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**Title:** New Rel-6 TS 32.296-100: "Telecommunication management; Charging management; Online Charging System (OCS): Applications and interfaces" - for SA Information  
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SP-040141	New Rel-6 TS 32.296-100: "Telecommunication management; Charging management; Online Charging System (OCS): Applications and interfaces" - for SA Information
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3GPP TSG-SA5 (Telecom Management)  
Meeting #37, Malaga, SPAIN, 23 - 27 Feb 2004

S5-044145

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### **Presentation of Specification to TSG or WG**

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**Presentation to:** TSG SA Meeting #23  
**Document for presentation:** TS 32.296, Version 1.0.0  
**Presented for:** Information

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**Abstract of document:**

This is a draft Technical Specification on the "Online Charging System (OCS): Applications and Interfaces". This specification continues the work in Technical Report 32.815 "Online Charging System (OCS) architecture study". The technical specification in Rel 6 is focused on the Re interface between the Rating Function and the Charging Function within the OCS.

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**Changes since last presentation to TSG SA:**

New

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**Outstanding Issues:**

- decision on the protocol for the Re interface is outstanding,
  - stage 3 description is missing,
  - parameter and message definitions need to be updated to cover all scenarios that are described in the document,
  - some message flows need to be elaborated in detail,
  - the (optional) method ServiceUsageRequest is not defined yet,
  - several other minor issues.
- 

**Contentious Issues:**

None.

# 3GPP TS 32.296 V1.0.0 (2004-03)

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*Technical Specification*

**3rd Generation Partnership Project;  
Technical Specification Group Service and System Aspects;  
Telecommunication management;  
Charging management;  
Online Charging System (OCS): Applications and interfaces  
(Release 6)**

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The present document has been developed within the 3<sup>rd</sup> Generation Partnership Project (3GPP<sup>TM</sup>) and may be further elaborated for the purposes of 3GPP.

The present document has not been subject to any approval process by the 3GPP Organizational Partners and shall not be implemented. This Specification is provided for future development work within 3GPP only. The Organizational Partners accept no liability for any use of this Specification. Specifications and reports for implementation of the 3GPP<sup>TM</sup> system should be obtained via the 3GPP Organizational Partners' Publications Offices.

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Keywords

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UMTS, OCS, Online charging, charging,  
management

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## Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

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# 1 Scope

The present document is part of a series of documents that specify charging functionality and charging management in GSM/UMTS networks. The GSM/UMTS core network charging architecture and principles are specified in 3GPP TS 32.240 [1], which provides an umbrella for other charging management documents that specify

- the content of the CDRs per domain and subsystem (offline charging);
- the content of real-time charging messages per domain / subsystem (online charging);
- the functionality of online and offline charging for those domains and subsystems;
- the interfaces that are used in the charging framework to transfer the charging information (i.e. CDRs or charging events).

The complete document structure for these TSs is defined in 3GPP TS 32.240 [1].

The present document covers all internal aspects of the Online Charging System (OCS). The document contains the architecture and functions of the OCS logical components and thereby derives the functionality of the OCS interfaces. A detailed specification of interfaces between the logical OCS components is also included. The functionality of the OCS, as described in the present document, applies to all charging domains (bearer, session and service).

Editor's Note: The protocol isn't selected.

Are we closed on Diameter? Proposal for Diameter: In the present document the messages content and format are specified along with the transport of these messages using the Diameter protocol [...] as an implementation reference. Details about message flows and the definitions of the Diameter AVPs are also included.

The interfaces connecting to the OCS (e.g. Ro, CAP) are out of the scope of the present document.

NOTE: In the current release the present document is limited to the interface between the charging function and the Rating Function, namely Re.

All references, abbreviations, definitions, descriptions, principles and requirements, used in the present document, that are common across 3GPP TSs, are defined in 3GPP TR 21.905 [50]. Those that are common across charging management in GSM/UMTS domains or subsystems are provided in the umbrella document 3GPP TS 32.240 [1] and are copied into clause 3 of the present document for ease of reading. Finally, those items that are specific to the present document are defined exclusively in the present document.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

**a) 3GPP charging specifications**

[1] 3GPP TS 32.240: "Telecommunication management; Charging management; Charging Architecture and Principles".

[2]-[9] Void.

- [10] 3GPP TS 32.250: "Telecommunication management; Charging management; Circuit Switched (CS) domain charging".
- [11] 3GPP TS 32.251: "Telecommunication management; Charging management; Packet Switched (PS) domain charging".
- [12] 3GPP TS 32.252: "Telecommunication management; Charging management; Wireless Local Area Network (WLAN) charging".
- [13]-[19] Void.
- [20] 3GPP TS 32.260: "Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging".
- [21]-[29] Void.
- [30] 3GPP TS 32.270: "Telecommunication management; Charging management; Multimedia Messaging Service (MMS) charging".
- [31] 3GPP TS 32.271: "Telecommunication management; Charging management; Location Services (LCS) charging".
- [32]-[39] Void.
- [40] 3GPP TS 32.299: "Telecommunication management; Charging management; Diameter charging application".
- [41] 3GPP TS 32.298: "Telecommunication management; Charging management; Charging Data Record (CDR) parameter description".
- [42] 3GPP TS 32.297: "Telecommunication management; Charging management; Charging Data Records (CDR) file format and transfer".
- [43]-[49] Void.
- b) Common 3GPP specifications**
- [50] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [51]-[59] Void.
- c) Other Domain and Service specific 3GPP / ETSI specifications**
- [60] 3GPP TR 32.815: "Online Charging System (OCS) architecture study".
- [61] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".
- [62] 3GPP TS 23.078: "Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase 4 - Stage 2".
- [63]-[69] Void.
- d) Non 3GPP / ETSI specifications**
- [70] Void.

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## 3 Definitions, symbols and abbreviations

Editor's note: verify the definitions, symbols and abbreviations synchronization between the documents and with 3GPP TR 21.905.

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [50], 3GPP TS 32.240 [1] and the following apply:

**account:** structure residing in the [OCS](#) for holding dynamic subscriber data with monetary equivalence  
Accounts may have a currency or a unit type. As opposed to bank accounts, transaction history is not necessarily kept in the [OCS](#) account data structure.

**account balance:** the current value of an account of service usage.

Editor's Note: Account and account Balance under discussion.

**charging:** functions whereby information related to a chargeable event is formatted and transferred in order to make it possible to determine usage for which the charged party may be billed  
This applies for all charging levels (e.g. transport, service, content, etc.).

**chargeable event:** activity utilizing telecommunications network infrastructure and related services for user to user communication (e.g. a single call, a data communication session or a short message), or for user to network communication (e.g. service profile administration), or for inter-network communication (e.g. transferring calls, signalling, or short messages), or for mobility (e.g. roaming or inter-system handover), which the network operator wants to charge for

**counter:** temporary aggregation of units of service usage, which may be in relation to subscriber contractual terms (e.g. number of used SMS per day or number of free minutes per month)  
These form the basis for any type of loyalty program like discounts or bonus.

**domain:** part of a communication network that provides services using a certain technology

**offline charging:** charging mechanism where charging information **does not** affect, in real-time, the service rendered

**online charging:** charging mechanism where charging information can affect, in real-time, the service rendered and therefore a direct interaction of the charging mechanism with session/service control is required

**tariff:** set of parameters defining the network utilization charges for the use of a particular service

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

Bo	Offline Charging Reference Point towards the operator's post-processing system
Rc	Online Charging Reference Point towards the Account Balance Management Function
Re	Online Charging Reference Point towards the Rating Function
Ro	<a href="#">IMS</a> Online Charging Reference Point towards the online charging functions ( <a href="#">ECF</a> , <a href="#">SCF</a> )
Rr	Online Charging Reference Point towards an external account recharging server

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

<a href="#">AoC</a>	Advice of Charge
<a href="#">BCF</a>	Bearer Charging Function
<a href="#">CAMEL</a>	Customized Applications for Mobile network Enhanced Logic
<a href="#">CAP</a>	<a href="#">CAMEL</a> Application Part
CCA	Credit Control Answer
CCR	Credit Control Request
<a href="#">CDR</a>	Charging Data Record
<a href="#">CSCF</a>	Call Session Control Function
<a href="#">ECF</a>	Event Charging Function
<a href="#">ECUR</a>	Event Charging with Unit Reservation
<a href="#">GGSN</a>	Gateway GPRS Support Node
<a href="#">HTTP</a>	HyperText Transfer Protocol



IEC	Immediate Event Charging
IMS	IP Multimedia core network Subsystem
IP	Internet Protocol
LCS	LoCation Services
MMS	Multimedia Messaging Service
OCS	Online Charging System
PS	Packet-Switched
SCF	Session Charging Function
SGSN	Serving GPRS Support Node
SIP	Session Initiation Protocol
SOAP	Simple Object Access Protocol
WLAN	Wireless Local Area Network
XML	eXtented Mark-up Language

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## 4 Required functionality of OCS

The Online Charging System (OCS) shall support mechanisms for:

- online bearer charging towards access / core network entities (e.g. SGSN, GGSN, IP Flow Handler, WLAN). Online charging interfaces to be supported are Ro and CAP;
- online charging of applications/services that are provided to subscribers via service nodes (outside the core network) e.g. MMS and LCS. The online charging interface to be supported is Ro;
- IMS online charging. Online charging interface to be supported is Ro;
- correlation of bearer, service and IMS charging;
- account balance management towards external account management servers e.g. recharge server, hot billing server;
- generation of Charging Data Records (CDRs) and their transfer to the operator's post-processing system.

