



Southbound Interface Charging Function APIs

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1 Introduction

1.1 Overview

The Operator Platform (OP) allows Operators to charge for the services and capabilities that are exposed by an Operator to Application Providers, subscribers and Other Operator Partners.

The Operator Platform architecture detailed in GSMA PRD OPG.02 [1] defines the Southbound Interface Charging Function (SBI-CHF) as the interface that allows the communication between the Operator Platform and the Operator's Charging Engine and that allows Operator's to charge for the services/capabilities exposure.

The purpose of this document is to provide the Southbound Interface Charging Function API requirements based on the following considerations:

- a. Requirements will be aligned with the set of technical charging requirements included in GSMA PRD OPG.02 [1]. The terminology regarding services classification (from a charging perspective) and charging factors described in GSMA PRD OPG.02 [1] will be used in this document.
- b. The APIs used for rating and charging in SBI-CHF will be based on charging specifications already defined by Standards Developing Organisations (SDO) such as 3GPP or TM Forum. References to the charging protocols/procedures to be used by the OP will be provided for each charging API described in this document.

As described in GSMA PRD OPG.02 [1], services and capabilities exposed by an Operator can be classified - from a charging perspective - into one of the following categories:

- Network capabilities exposure services with no impact on the device's data usage
- Network capabilities exposure services with impact on the device's data usage.
- Network provisioning services
- Edge application management services.

The table below summarizes the list of potential events/triggers for charging that could be used by an Operator to carry out the charging and billing, depending on the service category exposed. The factors marked with "YES" are the ones potentially applicable for the service category:

Potential Events/ Triggers for Charging	Service Categories			
	Network capabilities exposure: no impact on data traffic	Network capabilities exposure: with impact on data traffic	Network services provisioning	Edge capabilities management
Service activation	YES	YES	YES	YES
Service API invocation (and related notifications)	YES (API+ payload)	YES (API+payload)	YES (API+payload) Service lifecycle management	YES (API+payload) Reserved Infra resources Application lifecycle management
Data traffic usage in the Operator's Network	NO	YES Only if volume-based charging (info provided by the Network)	YES Only if volume-based charging (info provided by the Network)	YES Only if volume-based charging (info provided by the Network)
Edge enabling infrastructure resources usage	NO	NO	NO	YES Only in case charging based on effective use infra resources

Table 1: Charging factors summary

Section 2 of this document describes the SBI-CHF APIs requirements for each potential trigger event/charging factor and service category referenced in the previous table. For each case the following information will be provided:

- a. A brief description of the trigger event/charging factor.
- b. A reference to the charging requirements in GSMA PRD OPG.02 [1] describing that charging factor.
- c. A reference to the API to be used in SDOs specifications.

An informative Annex is also included at the end of this document aiming to provide some guidelines on how to interpret the SDO specification (procedures and charging information to be exchanged in each case) to meet the charging requirements in GSMA PRD OPG.02 [1].

1.2 Scope

The present document aims to define OP APIs that are related to the SBI-CHF Interface in the OP architecture.

1.3 Definitions

Term	Description
Converged Charging System	The element within the Operator's Network that allows to do the real time rating and charging for the services that are provided by that Operator
Operator	In the context of GSMA OP, an Operator is an entity that exposes capabilities and/or resources of their network (IT, mobile) to Application Providers, provides connectivity to User Equipment and has an Operator Platform.
Operator Platform	An Operator Platform (OP) facilitates access to the Edge Cloud and other capabilities of an Operator or federation of Operators and Partners. It follows the architectural and technical principles defined in this document.
Southbound Interface	Connects an OP with the specific operator infrastructure that delivers the network, cloud and charging services and capabilities.

