Oracle® Communications Billing and Revenue Management

ECE 5G CHF Protocol Implementation Conformance Statement

Release 15.0
F86188-02
June 2024

ORACLE

Oracle Communications Billing and Revenue Management ECE 5G CHF Protocol Implementation Conformance Statement, Release 15.0

F86188-02

Contents

Preface

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 Function is 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

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

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 purpose only in the specifications document.

1

Charging Function – Charging Service

> **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.

The following table describes the section compliance of 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09).

Section Compliance

Table 1-1 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) 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	-
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	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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 header is 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	-
6.1.3.3.4.2.1	Description	Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.1.1	Type ChargingDataRequest	Supported	-
	subscriberIdentifier	Supported	
	nfConsumerIdentification	Supported with Extensions	
	invocationTimeStamp	Supported	
	invocationSequenceNumber	Supported	
	retransmissionIndicator	Supported with Extensions	
	oneTimeEvent	Supported with Extensions	
	oneTimeEventType	Supported with Extensions	
	notifyUri	Supported	
	supportedFeatures	Supported with Extensions	
	serviceSpecificationInfo	Supported with Extensions	
	multipleUnitUsage	Supported	
	triggers	Supported with Extensions	
6.1.6.2.1.2	Type ChargingDataResponse	Supported	-
	invocationTimeStamp	Supported	
	invocationResult	Supported	
	invocationSequenceNumber	Supported	
	sessionFailover	Supported with Extensions	
	supportedFeatures	Supported with Extensions	
	multipleUnitInformation	Supported	
	triggers	Supported with Extensions	
6.1.6.2.1.3	Type ChargingNotifyRequest	Supported with Extensions	-
	notificationType	Supported with Extensions	
	reauthorizatoinDetails	Supported with Extensions	
6.1.6.2.1.4	Type NFIdentification	Supported with Extensions	-
	nodeFunctionality	Supported with Extensions	
	nFName	Supported with Extensions	
	nFIPv4Address	Supported with Extensions	
	nfIPv6Address	Supported with Extensions	
	nFFqdn	Supported with Extensions	
	nFPLMNID	Supported with Extensions	
6.1.6.2.1.5	Type MultipleUnitUsage	Supported	-
	ratingGroup	Supported	
	requestedUnit	Supported	
	usedUnitContainer	Supported	
6.1.6.2.1.6	Type InvocationResult	Supported with Extensions	-
	error (ProblemDetails)	Supported with Extensions	
	failureHandling	Supported with Extensions	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.1.7	Type Trigger	Supported with Extensions	See 6.1.6.3.6 for supported Trigger types.
	triggerType	Supported with Extensions	
	triggerCategory	Supported with Extensions	
	timeLimit (DurationSec)	Supported with Extensions	
	volumeLimit	Supported with Extensions	
	volumeLimit64	Supported with Extensions	
	maxNumberOfccc	Supported with Extensions	
6.1.6.2.1.8	Type MultipleUnitInformation	Supported	-
	resultCode	Supported	
	ratingGroup	Supported	
	grantedUnit	Supported	
	triggers	Supported with Extensions	
	validityTime (DurationSec)	Supported	
	quotaHandlingTime (DurationSec)	Supported	
	finalUnitIndication	Supported	
	timeQuotaThreshold	Supported with Extensions	
	volumeQuotaThreshold	Supported	
	unitQuotaThreshold	Supported	
6.1.6.2.1.9	Type RequestedUnit	Supported	-
	time	Supported	
	totalVolume	Supported	
	uplinkVolume	Supported	
	downLinkVolume	Supported	
	serviceSpecificUnits	Supported	
6.1.6.2.1.10	Type UsedUnitContainer	Supported	-
	serviceId	Supported	
	quotaManagementIndicator	Supported	
	triggers	Supported with Extensions	
	triggerTimeStamp	Supported with Extensions	
	time	Supported	
	totalVolume	Supported	
	uplinkVolume	Supported	
	downlinkVolume	Supported	
	serviceSpecificUnits	Supported	
	eventTimeStamps	Supported with Extensions	
	localSequenceNumber	Supported with Extensions	
6.1.6.2.1.11	Type GrantedUnit	Supported	-
	tariffTimeChange	Supported	
	time	Supported	
	totalVolume	Supported	
	uplinkVolume	Supported	
	downlinkVolume	Supported	
	serviceSpecificUnits	Supported	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.1.12	Type FinalUnitIndication finalUnitAction restrictionFilterRule filterId redirectServer	Supported Supported Not Supported Not Supported Supported	-
6.1.6.2.1.13	Type RedirectServer redirectAddressType redirectServerAddress	Supported Supported Supported	-
6.1.6.2.1.14	Type ReauthorizationDetails service (serviceId) ratingGroup quotaManagementIndicator	Supported Supported Supported Supported	-
6.1.6.2.1.15	Void	Not applicable	-
6.1.6.2.1.16	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	The out of the box charging flow does not process records for 5G roaming.
6.1.6.2.2.2	Type ChargingDataResponse pDUSessionChargingInformation roamingQBCInformation	Supported Supported with Extensions Not Supported with Extensions	The out of the box charging flow does not process records for 5G roaming.
6.1.6.2.2.3	Type MultipleUnitUsage uPFID (NfInstanceId)	Supported Supported with Extensions	-
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	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	uetimeZone is used as the request time for the event.

