

Oracle® Communications Billing and Revenue Management

ECE 5G CHF Protocol Implementation Conformance Statement



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About This Content

This guide serves as a protocol implementation compliance statement (PICS) for Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) HTTP/2 Gateway for 5G. 5G CHF supports Nchf interfaces for converged charging and spending limit control for policy. Interactions with Network Repository Functions are also listed in this document.

Audience

This guide is intended for system administrators, product integrators, and developers. Readers must be familiar with the following:

- Elastic Charging Engine
- 5G Service-based Network Function Architecture
- 5G Charging Function Interfaces

How to Read the Status in Section Compliance Sections

The below table describes the meaning of the status in section compliance sections.

If the status says	It means
Supported	Application supports functionality. Application supports the attribute and is mapped to ECE charging function. The attribute is received in the request and used in the charging flows. This attribute is sent in the response as indicated by the specifications. You can optionally leverage this attribute for storing in the event, and to make charging decisions.
Supported with Extensions	Application supports functionality with extension. Application supports the attribute and may be leveraged optionally for selecting a price. The attribute is received in the request and is not used in the out-of-the-box charging flow. The attribute may or may not be sent in the response. You may optionally leverage available extensions in the charging flow to achieve the intended functionality. You can optionally leverage this attribute for storing in the event, and for making charging decisions.
Not Supported	Application does not support the functionality. Application does not support the attribute.
Not Applicable	The section is not applicable for the implementation.
Informational	This section is for informational purposes only in the specifications document.

1

Charging Function – Charging Service

Learn about the Oracle Communications Elastic Charging Engine (ECE) compliance with the 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) specification.

Topics in this document:

- [Section Compliance](#)
- [Response Codes](#)

Caution

Deploying charging for 5G with HTTP Gateway (5G CHF) requires a cloud native deployment of ECE and BRM components. The HTTP Gateway can be used only on an ECE cloud native system.

Section Compliance

[Table 1-1](#) describes the section compliance of 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09).

Table 1-1 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
1	Scope	Informational	-
2	References	Informational	-
3	Definitions, symbols and abbreviations	Informational	-
4	Overview	Supported	-
5	Services offered by CHF	Supported	-
5.1	Introduction	Supported	-
5.2	Nchf_ConvergedCharging service	Supported	-
5.2.1	Service description	Supported	-
5.2.2	Service operations	Supported	-
5.2.2.1	Introduction	Supported	-
5.2.2.2	Nchf_ConvergedCharging_Create Operation	Supported	-
5.2.2.3	Nchf_ConvergedCharging_Update Operation	Supported	-
5.2.2.4	Nchf_ConvergedCharging_Release Operation	Supported	-
5.2.2.5	Nchf_ConvergedCharging_Notify Operation	Supported	-
5.3	Nchf_OfflineOnlyCharging service	Supported	-
5.3.1	Service description	Supported	-
5.3.2	Service operations	Supported	-
5.3.2.1	Introduction	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
5.3.2.2	Nchf_OfflineOnlyCharging_Create Operation	Supported	-
5.3.2.3	Nchf_OfflineOnlyCharging_Update Operation	Supported	-
5.3.2.4	Nchf_OfflineOnlyCharging_Release Operation	Supported	-
6	API Definitions	Supported	-
6.1	Nchf_ConvergedCharging Service API	Supported	-
6.1.1	Introduction	Supported	-
6.1.2	Usage of HTTP	Supported	-
6.1.2.1	General	Supported	-
6.1.2.2	HTTP standard headers	Supported	-
6.1.2.2.1	General	Supported	-
6.1.2.2.2	Content type	Supported	-
6.1.2.3	HTTP custom headers	Supported	-
6.1.2.3.1	General	Supported	Only 3gpp-Sbi-Target-apiRoot, 3gpp-Sbi-Binding headers are supported among custom headers.
6.1.3	Resources	Supported	-
6.1.3.1	Overview	Supported	-
6.1.3.2	Resource: Charging Data	Supported	-
6.1.3.2.1	Description	Supported	-
6.1.3.2.2	Resource Definition	Supported	-
6.1.3.2.3	Resource Standard Methods	Supported	-
6.1.3.2.3.1	POST	Supported	ChargingDataRequest and ChargingDataResponse. The response includes one of the following codes: For success 201 (created). For failure ProblemDetails include - 400, 403, 404.
6.1.3.2.4	Resource Custom Operations	Not Applicable	-
6.1.3.3	Resource: Individual Charging Data	Supported	-
6.1.3.3.1	Description	Supported	-
6.1.3.3.2	Resource Definition	Supported	-
6.1.3.3.3	Resource Standard Methods	Not Applicable	-
6.1.3.3.4	Resource Custom Operations	Supported	-
6.1.3.3.4.1	Overview	Supported	-
6.1.3.3.4.2	Operation: update	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.3.3.4.2.1	Description	Supported	-
6.1.3.3.4.2.2	Operation Definition	Supported	ChargingDataRequest and ChargingDataResponse. The response includes one of the following codes: For success 200 (OK). For failure ProblemDetails include - 400, 403, 404.
6.1.3.3.4.3	Operation: release	Supported	-
6.1.3.3.4.3.1	Description	Supported	-
6.1.3.3.4.3.2	Operation Definition	Supported	ChargingDataRequest and ChargingDataResponse. For success the response will be 204 (No content). For failure ProblemDetails include - 404.
6.1.4	Custom Operations without associated resources	Not Applicable	-
6.1.5	Notifications	Supported	-
6.1.5.1	General	Supported	-
6.1.5.2	Event Notification	Supported	-
6.1.5.2.1	Description	Supported	-
6.1.5.2.2	Target URI	Supported	-
6.1.5.2.3	Standard Methods	Supported	-
6.1.5.2.3.1	POST	Supported	ChargingDataRequest and ChargingDataResponse. For success the response will be 204 (No content). For failure ProblemDetails include - 404.
6.1.6	Data Model	Supported	-
6.1.6.1	General	Supported	-
6.1.6.2	Structured data types	Supported	-
6.1.6.2.1	Common Data Type	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.1.1	Type ChargingDataRequest subscriberIdentifier nfConsumerIdentification invocationTimeStamp invocationSequenceNumber retransmissionIndicator oneTimeEvent oneTimeEventType notifyUri supportedFeatures serviceSpecificationInfo triggers chargingId easid ednid eASProviderIdentifier aMFId mMTelChargingInformation iMSChargingInformation edgeInfrastructureUsageChargingInformation eASDeploymentChargingInformation directEdgeEnablingServiceChargingInformation exposedEdgeEnablingServiceChargingInformation proSeChargingInformation	Supported Supported Supported with Extensions Supported Supported Supported with Extensions Supported with Extensions Supported with Extensions Supported Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Not Supported Not Supported Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Not Supported Not Supported Not Supported	-
6.1.6.2.1.2	Type ChargingDataResponse invocationTimeStamp invocationResult invocationSequenceNumber sessionFailover supportedFeatures multipleUnitInformation triggers locationReportingChargingInformation	Supported Supported Supported Supported Supported with Extensions Supported with Extensions Supported Supported with Extensions Supported with Extensions	-
6.1.6.2.1.3	Type ChargingNotifyRequest notificationType reauthorizationDetails	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.1.4	Type NFIdentification nodeFunctionality nFName nFIPv4Address nFIPv6Address nFFqdn nFPLMNID	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.1.5	Type MultipleUnitUsage ratingGroup requestedUnit usedUnitContainer	Supported Supported Supported Supported	-
6.1.6.2.1.6	Type InvocationResult error (ProblemDetails) failureHandling	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.1.7	Type Trigger triggerType triggerCategory timeLimit (DurationSec) volumeLimit volumeLimit64 maxNumberOfccc eventLimit tariffTimeChange	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Not Supported Not Supported	See 6.1.6.3.6 for supported Trigger types.
6.1.6.2.1.8	Type MultipleUnitInformation resultCode ratingGroup grantedUnit triggers validityTime (DurationSec) quotaHandlingTime (DurationSec) finalUnitIndication timeQuotaThreshold volumeQuotaThreshold unitQuotaThreshold	Supported Supported Supported Supported Supported with Extensions Supported Supported Supported Supported with Extensions Supported Supported	-
6.1.6.2.1.9	Type RequestedUnit time totalVolume uplinkVolume downlinkVolume serviceSpecificUnits	Supported Supported Supported Supported Supported Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.1.1 0	Type UsedUnitContainer serviceld quotaManagementIndicator triggers triggerTimeStamp time totalVolume uplinkVolume downlinkVolume serviceSpecificUnits eventTimeStamps localSequenceNumber	Supported Supported Supported Supported with Extensions Supported with Extensions Supported Supported Supported Supported Supported Supported with Extensions Supported with Extensions	-
6.1.6.2.1.1 1	Type GrantedUnit tariffTimeChange time totalVolume uplinkVolume downlinkVolume serviceSpecificUnits	Supported Supported Supported Supported Supported Supported Supported	-
6.1.6.2.1.1 2	Type FinalUnitIndication finalUnitAction restrictionFilterRule filterId redirectServer restrictionFilterRuleList filterIdList	Supported Supported Not Supported Not Supported Supported Not Supported Not Supported	-
6.1.6.2.1.1 3	Type RedirectServer redirectAddressType redirectServerAddress	Supported Supported Supported	-
6.1.6.2.1.1 4	Type ReauthorizationDetails service (serviceld) ratingGroup quotaManagementIndicator	Supported Supported Supported Supported	-
6.1.6.2.1.1 5	Void	Not applicable	-
6.1.6.2.1.1 6	Type ChargingNotifyResponse invocationResult	Not Supported Not Supported	-
6.1.6.2.2	5G Data Connectivity Specified Data Type	Supported	-
6.1.6.2.2.1	Type ChargingDataRequest pDUSessionChargingInformation roamingQBCInformation	Supported Supported with Extensions Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.2.2	Type ChargingDataResponse pDUSessionChargingInformation roamingQBCInformation multihomedPDUAddress	Supported Supported with Extensions Supported with Extensions Not Supported	-
6.1.6.2.2.3	Type MultipleUnitUsage uPFID (NfInstanceId) multihomedPDUAddress	Supported Supported with Extensions Not Supported	-
6.1.6.2.2.4	Type MultipleUnitInformation uPFID (NfInstanceId)	Supported Supported with Extensions	-
6.1.6.2.2.5	Type UsedUnitContainer pDUContainerInformation	Supported Supported with Extensions	-
6.1.6.2.2.6	Type PDUSessionChargingInformation chargingId userInformation userLocationInfo userLocationTime presenceReportingAreaInformation ueTimeZone pduSessionInformation unitCountInactivityTime (DurationSec) rANSecondaryRATUsageReport sMFchargingId sMFHomeProvidedChargingId non3GPPUserLocationTime mAPDUNon3GPPUserLocationTime	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Not Supported Not Supported Not Supported Not Supported	ueTimeZone is used as the request time for the event.
6.1.6.2.2.7	Type UserInformation servedGPSI servedPEI unauthenticatedFlag roamerInOut	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.2.8	Type PDUSessionInformation	Supported with Extensions	-
	networkSlicingInfo	Supported with Extensions	
	pduSessionID	Supported with Extensions	
	pduType	Supported with Extensions	
	sscMode	Supported with Extensions	
	hPlmnId	Supported with Extensions	
	servingNetworkFunctionID	Supported with Extensions	
	servingCNPlmnId	Supported with Extensions	
	ratType	Supported with Extensions	
	mAPDUNon3GPPRATType	Supported with Extensions	
	dnnId	Supported with Extensions	
	dnnSelectionMode	Supported with Extensions	
	chargingCharacteristics	Supported with Extensions	
	chargingCharacteristicsSelectionMode	Supported with Extensions	
	startTime	Supported with Extensions	
	stopTime	Supported with Extensions	
	3gppPSDataOffStatus	Supported with Extensions	
	sessionStopIndicator	Supported with Extensions	
	pduAddress	Supported with Extensions	
	Diagnostics	Supported with Extensions	
	authorizedQoSInformation	Supported with Extensions	
	subscribedQoSInformation	Supported with Extensions	
	authorizedSessionAMBR	Supported with Extensions	
	subscribedSessionAMBR	Supported with Extensions	
	mAPDUSessionInformation	Supported with Extensions	
	enhancedDiagnostics	Not Supported	
	redundantTransmissionType	Not Supported	
	pDUSessionPairID	Not Supported	
	cpCtoTOptimisationIndicator	Not Supported	
	5GSCControlPlaneOnlyIndicator	Not Supported	
	smallDataRateControlIndicator	Not Supported	
	5GLANTypeService	Not Supported	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.2.9	Type PDUContainerInformation timeofFirstUsage timeofLastUsage qoSInformation qoSCharacteristics afChargingIdentifier afChargingString userLocationInformation ueTimeZone rATType servingNodeID presenceReportingAreaInformation 3gppPSDataOffStatus sponsorIdentity applicationServiceProviderIdentity chargingRuleBaseName mAPDUSteeringFunctionality mAPDUSteeringMode trafficForwardingWay qosMonitoringReport	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.10	Type NetworkSlicingInfo sNSSAI	Supported with Extensions Supported with Extensions	-
6.1.6.2.2.11	Type PDUAddress pduIPv4Address pduIPv6AddresswithPrefix pduAddressprefixlength IPv4dynamicAddressFlag IPv6dynamicPrefixFlag addIpv6AddrPrefixes addIpv6AddrPrefixList	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.12	Type ServingNetworkFunctionID servingNetworkFunctionInformation aMFID	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.13	Type RoamingQBCInformation multipleQFIcontainer uPFID roamingChargingProfile	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.2.1 4	Type MultipleQFIcontainer triggers triggerTimestamp time totalVolume uplinkVolume downlinkVolume localSequenceNumber qFIContainerInformation	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.1 5	Type RoamingChargingProfile triggers partialRecordMethod	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.1 6	Type QFIContainerInformation qFI reportTime timeofFirstUsage timeofLastUsage qoSInformation qoSCharacteristics userLocationInformation ueTimeZone presenceReportingAreaInformation rATType 3gppPSDataOffStatus 3gppChargingId diagnostics enhancedDiagnostics	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	All are supported only in request, not supported in response
6.1.6.2.2.1 7	Type RANSecondaryRATUsageReport rANSecondaryRATType qosFlowsUsage Reports	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.1 8	Type QosFlowsUsageReport qFI startTimestamp endTimestamp downlinkVolume uplinkVolume	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.1 9	Type MAPDUSessionInformation mAPDUSessionIndicator aTSSSCapability	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.2.2 0	Type EnhancedDiagnostics5G	Supported with Extensions	-
6.1.6.2.2.2 1	Type QosMonitoringReport	Supported with Extensions	-