To support these requirements, the functions listed below are necessary in the OCS:

1. rating (before and/or after service consumption):
  - unit determination: calculation and reservation of a number of session-related non-monetary units (service units, data volume, time and events);
  - price determination: calculation of monetary units (price) for a given number of non-monetary units;
  - tariff determination: determination of tariff information based on the subscribers contractual terms and service being requested (e.g. e-parameters for AoC);
  - get/set counters applicable for rating (alternatively these counters can be here or in the subscriber account balance management; for further details refer to subclause 6.1.2).
2. subscriber account balance management:
  - check account balance;
  - account balance update (credit/debit);
  - account balance reservation;
  - get/set counters;
  - get/set expiry date of the (prepaid) account (optional).
3. charging transaction control:
  - perform charging control on request basis for bearer and events/services;

- immediate charging and charging with reservation;
  - generation of charging information/[CDR](#) per charging transaction.
4. correlation function: for further study in later releases.

---

## 5 Architectural concept

### 5.1 Architecture reference model for online charging

The reference architecture model below (see figure 5-1) is based on 3GPP TR 32.815 [60]. The architecture is designed to support online charging mechanisms for bearer charging, service charging and [IMS](#) charging.

r

NOTE 1: The lines representing the Rc, Re and Bo reference points connecting the Bearer, Session and Event Charging Functions with Account Balance Management Function, Rating Function and the operator's post-processing system respectively are drawn only once for figure layout purposes only.

NOTE 2: The support of ISC as charging interface towards [IMS S-CSCF](#) requires additional functionality to be provided by the [OCS](#). The support of Ro as charging interface towards [OCS](#) requires additional functionality to be provided by the [IMS CSCF](#).

#### Figure 5-1: Online charging system

Note that towards the [SGSN](#), the [OCS](#) or a separate function could provide a translation between [CAP](#) and Ro. This is beyond the scope of the present document.

The Bearer Charging Function ([BCF](#)) performs bearer charging using the [CAP](#) interface towards the [SGSN](#) and Ro reference point or variants thereof towards other network entities in the access domain.

The Session Charging Function (SCF) performs IMS session charging using the Ro reference point towards the IMS CSCF. Whether the CSCF is directly connected to the OCS or via a gateway (IMS Gateway Function) is beyond the scope of the present document.

The Event Charging Function (ECF) performs event-based charging using the Ro reference point or variants thereof.

The Rating Function and the Account Balance Management Function are described in clause 4. The Re reference point allows the interaction between Charging Functions (BCF, SCF, ECF) and Rating Function.

The Rc reference point allows the interaction between Charging Functions (BCF, SCF, ECF) and Account Balance Management Function to access the subscribers account balance.

The Bo reference point allows the collection and transfer of charging information from the Charging Functions (BCF, SCF, ECF) to the operator's post-processing system as the OCS variant of the Bx interface description in 3GPP TS 32.297 [42].

The Rr reference point allows the interaction between Account Balance Management Function and an external recharging server.

There may be other external systems connected to the OCS (e.g. hot billing server). These systems are not considered in the present document.

## 5.2 Functions within the OCS

### 5.2.1 Charging Functions

#### 5.2.1.1 Bearer Charging Function (BCF)

The BCF performs the bearer level charging based on bearer usage requests received from the network. It controls the bearer usage in the network, e.g. in terms of time or volume granted. It communicates with the Rating Function in order to determine the value of the requested bearer resources. It communicates with the Account Balance Management Function to query and update the subscribers' account and counters status.

**Editor's note:** The following text should be clarified by the decision for one option: (counters not applicable in the "Extended Rating Engine" option, ref. subclause 5.1.2.3 in 3GPP TR 32.815 [60]).

#### 5.2.1.2 Event Charging Function (ECF)

The ECF performs event based charging (e.g. content charging) based on service usage requests received from the network. It can grant or deny the service usage in the network. It communicates with the Rating Function in order to determine the value of the requested service usage. It communicates with the Account Balance Management Function to query and update the subscribers' account and counters status.

**Editor's note:** The following text should be clarified by the decision for one option: (counters not applicable in the "Extended Rating Engine" option, ref. subclause 5.1.2.3 in 3GPP TR 32.815 [60]).

#### 5.2.1.3 Session Charging Function (SCF)

The SCF performs charging of sessions based on session resource usage requests received from the network (e.g. the IMS CSCF). It controls sessions in the network, e.g. it has the ability to grant or deny a session setup request and to terminate an existing session. It communicates with the Rating Function in order to determine the value of the requested session. It communicates with the Account Balance Management Function to query and update the subscribers' account and counters status.

**Editor's note:** The following text should be clarified by the decision for one option: (counters not applicable in the "Extended Rating Engine" option, ref. subclause 5.1.2.3 in 3GPP TR 32.815 [60]).

## 5.2.2 Rating Function

The Rating Function performs both monetary and non-monetary unit determination (rating). It provides the following functionalities:

- Rating for network- and external services and applications (session, service, event) before and after service delivery;
- Cross-product and cross-channel discounts, benefits and allowances.

The Rating Function must be able to handle a wide variety of rateable instances, such as:

- Rating of volume (in terms of granted units or money, e.g. based on charging initiated by an access network entity);
- Rating of time (in terms of granted units or money, e.g. based on charging initiated by a SIP application);
- Rating of events (e.g. based on charging of web content or MMS).

The Rating Function includes the determination of the tariff or the price of a chargeable event; examples include the price of a call minute, data volume, multimedia session, Web content, etc.

Upon receipt of a rate request (price or tariff request) from the Charging Function, the Rating Function:

- Evaluates the request. Rate requests include various rating parameters such as service identifier, subscriber reference, network identification, user location, service usage time, transferred data volume, etc.
- Determines the applicable price or tariff model and returns it to the Charging Function.

To support the online rating process, the Rating Function needs counters. The counters may be maintained by the Rating Function or by the Account Balance Management function. A Rating Function that does not maintain counters will be marked as class "A" Rating Function. A Rating Function that maintains counters will be marked as class "B" Rating Function. Both classes use the same set of messages, but some parameters will be optional as appropriate.

## 5.2.3 Account Balance Management Function

Not specified in the present document.

## 5.2.4 Correlation Function

*Editor's note: This subclause has to be decided.*

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# 6 Functionalities and Message Flows

## 6.1 Reference Point Required Functionality

### 6.1.1 Re Reference Point (BCF, SCF, ECF - Rating Function)

#### 6.1.1.1 Functionality for class "A" Rating Function

The following applies with respect to the Rating Interface:

- The Rating Function will potentially cover all rating scenarios for all charging levels (bearer, session and service) and all payment channels (prepaid and postpaid).
- The Rating Function will cover the following methods **PriceRequest** and **TariffRequest**.
- An additional method **ServiceUsageRequest**, where the number of service units for a given price is determined, may be supported.

- The Rating Function will operate in a stateless way on a per request basis. No context or state is stored internally.
- The Rating Function will not modify accounts or bonus counters directly. Instead it passes the corresponding information as part of the response (e.g. "debit 1 € from subscriber X", "credit 0.9 € to merchant Y", "add 100 loyalty points of partner Z to subscriber X", "increase counter SMScounter for subscriber X and merchant Y by 1").
- The Rating Interface is an interface in a trusted environment. Session handling, transaction control or authentication / authorization are not required.
- No records are written by the Rating Function. Thus billing relevant information is part of the response (e.g. "tariff Z for gold customers was applied").

Resulting from these requirements following functionality of Re reference point is proposed:

- Basic methods:
  - Price Request (to calculate a price for given service usage);
  - Tariff Request (to request a tariff that is applicable, e.g. e-parameters for [AoC](#));
  - Service Usage Request (to calculate service units for a given amount of money/loyalty) - optional.
- Additional supported functionalities:
  - Discounts by use of consumer specific counters;
  - Loyalty programs;
  - Taxes;
  - Detailed information for use during invoice generation.

Depending on the service or product offered and on the customer's contract, the Rating Function supports the following methods:

- **PriceRequest:** Determination of a price for the execution of a service or the delivery of a good. From the rating perspective this is the same method if run before delivery (e.g. for balance check or [AoC](#)), after delivery (post-rating for charging) or even later in a rating process. The same method applies for one-time or recurrent charges. The PriceRequest is used by the [ECF](#).
- **TariffRequest:** Determination of a tariff for a given service. This method is used, e.g., for voice calls, where e-parameters are returned by the Rating Function. Based on the tariff (e-parameters) the charging function calculates either the amount of units for a given price or the price for given number of units. The method can also be used for various other services. The TariffRequest is used by the [BCF](#) and the [SCF](#).

Scenarios involving granted units may be covered via a TariffRequest or by the Rating Function directly. The handling of the first case is part of the charging function. For the latter case the Re interface will offer a special request type:

- **ServiceUsageRequest:** This type of request, also called backward rating, determines the amount of units of a given service given the price. The ServiceUsageRequest is useful (but not limited) in the case where the subscriber's price plan is formed in usage per monetary units amount (e.g. 45 seconds per 100 Yen). Since the basic requirements are covered by the former requests, this request is optional.

Input for Rating:

- Rating Request Type: Price Request, Service Usage Request, Tariff Request.
- Service-specific data: Service-ID, Time/Date of Service usage, QoS, etc.
- Subscriber-specific static data: Subscriber-ID, Partner-ID {MVNO, merchant, ...}, additional tariff information ("Friends & Family" list, ...), other static data.
- Subscriber specific dynamic data: Account Balances incl. units/currency {money, loyalty}, Subscriber Counters (Service-Type {SMS/MMS/Volume/Time} used per time-unit {day/week/month/year}), other dynamic data)

Output of Rating:

- Rating Request Type Response: Price or Service units or Tariff incl. tariff switch information (e-parameters, Tariff Switch Time (absolute time/duration), etc.);
- Charge and Recharge Information: Value for accounts and Subscriber Counters (e.g. charge money, recharge loyalty accounts);
- Tax information;
- Detailed information to be used for invoice generation.