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.7	Type UserInformation	Supported with Extensions	-
	servedGPSI	Supported with Extensions	
	servedPEI	Supported with Extensions	
	unauthenticatedFlag	Supported with Extensions	
	roamerInOut	Supported with Extensions	
6.1.6.2.8	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	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.2.9	Type PDUContainerInformation	Supported with Extensions	-
	timeofFirstUsage	Supported with Extensions	
	timeofLastUsage	Supported with Extensions	
	qoSInformation	Supported with Extensions	
	qoSCharacteristics	Supported with Extensions	
	afChargingIdentifier	Supported with Extensions	
	afChargingString	Supported with Extensions	
	userLocationInformation	Supported with Extensions	
	uetimeZone	Supported with Extensions	
	rATType	Supported with Extensions	
	servingNodeID	Supported with Extensions	
	presenceReportingAreaInformation	Supported with Extensions	
	3gppPSDataOffStatus	Supported with Extensions	
	sponsorIdentity	Supported with Extensions	
	applicationserviceProviderIdentity	Supported with Extensions	
	chargingRuleBaseName	Supported with Extensions	
	mAPDUSteeringFunctionality	Supported with Extensions	
	mAPDUSteeringMode	Supported with Extensions	
6.1.6.2.2.10	Type NetworkSlicingInfo	Supported with Extensions	-
	sNSSAI	Supported with Extensions	
6.1.6.2.2.11	Type PDUAddress	Supported with Extensions	-
	pduIPv4Address	Supported with Extensions	
	pduIPv6AddresswithPrefix	Supported with Extensions	
	pduAddressprefixlength	Supported with Extensions	
	iPv4dynamicAddressFlag	Supported with Extensions	
	iPv6dynamicPrefixFlag	Supported with Extensions	
6.1.6.2.2.12	Type ServingNetworkFunctionID	Supported with Extensions	-
	servingNetworkFunctionInformation	Supported with Extensions	
	aMFId	Supported with Extensions	
6.1.6.2.2.13	Type RoamingQBCInformation	Supported with Extensions	-
	multipleQFIcontainer	Supported with Extensions	
	uPFID	Supported with Extensions	
	roamingChargingProfile	Supported with Extensions	
6.1.6.2.2.14	Type MultipleQFIcontainer	Supported with Extensions	-
	triggers	Supported with Extensions	
	triggerTimestamp	Supported with Extensions	
	time	Supported with Extensions	
	totalVolume	Supported with Extensions	
	uplinkVolume	Supported with Extensions	
	downlinkVolume	Supported with Extensions	
	localSequenceNumber	Supported with Extensions	
	qFIContainerInformation	Supported with Extensions	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.15	Type RoamingChargingProfile triggers partialRecordMethod	Supported with Extensions Supported with Extensions Supported with Extensions	The out of the box charging flow does not process records for 5G roaming
6.1.6.2.16	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
6.1.6.2.17	Type RANSecondaryRATUsageReport rANSecondaryRATType qosFlowsUsage Reports	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.18	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	-
6.1.6.2.19	Type MAPDUSessionInformation mAPDUSessionIndicator aTSSSCapability	Supported with Extensions Supported with Extensions Supported with Extensions	-
6.1.6.2.3	SMS Specified Data Type	Supported with Extensions	-
6.1.6.2.3.1	Type ChargingDataRequest sMSCharging Information	Supported with Extensions Supported with Extensions	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.3.2	Type SMSChargingInformation	Supported with Extensions	-
	originatorInfo	Supported with Extensions	
	recipientInfo	Supported with Extensions	
	userEquipment Info	Supported with Extensions	
	userLocationInfo	Supported with Extensions	
	uetimeZone	Supported with Extensions	
	rATType	Supported with Extensions	
	sMSCAddress	Supported with Extensions	
	sMDataCodingScheme	Supported with Extensions	
	sMMessageType	Supported with Extensions	
	sMReplyPathRequested	Supported with Extensions	
	sMUserDataHeader	Supported with Extensions	
	sMStatus	Supported with Extensions	
	sMDischargeTime	Supported with Extensions	
	numberofMessagesSent	Supported with Extensions	
	sMServiceType	Supported with Extensions	
	sMSequenceNumber	Supported with Extensions	
	sMSresult	Supported with Extensions	
	submissionTime	Supported with Extensions	
	sMpriority	Supported with Extensions	
	messageReference	Supported with Extensions	
	messageSize	Supported with Extensions	
	messageClass	Supported with Extensions	
	deliveryReportRequested	Supported with Extensions	