[illegible]

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.3.4	Type RecipientInfo recipientSUPI recipientGPSI recipientOtherAddress recipientReceivedAddress recipientSCCPAddress sMDestinationInterface sMRecipientProtocolId	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.3.5	Type SMAddressInfo sMAddressType sMAddressData sMAddressDomain	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.3.6	Type RecipientAddress recipientAddressInfo sMAddresseeType	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.3.7	Type MessageClass classIdentifier tokenText	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.3.8	Type SMAddressDomain domainName 3GPPIMSIMCCMNC	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.3.9	Type SMInterface interfaceId interfaceText interfacePort interfaceType	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.4	5G connection and mobility Specified Data	Not Supported	-
6.1.6.2.4.1	Type ChargingDataRequest ChargingDataRequest ChargingDataRequest ChargingDataRequest	Not Supported Not Supported Not Supported Not Supported	-
6.1.6.2.4.2	Type ChargingDataResponse	Not Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.4.3	Type RegistrationChargingInformation registrationMessageType userInformation userLocationInfo ueTimeZone rATType 5gMMCapability mIComModeIndication smsIndication taiList serviceAreaRestriction requestedNSSAI allowedNssai rejectedNSSAI pSCellInformation nSSAIMapList amfUeNgapId ranUeNgapId ranNodeBId	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported	-
6.1.6.2.4.4	Type N2ConnectionChargingInformation n2ConnectionMessageType userInformation userLocationInfo ueTimeZone rATType amfUeNgapId ranUeNgapId ranNodeBId restrictedRatList forbiddenAreaList serviceAreaRestriction restrictedCnList allowedNssai rrcEstCause pSCellInformation	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Supported with Extensions	-
6.1.6.2.4.5	Type LocationReportingChargingInformation locationReportingMessageType userInformation userLocation infoueTimeZone presenceReportingAreaInformation rATType pSCellInformation	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.4.6	Type PSCellInformation Nrcgi ecgi	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.4.7	Type NSSAIMap servingSnssai homeSnssai	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.5	Exposure Function Northbound API Specified	Not Supported	-
6.1.6.2.5.1	Type ChargingDataRequest	Not Supported	-
6.1.6.2.5.1 a	Type ChargingDataResponse	Not Supported	-
6.1.6.2.5.2	Type NEFChargingInformation groupIdentifier aPIDirection aPITargetNetworkFunction aPIResultCode aPIName aPIReference aPIContent externalIndividualIdentifier externalIndividualIdList externalGroupIdentifier	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported	-
6.1.6.2.6	Network Slice Management (NSM) Specified Data Type	Not Supported	-
6.1.6.2.6.1	Type ChargingDataRequest tenantIdentifier mnSConsumerIdentifier nSMChargingInformation	Not Supported Not Supported Not Supported Not Supported	-
6.1.6.2.6.2	Type ChargingDataResponse	Not Supported	-
6.1.6.2.6.3	Type NSMChargingInformation managementOperation idNetworkSliceInstance listOfServiceProfileChargingInformation managementOperationStatus operationalState administrativeState managementOperationalState managementAdministrativeState	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.6.4	Type ServiceProfileChargingInformation serviceProfileIdentifier sNSSAList latency availability resourceSharingLevel jitter reliability maxNumberOfUEs coverageArea uEMobilityLevel delayToleranceIndicator dLThptPerSlice dLThptPerUE uLThptPerSlice uLThptPerUE maxNumberOfPDUsessions kPIMonitoringList supportedAccessTechnology v2XCommunicationModelIndicator addServiceProfileChargingInfo sST resourceSharingLevel uEMobilityLevel delayToleranceIndicator v2XCommunicationModelIndicator	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported	-
6.1.6.2.6.5	Type Throughput guaranteedThpt maximumThpt	Not Supported Not Supported Not Supported	-
6.1.6.2.7	NS performance and analytics Specified Data Type	Not Supported	-
6.1.6.2.7.1	Type ChargingDataRequest tenantIdentifier nSPACHargingInformation	Not Supported Not Supported Not Supported	-
6.1.6.2.7.2	Type ChargingDataResponse	Not Supported	-
6.1.6.2.7.3	Type UsedUnitContainer nSPAContainerInformation	Not Supported Not Supported	-
6.1.6.2.7.4	Type NSPACHargingInformation singleNSSAI	Not Supported Not Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.7.5	Type NSPAContainerInformation latency throughput maximumPacketLossRate serviceExperienceStatisticsData theNumberOfPDUSessions theNumberOfRegisteredSubscribers loadLevel uplinkLatency downlinkLatency uplinkThroughput downlinkThroughput maximumPacketLossRateUL maximumPacketLossRateDL	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.8.1 0	Type ServerCapabilities	Not Supported	-
6.1.6.2.8.1 1	Type TrunkGroupID	Not Supported	-
6.1.6.2.8.1 2	Type MessageBody	Supported with Extensions	-
6.1.6.2.8.1 3	Type AccessTransferInformation	Supported with Extensions	-
6.1.6.2.8.1 4	Type AccessNetworkInfoChange	Supported with Extensions	-
6.1.6.2.8.1 5	Type NNInformation	Supported with Extensions	-
6.1.6.2.8.1 7	Type SDPTimeStamps	Not Supported	-
6.1.6.2.8.1 8	Type IMSAddress	Not Supported	-
6.1.6.2.8.3	Type IMSChargingInformation	Supported with Extensions	-
6.1.6.2.8.4	Type SIPEventType	Not Supported	-
6.1.6.2.8.5	Type ISUPCause	Supported with Extensions	-
6.1.6.2.8.6	Type CalledIdentityChange	Supported with Extensions	-
6.1.6.2.8.7	Type InterOperatorIdentifier	Not Supported	-
6.1.6.2.8.8	Type EarlyMediaDescription	Not Supported	-
6.1.6.2.8.9	Type SDPMediaComponent	Not Supported	-
6.1.6.2.9.1	Type MultipleUnitInformation announcementInformation	Supported Supported with Extensions	-
6.1.6.2.9.2	Type AnnouncementInformation	Supported with Extensions	-
6.1.6.2.9.3	Type VariablePart	Supported with Extensions	-
6.1.6.2.10. 3	Type MMTelChargingInformation	Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.10.4	Type SupplementaryService	Supported with Extensions	-
6.1.6.2.11.3	Type UsedUnitContainer pC5ContainerInformation	Supported Supported with Extensions	-
6.1.6.2.11.10	Type PC5DataContainer	Not Supported	-
6.1.6.2.11.4	Type PC5ContainerInformation	Supported with Extensions	-
6.1.6.2.11.5	Type CoverageInfo	Supported with Extensions	-
6.1.6.2.11.6	Type RadioParameterSetInfo	Supported with Extensions	-
6.1.6.2.11.7	Type TransmitterInfo	Supported with Extensions	-
6.1.6.2.11.8	Type ProseChargingInformation	Supported with Extensions	-
6.1.6.2.11.9	Type PFContainerInformation	Supported with Extensions	-
6.1.6.2.12.3	Type EdgeInfrastructureUsageChargingInformation	Supported with Extensions	-
6.1.6.2.12.4	Type EASDeploymentChargingInformation	Supported with Extensions	-
6.1.6.2.12.5	Type EASRequirements	Not Supported	-
6.1.6.3	Simple data types and enumerations	Supported	-
6.1.6.3.1	Introduction	Supported	-
6.1.6.3.2	Simple data types Diagnostics IPFilterRule N2ConnectionMessageType LocationReportingMessageType	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.3.3	Enumeration: NotificationType	Supported	-
6.1.6.3.4	Enumeration: NodeFunctionality	Supported	-
6.1.6.3.5	Enumeration: ChargingCharacteristicsSelectionMode	Supported	-
6.1.6.3.6	Enumeration: TriggerType	Supported	FINAL, RAT_CHANGE, and TARIFF_TIME_CHANGE are supported. Other trigger types are supported with extensions.
6.1.6.3.7	Enumeration: FinalUnitAction	Supported	-
6.1.6.3.8	Enumeration: RedirectAddressType	Supported	-
6.1.6.3.9	Enumeration: TriggerCategory	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.3.10	Enumeration: QuotaManagementIndicator	Supported	-
6.1.6.3.11	Enumeration: FailureHandling	Supported	-
6.1.6.3.12	Enumeration: SessionFailover	Supported	-
6.1.6.3.13	Enumeration: 3GPPPSDataOffStatus	Supported	-
6.1.6.3.14	Enumeration: ResultCode	Supported	-
6.1.6.3.15	Enumeration: PartialRecordMethod	Supported	-
6.1.6.3.16	Enumeration: RoamerInOut	Supported	-
6.1.6.3.17	Void	Supported	-
6.1.6.3.18	Enumeration: SMMessageType	Supported	-
6.1.6.3.19	Enumeration: SMPriority	Supported	-
6.1.6.3.20	Enumeration: DeliveryReportRequested	Supported	-
6.1.6.3.21	Enumeration: InterfaceType	Supported	-
6.1.6.3.22	Enumeration: ClassIdentifier	Supported	-
6.1.6.3.23	Enumeration: SMAddressType	Supported	-
6.1.6.3.24	Enumeration: SMAddresseeType	Supported	-
6.1.6.3.25	Enumeration: SMSServiceType	Supported	-
6.1.6.3.26	Enumeration: ReplyPathRequested	Supported	-
6.1.6.3.27	Enumeration: DnnSelectionMode	Supported	-
6.1.6.3.28	Enumeration: EventType	Supported	-
6.1.6.3.29	Enumeration: MICOModeIndication	Supported	-
6.1.6.3.30	Enumeration: RegistrationMessageType	Supported	-
6.1.6.3.31	Enumeration: SmsIndication	Supported	-
6.1.6.3.32	Enumeration: APIDirection	Supported	-
6.1.6.3.33	Enumeration: ManagementOperation	Supported	-
6.1.6.3.34	Enumeration: ManagementOperationStatus	Supported	-
6.1.6.3.35	Enumeration: IMSNodeFunctionality	Not Supported	-
6.1.6.3.36	Enumeration: RedundantTransmissionType	Not Supported	-
6.1.6.3.37	Enumeration: RoleOfIMSNode	Not Supported	-
6.1.6.3.38	Enumeration: IMSSessionPriority	Not Supported	-
6.1.6.3.39	Enumeration: MediaInitiatorFlag	Not Supported	-
6.1.6.3.40	Enumeration: SDPTType	Supported with Extensions	-
6.1.6.3.41	Enumeration: OriginatorPartyType	Not Supported	-
6.1.6.3.42	Enumeration: AccessTransferType	Not Supported	-
6.1.6.3.43	Enumeration: UETransferType	Not Supported	-
6.1.6.3.44	Enumeration: NNISSessionDirection	Not Supported	-
6.1.6.3.45	Enumeration: NNIType	Not Supported	-
6.1.6.3.46	Enumeration: NNIRelationshipMode	Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.3.47	Enumeration: TADIdentifier	Not Supported	-
6.1.6.3.48	Enumeration: VariablePartType	Not Supported	-
6.1.6.3.49	Enumeration: QuotaConsumptionIndicator	Not Supported	-
6.1.6.3.50	Enumeration: PlayToParty	Not Supported	-
6.1.6.3.51	Enumeration: AnnouncementPrivacyIndicator	Not Supported	-
6.1.6.3.52	Enumeration: SupplementaryServiceType	Not Supported	-
6.1.6.3.53	Enumeration: SupplementaryServiceMode	Not Supported	-
6.1.6.3.54	Enumeration: ParticipantActionType	Not Supported	-
6.1.6.3.55	Enumeration: TrafficForwardingWay	Not Supported	-
6.1.6.3.56	Enumeration: ProseFunctionality	Not Supported	-
6.1.6.3.57	Enumeration: ProseEventType	Not Supported	-
6.1.6.3.58	Enumeration: DirectDiscoveryModel	Not Supported	-
6.1.6.3.59	Enumeration: RoleOfUE	Not Supported	-
6.1.6.3.60	Enumeration: RangeClass	Not Supported	-
6.1.6.4	Data types describing alternative data types or combinations of data types	Not Applicable	-
6.1.6.5	Binary data	Not Applicable	-
6.1.7	Error handling	Supported	-
6.1.7.1	General	Supported	-
6.1.7.2	Protocol Errors	Not Applicable	-
6.1.7.3	Application errors	Supported	-
6.1.8	Feature negotiation	Not Supported	-
6.2	Nchf_OfflineOnlyCharging Service API	Supported	-
6.2.1	Introduction	Supported	-
6.2.2	Usage of HTTP	Supported	-
6.2.3	Resources	Supported	-
6.2.3.1	Overview	Supported	-
6.2.3.2	Resource: Charging Data	Supported	-
6.2.3.2.1	Description	Supported	-
6.2.3.2.2	Resource Definition	Supported	-
6.2.3.2.3	Resource Standard Methods	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.2.3.2.3.1	POST	Supported	ChargingDataRequest and ChargingDataResponse. The response includes one of the following codes: For success 201 (created). For failure ProblemDetails include - 400, 403, and 404.
6.2.3.2.4	Resource Custom Operations	Not Applicable	-
6.2.3.3	Resource: Individual Offline Only Charging Data	Supported	-
6.2.3.3.1	Description	Supported	-
6.2.3.3.2	Resource Definition	Supported	-
6.2.3.3.3	Resource Standard Methods	Not Applicable	-
6.2.3.3.4	Resource Custom Operations	Supported	-
6.2.3.3.4.1	Overview	Supported	-
6.2.3.3.4.2	Operation: update	Supported	-
6.2.3.3.4.2.1	Description	Supported	-
6.2.3.3.4.2.2	Operation Definition	Supported	ChargingDataRequest and ChargingDataResponse. The response includes one of the following codes: For success 200 (OK). For failure ProblemDetails include - 400, 403, and 404.
6.2.3.3.4.3	Operation: release	Supported	-
6.2.3.3.4.3.1	Description	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.2.3.3.4.3.2	Operation Definition	Supported	ChargingDataRequest and ChargingDataResponse. For success the response will be 204 (No content). For failure ProblemDetails include - 404.
6.2.4	Custom Operations without associated resources	Not Applicable	-
6.2.5	Data Model	Supported	-
6.2.5.1	General	Supported	-
6.2.5.2	Structured data types	Supported	-
6.2.5.2.1	Common Data Type	Supported	-
6.2.5.2.1.1	Type ChargingDataRequest subscriberIdentifier nfConsumerIdentification invocationTimeStamp invocationSequenceNumber serviceSpecificationInformation multipleUnitUsage triggers	Supported Supported Supported with Extensions Supported Supported Supported with Extensions Supported Supported with Extensions	-
6.2.5.2.1.2	Type ChargingDataResponse invocationTimeStamp invocationResult invocationSequenceNumber sessionFailover triggers	Supported Supported Supported Supported Supported with Extensions Supported with Extensions	-
6.2.5.2.1.3	Type MultipleUnitUsage ratingGroup usedUnitContainer	Supported Supported Supported	-
6.2.5.2.1.4	Type UsedUnitContainer serviceId triggers triggerTimeStamp time totalVolume uplinkVolume downlinkVolume serviceSpecificUnits eventTimeStamps localSequenceNumber	Supported Supported Supported Supported with Extensions Supported Supported Supported Supported Supported Supported with Extensions Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.2.5.2.1.5	Type Trigger triggerType triggerCategory timeLimit (DurationSec) volumeLimit64 eventLimit maxNumberOfccc	Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	See 6.2.5.3.5 for supported Trigger types.
6.2.5.2.2	5G Data Connectivity Specified Data Type	Supported	-
6.2.5.2.2.1	Type ChargingDataRequest	-	Same as 6.1.6.2.2.1
6.2.5.2.2.2	Type ChargingDataResponse	-	Same as 6.2.5.2.1.2
6.2.5.2.2.3	Type MultipleUnitUsage	-	Same as 6.2.5.2.1.3
6.2.5.2.2.4	Type UsedUnitContainer	-	Same as 6.2.5.2.1.4
6.2.5.2.2.5	Type PDUSessionChargingInformation	-	Same as 6.1.6.2.2.6
6.2.5.2.2.6	Type UserInformation	-	Same as 6.1.6.2.2.7
6.2.5.2.2.7	Type PDUSessionInformation	-	Same as 6.1.6.2.2.8
6.2.5.2.2.8	Type PDUContainerInformation	-	Same as 6.1.6.2.2.9
6.2.5.2.2.9	Type NetworkSlicingInfo	-	Same as 6.1.6.2.2.10
6.2.5.2.2.10	Type PDUAddress	-	Same as 6.1.6.2.2.11
6.2.5.2.2.11	Type ServingNetworkFunctionID	-	Same as 6.1.6.2.2.12
6.2.5.2.2.12	Type RoamingQBCInformation	-	Same as 6.1.6.2.2.13
6.2.5.2.2.13	Type MultipleQFIcontainer	-	Same as 6.1.6.2.2.14
6.2.5.2.2.14	Type RoamingChargingProfile	-	Same as 6.1.6.2.2.15
6.2.5.2.2.15	Type QFIContainerInformation	-	Same as 6.1.6.2.2.16
6.2.5.2.2.16	Type RANSecondaryRATUsageReport	-	Same as 6.1.6.2.2.17
6.2.5.2.2.17	Type QosFlowsUsageReport	-	Same as 6.1.6.2.2.18
6.2.5.3	Simple data types and enumerations	Supported	-
6.2.5.3.1	Introduction	Supported	-
6.2.5.3.2	Simple data types	-	Same as 6.1.6.3.2