**Editor's Note: revise after interface selection:**

Depending on the technological basis of the interface, results may be passed as return values (as described below) or in equivalent response-"methods" (rateResponse, tariffResponse).

### 6.1.1.2 Functionality for class "B" Rating Function

If class "B" Rating Function is chosen, i.e. counters are maintained in the Rating Function, then the Re Reference Point is modified with respect to the previous clause in the following way:

- the Rating Function has to become statefull;
- the Rating Function has to modify counters directly;
- the Rating Function has to handle sessions / has to support transaction control;
- the PriceRequest and TariffRequest have to support reservations.

### 6.1.2 Rc Reference Point (BCF, SCF, ECF - Account Balance Management Function)

To be defined in a later release.

## 6.2 Re Message Flows

**Editor's Note: Check if additional message flows are required.**

This subclause describes message flows for the Re Reference Point by explaining example online charging sessions (i.e. credit control sessions on the Ro interface or CAP dialogues).

On the interface towards the serving network nodes (i.e. Ro, CAP) the generic message names "online charging request" and "online charging response" are used. These generic names should be mapped to real messages depending on the type of interface as indicated in the following table.

generic name	Ro Interface	CAP Interface
online charging request	Credit Control Request (CCR)	Initial DP GPRS <i>(first message, initiates the charging dialogue)</i> Apply Charging Report GPRS <i>(subsequent messages)</i>
online charging response	Credit Control Answer (CCA)	Apply Charging GPRS

**Editor's Note: Ro messages for IMS handling need further study. CCR and CCA are preferred, but in Rel-5, Accounting Request (ACR) and Accounting Answer (ACA) were used.**

**Editor's Note II: How AoC is addressed in Ro / CAP – TBD (SCIGPRS message)?**

For details on the CAP messages and message flows, refer to 3GPP TS 23.078 [62].

## 6.2.1 Class "A" Rating Function Message Flows

### 6.2.1.1 PriceRequest method

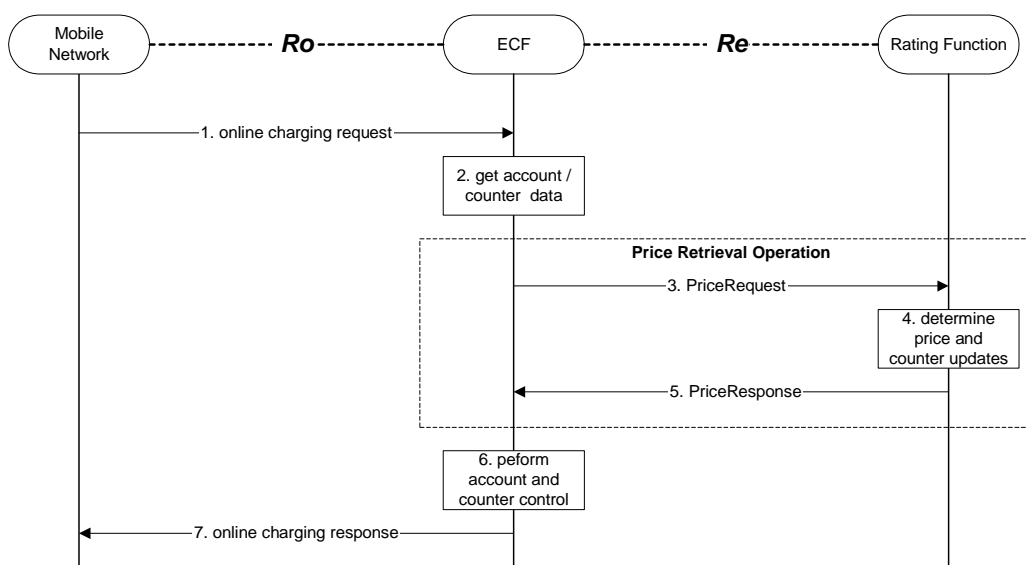
The PriceRequest method is used only for event based charging, i.e. only the **ECF** uses this method.

According to 3GPP TS 32.299 [40], two different scenarios need to be distinguished, the Immediate Event Charging (**IEC**) and the Event Charging with Unit Reservation (**ECUR**).

Both scenarios in this section describe the case where the **ECF** invokes the PriceRequest method for charging or Advice of Charge.

#### 6.2.1.1.1 PriceRequest scenario with Immediate Charging

Figure 6-1 describes the case where the **ECF** invokes the PriceRequest method in an Immediate Event Charging (**IEC**) scenario.

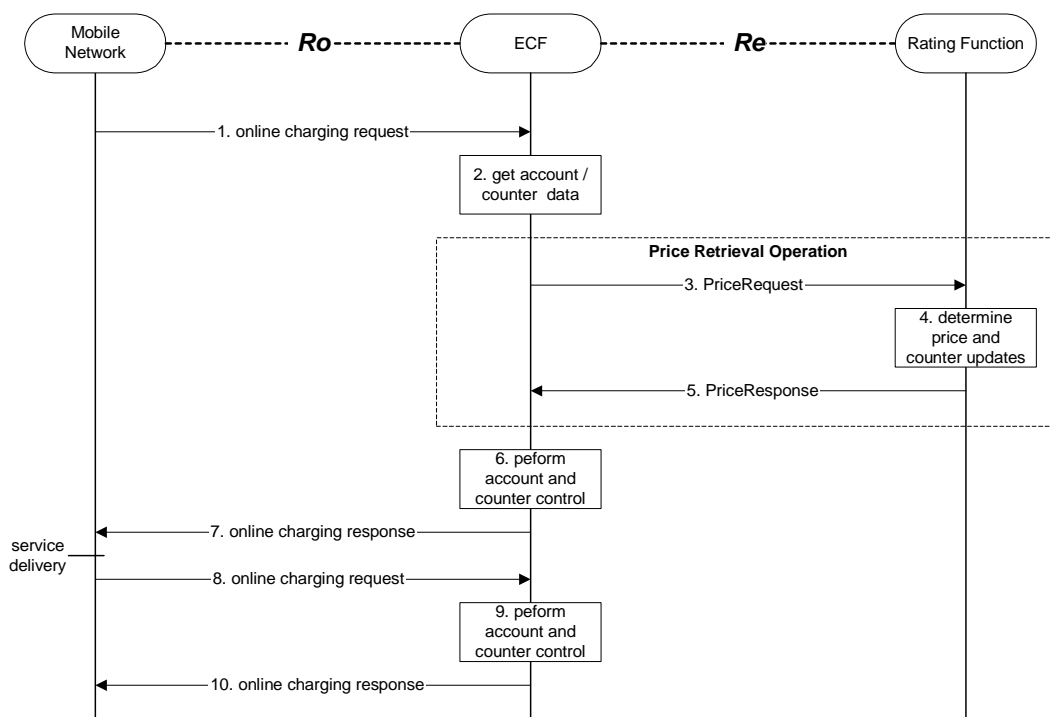


**Figure 6-1 : Price Request Method with immediate charging**

- Step 1: The **ECF** receives an online charging request for a certain event/service.
- Step 2: The **ECF** requests account and counter information for the subscriber from the Account Balance Management Function. Upon receipt of this data,
- Step 3: the **ECF** sends a price request to the Rating Function in order to determine the price of the desired service. Note that this scenario assumes that the **ECF** has not received any service cost information in the online charging request.
- Step 4: The Rating Function calculates the price and counter updates for the given service according to the service and subscriber specific information included in the request.
- Step 5: The calculated price and counter updates are returned to the **ECF**.
- Step 6: The **ECF** continues event charging and performs account and counter control (i.e. it checks and adjusts the account and counter values).
- Step 7: The **ECF** sends the appropriate online charging response.

### 6.2.1.1.2 PriceRequest scenario with Unit Reservation

Figure 6-2 describes the case where the **ECF** invokes the PriceRequest method in an Event Charging with Unit Reservation (**ECUR**) scenario.



**Figure 6-2: Price Request Method with unit reservation**

- Step 1: The **ECF** receives an online charging request for a certain event/service.
- Step 2: The **ECF** requests account and counter information for the subscriber from the Account Balance Management Function. Upon receipt of this data,
- Step 3: the **ECF** sends a price request to the Rating Function in order to determine the price of the desired service. Note that this scenario assumes that the **ECF** has not received any service cost information in the online charging request.
- Step 4: The Rating Function calculates the price and counter updates for the given service according to the service and subscriber specific information included in the request.
- Step 5: The calculated price and counter updates are returned to the **ECF**.
- Step 6: The **ECF** continues event charging and performs account and counter control (i.e. it makes reservations for the requested service).
- Step 7: The **ECF** sends the appropriate online charging response (i.e. it grants or denies service delivery).
- Step 8: After service delivery, the serving network node sends an indication of successful (or unsuccessful) service delivery to the **ECF**.
- Step 9: The **ECF** performs account and counter control (i.e. it adjusts the account and counter values accordingly).
- Step 10: Finally, the **ECF** sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

### 6.2.1.2 TariffRequest method

The TariffRequest method is used for bearer charging and **IMS** session charging, i.e. **BCF** and **SCF** use this method. The only difference between **BCF** and **SCF** with respect to the TariffRequest message flows is, that the **BCF** can supervise the bearer usage with respect to volume and/or time, whereas the **SCF** supervises the session resource usage with respect to time only. Therefore, all message flows described in this section are applicable for both, **BCF** and **SCF**.