6.1.6.2.3.3	Type OriginatorInfo	Supported with Extensions	-
	originatorSUPI	Supported with Extensions	
	originatorGPSI	Supported with Extensions	
	originatorOtherAddress	Supported with Extensions	
	originatorReceivedAddress	Supported with Extensions	
	originatorSCCPAddress	Supported with Extensions	
	sMOriginatorInterface	Supported with Extensions	
	sMOriginatorProtocolId	Supported with Extensions	
6.1.6.2.3.4	Type RecipientInfo	Supported with Extensions	-
	recipientSUPI	Supported with Extensions	
	recipientGPSI	Supported with Extensions	
	recipientOtherAddress	Supported with Extensions	
	recipientReceivedAddress	Supported with Extensions	
	recipientSCCPAddress	Supported with Extensions	
	sMDestinationInterface	Supported with Extensions	
	sMRecipientProtocolId	Supported with Extensions	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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	-
6.1.6.2.4.3	Type RegistrationChargingInformation registrationMessagetype userInformation userLocationinfo uetimeZone rATType 5gMMCapability mICOModeIndication smsIndication taiList serviceAreaRestriction requestedNSSAI allowedNssai rejectedNSSAI	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	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.4.4	Type N2ConnectionChargingInformation	Not Supported	-
	n2ConnectionMessageType	Not Supported	
	userInformation	Not Supported	
	userLocationinfo	Not Supported	
	uetimeZone	Not Supported	
	rATType	Not Supported	
	amfUeNgapId	Not Supported	
	ranUeNgapId	Not Supported	
	ranNodeId	Not Supported	
	restrictedRatList	Not Supported	
	forbiddenAreaList	Not Supported	
	serviceAreaRestriction	Not Supported	
	restrictedCnList	Not Supported	
	allowedNssai	Not Supported	
	rrcEstCause	Not Supported	
6.1.6.2.4.5	Type LocationReportingChargingInformation	Not Supported	-
	locationReportingMessageType	Not Supported	
	userInformation	Not Supported	
	userLocation	Not Supported	
	infouetimeZone	Not Supported	
	presenceReportingAreaInformation	Not Supported	
	rATType	Not Supported	
6.1.6.2.5	Exposure Function Northbound API Specified	Not Supported	-
6.1.6.2.5.1	Type ChargingDataRequest	Not Supported	-
6.1.6.2.5.1a	Type ChargingDataResponse	Not Supported	-
6.1.6.2.5.2	Type NEFChargingInformation	Not Supported	-
	groupIdentifier	Not Supported	
	aPIDirection	Not Supported	
	aPITargetNetworkFunction	Not Supported	
	aPIResultCode	Not Supported	
	aPIName	Not Supported	
	aPIReference	Not Supported	
	aPIContent	Not Supported	
6.1.6.2.6	Network Slice Management (NSM) Specified Data Type	Not Supported	-
6.1.6.2.6.1	Type ChargingDataRequest	Not Supported	-
	tenantIdentifier	Not Supported	
	mnSConsumerIdentifier	Not Supported	
	nSMChargingInformation	Not Supported	
6.1.6.2.6.2	Type ChargingDataResponse	Not Supported	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.6.3	Type NSMChargingInformation	Not Supported	-
	managementOperation	Not Supported	
	idNetworkSliceInstance	Not Supported	
	listOfServiceProfileChargingInformation	Not Supported	
	managementOperationStatus	Not Supported	
	operationalState	Not Supported	
	administrativeState	Not Supported	
6.1.6.2.6.4	Type ServiceProfileChargingInformation	Not Supported	-
	serviceProfileIdentifier	Not Supported	
	sNSSAIList	Not Supported	
	latency	Not Supported	
	availability	Not Supported	
	resourceSharingLevel	Not Supported	
	jitter	Not Supported	
	reliability	Not Supported	
	maxNumberofUEs	Not Supported	
	coverageArea	Not Supported	
	uEMobilityLevel	Not Supported	
	delayToleranceIndicator	Not Supported	
	dLThptPerSlice	Not Supported	
	dLThptPerUE	Not Supported	
	uLThptPerSlice	Not Supported	
	uLThptPerUE	Not Supported	
	maxNumberofPDUsessions	Not Supported	
	kPIMonitoringList	Not Supported	
	supportedAccessTechnology	Not Supported	
	v2XCommunicationModeIndicator	Not Supported	
	addServiceProfileChargingInfo	Not Supported	
6.1.6.2.6.5	Type Throughput	Not Supported	-
	guaranteedThpt	Not Supported	
	maximumThpt	Not Supported	
6.1.6.2.7	NS performance and analytics Specified Data Type	Not Supported	-
6.1.6.2.7.1	Type ChargingDataRequest	Not Supported	-
	tenantIdentifier	Not Supported	
	nSPAChargingInformation	Not Supported	
6.1.6.2.7.2	Type ChargingDataResponse	Not Supported	-
6.1.6.2.7.3	Type UsedUnitContainer	Not Supported	-
	nSPAContainerInformation	Not Supported	
6.1.6.2.7.4	Type NSPAChargingInformation	Not Supported	-
	singleNSSAI	Not Supported	