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v17.11.0 (2024-09) Section Compliance

Section Number	Section	Status	Notes
6.2.5.3.3	Enumeration: ChargingCharacteristicsSelectionMode	-	Same as 6.1.6.3.5
6.2.5.3.4	Enumeration: NodeFunctionality	Supported	-
6.2.5.3.5	Enumeration: TriggerType	Supported	FINAL, RAT_CHANGE and TARIFF_TIME_CHANGE are supported. Other trigger types are supported with extensions.
6.2.5.3.6	Enumeration: ResultCode	Supported	-
6.2.5.3.7	Enumeration: 3GPPPSDataOffStatus	-	Same as 6.1.6.3.13
6.2.5.3.8	Enumeration: PartialRecordMethod	-	Same as 6.1.6.3.15
6.2.5.3.9	Enumeration: RoamerInOut	-	Same as 6.1.6.3.16
6.2.5.3.10	Enumeration: SubscriberIdentityType	-	Same as 6.1.6.3.17
6.2.6	Error handling	Supported	-
6.2.6.1	General	Supported	-
6.2.6.2	Protocol Errors	Not Applicable	-
6.2.6.3	Application errors	Supported	-
6.2.7	Feature negotiation	Not Supported	-
7	Bindings of CDR field, Information Element and Resource Attribute	Supported	-
7.0	General	Supported	-
7.1	Bindings of common CDR field, Information Element and Resource Attribute	Supported	-
7.2	Bindings for 5G data connectivity	Supported	-
7.3	Bindings for SMS charging	Not Supported	-
7.4	Bindings for 5G connection and mobility	Not Supported	-
7.5	Bindings for Exposure Function Northbound API charging	Not Supported	-
7.6	Bindings for NS performance and Analytics charging	Not Supported	-
8.0	Security	Not Supported	OAuth2 is not supported.

Response Codes

[Table 1-2](#) describes the Charging Function (CF) response codes.

Table 1-2 Response Codes

Response codes	Description
201 Created (Create)	<p>The creation of a Charging Data resource is confirmed, and a representation of that resource is returned.</p> <p>The Charging Data resource is created and returned successfully.</p> <p>The representation of created resource is identified via Location header field in the 201 response.</p>
200 OK (Updates)	<p>The modification of a Charging Data resource is confirmed, and a representation of that resource is returned.</p> <p>The Charging Data resource which is modified and returned successfully.</p>
204 No Content (Release)	The Charging Data resource matching the ChargingDataRef is modified and then released.
400 Bad Request	<p>CHARGING_FAILED: The HTTP request is rejected because the set of session or subscriber information needed by the CHF for charging or CDR creation is incomplete or erroneous or not available (for example, Rating Group, subscriber information).</p> <p>RE_AUTHORIZATION_FAILED: The HTTP request is rejected because the set of information needed by the NF Consumer (CTF) to report the usage is incomplete or erroneous or not available.</p>
403 Forbidden	<p>CHARGING_NOT_APPLICABLE: The HTTP request is rejected by the CHF since it has been determined that the service can be granted to the end user without any charging or CDR creation.</p> <p>END_USER_REQUEST_DENIED: The HTTP request is denied by the CHF due to restrictions or limitations related to the end-user.</p> <p>QUOTA_LIMIT_REACHED: The HTTP request denied by the CHF because the end user's account could not cover the requested service. If the request contained used units they are deducted, if applicable.</p> <p>END_USER_REQUEST_REJECTED: The HTTP request rejected by the CHF due to end-user restrictions or limitations.</p>
404 Not Found	USER_UNKNOWN: The HTTP request is rejected because the end user specified in the request cannot be served by the CHF.
500 Internal Server Error	Common Application Error

2

Charging Function – Spending Limit Control Service

Learn about the Oracle Communications Elastic Charging Engine (ECE) compliance with the 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09) specification.

Topics in this document:

- [Section Compliance](#)
- [Response Codes](#)

Caution

Deploying the 5G Spending Limit Control Service with HTTP Gateway (5G CHF) requires a cloud native deployment of ECE and BRM components. The HTTP Gateway can be used only on an ECE cloud native system.

Section Compliance

[Table 2-1](#) describes the section compliance of 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09).

Table 2-1 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09) Section Compliance

Section Number	Section	Status	Notes
1	Scope	Informational	-
2	References	Informational	-
3	Definitions and abbreviations	Informational	-
4	Nchf_SpendingLimitControl Service	Supported	-
4.1	Service Description	Supported	-
4.1.1	Overview	Supported	-
4.1.2	Service Architecture	Supported	-
4.1.3	Network Functions	Supported	-
4.1.3.1	Charging Function (CHF)	Supported	-
4.1.3.2	NF Service Consumers	Supported	-
4.2	Service Operations	Supported	-
4.2.1	Introduction	Supported	-
4.2.2	Nchf_SpendingLimitControl_Subscribe service operation	Supported	-
4.2.2.1	General	Supported	-
4.2.2.2	Initial spending limit retrieval	Supported	-

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09) Section Compliance

Section Number	Section	Status	Notes
4.2.2.3	Intermediate spending limit report retrieval	Supported	-
4.2.3	Nchf_SpendingLimitControl_Unsubscribe service operation	Supported	-
4.2.3.1	General	Supported	-
4.2.3.2	Unsubscribe from spending limit reporting	Supported	-
4.2.4	Nchf_SpendingLimitControl_Notify service operation	Supported	-
4.2.4.1	General	Supported	-
4.2.4.2	Spending limit report	Supported	-
4.2.4.3	Subscription termination request by CHF	Not Supported	-
5	Nchf_SpendingLimitControl Service API	Supported	-
5.1	Introduction	Supported	-
5.2	Usage of HTTP	Supported	-
5.2.1	General	Supported	-
5.2.2	HTTP standard headers	Supported	-
5.2.2.1	General	Supported	-
5.2.2.2	Content type	Supported	-
5.2.3	HTTP custom headers	Supported	-
5.2.3.1	General	Supported	Only 3gpp-Sbi-Target-apiRoot, 3gpp-Sbi-Binding headers are supported among custom headers.
5.3	Resources	Supported	-
5.3.1	Resource Structure	Supported	-
5.3.2	Resource: Spending Limit Retrieval Subscriptions (Collection)	Supported	-
5.3.2.1	Description	Supported	-
5.3.2.2	Resource Definition	Supported	-
5.3.2.3	Resource Standard Methods	Supported	-
5.3.2.3.1	POST	Supported	POST request with SpendingLimitContext to create a new individual spending limit retrieval subscription. POST Response to contain SpendingLimitStatus as 201 (Created), ProblemDetails with 400 (Bad Request).
5.3.2.4	Resource Custom Operations	Not Applicable	-
5.3.3	Resource: Individual Spending Limit Retrieval Subscription (Document)	Supported	-
5.3.3.1	Description	Supported	-
5.3.3.2	Resource definition	Supported	-
5.3.3.3	Resource Standard Methods	Supported	-

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09) Section Compliance

Section Number	Section	Status	Notes
5.3.3.3.1	PUT	Supported	PUT request with SpendingLimitContext to modify the existing individual spending limit retrieval subscription. POST Response to contain SpendingLimitStatus as 200 (OK), ProblemDetails with 400 (Bad Request).
5.3.3.3.2	DELETE	Supported	DELETE request. DELETE Response to contain 204 (No Content). Successful case: The individual spending limit subscription matching the subscriptionId was deleted.
5.4	Customer Operations without associated resources	Not Applicable	-
5.5	Notifications	Supported	-
5.5.1	General	Supported	Terminate is not supported.
5.5.2	Spending limit notification	Supported	-
5.5.2.1	Description	Supported	-
5.5.2.2	Target URI	Supported	-
5.5.2.3	Standard Methods	Supported	-
5.5.2.3.1	POST	Supported	POST request with SpendingLimitStatus for the policy counters. POST Response to contain 204 (no Content) and the receipt of the notification is acknowledged.
5.5.3	Subscription Termination	Not Supported	-
5.5.3.1	Description	Supported	-
5.5.3.2	Target URI	Supported	-
5.5.3.3	Standard Methods	Supported	-
5.5.3.3.1	POST	Supported	POST request with SubscriptionTerminationInfo for deletion of a resource. POST Response to contain 204 (no Content) and the receipt of the notification is acknowledged.
5.6	Data Model	Supported	-

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09) Section Compliance

Section Number	Section	Status	Notes
5.6.1	General DateTime Uri Supi Gpsi SupportedFeatures	Supported Supported Supported Supported Supported Supported	-
5.6.2	Structured data types	Supported	-
5.6.2.1	Introduction	Supported	-
5.6.2.2	Type SpendingLimitContext supi gpsi policyCounterIds notifUri expiry supportedFeatures notifId	Supported Supported Supported Supported Supported Supported with Extensions Supported with Extensions Supported with Extensions	-
5.6.2.3	Type SpendingLimitStatus supi statusInfos expiry supportedFeatures notifId	Supported Supported Supported with Extensions Supported with Extensions Supported with Extensions Supported with Extensions	-
5.6.2.4	Type PolicyCounterInfo policyCounterId currentStatus penPolCounterStatuses	Supported Supported Supported Supported	-
5.6.2.5	Type PendingPolicyCounterStatus policyCounterStatus activationTime	Supported Supported Supported	-
5.6.2.6	Type SubscriptionTerminationInfo Supi termCause notifId	Not Supported Not Supported Not Supported Supported with Extensions	-
5.6.3	Simple data types and enumerations	Supported	-
5.6.3.1	Introduction	Supported	-
5.6.3.2	Simple data types PolicyCounterId	Supported Supported	-
5.6.3.3	Enumeration: TerminationCause	Not Supported	-
5.7	Error handling	Supported	-
5.7.1	General	Supported	-
5.7.2	Protocol Errors	Not Applicable	-
5.7.3	Application Errors	Supported	-

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v17.5.0 (2022-09) Section Compliance

Section Number	Section	Status	Notes
5.8	Feature negotiation	Not Supported	-
5.9	Security	Not Supported	OAuth2 is not supported.