All scenarios in this section describe the case where the **BCF** or **SCF** invokes the tariffRequest method for charging or Advice of Charge. All scenarios are valid independent of the type of applicable "units" (i.e. for both, time or volume).

In the context of bearer charging or session charging, only the Event Charging with Unit Reservation (**ECUR**) (3GPP 32.299 [40]) is relevant. Therefore, only **ECUR** is considered in this section.



6.2.1.2.1 Basic TariffRequest Scenario

Figure 6-3 shows a basic message flow for the tariff request method.

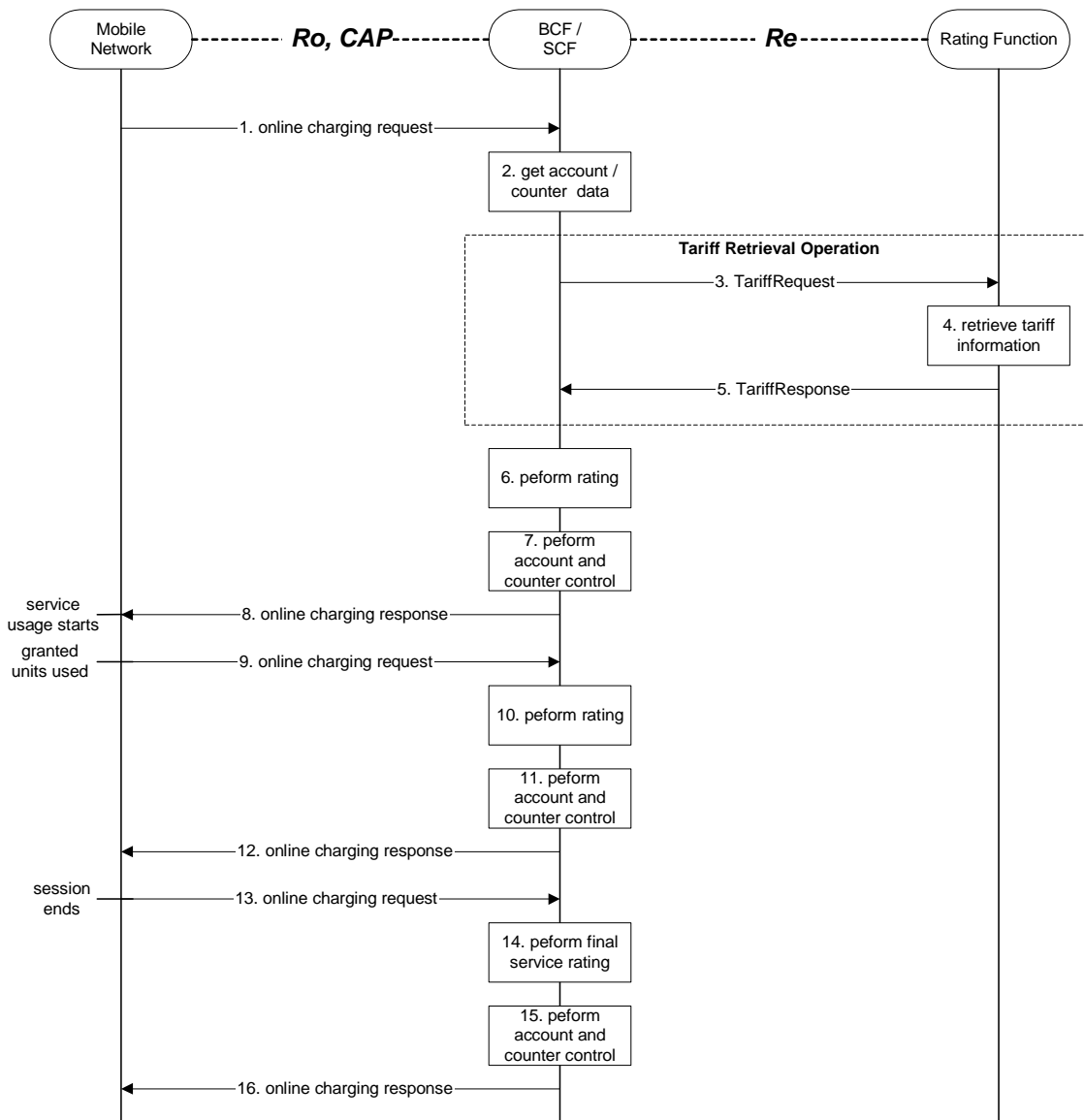


Figure 6-3: Basic Tariff request method

- Step 1: The **BCF/SCF** receives an online charging request referring to an MS's bearer/session resource usage.
- Step 2: The **BCF/SCF** requests account and counter information for the subscriber from the Account Balance Management Function. Upon receipt of this data,
- Step 3: it requests tariff information applicable for this bearer/session.
- Step 4: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session.
- Step 5: The Rating Function returns the tariff information to the **BCF/SCF**.
- Step 6: Based on the received tariff information, the **BCF/SCF** performs rating, i.e. determines the granted units and the price.
- Step 7: The **BCF/SCF** continues bearer/session charging and performs account and counters control (reservations).
- Step 8: It returns the granted units to the requesting network element.
- Step 9: When the granted units have been used, a new request is send from the serving network element to the **BCF/SCF**.
- Step 10: This time the **BCF/SCF** can directly perform the rating, i.e. determine the units and price.
- Step 11: The **BCF/SCF** performs account and counter control (reservations).

- Step 12: Again, assuming successful account control, a positive acknowledgment is returned to the network entity.
- Step 13: The MS terminates bearer/session usage. The used units are sent to the BCF/SCF.
- Step 14: The BCF/SCF performs final rating for the consumed bearer/session resources and
- Step 15: adjusts the account and counter accordingly.
- Step 16: Finally, the BCF/SCF sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

In this basic scenario only one request to the Rating Function is needed during the whole online charging sessions.

The message flow in figure 6-3 is an example of an online charging session to illustrate the usage of the basic Tariff Request method on the Re interface. The sequence of steps 6-9 can be repeated multiple times.

This basic scenario assumes, that the tariff information is valid for the whole online charging session (i.e. the tariff is not affected by the amount of resources used, the time of day, etc.).

### 6.2.1.2.2 TariffRequest Scenario with Tariff Switch

Figure 6-4 shows a message flow for the tariff request method with tariff switch, i.e. the tariff will change at a specified time.