1.4 Abbreviations

Term	Description
AF	Application Function
API	Application Programming Interface
CCS	Converged Charging System
CHF	Charging Function
CTF	Charging Trigger Function
LS	Liaison Statement
OP	Operator Platform
OPG	Operator Platform Group
PEC	Post Event Charging
PRD	(GSMA) Permanent Reference Document
SBI-CHF	Southbound Interface – Charging Function
SBI-NR	Southbound Interface – Network Resources

1.5 References

Ref	Doc Number	Title
[1]	PRD OPG.02	GSMA PRD OPG.02, Version 6.0, Issued <replace with date>
[2]	RFC 2119	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997. Available at http://www.ietf.org/rfc/rfc2119.txt
[3]	3GPP TS 32.240	Telecommunication management; Charging management; Charging architecture and principles https://www.3gpp.org/DynaReport/32240.htm

Ref	Doc Number	Title
[4]	3GPP TS 32.290	Telecommunication management; Charging management; 5G system; Services, operations and procedures of charging using Service Based Interface (SBI) https://www.3gpp.org/DynaReport/32290.htm
[5]	3GPP TS 32.291	Telecommunication management; Charging management; 5G system, charging service; Stage 3 https://www.3gpp.org/DynaReport/32291.htm
[6]	3GPP TS 32.254	Telecommunication management; Charging management; Exposure function Northbound Application Program Interfaces (APIs) charging https://www.3gpp.org/DynaReport/32254.htm
[7]	3GPP TS 32.257	Telecommunication management; Charging management; Edge computing domain charging https://www.3gpp.org/DynaReport/32257.htm
[8]	TMF 931	API Profile; OpenGW Operate API; API ordering, Developer & Application Onboarding and Management https://tmf-open-api-table-documents.s3.eu-west-1.amazonaws.com/Beta/5.0.0/user_guides/TMF931-Open_Gateway_Onboarding_and_Ordering_Component_Suite-v5.0.0.pdf
[9]	3GPP TS 28.538	Management and orchestration; Edge Computing Management https://www.3gpp.org/DynaReport/28538.htm

1.6 Conventions

The key words “must”, “must not”, “required”, “shall”, “shall not”, “should”, “should not”, “recommended”, “may”, and “optional” in this document are to be interpreted as described in RFC2119 [3].

1.7 Summary SDO Reference Mapping Table

Table below summarises the SDO Reference mapping between the OP SBI-CHF and the SDOs specifications for each potential event that could trigger charging.

No	Event triggering charging	OP Interface	SDO Reference Mapping
1	Service activation	SBI-CHF	TMF 931
2	Service API invocation	SBI-CHF	3GPP TS 32.254
3	Service API invocation (reserved infra resources)	SBI-CHF	(FFS pending from 3GPP guidance)
4	Data Traffic Usage in the Operator’s Network	N.A. *	
5	Edge enabling infrastructure resources usage	SBI-CHF	3GPP TS 32.257/TS 28.538

(*) The interface to be used to enable rating and charging based on data traffic usage in the Operator's Network is the one existing in the Operator between the Data Packet Core and the Converged Charging System (not an API invoked through SBI-CHF) and is out of the scope of the definitions in this document.

3GPP interfaces listed above are a subset of the charging interfaces defined by 3GPP. Charging interfaces defined by 3GPP (one charging interface is defined per charging domain e.g. voice, SMS ...) and follow an architecture and a set of common principles that are defined in 3GPP TS 32.240 "Telecommunication management;Charging management;Charging architecture and principles" [3].

Although 3GPP TS 32.240 [3] describes different potential charging architectures, the charging architecture using the service based interface described in 3GPP TS 32.240 will be the one used in the integration between the OP and the Operator's Charging Engine through the SBI-CHF.

According to this charging architecture, the Operator's Charging Engine exposes the Nchf interface to enable rating and charging and the Operator Platform would act as a Charging Trigger Function (CTF) consuming this service. The services exposed through the Nchf interface (REST based services) and the protocol used in this interface are described in 3GPP TS 32.290 [4] and 3GPP TS 32.291 [5].