Response Codes

[Table 2-2](#) describes the response codes for the Spending Limit Control Service.

Table 2-2 Response Codes

Response codes	Description
201 Created (Create)	SUCCESS: The spending limit subscription was created, and spending limit reports are provided.
200 OK (Updates)	The individual spending limit subscription was modified, and spending limit reports are provided.
204 No Content (Release)	Please see individual operations
400 Bad Request	USER_UNKNOWN: The subscriber specified in the request is not known at the CHF and the subscription cannot be created. NO_AVAILABLE_POLICY_COUNTERS: There are no policy counters available for the subscriber at the CHF.
500 Internal Server Error	Common Application Error

3

Charging Function – Interactions with Network Repository Function (NRF)

Learn about the Oracle Communications Elastic Charging Engine (ECE) compliance with the 5G System Network Function Repository Services 3GPP TS 29.510 v17.14.0 (2024-06) specification.

Topics in this document:

- [Section Compliance](#)

Caution

Deploying charging for 5G with HTTP Gateway (5G CHF) requires a cloud native deployment of ECE and BRM components. The HTTP Gateway can be used only on an ECE cloud native system.

Section Compliance

[Table 3-1](#) describes the services supported by CHF as a consumer Network Function for interacting with NRF, based on 5G System Network Function Repository Services 3GPP TS 29.510 v17.14.0 (2024-06).

Table 3-1 Services Supported by CHF as a Consumer Network Function

Section Number	Section	Status	Notes
5	Services Offered by the NRF	Supported	-
5.1	Introduction	Supported	Only NFManagement Service with operations NFRegister, NFUpdate, NFDeregister, and NFListRetrieval are supported.
5.2	Nnrf_NFManagement Service	Supported	-
5.2.1	Service Description	Supported	-
5.2.2	Service Operations	Supported	-
5.2.2.1	Introduction	Supported	-
5.2.2.2	NFRegister	Supported	-
5.2.2.2.1	General	Supported	-
5.2.2.2.2	NF (other than NRF) registration to NRF	Supported	-
5.2.2.3	NFUpdate	Supported	-
5.2.2.3.1	General	Supported	-
5.2.2.3.2	NF Heart-Beat	Supported	-

Table 3-1 (Cont.) Services Supported by CHF as a Consumer Network Function

Section Number	Section	Status	Notes
5.2.2.4	NFDeregister	Supported	-
5.2.2.4.1	General	Supported	-
5.2.2.5	NFStatusSubscribe	Not Supported	-
5.2.2.6	NFStatusNotify	Not Supported	-
5.2.2.7	NFStatusUnsubscribe	Not Supported	-
5.2.2.8	NFListRetrieval	Supported	-
5.2.2.8.1	General	Supported	-
5.2.2.9	NFProfileRetrieval	Not Supported	-
5.2.2.9.1	General	Not Supported	-

4

CHF-CDR Format

Learn about the Oracle Communications Elastic Charging Engine (ECE) compliance with the 3GPP TS 32.298 version 17.11.0 (2024-06) specification.

See "[Oracle nCHF CDR Specification](#)" for more information.

Topics in this document:

- [Field Compliance](#)

Caution

Deploying charging for 5G with HTTP Gateway (5G CHF) requires a cloud native deployment of ECE and BRM components. The HTTP Gateway can be used only on an ECE cloud native system.

Field Compliance

[Table 4-1](#) describes the conformance status for the fields in the 3GPP Charging Function Call Detail Record (CHF-CDR), taken from the 3GPP TS 32.298 version 17.11.0 (2024-06) specification. You can configure ECE to generate CHF-CDRs. See "Generating CDRs for External Systems" in *ECE Implementing Charging*.

Table 4-1 CHF-CDR Format

Field	Status
Record Type	Supported
Recording Network Function ID	Not Supported
Charging Session Identifier	Supported
Subscriber Identifier	Supported
Tenant Identifier	Not Supported
MnS Consumer Identifier	Not Supported
NF Consumer Information	Supported
NF Functionality	Supported
NF Name	Supported
NF Address	Supported
NF PLMN ID	Supported
Charging Identifier	Not Supported
Triggers	Supported
SMF Triggers	Supported
List of Multiple Unit Usage	Supported
Rating Group	Supported
Used Unit Container	Supported

Table 4-1 (Cont.) CHF-CDR Format

Field	Status
Service Identifier	Supported
Quota Management Indicator	Supported
Local Sequence Number	Supported
Time	Supported
Uplink Volume	Supported
Downlink Volume	Supported
Total Volume	Supported
Service Specific Units	Supported
Event Time Stamp	Supported
Rating Indicator	Supported
Triggers	Supported
SMF Triggers	Supported
Trigger Time Stamp	Supported
PDU Container Information	Supported
UPF ID	Supported
Record Opening Time	Supported
Duration	Supported
Record Sequence Number	Supported
Cause for Record Closing	Supported
Local Record Sequence Number	Supported
Record Extensions	Not Supported
Service Specification Information	Supported
PDU Session Charging Information	Supported
Roaming QBC Information	Supported
SMS Charging Information	Supported
PC5 Container Information	Supported
Registration Charging Information	Not Supported
N2 Connection Charging Information	Not Supported
Location Reporting Charging Information	Not Supported
NEF API Charging Information	Not Supported
NSPA Charging Information	Not Supported
NSPA Container Information	Not Supported
NSM Charging Information	Not Supported
IMS Charging Information	Not Supported
ProSe Charging Information	Not Supported
Edge Enabling Infrastructure Resource Usage Charging Information	Not Supported
EAS Deployment Charging Information	Not Supported
Direct Edge Enabling Service Charging Information	Not Supported
Exposed Edge Enabling Service Charging Information	Not Supported
EAS ID	Not Supported
EDN ID	Not Supported
EAS Provider Identifier	Not Supported

A

Oracle nCHF CDR Specification

Learn about the Oracle nCHF CDR OpenAPI specification.

Topics in this document:

- [Specification Details](#)

Specification Details

Following is the Oracle nCHF CDR OpenAPI specification:

```
openapi: 3.0.0
servers:
  # Added by API Auto Mocking Plugin
  - description: Sample CDR for 5G nCHF OpenAPI
    url: Oracle/CAGBU/nCHF_ConvergentCharging_CDR/
info:
  description: |
    Oracle nCHF Converged Charging CDR Specification.
    1. All fields described in the document are supported, non-supported
    fields are not included in the document.
    2. Fields are passed through the network unless description states
    enriched/populated by CHF.
    3. Fields marked by asterisks (*) are mandatory for all scenarios.
    Unmarked fields are optional and can be conditional based on vendor and
    charging scenarios.
    4. Attributes are as described in this document, conforming to 3GPP
    TS32.298 v16.5.0 Section 5.1.5
    5. CHF CDRs are produced formatted as JSON only and not ASN.1, and does
    not conform to file based CDR transfer procedures as stated in 3GPP TS32.297
    6. For CHF CDR please refer to Schema definition for ChargingDataCDR
    below. The rest of the schema elements are referenced from within the schema
    of ChargingDataCDR.
  version: "1.0"
  title: Oracle nCHF CDR Specification
paths:
  /cdr:
    get:
      tags:
        - convergedCharging
      summary: Example Converged Charging CDR
      operationId: convergedChargingCDR
      description: |
        Example nCHF_CC CDR Structure
      responses:
        '200':
          description: "nCHF_CC CDR Structure"
          content:
            application/json:
```

```

        schema:
          $ref: '#/components/schemas/ChargingDataCDR'
components:
  schemas:
    ChargingDataCDR:
      type: object
      properties:
        recordType:
          description: |
            "Populated by CHF. CHF Record type based on type of content,
            example 200 for Charging Function Record.

```

CS specific. The contents are defined in TS 32.250 [10]

- moCallRecord (0),
- mtCallRecord (1),
- roamingRecord (2),
- incGatewayRecord (3),
- outGatewayRecord (4),
- transitCallRecord (5),
- moSMSRecord (6),
- mtSMSRecord (7),
- moSMSIWRecord (8),
- mtSMSGWRecord (9),
- ssActionRecord (10),
- hlrIntRecord (11),
- locUpdateHLRRecord (12),
- locUpdateVLRRecord (13),
- commonEquipRecord (14),
- moTraceRecord (15), -- used in earlier releases
- mtTraceRecord (16), -- used in earlier releases
- termCAMELRecord (17),

GPRS specific. The contents are defined in TS 32.251 [11]

- sgsnPDPRecord (18),
- sgsnMMRecord (20),
- sgsnSMORecord (21), -- also MME UE originated SMS record
- sgsnSMTRRecord (22), -- also MME UE terminated SMS record

CS-LCS specific. The contents are defined in TS 32.250 [10]

- mtLCSRecord (23),
- moLCSRecord (24),
- niLCSRecord (25),

GPRS-LCS specific. The contents are defined in TS 32.251 [11]

- sgsnMTLCSRecord (26),
- sgsnMOLCSRecord (27),
- sgsnNILCSRecord (28),

MMS specific. The contents are defined in TS 32.270 [30]

- mMO1SRecord (30),
- mMO4FRqRecord (31),
- mMO4FRsRecord (32),
- mMO4DRecord (33),
- mMO1DRecord (34),
- mMO4RRecord (35),
- mMO1RRecord (36),

- mMOMDRecord (37),
- mMR4FRecord (38),
- mMR1NRqRecord (39),
- mMR1NRsRecord (40),
- mMR1RtRecord (41),
- mMR1AFRecord (42),
- mMR4DRqRecord (43),
- mMR4DRsRecord (44),
- mMR1RRRecord (45),
- mMR4RRqRecord (46),
- mMR4RRsRecord (47),
- mMRMDRecord (48),
- mMFRecord (49),
- mMBx1SRecord (50),
- mMBx1VRecord (51),
- mMBx1URecord (52),
- mMBx1DRecord (53),
- mM7SRecord (54),
- mM7DRqRecord (55),
- mM7DRsRecord (56),
- mM7CRecord (57),
- mM7RRecord (58),
- mM7DRRqRecord (59),
- mM7DRRsRecord (60),
- mM7RRqRecord (61),
- mM7RRsRecord (62),

IMS specific. The contents are defined in TS 32.260 [20]

- sCSCFRecord (63),
- pCSCFRecord (64),
- iCSCFRecord (65),
- mRFCRecord (66),
- mGCFRecord (67),
- bGCFRecord (68),
- aSRecord (69),
- eCSCFRecord (70),
- iBCFRecord (82),
- tRFRecord (89),
- tFRecord (90),
- aTCFRecord (91),

LCS specific. The contents are defined in TS 32.271 [31]

- lCSGMORRecord (71),
- lCSRGMTRRecord (72),
- lCSHGMTRRecord (73),
- lCSVGMTRRecord (74),
- lCSGNIRRecord (75),

MBMS specific. The contents are defined in TS 32.251 [11] and
TS 32.273 [33]

- sgsnMBMSRecord (76),
- ggsnMBMSRecord (77),
- gwMBMSRecord (86),
- sUBBMSRecord (78),
- cCONTENTBMSRecord (79),

PoC specific. The contents are defined in TS 32.272 [32]

- pPFRecord (80),
- cPFRecord (81),

EPC specific. The contents are defined in TS 32.251 [11]

- sGWRecord (84),
- pGWRecord (85),
- tDFRecord (92),
- iPERRecord (95),
- ePDGRecord (96),
- tWAGRecord (97),

MMTel specific. The contents are defined in TS 32.275 [35]

- mMTelRecord (83),

CS specific. The contents are defined in TS 32.250 [10]

- mSCsRVCCRecord (87),
- mMTRFRecord (88),
- iCSRegisterRecord (99),

SMS specific. The contents are defined in TS 32.274 [34]

- sCSMORRecord (93),
- sCSMTRecord (94),

ProSe specific. The contents are defined in TS 32.277 [36]

- pFDDRecord (100),
- pFEDRecord (101),
- pFDCRecord (102),

32.278 [38] Monitoring Event specific. The contents are defined in TS

- mECORRecord (103),
- mERERRecord (104),

32.253 [13] CP data transfer specific. The contents are defined in TS

- cPDTSCERRecord (105),
- cPDTSNRRecord (106), --

SMS specific. The contents are defined in TS 32.274 [34]