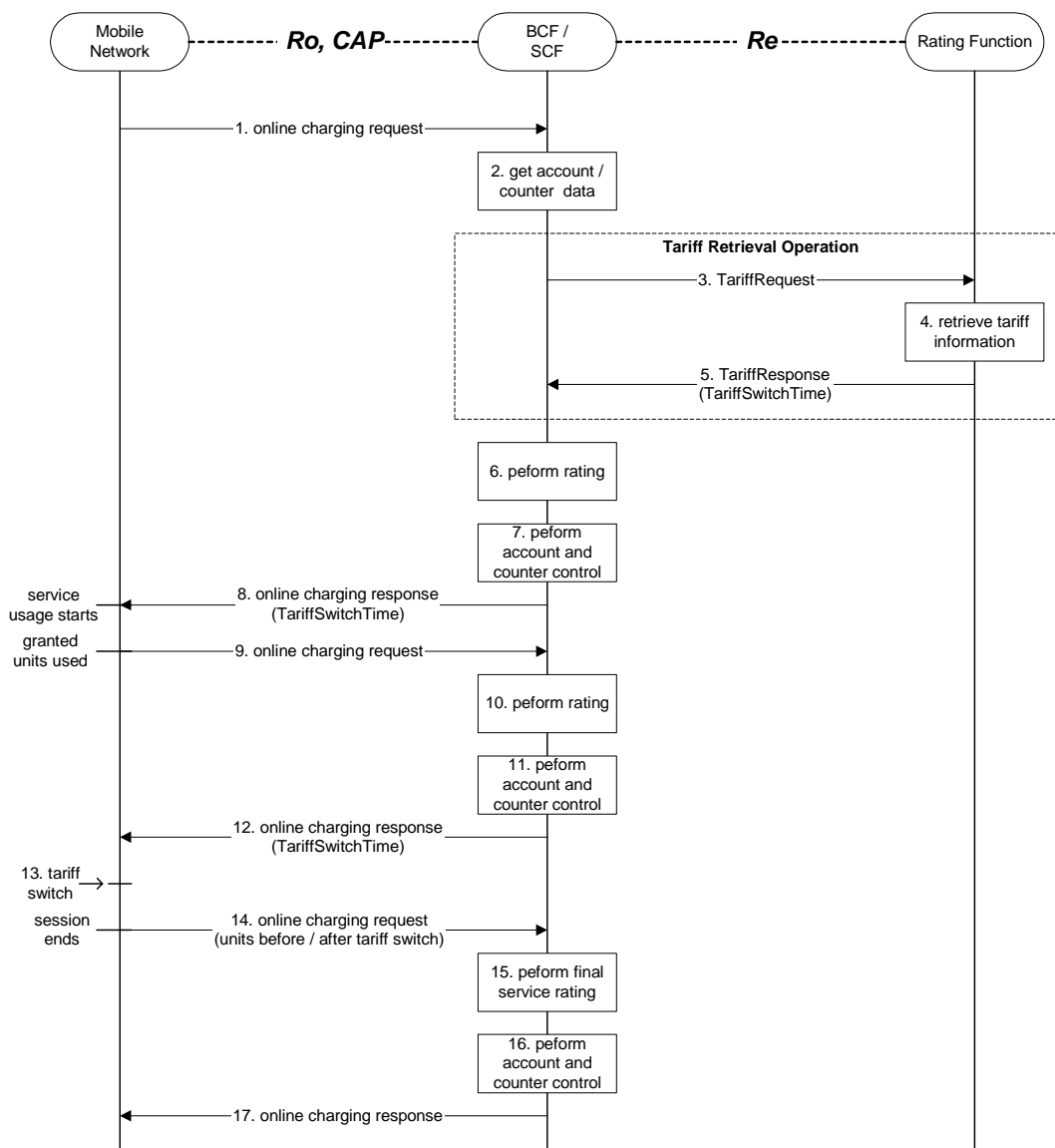


Figure 6-4: Tariff request method with tariff switch

- Step 1: The **BCF/SCF** receives an online charging request referring to an MS's bearer usage/session resource usage.
- Step 2: The **BCF/SCF** requests account and counter information for the subscriber from the Account Balance Management Function. Upon receipt of this data,
- Step 3: it requests tariff information applicable for this bearer/session.
- Step 4: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session.
- Step 5: The Rating Function returns the tariff information to the **BCF/SCF**, including indication of an upcoming tariff switch.
- Step 6: Based on the received tariff information, the **BCF/SCF** performs rating, i.e. determines the granted units and the price.
- Step 7: The **BCF/SCF** continues bearer/session charging and performs account and counter control (reservations).
- Step 8: It returns the granted units and an indication of the upcoming tariff switch to the requesting network element.
- Step 9: When the granted units have been used, a new request is send from the serving network element to the **BCF/SCF**.
- Step 10: This time the **BCF/SCF** can directly perform the rating, i.e. determine the units and price.
- Step 11: The **BCF/SCF** performs account and counter control (reservations).
- Step 12: Again, assuming successful account control, a positive acknowledgment (including tariff switch indication) is returned to the network entity.
- Step 13: The tariff switch occurs in the network.  
*Note: The tariff switch could also occur between steps 8. and 9.*
- Step 14: The MS terminates bearer/session usage. The units used before and after the tariff switch are sent to the **BCF/SCF** as separate values.
- NOTE: If the tariff switch occurred between steps 8 and 9 already, the units used before and after the tariff switch would be sent to the **BCF/SCF** in step 9.
- Step 15: The **BCF/SCF** performs final rating for the consumed bearer/session resources and
- Step 16: adjusts the account and counter accordingly.
- Step 17: Finally, the **BCF/SCF** sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

In this scenario only one request to the Rating Function is needed during the whole online charging session. No messages are sent at the time when the tariff switch occurs. The **BCF/SCF** is informed about the units used before and after the tariff switch in the *first* online charging request, that is sent after the tariff switch has occurred (step 14 in the example scenario).

The message flow in figure 6-4 is an example of an online charging session to illustrate the usage of the Tariff Request method on the Re interface if tariff switch handling is required. The sequence of steps 6-9 can be repeated multiple times, and (as already indicated in the description of step 13) the tariff switch can occur anytime during the session between an online charging response and the next online charging request. However, it is assumed that only one tariff switch can occur during the whole online charging session.

This scenario is included to illustrate the principle of tariff switch handling. It should be noted, that this scenario is identical to the basic scenario! The tariff switch does not lead to any additional messages, nor does it require any additional handling in the **BCF/SCF**.

### 6.2.1.2.3 TariffRequest Scenario with Valid Units

Figure 6-5 shows a message flow for the tariff request method with limited validity, i.e. the tariff is only valid for a limited number of used service units (e.g. minutes, kbytes). This scenario applies e.g. for regressive tariffs or for the usage of free / discounted service units.

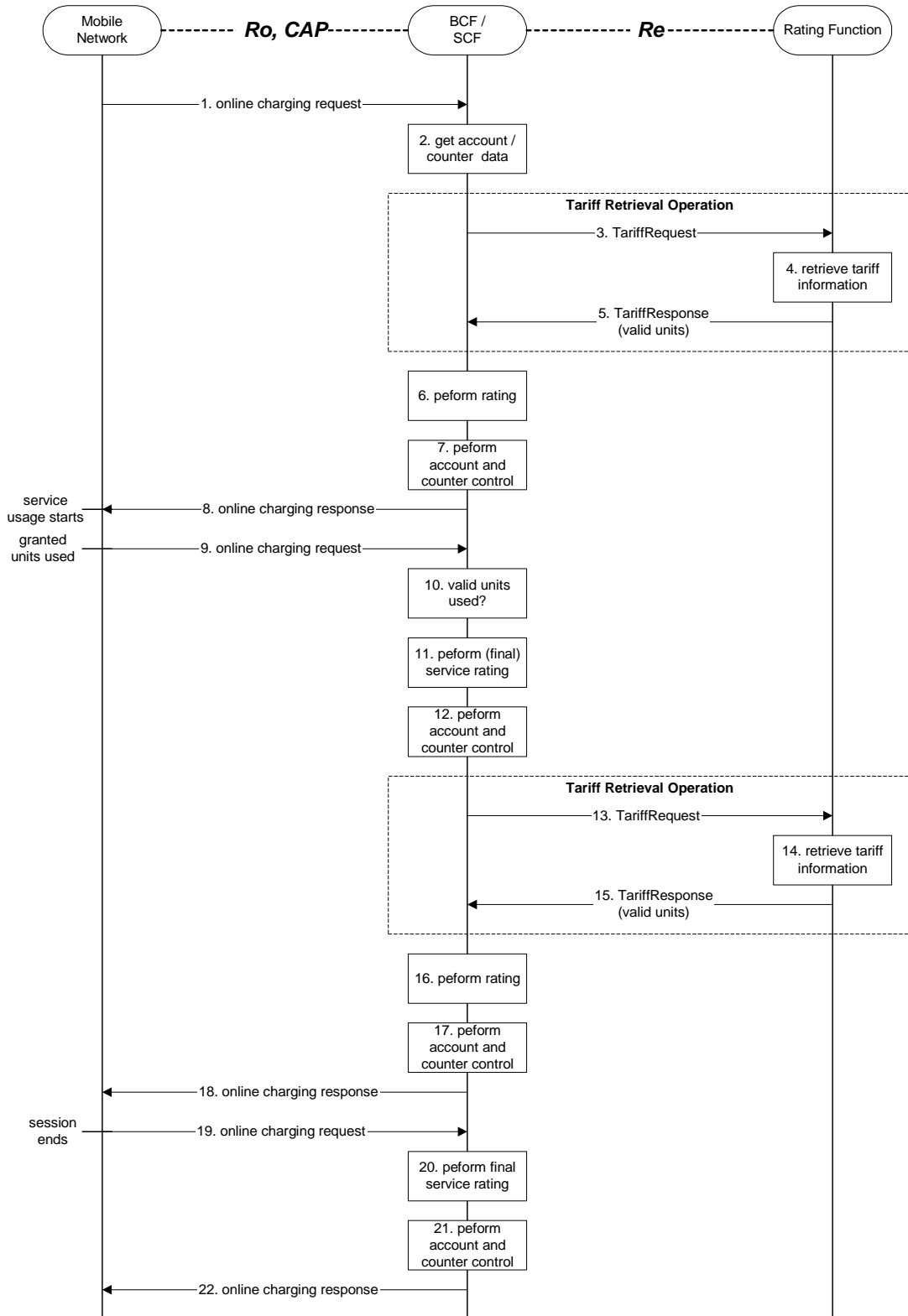


Figure 6-5: Tariff request method with valid units

- Step 1: The **BCF/SCF** receives an online charging request referring to an MS's bearer usage/session resource usage.
- Step 2: The **BCF/SCF** requests account and counter information for the subscriber from the Account Balance Management Function. Upon receipt of this data,
- Step 3: it requests tariff information applicable for this bearer/session.
- Step 4: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session.
- Step 5: The Rating Function returns the tariff information to the **BCF/SCF**, including indication of the number of units for which this tariff is valid.
- Step 6: Based on the received tariff information, the **BCF/SCF** performs rating, i.e. determines the granted units and the price.
- Step 7: The **BCF/SCF** continues bearer/session charging and performs account and counter control (reservations).
- Step 8: It returns the granted units to the requesting network element. Note that the number of granted units is in general different from the number of "valid units" received from the Rating Function (i.e. the number of granted units can be smaller than the number of valid units).
- Step 9: When the granted units have been used, a new request is send from the serving network element to the **BCF/SCF**.
- Step 10: The **BCF/SCF** checks, whether all valid units have been used. If there are valid units left, the scenario continues with step 6 again. If all valid units have been used,
- Step 11: the **BCF/SCF** performs (final) rating for the bearer/session resources consumed so far and
- Step 12: adjusts the account and counter accordingly.
- Step 13: The **BCF/SCF** again requests tariff information applicable for the bearer/session.
- Step 14: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session.
- Step 15: The Rating Function returns the tariff information to the **BCF/SCF**, including indication of the number of units for which this tariff is valid.
- Step 16: Based on the received tariff information, the **BCF/SCF** performs rating, i.e. determines the granted units and the price.
- Step 17: The **BCF/SCF** continues bearer/session charging and performs account and counter control (reservations).
- Step 18: It returns the granted units to the requesting network element.
- Step 19: The MS terminates bearer/session usage. The used units are sent to the **BCF/SCF**.
- Step 20: The **BCF/SCF** performs final rating for the consumed bearer/session resources and
- Step 21: adjusts the account and counter accordingly.
- Step 22: Finally, the **BCF/SCF** sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

In this scenario two requests to the Rating Function are needed during the online charging session. In general, one additional request is needed, whenever a tariff expires (i.e. whenever the number of valid units has been consumed). The handling when the number of valid units has been consumed is similar to the closing of one online charging session and the immediate starting of a new online charging session.