The charging interfaces defined in 3GPP TS 32.254 [6] and 3GPP TS 32.257 [7] are an extension of the Nchf interface defined in 3GPP TS 32.290 [4]/32.291 [5] including additional information elements that are specific to the charging domain that they cover (e.g. API exposure charging, edge charging). These charging interfaces are subject to the same protocol definitions described in 3GPP TS 32.290 [4]/32.291 [5].

2 SBI-CHF API requirements

2.1 Service activation

2.1.1 Description

A one-time fee or a periodical fee (e.g. a monthly fee) can be charged by an Operator to third parties. This fee enables the access to a particular service (different fee per service/group of services) and is not dependent on the service usage.

2.1.2 Requirements and Service Aspects

The requirements for the API are specified in the GSMA PRD OPG.02 [1]. in the following sections:

Section	Document	Reference Section Title
5.1.5.2	OPG.02	Services and capabilities exposure charging requirements

2.1.3 API

As part of onboarding an Application Provider is provisioned to get access to the service APIs and within this process it is possible to have service activation fees (one time/recurring) generated. This work is linked to ongoing work being performed by TM Forum in relation to

the Operate API work as is being described in TMF 931 [8] and relating to the Commonalities APIs specification.

As part of that specification, TM Forum members have defined the “Developer & Application Onboarding and Management” procedures and APIs to be used. From a high-level perspective, that onboarding process has implications on the provisioning on the Operator’s BSS/OSS Systems that will also be responsible for triggering the service activation fees (developer, application and product offering provisioning - with an associated product offering price - to enable the developer/application with access to a service API that is associated to that product offering).

It is not expected that OP will trigger any API invocation via SBI-CHF to implement this charging factor as this is part of the normal provisioning flow of the operator.

2.2 Service API invocation

2.2.1 Description

An Operator could do the rating and charging based on the service API that is invoked by an Application Provider. Depending on the Operator’s decision this charging factor would allow to charge based on for example:

- The particular API/operation that is invoked by the Application Provider not considering the contents of the API invocation (e.g. parameters included in the API payload).
- The particular API/operation that is invoked by the Application Provider and considering some parameters in the contents of the API invocation.

2.2.2 Requirement and Service Aspects

The requirements for this charging factor API are specified in the GSMA PRD OPG.02 [1]. in the following section(s).

Section	Document	Reference Section Title
5.1.5.2	OPG.02	Services and capabilities exposure charging requirements

2.2.3 API

The following API defined by 3GPP shall be used by Operator Platform.

3GPP TS	Section
32.254	6.2a “Data description for NEF converged charging”

Although different charging models are possible according to 3GPP TS 32.254 [6], only the PEC (Post Event Charging) charging model will be used in the Operator Platform SBI-CHF implementation. The inclusion of other charging models (e.g. ECUR – Enhanced Charging with unit reservation - or IEC – Immediate Event Charging) is for further study as they have some limitations for the implementation of OP charging use cases and require from enhancements to the 3GPP specifications.

The Converged Charging API implementation based on REST APIs shall be the one used in this case. The Diameter based interfaces defined for this purpose by 3GPP in TS 32.254 [6] are not be considered.

The diagram flow including the SBI-CHF invocation for this charging factor is included in section 4.9.1 of GSMA PRD OPG.02 [1].

2.3 Service API invocation - reserved edge infrastructure resources

2.3.1 Description

The Operator Platform could do rating and charging for the reservation of subscribed edge resources requested by an application provider. Some measurements that an Operator could consider for rating and charging are for example:

- Virtual CPU usage
- Virtual memory usage
- Virtual disk usage
- Incoming bytes
- Outgoing bytes
- Reservation time period

2.3.2 Requirement and Service Aspects

The requirements for this charging factor API are specified in the GSMA PRD OPG.02 [1], in the following section(s).