- sCDVT4Record (110),
- sCSMOT4Record (111),
- iSMSMORRecord (112),
- iSMSMTRecord (113),

32.254 [14] Exposure Function API specific. The contents are defined in TS

- eASCERecord (120),

Record values from 200 are specific to Charging Function domain

- chargingFunctionRecord (200)"

example: 200

type: integer

sessionId:

description: "Session Identifier described in TS 32.290 [57]. This field is populated by CHF and generated when first CREATE request is

```

received."
    example: "1-ff9169f9-14c8-5e00-fbf3-4c1d1801120b"
    type: string
    subscriberIdentifier:
        description: "5G Subscription Permanent Identifier (SUPI) of the
served party as specified in TS 29.571 [249], if available."
        example: "imsi-244917850000058"
        type: string
    nfConsumerIdentification:
        $ref: '#/components/schemas/NFIdentification'
    triggers:
        $ref: '#/components/schemas/Trigger'
    multipleUnitUsage:
        $ref: '#/components/schemas/MultipleUnitUsage'
    recordOpeningTime:
        description: "Timestamp when the PDU session is activated in the
SMF or record opening time on subsequent partial records."
        format: date-time
        type: string
    duration:
        description: "This field holds the relevant duration of this record
in seconds. Enriched by CHF."
        example: 60
        type: integer
    recordSequenceNumber:
        description: "Partial record sequence number, only present in case
of partial records. Populated by CHF."
        example: 10
        type: integer
    causeForRecordClosing:
        description: "This field contains a reason for the release of the
CDR, in case of Oracle CHF for session closure [NORMAL_RELEASE]. Populated by
CHF and can be vendor specific ENUM."
        example: "NORMAL_RELEASE"
        enum:
            - NORMAL_RELEASE
            - ABNORMAL_RELEASE
            - PARTIAL_RECORD
            - CAMEL_INIT_CALL_RELEASE
            - VOLUME_LIMIT
            - TIME_LIMIT
            - SERVING_NODE_CHANGE
            - MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS
            - MANAGEMENT_INTERVENTION
            - INTRA_SGSN_INTERSYSTEM_CHANGE
            - RAT_CHANGE
            - MTIME_ZONE_CHANGE
            - SGSN_PLMNID_CHANGE
            - SGW_CHANGE
            - APNAMBR_CHANGE
            - MO_EXCEPTION_DATA_COUNTER_RECEIPT
            - UNAUTHORIZED_REQUESTING_NETWORK
            - UNAUTHORIZED_LCS_CLIENT
            - POSITION_METHOD_FAILURE
            - UNKNOWN_OR_UNREACHABLE_LCS_CLIENT
            - LIST_OF_DOWNSTREAM_NODE_CHANGE

```

```

- SESSION_TYPE_CHANGE
- UNSUCCESSFUL_SERVICE_DELIVERY
- SERVICE_CHANGE
- NUMBER_OF_TALK_BURST_LIMIT
- SERVICE_DELIVERY_END_SUCCESSFULLY
- UE_TIMEZONE_CHANGE
- PLMN_CHANGE
- SESSION_AMBR_CHANGE
- REMOVAL_OF_UPF
type: string
localRecordSequenceNumber:
  description: "Consecutive record number created by the CDF. The
number is allocated sequentially including all CDR types. Populated by CHF."
  example: 15
  type: integer
recordExtensions:
  $ref: '#/components/schemas/ManagementExtensions'
pDUSessionChargingInformation:
  $ref: '#/components/schemas/PDUSessionChargingInformation'
roamingQBCInformation:
  $ref: '#/components/schemas/RoamingQBCInformation'
SMSChargingInformation:
  $ref: '#/components/schemas/SMSChargingInformation'
serviceSpecificationInfo:
  description: "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."
  type: string
required:
- recordType
- subscriberIdentifier
- nfConsumerIdentification
- duration
- causeForRecordClosing
NFIdentification:
  properties:
    nFName:
      description: "Name of the Network Function Used"
      format: uuid
      type: string
    nFIPv4Address:
      $ref: '#/components/schemas/Ipv4Addr'
    nFIPv6Address:
      $ref: '#/components/schemas/Ipv6Addr'
    nFPLMNID:
      $ref: '#/components/schemas/PlmnId'
    nodeFunctionality:
      $ref: '#/components/schemas/NodeFunctionality'
    nFFqdn:
      description: "Fully qualified domain name (FQDN) is the complete
domain name for a specific network function."
      example: "mypeer.somesmf.ora"
      type: string
  required:
- nodeFunctionality
type: object

```

```

MultipleUnitUsage:
  description: "This field holds the parameters for the unit reporting.
It may have multiple occurrences."
  properties:
    ratingGroup:
      $ref: '#/components/schemas/RatingGroup'
    usedUnitContainer:
      items:
        $ref: '#/components/schemas/UsedUnitContainer'
      minItems: 0
      type: array
    uPFID:
      description: "This field holds the UPF identifier used to identify
the UPF when reporting the usage for the UPF"
      format: uuid
      type: string
    required:
      - ratingGroup
      type: object
  Trigger:
    description: "This field holds the triggers that are common to all
Multiple Unit Usage. Can be the same as in Used Unit Container."
    properties:
      triggerType:
        $ref: '#/components/schemas/TriggerType'
      triggerCategory:
        $ref: '#/components/schemas/TriggerCategory'
      timeLimit:
        description: "Time limit if trigger type is 'Expiry of data time
limit'."
        type: integer
      volumeLimit:
        description: "Volume limit if trigger type is 'Expiry of data
volume limit'."
        allOf:
          - $ref: '#/components/schemas/Uint32'
      volumeLimit64:
        description: "Volume limit if trigger type is 'Expiry of data
volume limit'."
        allOf:
          - $ref: '#/components/schemas/Uint64'
      maxNumberOfccc:
        description: "Maximum number if trigger type is 'Max number of
charging condition changes'."
        allOf:
          - $ref: '#/components/schemas/Uint32'
      required:
        - triggerCategory
        - triggerType
      type: object
  UsedUnitContainer:
    description: "This field holds the used units and information connected
to the reported units. Enriched by CHF."
    properties:
      serviceId:
        $ref: '#/components/schemas/ServiceId'

```

```

    quotaManagementIndicator:
      $ref: '#/components/schemas/QuotaManagementIndicator'
    triggers:
      items:
        $ref: '#/components/schemas/Trigger'
      minItems: 0
      type: array
    triggerTimestamp:
      description: "This field holds the timestamp when the reporting
trigger occur"
      allOf:
        - $ref: '#/components/schemas/DateTime'
    time:
      description: "This field holds the amount of used time in seconds.
This field is enriched by CHF."
      allOf:
        - $ref: '#/components/schemas/UInt32'
    totalVolume:
      description: "This field holds the amount of used volume in both
uplink and downlink directions in bytes. This field is enriched by CHF."
      allOf:
        - $ref: '#/components/schemas/UInt64'
    uplinkVolume:
      description: "This field holds the amount of used volume in uplink
direction in bytes. This field is enriched by CHF."
      allOf:
        - $ref: '#/components/schemas/UInt64'
    downlinkVolume:
      description: "This field holds the amount of used volume in
downlink direction in bytes. This field is enriched by CHF."
      allOf:
        - $ref: '#/components/schemas/UInt64'
    serviceSpecificUnits:
      description: "This field holds the amount of used service specific
units. This field is enriched by CHF."
      allOf:
        - $ref: '#/components/schemas/UInt64'
    eventTimeStamps:
      description: "This field holds the timestamps of the event reported
in the Service Specific Unit s, if the reported units are event based"
      items:
        $ref: '#/components/schemas/DateTime'
      minItems: 0
      type: array
    localSequenceNumber:
      description: "Holds the Used Unit sequence number, i.e. the order
when charging event occurs. It increased by 1 for each Used Unit generation.
Populated by CHF."
      example: 10
      type: integer
    ratingIndicator:
      description: "indicates if the units have been rated or not.
Populated by CHF."
      type: boolean
    pduContainerInformation:
      $ref: '#/components/schemas/PDUContainerInformation'

```

```

    required:
    - localSequenceNumber
    type: object
  ManagementExtension:
    description: "List of extension objects"
    items:
      $ref: '#/components/schemas/ManagementExtension'
    minItems: 0
    type: array
  ManagementExtensions:
    description: "Extension object"
    properties:
      possibleDuplicateUsage:
        $ref: '#/components/schemas/PossibleDuplicateUsage'
      incompleteCDR:
        $ref: '#/components/schemas/IncompleteCDR'
      staleSessionCleanup:
        $ref: '#/components/schemas/StaleSessionCleanup'
      lastInvocationSeqNumber:
        $ref: '#/components/schemas/LastInvocationSeqNumber'
  PDUSessionChargingInformation:
    description: "This field holds the 5G data connectivity specific
    information described in TS 32.255 [15]"
    properties:
      chargingId:
        $ref: '#/components/schemas/ChargingId'
      homeProvidedChargingId:
        $ref: '#/components/schemas/ChargingId'
      userInformation:
        $ref: '#/components/schemas/UserInformation'
      userLocationInfo:
        $ref: '#/components/schemas/UserLocation'
      mAPDUNon3GPPUserLocationInfo:
        $ref: '#/components/schemas/UserLocation'
      presenceReportingAreaInformation:
        description: "The presence Reporting Area status of UE during the
        used unit container interval"
        additionalProperties:
          $ref: '#/components/schemas/PresenceInfo'
        minProperties: 0
        type: object
      ueTimeZone:
        description: "Timezone where the User Equipment is located"
        allOf:
          - $ref: '#/components/schemas/TimeZone'
      pduSessionInformation:
        $ref: '#/components/schemas/PDUSessionInformation'
      unitCountInactivityTimer:
        type: integer
      rANSecondaryRATUsageReport:
        $ref: '#/components/schemas/RANSecondaryRATUsageReport'
    type: object
  UserInformation:
    properties:
      servedGPSI:
        $ref: '#/components/schemas/Gpsi'

```

```

    servedPEI:
      $ref: '#/components/schemas/Pei'
    unauthenticatedFlag:
      type: boolean
    roamerInOut:
      $ref: '#/components/schemas/RoamerInOut'
    type: object
PDUSessionInformation:
  properties:
    networkSlicingInfo:
      $ref: '#/components/schemas/NetworkSlicingInfo'
    pduSessionID:
      $ref: '#/components/schemas/PduSessionId'
    pduType:
      $ref: '#/components/schemas/PduSessionType'
    sscMode:
      $ref: '#/components/schemas/ScsMode'
    hPlmnId:
      $ref: '#/components/schemas/PlmnId'
    servingNetworkFunctionID:
      $ref: '#/components/schemas/ServingNetworkFunctionID'
    ratType:
      $ref: '#/components/schemas/RatType'
    mAPDUNon3GPPRATType:
      $ref: '#/components/schemas/RatType'
    dnnId:
      $ref: '#/components/schemas/Dnn'
    dnnSelectionMode:
      $ref: '#/components/schemas/dnnSelectionMode'
    chargingCharacteristics:
      pattern: "^[0-9a-fA-F]{1,4}$"
      type: string
    chargingCharacteristicsSelectionMode:
      $ref: '#/components/schemas/ChargingCharacteristicsSelectionMode'
    startTime:
      $ref: '#/components/schemas/DateTime'
    stopTime:
      $ref: '#/components/schemas/DateTime'
    "3gppPSDataOffStatus":
      $ref: '#/components/schemas/3GPPPSDataOffStatus'
    sessionStopIndicator:
      type: boolean
    pduAddress:
      $ref: '#/components/schemas/PDUAddress'
    diagnostics:
      type: integer
    authorizedQoSInformation:
      $ref: '#/components/schemas/AuthorizedDefaultQos'
    subscribedQoSInformation:
      $ref: '#/components/schemas/SubscribedDefaultQos'
    authorizedSessionAMBR:
      description: "This field holds the authorized session-AMBR"
      allof:
        - $ref: '#/components/schemas/Ambr'
    subscribedSessionAMBR:
      description: "This field holds the subscribed session-AMBR"

```

```

    allof:
      - $ref: '#/components/schemas/Ambr'
    servingCNPlmnId:
      $ref: '#/components/schemas/PlmnId'
    mAPDUSessionInformation:
      $ref: '#/components/schemas/MAPDUSessionInformation'
    required:
      - dnnId
      - pduSessionID
    type: object
  PDUContainerInformation:
    properties:
      timeofFirstUsage:
        description: "The UTC time indicating time stamp for the first IP
packet to be transmitted and mapped to the reporting used unit"
        allof:
          - $ref: '#/components/schemas/DateTime'
      timeofLastUsage:
        description: "The UTC time indicating time stamp for the last IP
packet to be transmitted and mapped to the reporting used unit"
        allof:
          - $ref: '#/components/schemas/DateTime'
      qoSInformation:
        $ref: '#/components/schemas/QoSData'
      qoSCharacteristics:
        $ref: '#/components/schemas/QoSCharacteristics'
      afChargingIdentifier:
        $ref: '#/components/schemas/ChargingId'
      afChargingIdString:
        type: string
      userLocationInformation:
        $ref: '#/components/schemas/UserLocation'
      uetimeZone:
        description: "Timezone where the User Equipment is located"
        allof:
          - $ref: '#/components/schemas/TimeZone'
      rATType:
        $ref: '#/components/schemas/RatType'
      servingNodeID:
        items:
          $ref: '#/components/schemas/ServingNetworkFunctionID'
        minItems: 0
        type: array
      presenceReportingAreaInformation:
        additionalProperties:
          $ref: '#/components/schemas/PresenceInfo'
        minProperties: 0
        type: object
      "3gppPSDataOffStatus":
        $ref: '#/components/schemas/3GPPPSDataOffStatus'
      sponsorIdentity:
        type: string
      applicationserviceProviderIdentity:
        type: string
      chargingRuleBaseName:
        description: "The reference to group of PCC rules predefined at the