The message flow in figure 6-5 is an example of an online charging session to illustrate the usage of the Tariff Request method on the Re interface, if the tariff is valid only for a limited number of service units. The sequence of steps 6-10 can be repeated multiple times (as already indicated in step 6), and also the sequence of steps 6-15 can be repeated multiple times (i.e. including the complete consumption of valid units and a new request towards the Rating Function).

A TariffRequest scenario with limited validity, where the tariff is only valid for a limited number of used service units, shall not be combined with a tariff switch scenario (ref. subclause 6.2.1.2.2).

6.2.1.2.4 TariffRequest Scenario supporting unsolicited changes of session parameters

Figure 6-6 shows a message flow for the tariff request method in a scenario, where the tariff depends on the Quality of Service (QoS). In this case, a new tariff applies whenever the QualityOfService in the network changes. The QoS change is an example of an unsolicited change of charging relevant session parameters in the network.

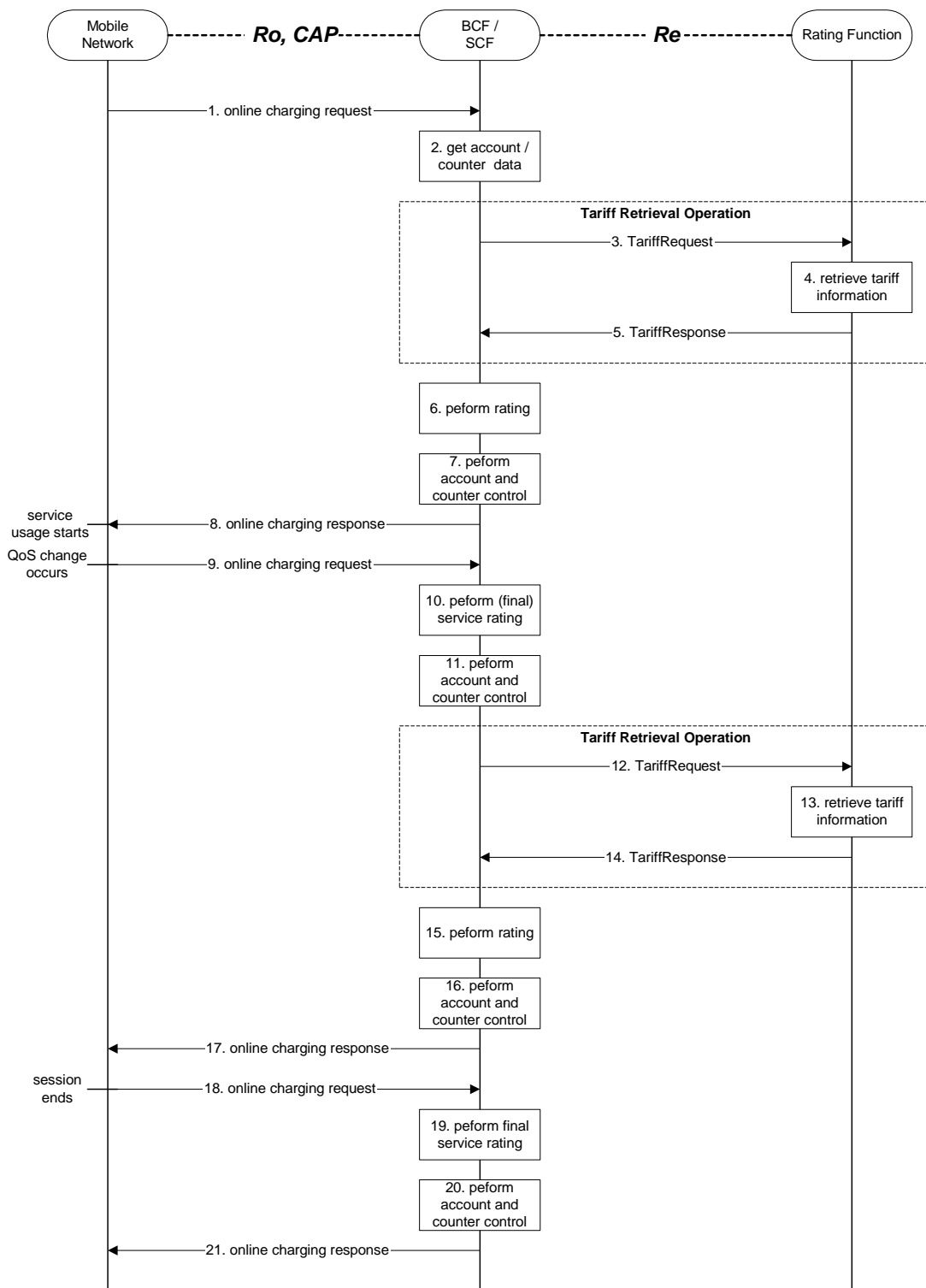


Figure 6-6: Tariff request method with charging based on QoS

- Step 1: The BCF/SCF receives an online charging request referring to an MS's bearer usage/session resource usage.
- Step 2: The BCF/SCF requests account and counter information for the subscriber from the Account Balance Management Function. Upon receipt of this data,

- Step 3: it requests tariff information applicable for this bearer/session.
- Step 4: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session.
- Step 5: The Rating Function returns the tariff information to the **BCF/SCF**.
- Step 6: Based on the received tariff information, the **BCF/SCF** performs rating, i.e. determines the granted units and the price.
- Step 7: The **BCF/SCF** continues bearer/session charging and performs account and counter control (reservations).
- Step 8: It returns the granted units to the requesting network element.
- Step 9: When a QoS change occurs in the network, a new request is sent from the serving network element to the **BCF/SCF** immediately. This request includes the number of units consumed so far.
- Step 10: The **BCF/SCF** performs (final) rating for the bearer/session resources consumed so far and
- Step 11: adjusts the account and counter accordingly.
- Step 12: The **BCF/SCF** again requests tariff information applicable for the bearer/session. Note that the new (changed) QoS is included in this request.
- Step 13: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session.
- Step 14: The Rating Function returns the tariff information to the **BCF/SCF**.
- Step 15: Based on the received tariff information, the **BCF/SCF** performs rating, i.e. determines the granted units and the price.
- Step 16: The **BCF/SCF** continues bearer/session charging and performs account and counter control (reservations).
- Step 17: It returns the granted units to the requesting network element.
- Step 18: The MS terminates bearer/session usage. The used units are sent to the **BCF/SCF**.
- Step 19: The **BCF/SCF** performs final rating for the consumed bearer/session resources and
- Step 20: adjusts the account and counter accordingly.
- Step 21: Finally, the **BCF/SCF** sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

In this scenario two requests to the Rating Function are needed during the online charging session. In general, one additional request is needed, whenever the QualityOfService changes in the network. A change in the QualityOfService is handled similar to the closing of one online charging session and the immediate starting of a new online charging session.

The message flow in figure 6-6 is an example of an online charging session to illustrate the usage of the Tariff Request method on the Re interface, if the tariff expires due to an unsolicited change of charging relevant session parameters in the mobile network. Besides a QualityOfService change, other events in the network that could cause a tariff expiry include e.g. a location change, an **SGSN** change, etc. Also, e.g. the sequence of steps 6-9 can be repeated multiple times (if no QoS change occurs and the granted units have been used in step 9), and also the sequence of steps 6-14 can be repeated multiple times (if multiple QoS changes occur).

## 6.2.2 Class "B" Rating Function Message Flows

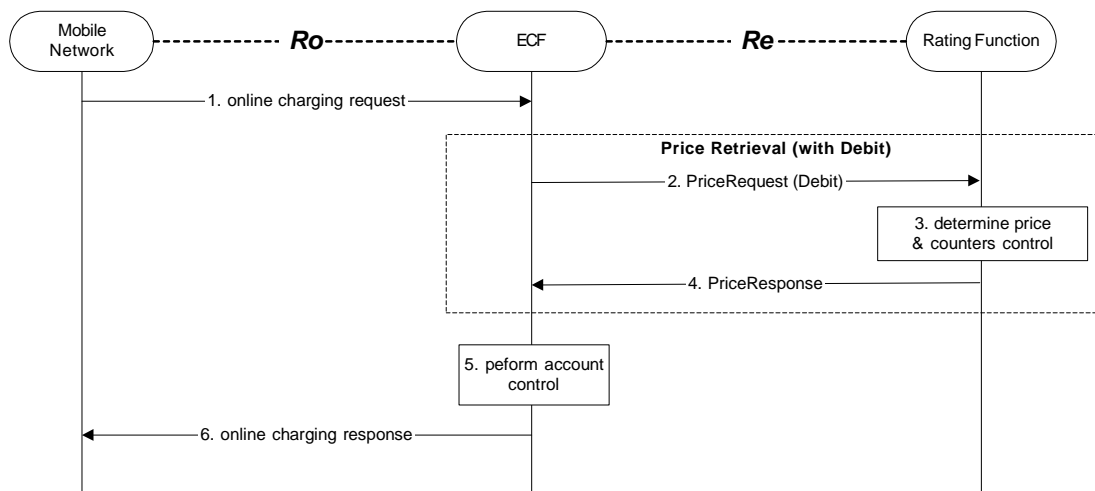
### 6.2.2.1 PriceRequest method

The PriceRequest method is used only for event based charging, i.e. only the **ECF** uses this method.

According to 3GPP TS 32.299 [40], two different scenarios need to be distinguished, the Immediate Event Charging (**IEC**) and the Event Charging with Unit Reservation (**ECUR**).

6.2.2.1.1 PriceRequest scenario with Immediate Charging

Figure 6-7 describes the case where the ECF invokes the PriceRequest method in an Immediate Event Charging (IEC) scenario.