Section	Document	Reference Section Title
5.1.5.2	OPG.02	Services and capabilities exposure charging requirements

2.3.3 API

3GPP TS	Section
32.257	NONE FOUND

Currently there is no clear mapping to 3GPP for rating and charging of the reservation of edge infrastructure resources. The content to be able to do rating and charging for reservation is very similar to what is available in the actual use of edge through the edge enabling infrastructure resource usage charging defined in 3GPP TS 32.257 [7] but instead of mean usage reserved usage and reserved time period should be used.

Note: OPAG have sent an LS to get assistance from 3GPP on which API to be used for this purpose. The API to be used in this case is FFS and pending on 3GPP guidance.

The diagram flow including the SBI-CHF invocation for this charging factor is included in section 4.9.1 of GSMA PRD OPG.02 [1].

2.4 Data traffic usage in the Operator's Network

2.4.1 Description

An Operator could decide to do the rating and charging based on the data traffic usage of a device in the Operator's Network as a result of a service API invocation.

Depending on the Operator's decision, for example the following charging models could be used:

- Time based charging
- Volume based charging

The feasibility of enabling this charging factor depends on the ability to correlate the data traffic in the Operator's Network that is impacted by a particular API call with the API invocation.

2.4.2 Requirement and Service Aspects

The requirements for this charging factor API are specified in the GSMA PRD OPG.02 [1], in the following section(s).

Section	Document	Reference Section Title
5.1.5.2	OPG.02	Services and capabilities exposure charging requirements

2.4.3 API

As was mentioned in section 1 of this document and also in the charging requirements in GSMA PRD OPG.02 [1], the SBI-CHF interface is not involved in this charging dialogue.

The existing interface to do the rating and charging in the Operator for data traffic navigation will be the one used in this case. The Operator's Network will be responsible for providing the necessary information for the correlation of the data traffic in the Operator's Network that is impacted by a particular API call with the API invocation.

The Operator Platform would be responsible for providing some information to allow for the correlation through the SBI-NR interface when requesting the service delivery from the Operator's Network.

Note: OPAG have produced an LS to get assistance from 3GPP on which correlation information to be used for this purpose. The exact correlation information to be used in this case is FFS and pending from 3GPP guidance.

The diagram flow including the SBI-CHF invocation for this charging factor is included in section 4.9.2 of GSMA PRD OPG.02 [1].

2.5 Edge enabling infrastructure resources usage

2.5.1 Description

The Operator Platform can periodically collect performance measurements from the Edge Application Server that an Application Provider use and send that information to the Operator's

Charging engine. Some measurements that are possible to collect for a given duration are for example:

- Mean virtual CPU usage
- Mean virtual memory usage
- Mean virtual disk usage
- Measured incoming bytes
- Measured outgoing bytes

2.5.2 Requirement and Service Aspects

The requirements for this charging factor API are specified in the GSMA PRD OPG.02 [1]. in the following section(s).

Section	Document	Reference Section Title
5.1.5.2	OPG.02	Services and capabilities exposure charging requirements

2.5.3 API

The following API defined by 3GPP shall be used by Operator Platform.

3GPP TS	Section
32.257	6.1 "Definition of charging information for edge enabling infrastructure resource usage charging"

The charging factor edge enabling infrastructure resource usage will be implemented following 3GPP TS 32.257 "Telecommunication management; Charging management; Edge computing domain charging" [7]. The charging model defined for this case is PEC (Post Event Charging).

The diagram flow including the SBI-CHF invocation for this charging factor is included in section 4.9.3 of GSMA PRD OPG.02 [1].

2.6 Edge Application Lifecycle Management

2.6.1 Description

An operator could do rating and charging for application life cycle management on Edge Application Servers. Depending on the Operator's decision this charging factor would allow to charge based on for example:

- Instantiation
- Upgrade
- Termination

2.6.2 Requirement and Service Aspects

The requirements for this charging factor API are specified in the GSMA PRD OPG.02 [1]. in the following section(s).

