:*** | Add the enhanced Diagnostics in PDU session charging information. |
|  |  |
| ***Consequences if not approved:*** | The enhanced Diagnostics is absent. |
|  |  |
| ***Clauses affected:*** | 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:*** |  |

|  |
| --- |
| **First change** |

#### 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,

EnhancedDiagnostics,

DynamicAddressFlag,

InvolvedParty,

IPAddress,

LocalSequenceNumber,

ManagementExtensions,

MessageClass,

MessageReference,

MSTimeZone,

NodeAddress,

PLMN-Id,

PriorityType,

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)}

;

--

-- 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

}

--

-- 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 [XX] EnhancedDiagnostics5G 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

{

 sMSNodeAddress [0] AddressString,

 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,

 messageSize [33] INTEGER OPTIONAL,

 messageClass [34] MessageClass OPTIONAL,

 sMdeliveryReportRequested [35] SMdeliveryReportRequested OPTIONAL

}

--

-- Exposure Function API Information

--

ExposureFunctionAPIInformation ::= SET

{

 groupIdentifier [0] AddressString,

 aPIDirection [1] APIDirection OPTIONAL,

 aPITargetNetworkFunction [2] NetworkFunctionInformation OPTIONAL,

 aPIResultCode [3] APIResultCode OPTIONAL,

 aPIName [4] IA5String,

 aPIReference [5] IA5String OPTIONAL,

 aPIContent [6] OCTET STRING 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] OCTET STRING OPTIONAL,

 userLocationInfoTime [6] TimeStamp OPTIONAL,

 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

}

--

-- 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] OCTET STRING OPTIONAL,

 userLocationInfoTime [6] TimeStamp OPTIONAL,

 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

}

--

-- 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] OCTET STRING OPTIONAL,

 userLocationInfoTime [6] TimeStamp OPTIONAL,

 uETimeZone [7] MSTimeZone OPTIONAL,

 presenceReportingAreaInfo [8] PresenceReportingAreaInfo OPTIONAL,

 rATType [9] RATType 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

}

--

-- 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

}

--

-- QFI Container Information

--

MultipleQFIContainer ::= SEQUENCE

{

 qosFlowId [0] QoSFlowId OPTIONAL,

 triggers [1] SEQUENCE OF Trigger,

 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

}

--

-- CHF CHARGING TYPES

--

--

-- A

--

AFChargingID ::= UTF8String

--

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

--

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))

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

AmfUeNgapId ::= INTEGER

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,

 aRP [2] AllocationRetentionPriority,

 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

--

ChargingSessionIdentifier ::= OCTET STRING

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

CoreNetworkType ::= ENUMERATED

{

 fiveGC (0),

 ePC (1)

}

--

-- D

--

APIResultCode ::= INTEGER

--

-- See specific API for more information

--

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.

--

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

--

EnhancedDiagnostics5G ::= SEQUENCE

{

 rANNASRelCause [0] SEQUENCE OF RANNASRelCause

}

EpsRanNasRelCause ::= OCTET STRING

--

-- See 3GPP TS 29.512 [251] for details

--

--

-- F

--

FiveGMMCapability ::= OCTET STRING

--

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

--

FiveGMmCause ::= INTEGER

FiveGQoSInformation ::= SEQUENCE

--

-- See TS 32.291 [58] for more information

--

{

 fiveQi [1] INTEGER,

 aRP [2] AllocationRetentionPriority,

 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

--

-- G

--

GlobalRanNodeId ::= SEQUENCE

{

 pLMNId [0] PLMN-Id OPTIONAL,

 n3IwfId [1] N3IwFId OPTIONAL,

 gNbId [2] GNbId OPTIONAL,

 ngeNbId [3] NgeNbId OPTIONAL

}

GNbId ::= SEQUENCE

{

 bitLength [0] INTEGER,

 gNbValue [1] IA5String (SIZE(10))

}

--

-- 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

--

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)

}

MultipleUnitUsage ::= SEQUENCE

{

 ratingGroup [0] RatingGroupId,

 usedUnitContainers [1] SEQUENCE OF UsedUnitContainer OPTIONAL,

 uPFID [2] NetworkFunctionName OPTIONAL

}

--

-- N

--

N2ConnectionMessageType ::= INTEGER

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

--

-- 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 is a reserved value and is not used

 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)

}

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

}

--

-- 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

}

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)

}

--

-- R

--

RanUeNgapId ::= INTEGER

RANNASRelCause ::= SEQUENCE

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

{

 ngApCause [0] NgApCause OPTIONAL,

 5gMmCause [1] 5GMmCause OPTIONAL,

 5gSmCause [2] 5GSmCause OPTIONAL,

 epsCause [3] EpsRanNasRelCause 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

-- 1 reserved for uTRA

-- 2 reserved for gERA

 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

}

RrcEstablishmentCause ::= OCTET STRING

--

-- S

--

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

}

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),

-- 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),

-- Limit per QoS Flow

 qoSFlowExpiryDataTimeLimit (600),

 qoSFlowExpiryDataVolumeLimit (601),

-- interworking with EPC

 eCGIChange (700),

 tAIChange (701),

 handoverCancel (702),

 handoverStart (703),

 handoverComplete (704)

}

-- 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)

}

SSCMode ::= INTEGER

{

 sSCMode1 (1),

 sSCMode2 (2),

 sSCMode3 (3)

}

-- See 3GPP TS 29.501 [248] 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

}

Trigger ::= CHOICE

{

 sMFTrigger [0] SMFTrigger

}

TriggerCategory ::= ENUMERATED

{

 immediateReport (0),

 deferredReport (1)

}

--

-- U

--

UsedUnitContainer ::= SEQUENCE

{

 serviceIdentifier [0] ServiceIdentifier OPTIONAL,

 time [1] CallDuration OPTIONAL,

 triggers [2] SEQUENCE OF Trigger,

 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

}

UserLocationInformation ::= OCTET STRING

--

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

--

--

-- V

--

V2XCommunicationModeIndicator ::= ENUMERATED

{

 v2XComSupported (0),

 v2XComNotSupported (1)

}

.#END

|  |
| --- |
| **End of change** |