**Figure 6-7: PriceRequest method with Immediate Charging**

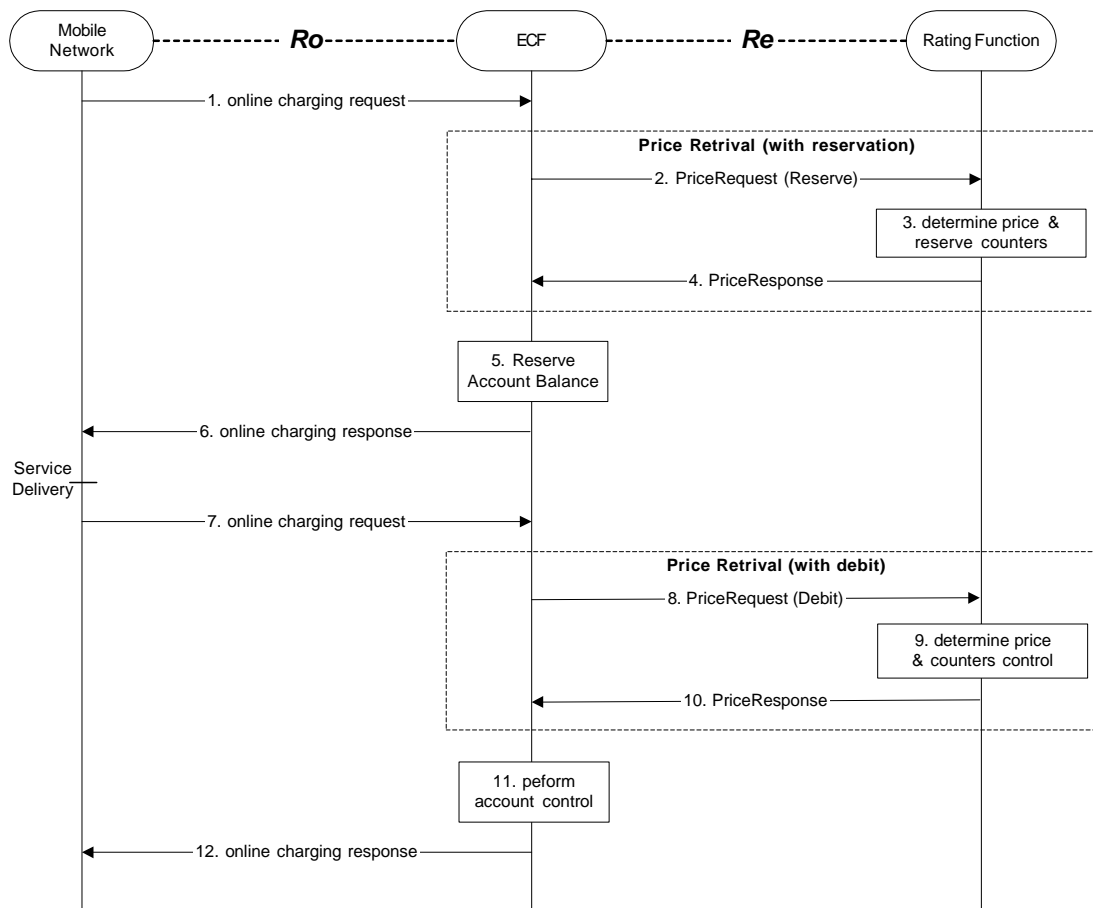
- Step 1: The ECF receives an online charging request for a certain event/service.
- Step 2: The ECF sends a price request with a debit instruction to the Rating Function.
- Step 3: The Rating Function calculates the price if needed and updates the counters as necessary.
- Step 4: The calculated price is returned to the ECF.
- Step 5: The ECF performs account control.
- Step 6: The ECF sends the appropriate online charging response.



### 6.2.2.1.2 PriceRequest scenario with Unit Reservation

Figure 6-8 describes the case where the ECF invokes the PriceRequest method to make reservation but debits after service delivery. Two PriceRequest's are always issued (Reserve & Debit).

The service parameters may be changed in the second request.



**Figure 6-8: PriceRequest method with Unit Reservation**

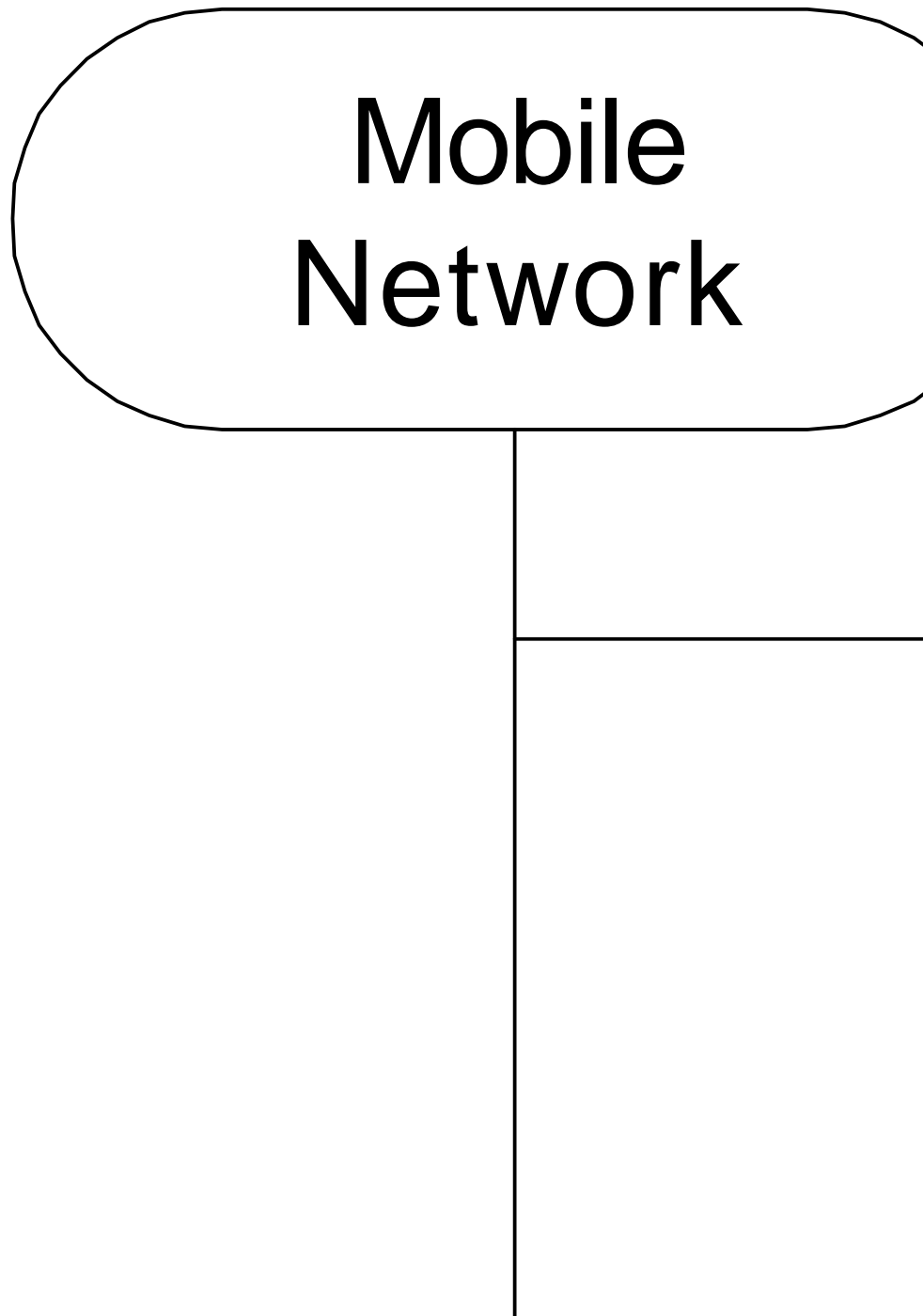
- Step 1: The ECF receives an online charging request for a certain event/service.
- Step 2: the ECF sends a price request with a reserve instruction to the Rating Function in order to determine the price of the desired service. Please note that this scenario assumes that the ECF has not received any service cost information in the online charging request.
- Step 3: The Rating Function calculates the price and reserves the counters related to the given service according to the service and subscriber specific information included in the request and
- Step 4: the calculated price is returned to the ECF.
- Step 5: The ECF reserves amount for the subscriber from the Account Balance Management Function. Upon receipt of this data
- Step 6: It returns the granted units to the requesting network element.
- Step 7: The ECF receives an online charging request after the service consumption.
- Step 8: The ECF sends a price request with a debit instruction to the Rating Function. Please note that the request may contain updated information about the consumed service.
- Step 9: The Rating Function re-calculates the price if needed and updates the counters as necessary.
- Step 10: The final calculated price is returned to the ECF.
- Step 11: The ECF performs account control.
- Step 12: Finally, the ECF sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

### 6.2.2.2 TariffRequest with reservation method

All message flows described in this section are applicable for both, **BCF** and **SCF**.

In the context of bearer charging or session charging, only the Event Charging with Unit Reservation (**ECUR**) [40] is relevant. Therefore, only **ECUR** is considered in this section.

Figure 6-9 describes the message flow for the tariff request method. The scenario describes the case where the **BCF/SCF** invokes the tariffRequest method for charging couple of times during the same session, with reservation.



**Figure 6-9: Tariff request method with reservations**

- Step 1: The **BCF/SCF** receives an online charging request referring to an MS's bearer/session usage.  
Step 2: The **BCF/SCF** requests tariff information applicable for this bearer and counters reservation when applicable.