Section	Document	Reference Section Title
5.1.5.2	OPG.02	Services and capabilities exposure charging requirements

2.6.3 API

The following API defined by 3GPP shall be used by Operator Platform.

3GPP TS	Section
32.257	6.2 "Definition of charging information for EAS deployment charging"

The charging factor edge enabling infrastructure resource usage will be implemented following 3GPP TS 32.257 "Telecommunication management; Charging management; Edge computing domain charging" [7]. The charging model defined for this case is PEC (Post Event Charging).

The diagram flow including the SBI-CHF invocation for this charging factor is included in section 4.9.1 of GSMA PRD OPG.02 [1].

Annex A Guidelines for interpretation of SDO charging specifications

A.1 Service activation charging APIs

Service activation charging should be aligned with the “Developer & Application Onboarding and Management” specifications [8] in TM Forum.

Onboarding and management procedures defined by TM Forum have implications on the Operator’s IT Systems (BSS and OSS) as they require from provisioning of:

- The different actors/parties involved in the service exposure transactions.
- The products that entitle these actors/parties to use the services (services are modelled as product offerings as per TM Forum definition, composed of several characteristics that include the product offering price)

According to that definition, it is recommended to follow the regular procedures in that Operator used to charge fees associated to the Products Offerings provisioning to implement this charging factor.

A.2 Service API invocation charging APIs

The table below shows:

- The information elements defined by 3GPP in TS 32.254 [6] that are part of the charging requests sent by a charging client (Operator Platform in the case of SBI-CHF) to the Operator’s Charging engine.
- A brief description of each information element (according to 3GPP specification), including an interpretation/guideline for the implementation in the SBI-CHF.
- A reference to the relevant charging information identified in GSMA PRD OPG.02 [1] for that charging factor.

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
Session Identifier	This is an optional field that is used to identify the charging session transaction. This field is not applicable in REST API requests, as this unique identifier is generated by the Charging Engine and not by the charging client. This field should not be included in the charging requests sent by the OP.	
Subscriber Identifier	This field includes the identification of the chargeable party (e.g. the Application	AppId AppProviderId ChannelPartnerId