```



```

SMF."
    type: string
    mAPDUSteeringFunctionality:
        $ref: '#/components/schemas/SteeringFunctionality'
    mAPDUSteeringMode:
        $ref: '#/components/schemas/SteeringMode'
    type: object
NetworkSlicingInfo:
    properties:
        sNSSAI:
            $ref: '#/components/schemas/Snssai'
    required:
        - sNSSAI
    type: object
PDUAddress:
    properties:
        pduIPv4Address:
            description: "The IPv4 address of the served SUPI allocated for the
PDU session"
            allOf:
                - $ref: '#/components/schemas/Ipv4Addr'
        pduIPv6AddresswithPrefix:
            description: "The IPv6 address with prefix of the served SUPI
allocated for the PDU session"
            allOf:
                - $ref: '#/components/schemas/Ipv6Addr'
        pduAddressprefixlength:
            description: "PDU Address prefix length of an IPv6 typed Served PDU
Address. The field needs not available for prefix length of 64 bits"
            type: integer
            example: 6
        ipv4dynamicAddressFlag:
            description: "This field indicates whether served IPv4 address is
dynamically allocated. This field is missing if address is static."
            type: boolean
            example: true
        ipv6dynamicPrefixFlag:
            description: "List of additional IPv6 prefix allocated for the PDU
session"
            type: boolean
            example: true
    type: object
ServingNetworkFunctionID:
    properties:
        servingNetworkFunctionInformation:
            $ref: '#/components/schemas/NFIdentification'
        amfId:
            $ref: '#/components/schemas/AmfId'
    required:
        - servingNetworkFunctionInformation
    type: object
RoamingQBCInformation:
    description: "This field holds the roaming 5G data connectivity
specific information described in TS 32.255 [15]"
    properties:
        multipleQFContainer:

```

```

        items:
          $ref: '#/components/schemas/MultipleQFIcontainer'
        minItems: 0
        type: array
      uPFID:
        format: uuid
        type: string
      roamingChargingProfile:
        $ref: '#/components/schemas/RoamingChargingProfile'
      type: object
    MultipleQFIcontainer:
      description: "This field holds the roaming 5G data connectivity
specific information described in TS 32.255 [15]"
      properties:
        triggers:
          items:
            $ref: '#/components/schemas/Trigger'
          minItems: 0
          type: array
        triggerTimestamp:
          description: "This field holds the timestamp when the reporting
trigger occur"
          allOf:
            - $ref: '#/components/schemas/DateTime'
        time:
          description: "This field holds the amount of used time."
          allOf:
            - $ref: '#/components/schemas/UInt32'
        totalVolume:
          description: "This field holds the amount of used volume in both
uplink and downlink directions."
          allOf:
            - $ref: '#/components/schemas/UInt64'
        uplinkVolume:
          description: "This field holds the amount of used volume in uplink
direction."
          allOf:
            - $ref: '#/components/schemas/UInt64'
        downlinkVolume:
          description: "This field holds the amount of used volume in
downlink direction."
          allOf:
            - $ref: '#/components/schemas/UInt64'
        localSequenceNumber:
          type: integer
        qFIContainerInformation:
          $ref: '#/components/schemas/QFIContainerInformation'
      required:
        - localSequenceNumber
      type: object
    QFIContainerInformation:
      properties:
        qFI:
          $ref: '#/components/schemas/Qfi'
        reportTime:
          $ref: '#/components/schemas/DateTime'

```

```

timeofFirstUsage:
  $ref: '#/components/schemas/DateTime'
timeofLastUsage:
  $ref: '#/components/schemas/DateTime'
qoSInformation:
  $ref: '#/components/schemas/QoSData'
qoSCharacteristics:
  $ref: '#/components/schemas/QoSCharacteristics'
userLocationInformation:
  $ref: '#/components/schemas/UserLocation'
uetimeZone:
  description: "Timezone where the User Equipment is located"
  allOf:
    - $ref: '#/components/schemas/TimeZone'
presenceReportingAreaInformation:
  additionalProperties:
    $ref: '#/components/schemas/PresenceInfo'
  minProperties: 0
  type: object
rATType:
  $ref: '#/components/schemas/RATType'
servingNetworkFunctionID:
  items:
    $ref: '#/components/schemas/ServingNetworkFunctionID'
  minItems: 0
  type: array
"3gppPSDataOffStatus":
  $ref: '#/components/schemas/3GPPPSDataOffStatus'
"3gppChargingId":
  $ref: '#/components/schemas/ChargingId'
diagnostics:
  type: integer
enhancedDiagnostics:
  items:
    type: string
  type: array
required:
- reportTime
type: object
RoamingChargingProfile:
  properties:
    triggers:
      items:
        $ref: '#/components/schemas/Trigger'
      minItems: 0
      type: array
    partialRecordMethod:
      $ref: '#/components/schemas/PartialRecordMethod'
  type: object
SMSChargingInformation:
  description: "This field holds the SMS specific information described
in TS 32.274 [34].\"
  properties:
    originatorInfo:
      $ref: '#/components/schemas/OriginatorInfo'
    recipientInfo:

```

```

      items:
        $ref: '#/components/schemas/RecipientInfo'
      minItems: 0
      type: array
    userEquipmentInfo:
      $ref: '#/components/schemas/Pei'
    userLocationInfo:
      $ref: '#/components/schemas/UserLocation'
    uetimeZone:
      description: "Timezone where the User Equipment is located"
      allOf:
        - $ref: '#/components/schemas/TimeZone'
    rATType:
      $ref: '#/components/schemas/RatType'
    smSCAddress:
      type: string
    smDataCodingScheme:
      type: integer
    smMessageType:
      $ref: '#/components/schemas/SMMessageType'
    smReplyPathRequested:
      $ref: '#/components/schemas/ReplyPathRequested'
    smUserDataHeader:
      type: string
    smStatus:
      type: string
    smDischargeTime:
      $ref: '#/components/schemas/DateTime'
    numberOfMessagesSent:
      $ref: '#/components/schemas/Uint32'
    smServiceType:
      $ref: '#/components/schemas/SMServiceType'
    smSequenceNumber:
      $ref: '#/components/schemas/Uint32'
    smSresult:
      $ref: '#/components/schemas/Uint32'
    submissionTime:
      $ref: '#/components/schemas/DateTime'
    smPriority:
      $ref: '#/components/schemas/SMPriority'
    messageReference:
      type: string
    messageSize:
      $ref: '#/components/schemas/Uint32'
    messageClass:
      $ref: '#/components/schemas/MessageClass'
    deliveryReportRequested:
      $ref: '#/components/schemas/DeliveryReportRequested'
  type: object
OriginatorInfo:
  properties:
    originatorSUPI:
      $ref: '#/components/schemas/Supi'
    originatorGPSI:
      $ref: '#/components/schemas/Gpsi'
    originatorOtherAddress:

```

```

    $ref: '#/components/schemas/SMAddressInfo'
  originatorReceivedAddress:
    $ref: '#/components/schemas/SMAddressInfo'
  originatorSCCPAddress:
    type: string
  sMOriginatorInterface:
    $ref: '#/components/schemas/SMInterface'
  sMOriginatorProtocolId:
    type: string
  type: object
RecipientInfo:
  properties:
    recipientSUPI:
      $ref: '#/components/schemas/Supi'
    recipientGPSI:
      $ref: '#/components/schemas/Gpsi'
    recipientOtherAddress:
      $ref: '#/components/schemas/SMAddressInfo'
    recipientReceivedAddress:
      $ref: '#/components/schemas/SMAddressInfo'
    recipientSCCPAddress:
      type: string
    sMDestinationInterface:
      $ref: '#/components/schemas/SMInterface'
    sMrecipientProtocolId:
      type: string
    type: object
SMAddressInfo:
  properties:
    sMaddressType:
      $ref: '#/components/schemas/SMAddressType'
    sMaddressData:
      type: string
    sMaddressDomain:
      $ref: '#/components/schemas/SMAddressDomain'
    type: object
MessageClass:
  description: "Implementation dependent the value selected for a
specific transaction."
  example:
    classIdentifier: null
    tokenText: tokenText
  properties:
    classIdentifier:
      $ref: '#/components/schemas/ClassIdentifier'
    tokenText:
      type: string
    type: object
SMAddressDomain:
  description: "The domain/network to which the associated address
resides"
  properties:
    domainName:
      type: string
    "3GPPIMSIMCCMNC":
      type: string

```

```

    type: object
  SMInterface:
    description: "Containing information describing the interface on which
the SM was requested to be delivered"
    properties:
      interfaceId:
        description: "The interface identification provided by the
messaging node (originator/destination). interfaceText string"
        type: string
      interfaceText:
        description: "It is the consolidation information about the
application associated with the charging event"
        type: string
      interfacePort:
        description: "The port-identification or contains information about
the transport layer port used by the application associated with the charging
event"
        type: string
      interfaceType:
        $ref: '#/components/schemas/InterfaceType'
    type: object
  RANSecondaryRATUsageReport:
    properties:
      rANSecondaryRATType:
        $ref: '#/components/schemas/RatType'
      qosFlowsUsageReports:
        items:
          $ref: '#/components/schemas/QosFlowsUsageReport'
        type: array
    type: object
  QosFlowsUsageReport:
    properties:
      qFI:
        $ref: '#/components/schemas/Qfi'
      startTimestamp:
        $ref: '#/components/schemas/DateTime'
      endTimestamp:
        $ref: '#/components/schemas/DateTime'
      uplinkVolume:
        $ref: '#/components/schemas/Uint64'
      downlinkVolume:
        $ref: '#/components/schemas/Uint64'
    type: object
  MAPDUSessionInformation:
    properties:
      mAPDUSessionIndicator:
        $ref: '#/components/schemas/MapduIndication'
      aTSSSCapability:
        $ref: '#/components/schemas/AtssscCapability'
    type: object
  NodeFunctionality:
    description: "Type of Network Function Node"
    enum:
      - AMF
      - SMF
      - SMSF

```

```
- SGW
- I_SMF
- ePDG
- CEF
type: string
ChargingCharacteristicsSelectionMode:
  description: "Home - The subscriber belongs to the same PLMN as the
SMF, Roaming - The subscriber belongs to same PLMN and the AMF belongs to a
different PLMN, Visiting - The subscriber belongs to a different PLMN"
  enum:
    - HOME_DEFAULT
    - ROAMING_DEFAULT
    - VISITING_DEFAULT
  type: string
TriggerType:
  description: "The events whose occurrence lead to charging event is
issued towards the CHF."
  enum:
    - QUOTA_THRESHOLD
    - QHT
    - FINAL
    - QUOTA_EXHAUSTED
    - VALIDITY_TIME
    - OTHER_QUOTA_TYPE
    - FORCED_REAUTHORISATION
    - UNUSED_QUOTA_TIMER
    - UNIT_COUNT_INACTIVITY_TIMER
    - ABNORMAL_RELEASE
    - QOS_CHANGE
    - VOLUME_LIMIT
    - TIME_LIMIT
    - EVENT_LIMIT
    - PLMN_CHANGE
    - USER_LOCATION_CHANGE
    - RAT_CHANGE
    - SESSION_AMBR_CHANGE
    - UE_TIMEZONE_CHANGE
    - TARIFF_TIME_CHANGE
    - MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS
    - MANAGEMENT_INTERVENTION
    - CHANGE_OF_UE_PRESENCE_IN_PRESENCE_REPORTING_AREA
    - CHANGE_OF_3GPP_PS_DATA_OFF_STATUS
    - SERVING_NODE_CHANGE
    - REMOVAL_OF_UPF
    - ADDITION_OF_UPF
    - INSERTION_OF_ISMF
    - REMOVAL_OF_ISMF
    - CHANGE_OF_ISMF
    - START_OF_SERVICE_DATA_FLOW
    - ECGI_CHANGE
    - TAI_CHANGE
    - HANDOVER_CANCEL
    - HANDOVER_START
    - HANDOVER_COMPLETE
    - GFBR_GUARANTEED_STATUS_CHANGE
    - ADDITION_OF_ACCESS
```

```

- REMOVAL_OF_ACCESS
- START_OF_SDF_ADDITIONAL_ACCESS
type: string
TriggerCategory:
  description: "This field indicates whether the charging data generated
by the NF consumer for the trigger lead to a Charging Event towards the CHF
immediately or not"
  enum:
    - IMMEDIATE_REPORT
    - DEFERRED_REPORT
  type: string
QuotaManagementIndicator:
  description: "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.
Passed through CHF, Default is offline if absent."
  enum:
    - ONLINE_CHARGING
    - OFFLINE_CHARGING
    - QUOTA_MANAGEMENT_SUSPENDED
  type: string
"3GPPPSDataOffStatus":
  description: "3GPP Data Status either active or not"
  enum:
    - ACTIVE
    - INACTIVE
  type: string
PartialRecordMethod:
  description: "Method uses for partial record closure"
  enum:
    - DEFAULT
    - INDIVIDUAL
  type: string
RoamerInOut:
  description: "The enumeration RoamerInOut indicates whether the user is
an in-bound or out-bound roamer."
  enum:
    - IN_BOUND
    - OUT_BOUND
  type: string
SMMessageType:
  description: "Identifies the message that triggered the generation of
charging information."
  enum:
    - SUBMISSION
    - DELIVERY_REPORT
    - SM_SERVICE_REQUEST
  type: string
SMPriority:
  description: "Any priority information associated with an SM"
  enum:
    - LOW
    - NORMAL
    - HIGH
  type: string
DeliveryReportRequested:

```



```
description: "Indicates if delivery report is requested"
enum:
- "true"
- "false"
type: string
InterfaceType:
description: "Type of interface / nature of the transaction in the
messaging node for which the charging event occurs"
enum:
- UNKNOWN
- MOBILE_ORIGINATING
- MOBILE_TERMINATING
- APPLICATION_ORIGINATING
- APPLICATION_TERMINATING
type: string
ClassIdentifier:
description: "Indicate the class identifier"
enum:
- PERSONAL
- ADVERTISEMENT
- INFORMATIONAL
- AUTO
type: string
SMAddressType:
description: "The type of address carried"
enum:
- EMAIL_ADDRESS
- MSISDN
- IPV4_ADDRESS
- IPV6_ADDRESS
- NUMERIC_SHORTCODE
- ALPHANUMERIC_SHORTCODE
- OTHER
- IMSI
type: string
SMSServiceType:
description: "The type of SM service that caused the charging
interaction. It is only applicable for SM supplementary service procedures"
enum:
- VAS4SMS_SHORT_MESSAGE_CONTENT_PROCESSING
- VAS4SMS_SHORT_MESSAGE_FORWARDING
- VAS4SMS_SHORT_MESSAGE_FORWARDING_MULTIPLE_SUBSCRIPTIONS
- VAS4SMS_SHORT_MESSAGE_FILTERING
- VAS4SMS_SHORT_MESSAGE_RECEIPT
- VAS4SMS_SHORT_MESSAGE_NETWORK_STORAGE
- VAS4SMS_SHORT_MESSAGE_TO_MULTIPLE_DESTINATIONS
- VAS4SMS_SHORT_MESSAGE_VIRTUAL_PRIVATE_NETWORK(VPN)
- VAS4SMS_SHORT_MESSAGE_AUTO_REPLY
- VAS4SMS_SHORT_MESSAGE_PERSONAL_SIGNATURE
- VAS4SMS_SHORT_MESSAGE_DEFERRED_DELIVERY
type: string
ReplyPathRequested:
enum:
- NO_REPLY_PATH_SET
- REPLY_PATH_SET
type: string
```

```

dnnSelectionMode:
  description: "The enumeration DnnSelectionMode indicates whether the
DNN of a PDU session being established corresponds to an explicitly
subscribed DNN or to the usage of a wildcard subscription. "
  enum:
    - VERIFIED
    - UE_DNN_NOT_VERIFIED
    - NW_DNN_NOT_VERIFIED
  type: string
Supi:
  description: "String identifying a Supi shall contain either an IMSI or
an NAI"
  pattern: "^(imsi-[0-9]{5,15}|nai-.+|gci-.+|gli-.+|.+) $"
  type: string
DateTime:
  description: "Timestamp in UTC"
  format: date-time
  type: string
Uint32:
  maximum: 4294967295
  minimum: 0
  type: integer
Uint64:
  maximum: 18446744073709551615
  minimum: 0
  type: integer
Ipv4Addr:
  description: "An IPv4 Address Type with three periods and four octets
between 0-255"
  example: 198.51.100.1
  pattern: "^(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\\.){3}
([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5]) $"
  type: string
Ipv6Addr:
  description: "An IPv6 address has the format y:y:y:y:y:y:y:y, where y
is called a segment and can be any hexadecimal value between 0 and FFFF. The
segments are separated by colons"
  example: 2001:db8:85a3::8a2e:370:7334
  type: string
PlmnId:
  description: "Indicates the identity of the PLMN that the RAN node
belongs to"
  properties:
    mcc:
      $ref: '#/components/schemas/Mcc'
    mnc:
      $ref: '#/components/schemas/Mnc'
  required:
    - mcc
    - mnc
  type: object
Mcc:
  description: "Three digit Mobile Country Code Value"
  example: 272
  pattern: "^\\d{3} $"
  type: string

```

```

Mnc:
  description: "Two or three digit Mobile Network Code Value"
  example: 03
  pattern: "^\\d{2,3}$"
  type: string
RatingGroup:
  description: "IP service flow identity, this field holds the rating
group. The parameter corresponds to the Charging Key as specified in TS
23.203 [203]"
  maximum: 4294967295
  minimum: 0
  type: integer
ServiceId:
  description: "Identifier of a Service"
  maximum: 4294967295
  minimum: 0
  type: integer
ChargingId:
  description: "Charging identifier allowing correlation of charging
information"
  maximum: 4294967295
  minimum: 0
  type: integer
UserLocation:
  description: "Indicates the location of the subscriber"
  properties:
    eutraLocation:
      $ref: '#/components/schemas/EutraLocation'
    nrLocation:
      $ref: '#/components/schemas/NrLocation'
    n3gaLocation:
      $ref: '#/components/schemas/N3gaLocation'
  type: object
EutraLocation:
  description: "E-UTRA user location"
  properties:
    tai:
      $ref: '#/components/schemas/Tai'
    ecgi:
      $ref: '#/components/schemas/Ecgi'
    ignoreEcgi:
      default: false
      type: boolean
    ageOfLocationInformation:
      maximum: 32767
      minimum: 0
      type: integer
    ueLocationTimestamp:
      $ref: '#/components/schemas/DateTime'
    geographicalInformation:
      pattern: "^[0-9A-F]{16}$"
      type: string
    geodeticInformation:
      pattern: "^[0-9A-F]{20}$"
      type: string
    globalNgenbId:

```

```

        $ref: '#/components/schemas/GlobalRanNodeId'
      globaleNbId:
        $ref: '#/components/schemas/GlobalRanNodeId'
      required:
      - ecgi
      - tai
      type: object
    Tai:
      description: "Tracking Area Identity"
      properties:
        plmnId:
          $ref: '#/components/schemas/PlmnId'
        tac:
          $ref: '#/components/schemas/Tac'
        nid:
          $ref: '#/components/schemas/Nid'
      required:
      - plmnId
      - tac
      type: object
    Tac:
      pattern: "([A-Fa-f0-9]{4}$)|([A-Fa-f0-9]{6}$)"
      type: string
    Nid:
      description: "Network Identity"
      pattern: "[A-Fa-f0-9]{11}$"
      type: string
    Ecgi:
      description: "E-UTRA Cell Identity"
      properties:
        plmnId:
          $ref: '#/components/schemas/PlmnId'
        eutraCellId:
          $ref: '#/components/schemas/EutraCellId'
        nid:
          $ref: '#/components/schemas/Nid'
      required:
      - eutraCellId
      - plmnId
      type: object
    EutraCellId:
      description: "E-UTRA Cell Identity"
      pattern: "[A-Fa-f0-9]{7}$"
      type: string
    GlobalRanNodeId:
      description: "RAN Node Ids, populated only if present. At least one of
the attributes from n3IwfId, gNbId and ngeNbId is also required."
      type: object
      properties:
        plmnId:
          $ref: '#/components/schemas/PlmnId'
        n3IwfId:
          $ref: '#/components/schemas/N3IwfId'
        gNbId:
          $ref: '#/components/schemas/GNbId'
        ngeNbId:

```

```

        $ref: '#/components/schemas/NgeNbId'
      required:
        - plmnId
    N3IwfId:
      description: "This IE shall contain the N3IWF identifier received over
NGAP and shall be encoded as a string of hexadecimal characters"
      pattern: "^[A-Fa-f0-9]+$"
      type: string
    GNBId:
      description: "It indicates the global identity of the gNodeB in which
the UE is currently located. See 3GPP TS 38.413 [11] subclause 9.3.1.6"
      properties:
        bitLength:
          maximum: 32
          minimum: 22
          type: integer
        gNBValue:
          pattern: "^[A-Fa-f0-9]{6,8}$"
          type: string
      required:
        - bitLength
        - gNBValue
      type: object
    NgeNbId:
      description: "This represents the identifier of the ng-eNB ID as
specified in subclause 9.3.1.8 of 3GPP TS 38.413 [11]"
      type: string
      pattern: '^(MacroNGeNB-[A-Fa-f0-9]{5}|LMacroNGeNB-[A-Fa-f0-9]{6}|
SMacroNGeNB-[A-Fa-f0-9]{5})$'
    WAgfId:
      type: string
      pattern: '^[A-Fa-f0-9]+$'
    TngfId:
      type: string
      pattern: '^[A-Fa-f0-9]+$'
    ENbId:
      type: string
      pattern: '^(MacroeNB-[A-Fa-f0-9]{5}|LMacroeNB-[A-Fa-f0-9]{6}|SMacroeNB-
[A-Fa-f0-9]{5}|HomeeNB-[A-Fa-f0-9]{7})$'
    NrLocation:
      description: "NR user location"
      properties:
        tai:
          $ref: '#/components/schemas/Tai'
        ncgi:
          $ref: '#/components/schemas/Ncgi'
        ageOfLocationInformation:
          description: "The value represents the elapsed time in minutes
since the last network contact of the mobile station"
          maximum: 32767
          minimum: 0
          type: integer
        ueLocationTimestamp:
          description: "The value represents the UTC time when the UeLocation
information was acquired."
          format: date-time

```

```

        type: string
        geographicalInformation:
            description: "Only the description of an ellipsoid point with
uncertainty circle is allowed to be used"
            pattern: "^[0-9A-F]{16}$"
            type: string
        geodeticInformation:
            description: "Refers to Calling Geodetic Location"
            pattern: "^[0-9A-F]{20}$"
            type: string
        globalGnbId:
            $ref: '#/components/schemas/GlobalRanNodeId'
        required:
        - ncgi
        - tai
        type: object
    Ncgi:
        description: "NR cell Ids"
        properties:
            plmnId:
                $ref: '#/components/schemas/PlmnId'
            nrCellId:
                $ref: '#/components/schemas/NrCellId'
            nid:
                $ref: '#/components/schemas/Nid'
        required:
        - nrCellId
        - plmnId
        type: object
    NrCellId:
        description: "36-bit string identifying an NR Cell Id as specified in
subclause 9.3.1.7 of 3GPP TS 38.413 [11], in hexadecimal representation"
        example: "225BD6007"
        pattern: "^[A-Fa-f0-9]{9}$"
        type: string
    N3gaLocation:
        description: "Non-3GPP access user location"
        properties:
            n3gppTai:
                $ref: '#/components/schemas/Tai'
            n3IwfId:
                $ref: '#/components/schemas/N3IwfId'
            ueIpv4Addr:
                $ref: '#/components/schemas/Ipv4Addr'
            ueIpv6Addr:
                $ref: '#/components/schemas/Ipv6Addr'
            portNumber:
                description: "UDP or TCP source port number."
                minimum: 0
                type: integer
            tnapId:
                $ref: '#/components/schemas/TnapId'
            twapId:
                $ref: '#/components/schemas/TwapId'
            hfcNodeId:
                $ref: '#/components/schemas/HfcNodeId'

```

```

        gli:
          $ref: '#/components/schemas/Gli'
        w5gbanLineType:
          $ref: '#/components/schemas/LineType'
        gci:
          $ref: '#/components/schemas/Gci'
        type: object
    TnapId:
      description: "This IE shall contain the TNAP Identifier, see clause
5.6.2 of 3GPP TS 23.501 [8]."
```

properties:

```

      ssid:
        $ref: '#/components/schemas/SsId'
      bssId:
        $ref: '#/components/schemas/BssId'
      civicAddress:
        $ref: '#/components/schemas/Bytes'
      type: object
    Bytes:
      description: "Value in bytes"
      example: 01001000
      format: byte
      type: string
    BssId:
      example: "weget1204"
      type: string
    SsId:
      example: "weget1204"
      type: string
    TwapId:
      description: "This IE shall contain the TWAP Identifier, see clause
4.2.8.5.3 of 3GPP TS 23.501 [8]."
```

properties:

```

      ssid:
        $ref: '#/components/schemas/SsId'
      bssId:
        $ref: '#/components/schemas/BssId'
      civicAddress:
        $ref: '#/components/schemas/Bytes'
      required:
        - ssid
      type: object
    HfcNodeId:
      description: "This IE shall contain the HFC Node Identifier received
over NGAP. It shall be present for a 5G-CRG/FN-CRG accessing the 5GC via
wireline access network."
```