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.2.7.5	Type NSPAContainerInformation latency throughput maximumPacketLossRate serviceExperienceStatisticsData theNumberOfPDUSessions theNumberOfRegisteredSubscribers loadLevel	Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported 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	-
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	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
6.1.6.3.24	Enumeration: SMAddresseeType	Supported	-
6.1.6.3.25	Enumeration: SMServiceType	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	-
6.1.6.4	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	-
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	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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	-
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	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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	-
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

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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
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	-

Table 1-1 (Cont.) 5G System Charging Service 3GPP TS 32.291 v16.5.1 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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 Response Codes

Response codes	Description
201 Created (Create)	The creation of a Charging Data resource is confirmed, and a representation of that resource is returned. The Charging Data resource is created and returned successfully. The representation of created resource is identified via Location header field in the 201 response.
200 OK (Updates)	The modification of a Charging Data resource is confirmed, and a representation of that resource is returned. The Charging Data resource which is modified and returned successfully.
204 No Content (Release)	The Charging Data resource matching the ChargingDataRef is modified and then released.
400 Bad Request	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). 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.
403 Forbidden	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. END_USER REQUEST_DENIED: The HTTP request is denied by the CHF due to restrictions or limitations related to the end-user. 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. END_USER_REQUEST_REJECTED: The HTTP request rejected by the CHF due to end-user restrictions or limitations.
404 Not Found	USER_UNKNOWN: The HTTP request is rejected because the end user specified in the request cannot be served by the CHF.

Table 1-2 (Cont.) Response Codes

Response codes	Description
500 Internal Server Error	Common Application Error

2

Charging Function – Spending Limit Control Service

> **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.

The following table describes the section compliance of 5G System Charging Service 3GPP TS 29.594 v16.3.0 (2020-09).

Section Compliance

Table 2-1 5G System Charging Service 3GPP TS 29.594 v16.3.0 (2020-09) 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	-
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	-

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v16.3.0 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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 header is 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	-
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).