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
	<p>Identifier that is sending the API invocation to the OP).</p> <p>The information included in this field should allow the Operator's Charging Engine to identify the different parties involved in the transaction:</p> <ul style="list-style-type: none"> - Application Id - Developer Id - Channel Partner Id (e.g. Marketplace Id) <p>The formats and information to be included should be aligned with the procedures defined by TM Forum as part of the "Developer & Application Onboarding and Management" specifications [8].</p>	
NF consumer identification:	<p>This grouped Information Element contains information that allows to identify the charging client, that in the case of SBI-CHF is the Operator Platform.</p> <p>It is an Operator decision which optional elements to include.</p>	Operator Platform Id
NF Functionality	<p>This field is mandatory and provides information about the function of the charging client. The Operator should choose between one of the possible values defined by 3GPP in TS 32.291 [5]. The value chosen is an Operator decision as is not expected to be relevant for rating and charging.</p>	
NF Name	<p>This is an optional field that contains a string (a UUID) that identifies the charging client (OP in this case)</p>	
NF IP v4 Address	<p>This is an optional field that contains the IP v4 address of the charging client (OP in this case)</p>	
NF IP v4 Address	<p>This is an optional field that contains the IP v6 address of the charging client (OP in this case)</p>	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
NF PLMN Id	This is an optional field that contains the PLMN identifier of the charging client (OP in this case)	
Charging identifier	This is an optional field is deprecated by 3GPP and should not be included in the charging requests sent by the OP.	
Invocation timestamp	This field contains the timestamp of the service API invocation.	
Invocation sequence number	This field contains the sequence number of the charging service invocation by the charging client. This field should be set to 0.	
One time event	This is a Boolean field that indicates that event based charging is used for this charging request. This field should be set to TRUE.	
One time event type	This field should be set to PEC (Post Event Charging)	
Supported features	This optional field is used when optional features are negotiated in the charging dialogue (see section 6.1.8 in 3GPP TS 32.291 [5] for additional details). This field should not be included in the charging requests sent by the OP.	
Triggers	This optional field provides an indication of the event that triggered the charging request when session dialogue charging is used (not applicable to event based charging). This field should not be included in the charging requests sent by the OP.	
Multiple Unit Usage:	This is a structured field that holds the parameters for the quota management and/or usage reporting information	
Rating Group	This is a mandatory field (integer value) that identifies the rating group.	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
	The recommendation is to use a preagreed value with Operator's Charging Engine. It is up to the Operator to choose the strategy to select the numbers to assign for this purpose.	
Requested Unit	This optional field that indicates that quota management is required, and may contain the amount of requested service units. This field is not applicable to SBI-CHF and should not be included in the charging requests sent by the OP.	
Used Unit container	This optional field contains the amount of used units for rating and charging. This field is not applicable to SBI-CHF and should not be included in the charging requests sent by the OP.	
NEF API Charging information:	This structured information element holds the NEF API specific information. In the case of SBI-CHF, NEF should be interpreted as OP.	
External individual identifier	This field includes the device identifier in MSISDN format.	Customer device Id
Internal individual identifier	This optional field that contains the device identifier in IMSI format. It is up to the Operator to included this field in the charging requests sent by the OP.	
External Group identifier	This optional field holds the external identifier for a group of individual UE(s), if available. This field should not be included in the charging requests sent by the OP.	
Internal Group identifier	This optional field holds the internal identifier for a group of individual UE(s).	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
	This field should not be included in the charging requests sent by the OP.	
API direction	This field can be set to invocation or notification depending on the API operation to be charged.	
API Result code	This is an integer field that contains the result code of the API service delivery.	API Result
API Name	This field contains the name of the API that was invoked.	API type/operation
API Operation	This field contains the operation name of the API that was invoked.	API type/operation
API Reference	This field contains an URI that is a reference to the specification that needs to be used by the Operator's Charging Engine in order to decode the information included in the API content field that is described next.	
API content	This field contains the content of the API invocation received by the AP. It includes both the headers (that will contain relevant information for E2E traceability) and the payload.	Correlation Id Selected API payload

A.3 Service API invocation - reserved edge infrastructure resource

For further study and consultation with 3GPP.

A.4 Edge enabling infrastructure resource usage

The table below shows the information elements (as per 3GPP TS 32.257 [7] specification) to be included in the charging requests by the OP. A brief description of each information element including a guideline for the implementation is provided and additionally a reference to the relevant charging information in GSMA PRD OPG.02 [1] for that charging factor is included:

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
Session Identifier	Not applicable	
Subscriber Identifier	Not applicable	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
NF consumer identification:	<p>This grouped Information Element contains information that allows to identify the charging client, that in the case of SBI-CHF is the Operator Platform.</p> <p>It is an Operator decision which optional elements to include.</p>	Operator Platform Id
NF Functionality	<p>This field is mandatory and provides information about the function of the charging client. The Operator should choose between one of the possible values defined by 3GPP in TS 32.291 [5]. The value chosen is an Operator decision as is not expected to be relevant for rating and charging.</p>	
NF Name	<p>This is an optional field that contains a string (a UUID) that identifies the charging client (OP in this case)</p>	
NF IP v4 Address	<p>This is an optional field that contains the IP v4 address of the charging client (OP in this case)</p>	
NF IP v4 Address	<p>This is an optional field that contains the IP v6 address of the charging client (OP in this case)</p>	
NF PLMN Id	<p>This is an optional field that contains the PLMN identifier of the charging client (OP in this case)</p>	
Charging identifier	<p>This is an optional field is deprecated by 3GPP and should not be included in the charging requests sent by the OP.</p>	
Invocation timestamp	<p>This field contains the timestamp of the service API invocation.</p>	
Invocation sequence number	<p>This field is not applicable.</p>	
One time event	<p>This is a Boolean field that indicates that event based charging is used for this charging request. This field should be set to TRUE.</p>	
One time event type	<p>This field should be set to PEC (Post Event Charging)</p>	
Supported features	<p>This optional field is used when optional features are negotiated</p>	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
	<p>in the charging dialogue (see section 6.1.8 in 3GPP TS 32.291 [5] for additional details).</p> <p>This field should not be included in the charging requests sent by the OP.</p>	
Triggers	<p>This optional field provides an indication of the event that triggered the charging request when session dialogue charging is used (not applicable to event based charging).</p> <p>This field should not be included in the charging requests sent by the OP.</p>	
Multiple Unit Usage:	This is a structured field that holds the parameters for the quota management and/or usage reporting information	
Rating Group	<p>This is a mandatory field (integer value) that identifies the rating group.</p> <p>The recommendation is to use a preagreed value with Operator's Charging Engine. It is up to the Operator to choose the strategy to select the numbers to assign for this purpose.</p>	
Requested Unit	<p>This optional field that indicates that quota management is required, and may contain the amount of requested service units.</p> <p>This field is not applicable to SBI-CHF and should not be included in the charging requests sent by the OP.</p>	
Used Unit container	<p>This optional field contains the amount of used units for rating and charging.</p> <p>This field is not applicable to SBI-CHF and should not be included in the charging requests sent by the OP.</p>	
EAS ID	This field typically holds the chargeable party, that will identify the application Id.	Application Id

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
EDN ID	This field holds the Datacenter where the App is deployed (the EAS). It is possible for the operator to use this to configure different prices depending on the "location" where the application was deployed.	
EAS Provider Identifier	This field holds the identifier of the Application Service Provider of the Edge Application Server	Application Provider ID
Edge Enabling Infrastructure Resource Usage Charging Information:	This grouped Information Element holds the specific information required for edge enabling infrastructure resource usage charging.	
Mean Virtual CPU Usage	This field contains the mean virtual CPU usage for the EAS.	vCPUs
Mean Virtual Memory Usage	This field contains the mean virtual CPU usage for the EAS	memory
Mean Virtual Disk Usage	This field contains the mean virtual CPU usage for the EAS	storage
Measured Incoming Bytes	This field holds the measurement of number of incoming bytes received by the EAS,	Incoming data volume
Measured Outgoing Bytes	This field holds the measurement of number of outgoing bytes transmitted from the EAS	Outgoing data volume
Duration Start Time	This field contains the start time for the usage measured	time period
Duration End Time	This field contains the end time for the usage measured	time period

A.5 Edge Application Life Cycle Management

The table below shows the information elements (as per 3GPP TS 32.257 [7] specification) to be included in the charging requests by the OP. A brief description of each information element including a guideline for the implementation is provided and additionally a reference to the relevant charging information in GSMA PRD OPG.02 [1] for that charging factor is included:

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
Session Identifier	Not applicable	
Subscriber Identifier	Not applicable	
NF consumer identification:	<p>This grouped Information Element contains information that allows to identify the charging client, that in the case of SBI-CHF is the Operator Platform.</p> <p>It is an Operator decision which optional elements to include.</p>	Operator Platform Id
NF Functionality	<p>This field is mandatory and provides information about the function of the charging client. The Operator should choose between one of the possible values defined by 3GPP in TS 32.291 [5]. The value chosen is an Operator decision as is not expected to be relevant for rating and charging.</p>	
NF Name	<p>This is an optional field that contains a string (a UUID) that identifies the charging client (OP in this case)</p>	
NF IP v4 Address	<p>This is an optional field that contains the IP v4 address of the charging client (OP in this case)</p>	
NF IP v4 Address	<p>This is an optional field that contains the IP v6 address of the charging client (OP in this case)</p>	
NF PLMN Id	<p>This is an optional field that contains the PLMN identifier of the charging client (OP in this case)</p>	
Charging identifier	<p>This is an optional field is deprecated by 3GPP and should not be included in the charging requests sent by the OP.</p>	
Invocation timestamp	<p>This field contains the timestamp of the service API invocation.</p>	
Invocation sequence number	<p>This field is not applicable.</p>	
One time event	<p>This is a Boolean field that indicates that event based charging is used for this charging request. This field should be set to TRUE.</p>	
One time event type	<p>This field should be set to PEC (Post Event Charging)</p>	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
Supported features	<p>This optional field is used when optional features are negotiated in the charging dialogue (see section 6.1.8 in 3GPP TS 32.291 [5] for additional details).</p> <p>This field should not be included in the charging requests sent by the OP.</p>	
Triggers	<p>This optional field provides an indication of the event that triggered the charging request when session dialogue charging is used (not applicable to event based charging).</p> <p>This field should not be included in the charging requests sent by the OP.</p>	
Multiple Unit Usage:	<p>This is a structured field that holds the parameters for the quota management and/or usage reporting information</p>	
Rating Group	<p>This is a mandatory field (integer value) that identifies the rating group.</p> <p>The recommendation is to use a preagreed value with Operator's Charging Engine. It is up to the Operator to choose the strategy to select the numbers to assign for this purpose.</p>	
Requested Unit	<p>This optional field that indicates that quota management is required, and may contain the amount of requested service units.</p> <p>This field is not applicable to SBI-CHF and should not be included in the charging requests sent by the OP.</p>	
Used Unit container	<p>This optional field contains the amount of used units for rating and charging.</p> <p>This field is not applicable to SBI-CHF and should not be included in the charging requests sent by the OP.</p>	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
EAS ID	This field typically holds the chargeable party, that will identify the application Id.	Application Id
EDN ID	This fields holds the Datacenter where the App is deployed (the EAS). It is possible for the operator to use this to configure different prices depending on the "location" where the application was deployed.	
EAS Provider Identifier	This field holds the identifier of the Application Service Provider of the Edge Application Server	Application Provider ID
EAS Deployment Charging Information:	This grouped Information Element holds the specific information required for charging edge application life cycle management.	
EAS Deployment Requirements	Optional field that holds more information around the requirements of the entity to be deployed. Currently not identified as a potential charging factor but could be for further analysis.	
LCM Event Type	This field is optional and when used identifies the LCM Event type based on management operation notification of success. The following values are possible:	
<i>CREATE_MOI</i>	Create a Managed Object instance. Set when indicating an instantiation.	
<i>MODIFY_MOI_ATTR</i>	Modification of one or more Managed Object instances. Set when indicating a modification.	
<i>DELETE_MOI</i>	Deletion of one or more Managed Object instances. Set when indicating a termination.	

3GPP TS 32.254 [6] Information Element	3GPP Description/Guideline for implementation	Charging information in GSMA PRD OPG.02 [1]
<i>NOTIFY_MOL_CREATION</i>	Optional. Not identified for charging at this point	
<i>NOTIFY_MOL_ATTR_CHANGE</i>	Optional. Not identified for charging at this point	
<i>NOTIFY_MOL_DELETION</i>	Optional. Not identified for charging at this point	
LCM Start Time	To be filled in by OP with the timestamp of the start time for the EAS LCM process	
LCM End Time	To be filled in by OP with the timestamp of the end time for the EAS LCM process	

Annex B Document Management

B.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	16 Feb 2024	New PRD (OPG.07)	ISAG	Mario González del Campo / Telefónica, Elisabeth Andersson /MATRIX software

B.2 Other Information

Type	Description
Document Owner	Operator Platform Group
Editor / Company	Mario González del Campo / Telefónica

It is our intention to provide a quality product for your use. If you find any errors or omissions, please contact us with your comments. You may notify us at prd@gsma.com

Your comments or suggestions & questions are always welcome.