properties:

```

      hfcNId:
        $ref: '#/components/schemas/HfcNId'
      required:
        - hfcNId
      type: object
    HfcNId:
      description: "HFC Node Id."
      maxLength: 6
      type: string
```

```

Gli:
  description: "This IE shall contain the Global Line Identifier. It
shall be present for a 5G-BRG/FN-BRG accessing the 5GC via wireline access
network."
  format: byte
  type: string
LineType:
  enum:
    - DSL
    - PON
  type: string
Gci:
  description: "This IE shall contain the Global Cable Identifier. It
shall be present for the N5GC device accessing the 5GC via wireline access
network. See clause 4.10a of 3GPP TS 23.316 [30]"
  type: string
PresenceInfo:
  description: "The Presence Reporting Area status of UE during the
container interval."
  properties:
    praId:
      description: "Represents an identifier to the specified area. "
      type: string
    additionalPraId:
      type: string
    presenceState:
      $ref: '#/components/schemas/PresenceState'
    trackingAreaList:
      items:
        $ref: '#/components/schemas/Tai'
      minItems: 1
      type: array
    ecgiList:
      items:
        $ref: '#/components/schemas/Ecgi'
      minItems: 1
      type: array
    ncgiList:
      items:
        $ref: '#/components/schemas/Ncgi'
      minItems: 1
      type: array
    globalRanNodeIdList:
      items:
        $ref: '#/components/schemas/GlobalRanNodeId'
      minItems: 1
      type: array
    globaleNbIdList:
      items:
        $ref: '#/components/schemas/GlobalRanNodeId'
      minItems: 1
      type: array
  type: object
PresenceState:
  description: "Indicates whether the UE is inside or outside of the area
of interest , or if the presence reporting area is inactive in the serving

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node."
  enum:
    - IN_AREA
    - OUT_OF_AREA
    - UNKNOWN
    - INACTIVE
  type: string
TimeZone:
  description: "The timezone offset from UTC"
  type: string
Gpsi:
  description: "Generic Public Subscription Identifier (GPSI) is used for
addressing a 3GPP subscription in different data networks outside of the 3GPP
system. For devices that are capable of accessing a 3GPP network, the PEI
will be an MSISDN"
  pattern: "^(msisdn-[0-9]{5,15}|extid-[^@]+@[^@]+|.+) $"
  type: string
Pei:
  description: "Permanent Equipment Identifier, the means by which the
network identifies the User Equipment (for devices that are capable of
accessing a 3GPP network, the PEI will be an IMEI)"
  pattern: "^(imei-[0-9]{15}|imeisv-[0-9]{16}|mac((-[0-9a-fA-F]{2}){6})(-
untrusted)?|eui((-[0-9a-fA-F]{2}){8})|.+) $"
  type: string
PduSessionId:
  description: "Unsigned integer identifying a PDU session, within the
range 0 to 255, as specified in subclause 11.2.3.1b, bits 1 to 8, of 3GPP TS
24.007 [13]"
  maximum: 255
  minimum: 0
  type: integer
PduSessionType:
  description: "The enumeration PduSessionType indicates the type of a
PDU session"
  example:
    IPV4
  enum:
    - IPV4
    - IPV6
    - IPV4V6
    - UNSTRUCTURED
    - ETHERNET
  type: string
SscMode:
  description: "Represents the service and session continuity mode"
  enum:
    - SSC_MODE_1
    - SSC_MODE_2
    - SSC_MODE_3
  type: string
RatType:
  example: EUTRA
  description: "Indicate which Radio Access Technology is currently
serving the UE"
  enum:
    - NR

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- EUTRA
- WLAN
- VIRTUAL
- NBIOT
- WIRELINE
- WIRELINE_CABLE
- WIRELINE_BBF
- LTE-M
- NR_U
- EUTRA_U
- TRUSTED_N3GA
- TRUSTED_WLAN
- UTRA
- GERA
type: string
Dnn:
  description: "String representing a Data Network as defined in
subclause 9A of 3GPP TS 23.003 [7]. It shall be formatted as string in which
the labels are separated by dots (e.g.Label1.Label2.Label3)"
  type: string
AuthorizedDefaultQos:
  description: "This field holds the authorized QoS applied to PDU
session. Refer 3GPP TS 29.512 [302]"
  properties:
    "5qi":
      $ref: '#/components/schemas/5Qi'
    arp:
      $ref: '#/components/schemas/Arp'
    priorityLevel:
      description: "Unsigned integer indicating the 5QI Priority Level,
within a range of 1 to 127."
      maximum: 127
      minimum: 1
      nullable: true
      type: integer
    averWindow:
      $ref: '#/components/schemas/AverWindow'
    maxDataBurstVol:
      $ref: '#/components/schemas/MaxDataBurstVol'
    maxbrUl:
      description: "Indicates the max bandwidth in uplink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    maxbrDl:
      description: "Indicates the max bandwidth in downlink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    gbrUl:
      description: "Indicates the guranteed bandwidth in uplink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    gbrDl:
      description: "Indicates the guranteed bandwidth in downlink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    qnc:

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        description: "Indicates whether notifications are requested from
3GPP NG-RAN when the GFBR can no longer (or again) be guaranteed for a QoS
Flow during the lifetime of the QoS Flow."
        type: boolean
        extMaxDataBurstVol:
            $ref: '#/components/schemas/ExtMaxDataBurstVol'
        type: object
SubscribedDefaultQos:
    description: "Subscribed default QoS. Refer to 3GPP TS 29.571 [371]"
    properties:
        "5qi":
            $ref: '#/components/schemas/5Qi'
        arp:
            $ref: '#/components/schemas/Arp'
        priorityLevel:
            description: "Unsigned integer indicating the 5QI Priority Level,
within a range of 1 to 127."
            maximum: 127
            minimum: 1
            type: integer
        required:
            - 5qi
            - arp
        type: object
5Qi:
    description: "Default 5G QoS identifier"
    type: integer
    minimum: 0
    maximum: 255
Arp:
    description: "Default Allocation and Retention Priority"
    properties:
        priorityLevel:
            maximum: 15
            minimum: 1
            type: integer
        preemptCap:
            $ref: '#/components/schemas/PreemptionCapability'
        preemptVuln:
            $ref: '#/components/schemas/PreemptionVulnerability'
        required:
            - preemptCap
            - preemptVuln
            - priorityLevel
        type: object
PreemptionCapability:
    description: "Indicates the pre-emption capability of a request on
other QoS flow"
    enum:
        - NOT_PREEMPT
        - MAY_PREEMPT
    type: string
PreemptionVulnerability:
    description: "Indicates the pre-emption vulnerability of the QoS flow
to pre-emption from other QoS flows."
    enum:

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- NOT_PREEMPTABLE
- PREEMPTABLE
type: string
Ambr:
  description: "Session AMBR."
  example:
    uplink: uplink
    downlink: downlink
  properties:
    uplink:
      $ref: '#/components/schemas/BitRate'
    downlink:
      $ref: '#/components/schemas/BitRate'
  required:
    - downlink
    - uplink
  type: object
BitRate:
  description: "Data volume over time e.g. 125 Mbps, 0.125 Gbps, 125000
Kbps"
  example: "124 Mbps"
  pattern: ^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$
  type: string
QosData:
  nullable: true
  properties:
    qosId:
      description: "Univocally identifies the QoS control policy data
within a PDU session."
      example: "11522304-100"
      type: string
    "5qi":
      $ref: '#/components/schemas/5Qi'
    maxbrUl:
      description: "Indicates the max bandwidth in uplink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    maxbrDl:
      description: "Indicates the max bandwidth in downlink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    gbrUl:
      description: "Indicates the guranteed bandwidth in uplink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    gbrDl:
      description: "Indicates the guranteed bandwidth in downlink."
      allOf:
        - $ref: '#/components/schemas/BitRate'
    arp:
      $ref: '#/components/schemas/Arp'
    qnc:
      description: "Indicates whether notifications are requested from
3GPP NG-RAN when the GFBR can no longer (or again) be guaranteed for a QoS
Flow during the lifetime of the QoS Flow."
      type: boolean

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    priorityLevel:
      maximum: 127
      minimum: 1
      nullable: true
      type: integer
    averWindow:
      $ref: '#/components/schemas/AverWindow'
    maxDataBurstVol:
      $ref: '#/components/schemas/MaxDataBurstVol'
    reflectiveQos:
      description: "Indicates whether the QoS information is reflective
for the corresponding service data flow."
      type: boolean
    sharingKeyDl:
      description: "Indicates, by containing the same value, what PCC
rules may share resource in downlink direction."
      example: sharingKeyDl
      type: string
    sharingKeyUl:
      description: "Indicates, by containing the same value, what PCC
rules may share resource in uplink direction."
      example: sharingKeyUl
      type: string
    maxPacketLossRateDl:
      description: "Value of Maximum Packet Loss Rate for Download"
      maximum: 1000
      minimum: 0
      nullable: true
      type: integer
    maxPacketLossRateUl:
      description: "Value of Maximum Packet Loss Rate for Upload"
      maximum: 1000
      minimum: 0
      nullable: true
      type: integer
    defQosFlowIndication:
      description: "Indicates that the dynamic PCC rule shall always have
its binding with the QoS Flow associated with the default QoS rule"
      type: boolean
    extMaxDataBurstVol:
      $ref: '#/components/schemas/ExtMaxDataBurstVol'
    packetDelayBudget:
      minimum: 1
      type: integer
    packetErrorRate:
      description: "String indicating the packet error rate."
      pattern: "^[0-9]E-[0-9])$"
      type: string
    required:
      - qosId
    type: object
  QosCharacteristics:
    description: "Map of QoS characteristics for non standard 5QIs and non-
preconfigured 5QIs"
    properties:
      "5qi":

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    $ref: '#/components/schemas/5Qi'
  resourceType:
    $ref: '#/components/schemas/QosResourceType'
  priorityLevel:
    maximum: 127
    minimum: 1
    type: integer
  packetDelayBudget:
    $ref: '#/components/schemas/PacketDelBudget'
  packetErrorRate:
    $ref: '#/components/schemas/PacketErrRate'
  averagingWindow:
    $ref: '#/components/schemas/AverWindow'
  maxDataBurstVol:
    $ref: '#/components/schemas/MaxDataBurstVol'
  extMaxDataBurstVol:
    $ref: '#/components/schemas/ExtMaxDataBurstVol'
  required:
    - 5qi
    - packetDelayBudget
    - packetErrorRate
    - priorityLevel
    - resourceType
  type: object
  SteeringFunctionality:
    description: "Indicates functionality to support traffic steering,
switching and splitting determined by the PCF."
    enum:
      - MPTCP
      - ATSSS_LL
    type: string
  SteeringMode:
    description: "Contains the steering mode value and parameters
determined by the PCF"
    example:
      steerModeValue: null
      standby: null
      prioAcc: null
      active: null
      "3gLoad": 0
    properties:
      steerModeValue:
        $ref: '#/components/schemas/SteerModeValue'
      active:
        $ref: '#/components/schemas/AccessType'
      standby:
        $ref: '#/components/schemas/AccessTypeRm'
      "3gLoad":
        minimum: 0
        type: integer
      prioAcc:
        $ref: '#/components/schemas/AccessType'
    required:
      - steerModeValue
    type: object
  SteerModeValue:

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        description: "Indicates the steering mode value determined by the PCF."
        enum:
        - ACTIVE_STANDBY
        - LOAD_BALANCING
        - SMALLEST_DELAY
        - PRIORITY_BASED
        type: string
    Snssai:
        description: "List of S-NSSAI "
        properties:
            sst:
                description: "Unsigned integer, within the range 0 to 255,
representing the Slice/Service Type"
                maximum: 255
                minimum: 0
                type: integer
            sd:
                description: "3-octet string, representing the Slice
Differentiator, in hexadecimal representation. "
                pattern: "^[A-Fa-f0-9]{6}$"
                type: string
        required:
        - sst
        type: object
    AmfId:
        description: "identifying the AMF ID composed of AMF Region ID (8
bits), AMF Set ID (10 bits) and AMF Pointer (6 bits) "
        pattern: "^[A-Fa-f0-9]{6}$"
        type: string
    Qfi:
        description: "Unsigned integer identifying a QoS flow, within the range
0 to 63."
        maximum: 63
        minimum: 0
        type: integer
    MaPduIndication:
        description: "Contains the MA PDU session indication"
        enum:
        - MA_PDU_REQUEST
        - MA_PDU_NETWORK_UPGRADE_ALLOWED
        type: string
    AtsssCapability:
        description: "Contains the ATSSS capability."
        example:
            rttWithoutPmf: false
            atsssLL: false
            mptcp: false
        properties:
            atsssLL:
                default: false
                type: boolean
            mptcp:
                default: false
                type: boolean
            rttWithoutPmf:
                default: false

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        type: boolean
    type: object
    PacketDelBudget:
        description: "Indicates the size of the packet available"
        minimum: 1
        type: integer
    PacketErrRate:
        description: "Indicates the rate of errors seen in the packet"
        pattern: "^[0-9]E-[0-9])$"
        type: string
    QosResourceType:
        description: "indicates whether a QoS Flow is non-GBR, delay critical
GBR, or non-delay critical GBR"
        enum:
            - NON_GBR
            - NON_CRITICAL_GBR
            - CRITICAL_GBR
        type: string
    AverWindow:
        description: "Indicates the averaging window."
        type: integer
        minimum: 1
        maximum: 4095
        default: 2000
    MaxDataBurstVol:
        description: "Unsigned integer indicating the maximum data burst
volume. "
        type: integer
        minimum: 1
        maximum: 4095
    ExtMaxDataBurstVol:
        description: "Unsigned integer indicating the maximum data burst
volume."
        type: integer
        minimum: 4096
        maximum: 2000000
    AccessType:
        description: "The identification of the type of access network."
        enum:
            - 3GPP_ACCESS
            - NON_3GPP_ACCESS
        type: string
    AccessTypeRm:
        description: "This data type is defined in the same way as the
AccessType data type, but with the OpenAPI nullable true property."
        enum:
            - 3GPP_ACCESS
            - NON_3GPP_ACCESS
            - NULL_VALUE
        type: string
    PossibleDuplicateUsage:
        description: "indicates if the CDR is a possible duplicate or not.
Populated by CHF."
        type: boolean
    IncompleteCDR:
        description: "indicates the possibility of usage missed while the CDR

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is generated. The usage records could come as a late CDR from another CHF site. Populated by CHF."

type: boolean

StaleSessionCleanup:

description: "indicates a CDR created due to Stale session cleanup and a possible failover. Populated by CHF."

type: boolean

LastInvocationSeqNumber:

description: "indicates invocationSequenceNumber of N40 request which was received by CHF for this charging session."

type: integer