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v16.3.0 (2020-09) Section Compliance

Section Number	Section	Status	Notes
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	-
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	-

Table 2-1 (Cont.) 5G System Charging Service 3GPP TS 29.594 v16.3.0 (2020-09) Section Compliance

Section Number	Section	Status	Notes
5.6.2.2	Type SpendingLimitContext supi gpsi policyCounterIds notifUri expiry supportedFeatures	Supported Supported Supported Supported Supported Supported with Extensions Supported with Extensions	-
5.6.2.3	Type SpendingLimitStatus supi statusInfos expiry supportedFeatures	Supported Supported 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	Not Supported Not Supported Not Supported	-
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	-
5.8	Feature negotiation	Not Supported	-
5.9	Security	Not Supported	OAuth2 is not supported.

Response Codes

Table 2-2 Response Codes

Response codes	Description
201 Created (Create)	SUCCESS: The spending limit subscription was created, and spending limit reports are provided.

Table 2-2 (Cont.) Response Codes

Response codes	Description
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)

> **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.

The following table 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 v16.5.0 (2020-09).

Section Compliance

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	-
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	-

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

Section Number	Section	Status	Notes
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

> **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.

The following table 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 16.5.0 specification. You can configure Oracle Communications Elastic Charging Engine (ECE) to generate CHF-CDRs. See "Generating CDRs" 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
NF Consumer Information	Supported
NF Functionality	Supported
NF Name	Supported
NF Address	Supported
NF PLMN ID	Supported
Triggers	Supported
SMF Triggers	Supported
List of Multiple Unit Usage	Supported
Rating Group	Supported
Used Unit Container	Supported
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

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

Field	Status
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
Registration Charging Information	Not supported
N2 connection charging Information	Not supported
Location reporting charging Information	Not supported

See "Oracle nCHF CDR Specification" for more information.

A

Oracle nCHF CDR Specification

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
              - sgsnSMTRecord (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]
                    - lCSGMORecord (71),
                    - lCSRGMTRecord (72),
                    - lCSHGMTRecord (73),
                    - lCSVGMTRecord (74),
                    - lCSGNIRecord (75),

                    MBMS specific.The contents are defined in TS 32.251 [11] and TS
32.273 [33]
                    - sgsnMBMSRecord (76),
                    - ggsnMBMSRecord (77),
                    - gwMBMSRecord (86),
                    - sUBBMSCRecord (78),
                    - cONTENTBMSCRecord (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),
```

```
                - iPERecord (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]
                - sCSMORecord (93),
                - sCSMTRecord (94),

                ProSe specific. The contents are defined in TS 32.277 [36]
                - pFDDRecord (100),
                - pFEDRecord (101),
                - pFDCRecord (102),

                Monitoring Event specific. The contents are defined in TS
32.278 [38]
                - mECORecord (103),
                - mERERecord (104),

                CP data transfer specific. The contents are defined in TS
32.253 [13]
                - cPDTSCERecord (105),
                - cPDTSNNRecord (106), --

                SMS specific. The contents are defined in TS 32.274 [34]
                - sCDVTT4Record (110),
                - sCSMOT4Record (111),
                - iSMSMORecord (112),
                - iSMSMTRecord (113),

                Exposure Function API specific. The contents are defined in TS
32.254 [14]
                - 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
          - MSTIME_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 amoung 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 Equiptment 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/SscMode'
  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 Equiptment 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:
        multipleQFIcontainer:
          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 amoung 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 Equiptment 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 Equiptment 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/AtsssCapability'
      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
    SMServiceType:
      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 filed 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}$"
          type: string
      required:
      - bitLength
      - gNBValue
      type: object
    NgeNbId:
      description: "This represents the identifier of the ng-eNB ID as
specified insubclause 9.3.1.8 of 3GPP TS 38.413 [11]"
      type: string
      pattern: '^(MacroNGeNB-[A-Fa-f0-9]{5}|LMacroNGeNB-[A-Fa-f0-9]{6}|
SMacroNGeNB-[A-Fa-f0-9]{5})$'
    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
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
      - 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:
          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:
      - 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
        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":
          $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:
      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
          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
is generated. The usages could come as a late CDR from another CHF site.
Populated by CHF."
      type: boolean
    StaleSessionCleanup:
      description: "indicates 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
```