- Step 3: The Rating Function retrieves the appropriate tariff to be applied for the bearer/session and reserve counter values if needed.
- Step 4: The Rating Function returns the tariff information including the price to the BCF/SCF.
- Step 5: Based on the received unit price, the BCF performs balance reservation.
- Step 6: It returns the granted units to the requesting network element.
- Step 7: When the granted units have been used, a new request is send from the network element to the BCF/SCF.
- Step 8-10: Repeat steps 2-4.
- Step 11: The BCF performs another balance reservation.
- Step 12: Repeat step 6.
- Step 13: The session ends and a final charging request is issued with updated session details (e.g. exact session length).
- Step 14: The BCF/SCF requests final rating request with a debit instruction.
- Step 15: The Rating Function performs final rating for the consumed bearer resources and adjusts the counters accordingly.
- Step 16: The Rating Function returns the final unit price to the BCF/SCF.
- Step 17: Based on the received unit price, the BCF/SCF performs final account control.
- Step 18: Finally, the BCF/SCF sends an acknowledgment message to the serving network node in order to terminate the online charging dialogue.

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## 7 Definition of charging information

### 7.1 General guidelines

#### 7.1.1 Protocol

There are basically several options for the Re protocol to be used:

- XML (via socket, SOAP, HTTP, etc.);
- Diameter/Radius;
- CORBA.

Since the main input to the OCS comes through the Ro interface, which is based on diameter, diameter shall be used for the OCS internal reference points, whenever the components reside on separate nodes.

#### 7.1.2 General Description of Data types and Message Formats

Each message contains a header part and a body part.

*CR Editor's note: Details are TBD.*

The following primitive datatypes are used in the messages:

- Int: numeric integer value (positive and negative values possible)
- unsigned Int: positive numeric integer value
- Enum: Enumerated
- Time: time to one second precision
- BCD: Binary Coded Decimal (digits 0-F)
- charstring: a string of characters

More complex datatypes based on these primitive types are defined in subclauses 7.2.2 and 7.2.3.

## 7.2 Re Message Types and Formats

### 7.2.1 Rating Function Class selection

Although the contents of the messages are almost identical, the handling of the messages in the Rating Function will be different depending on the class of Rating Function used in a network. To distinguish between both classes of Rating Functions, a parameter RequestSubType is used.

If a "Class A" rating engine is used, the parameter RequestSubType will not be present, because there are no subtypes in this case.

If a "Class B" Rating Function is used, the parameter RequestSubType will always be present.

### 7.2.2 PriceRequest Method

This request type is used to determine the price for a given event.

The following tables indicate the contents of the PriceRequest and PriceResponse messages.

The column "Status" denotes, whether the field is 'mandatory' (M) or 'optional' (O).

The body of the **PriceRequest** message consists of the following fields.

Category	Type	Status	Description	Example
RequestSubType	Enum	O	Request sub type as described below. This parameter is not present in Class A and is mandatory in Class B.	Reservation
ActualTime	Time	M	Actual timestamp of the current request.	
SubscriberID	BCD	M	Charged Party Number (MSISDN)	
ServiceID	charstring	M	Service Name	"MMS-MO"
LocInfo	BCD	O	Indicates the visited network ID of the served subscriber.	00436760100000
AccessPoint-Name	charstring	O	Access Point Name (see note)	
Counters	Array of "Counter"	O	A list of Counter elements. The structure of an individual Counter element is described below. This parameter is not -present in Class B.	{{"free SMS",17,20031212}, {"Bonus",500,NULL}}
Rating Parameters	TBD	O	List of rating parameters describing service and subscriber.	destinations, contract parameters, content description, QoS, etc.
NOTE:	3GPP TS 23.003[AvT1] defines the APN with a maximum length of 100 octets, but MAP uses a length of 63.			

The parameter RequestSubType can have the following values:

- **AoC** - Advice of Charge. In this sub-type, there is no counter reservation and no counter updates by the Rating Function.
- **Reservation** - This Price Request sub-type is used at event authorization time, prior to granting a service to a user. The Rating Function will reserve counters as needed according to the request. A Price Request with a Debit sub-type should follow after a service successful delivery or a Release sub-type in case the delivery failed.
- **Debit** - This Price Request sub-type is issued when a session ends or a service was granted successfully to a user, in order to debit a previously reservation request. The Rating Function will free any unused portion of an outstanding counter reservation. Note that multiple Price Requests with a Debit sub-type can be sent during a session for partial charging.
- **Release** - This Price Request sub-type is issued when a service delivery failed to release a previously reserved amount. The Rating Function will free any outstanding counter reservation.

The **Counter** type has the following structure:

Category	Type	Status	Description	Example
CounterName	charstring	M	Identifies the Counter.	"free SMS"
CounterValue	Int	O	The actual current value of the Counter.	17
ExpiryDate	Time	O	Timestamp for the expiration date of the current counter value.	

The body of the **PriceResponse** message from the Rating Engine consists of the following fields:

Name	Type	Status	Description	Example
Price	Unsigned Int	M	Price for the requested service. <i>Details are TBD.</i>	
CountersPrice	Array of "CounterPrice"	O	A list of currently valid CounterPrice elements. The structure of an individual CounterPrice element is described below.	
BillingInfo	charstring	O	Textual description for bill presentation. <i>(Alternative: some ID to be mapped to text )</i>	"normal / Moonshine"

The **CounterPrice** type has the following structure (*details are TBD*):

Category	Type	Status	Description	Example
CounterName	charstring	M	Identifies the Counter	"free SMS"
CounterChange	Int	O	Value with which the counter shall be incremented or decremented.	-2

*Editor's note: In addition to the parameters listed above, the PriceRequest and PriceResponse messages may contain further operator specific fields; details on the definition and coding of these fields are TBD. (after decision on protocol has been made).*

## 7.2.3 TariffRequest Method

The following tables indicate the contents of the TariffRequest and TariffResponse messages.

The column "Status" denotes, whether the field is 'mandatory' (M) or 'optional' (O).

The body of the **TariffRequest** message consists of the following fields:

Category	Type	Status	Description	Example
RequestSubType	Enum	O	Request sub type as described above. This parameter is not present in Class A and is mandatory in Class B.	AoC
SessionID	Unsigned Int	M	Session-identification	
BeginTime	Time	O	Event-timestamp of service activation request.	
ActualTime	Time	M	Actual timestamp of the current request.	
SubscriberID	BCD	M	Charged Party Number (MSISDN)	
ServiceID	charstring	M	Service Name	"MMS-MO"
LocInfo	BCD	O	Indicates the visited network ID of the served subscriber.	00436760100000
AccessPoint-Name	charstring	O	Access Point Name (see note)	
Counters	Array of "Counter-Tariff"	O	A list of Counter elements. The structure of an individual Counter element is described below. This parameter is not present in Class B.	{{"free minutes",17,20031212}, {"Bonus",500,NULL}}
Rating Parameters	TBD	O	List of rating parameters describing service and subscriber.	destinations, contract parameters, content description, QoS, ...

NOTE: 3GPP TS 23.003 defines the APN with a maximum length of 100 octets, but MAP uses a length of 63.

The **Counter** type has the following structure:

Category	Type	Status	Description	Example
CounterName	charstring	M	Identifies the Counter.	"free minutes"
CounterValue	Int	O	The actual current value of the Counter.	17
ExpiryDate	Time	O	Timestamp for the expiration date of the current counter value.	

The body of the **TariffResponse** message from the Rating Engine consists of the following fields:

Name	Type	Status	Description	Example
TariffSwitch-Time	Unsigned Int	O	Time in Seconds from the time in parameter ActualTime of the TariffRequest until a tariff switch occurs. '0' means immediately (the second set of e-parameters is valid).	
MonetaryTariff	Eparm	M	E-parameters that are currently valid. Eparm type is defined below.	
Next Monetary-Tariff	Eparm	O	E-parameters after the next TariffSwitch. Eparm type is defined below.	
CountersTariff	Array of "CounterTariff"	O	A list of currently valid CounterTariff elements. The structure of an individual CounterTariff element is described below.	
NextCounter-Tariffs	Array of "CounterTariff"	O	CounterTariffs after the next TariffSwitch. The structure of an individual CounterTariff element is described below.	
ValidUnits	Unsigned Int	O	Defines for how many units the tariff is valid.	4
BillingInfo	charstring	O	Textual description for bill presentation. (Alternative: some ID to be mapped to text )	"normal / Moonshine"

The **EParm** type has the following structure:

Category	Type	Status	Description	Example
E-parameter_E1	Int	M	Refer to 3GPP TS 22.024 [61].	
E-parameter_E2	Int	M	Refer to 3GPP TS 22.024 [61].	
E-parameter_E3	Int	M	Refer to 3GPP TS 22.024 [61].	
E-parameter_E4	Int	M	Refer to 3GPP TS 22.024 [61].	
E-parameter_E5	Int	M	Refer to 3GPP TS 22.024 [61].	
E-parameter_E6	Int	M	Refer to 3GPP TS 22.024 [61].	
E-parameter_E7	Int	M	Refer to 3GPP TS 22.024 [61].	

The **CounterTariff** type has the following structure (*details are TBD*):

Category	Type	Status	Description	Example
CounterName	charstring	M	Identifies the Counter.	"free minutes"
CounterChange-PerSession	Int	O	Value, with which the counter shall be incremented or decremented for the whole session.	4
CounterChange-PerUnit	Int	O	Value, with which the counter shall be incremented or decremented per consumed service unit.	-1

*Editor's note: In addition to the parameters listed above, the TariffRequest and TariffResponse messages may contain further operator specific fields; details on the definition and coding of these fields are tbd. (after decision on protocol has been made).*

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## Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Mar 2004	S_23	SP-040141	--	--	Submitted to TSG SA#23 for Information	1.0.0	