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Technical Specification

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Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification has been produced by the 3rd 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

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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 [2], which provides an umbrella for other charging management TSs that specify:

- the content of the CDRs per domain / subsystem / service (offline charging);
- the content of real-time charging messages per domain / subsystem / service (online charging);
- the functionality of online and offline charging for those domains / subsystems / services;
- 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 [2].

The present document specifies the Offline and Online Charging description for the Short Message Service (SMS), based on the functional description in 3GPP TS 23.040 [7] and on the SMS over IP in 3GPP TS 23.204 [8]. The present document does not replace existing offline SMS charging functionality and therefore is in addition to that defined in 3GPP TS 32.250 [9] and 3GPP TS 32.251 [10]. This charging description includes the offline and online charging architecture and scenarios specific to SMS, as well as the mapping of the common 3GPP charging architecture specified in 3GPP TS 32.240 [1] onto SMS. It further specifies the structure and content of the CDRs for offline charging, and the charging events for online charging. The present document is related to other 3GPP charging TSs as follows:

- The common 3GPP charging architecture is specified in 3GPP TS 32.240 [2];
- The parameters, abstract syntax and encoding rules for the CDRs are specified in 3GPP TS 32.298 [3];
- A transaction based mechanism for the transfer of CDRs within the network is specified in TS 32.295 [6];
- The file based mechanism used to transfer the CDRs from the network to the operator"s billing domain (e.g. the billing system or a mediation device) is specified in 3GPP TS 32.297 [5];
- The 3GPP Diameter application that is used for SMS offline and online charging is specified in 3GPP TS 32.299 [4].

Furthermore, requirements that govern the charging work are specified in 3GPP TS 22.115 [102].

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.*

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 32.240: "Telecommunication management; Charging management; Charging architecture and principles".

[3] 3GPP TS 32.298: "Telecommunication management; Charging management; Charging Data Record (CDR) parameter description".

[4] 3GPP TS 32.299: "Telecommunication management; Charging management; Diameter charging application".

[5] 3GPP TS 32.297: "Telecommunication management; Charging management; Charging Data Record (CDR) file format and transfer".

[6] 3GPP TS 32.295: "Telecommunication management; Charging management; Charging Data Record (CDR) transfer".

[7] 3GPP TS 23.040: "Technical realization of Short Message Service (SMS)"

[8] 3GPP TS 23.204: "Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2"

[9] 3GPP TS 32.250: "Telecommunication management; Charging management; Circuit Switched (CS) domain charging".

[10] 3GPP TS 32.251: "Telecommunication management; Charging management; Packet Switched (PS) domain charging".

[11] 3GPP TS 32.296: "Telecommunication management; Charging management; Online Charging System (OCS) applications and interfaces".

[12] IETF RFC 4006: "Diameter Credit-Control Application"

[13] 3GPP TS 32.270: "Telecommunication management; Charging management; Multimedia Messaging Service (MMS) charging".

[14] 3GPP TS 23.038: "Alphabets and language-specific information".

[15] 3GPP TS 32.260: "Telecommunication management; Charging management; IP Multimedia Services (IMS) charging".

[16] 3GPP TS 22.142: " Value Added Services (VAS) for Short Message Service (SMS) requirements "

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1], TS 32.240 [2] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1] or TS 32.240[2].

SMS node: An SMS node, in this specification, refers to either an SMS router, IP-SM-GW, SMS-SC or a combination of these nodes.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1], TS 32.240 [2] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1] or TS 32.240 [2].

4 Architecture considerations

4.1 High level SMS architecture

The high level SMS architecture is as defined in 3GPP TS 23.040 [7].Only the SMS Router, SMS-SC and the IP-SM-GW are within the scope of this specification. The details for the other nodes in the SMS architecture are defined within 3GPP TS 32.250 [9] and 3GPP TS 32.251 [10].

4.2 SMS offline charging architecture

Editor's Note: The offline architecture is For Further Study.

4.3 SMS online charging architecture

For online charging, the relevant SMS nodes utilise the Ro interface and application towards the OCS as specified in TS 32.299 [4]. The Ro reference point covers all online charging functionality required for SMS.

The SMS online charging architecture is depicted in figure 4.3.

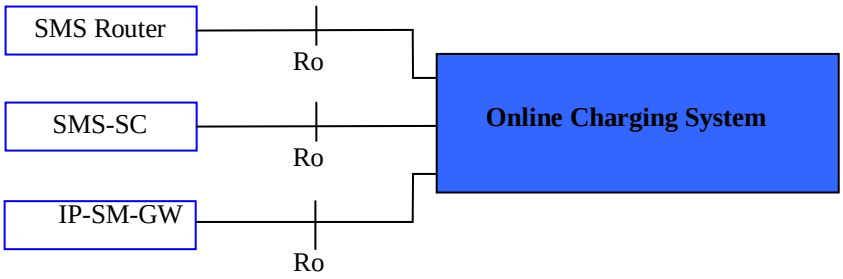

Figure 4.3: SMS online charging architecture

Details on the interfaces and functions can be found in TS 32.240 [2] for the general architecture components, TS 32.296 [11] for the OCS, and 32.299 [4] for the Ro application.

5 SMS charging principles and scenarios

5.1 SMS charging principles

5.1.1 General principles

The Short Message Service comprises 4 main operational scenarios:

- Person to Person: The message is sent by a UE as originator and received by a UE as destination.
- Person to Application: The message is sent by a UE as originator and received by a third party application as destination.
- Application to Person: The message is sent by a third party application as originator and received by a UE as destination.
- Application to Application: The message is sent by a third party application as originator and received by another third party application as destination.

In addition SMS Nodes may apply services such as value added services specified in 3GPP TS 22.142 [16], services defined in industry standard protocols for SM submission from applications in a fixed network (protocols such as SMPP, UCP/EMI, OIS, CIMD, etc.) or vendor specific services as endorsed by 3GPP TS 23.040 [7].

As such, the SMS node collects charging information such as:

- the destination and source addresses applied for an SM;
- an indication of origination or termination handling;
- identification of the node(s) and connection(s) involved in the SM transaction;
- SM validity period;
- in scenarios involving an application / VASP, the charging information describes the identification of the application / VASP;
- requested SM service type.

5.1.2 Segmentation and concatenation

Information about concatenated messages should be sent to the charging systems in order to apply the appropriate charging models. The charging system may be required to be stateful to process information about segmented messages.

5.1.3 Triggers for generation of charging information

The following service level events shall, based on operator configuration, trigger the generation of charging information:

- Simple submission – based on reception at the SMS node.
- Enhanced submission – based on completion of the transaction handling at the SMS node.
- Origination retry – based on the enhanced submission where the initial handling fails and a redelivery attempt is initiated.
- Delivery report
- Termination – Application to Person scenario only.
- Termination retry – Application to Person scenario only – reattempt delivery of an SM to a terminating entity;

- SM service request.

Depending on the charging model applied, a "refund" may be necessary for unsuccessful delivery.

See clause 5.3 for detailed procedures associated with the triggers above.

5.2 SMS offline charging scenarios

5.2.1 Basic principles

Editor's Note: For Further Study.

5.2.2 Rf message flows

Editor's Note: For Further Study.

5.2.3 CDR generation

5.2.3.1 Triggers for xxx-CDR charging information collection

Editor's Note: For Further Study.

5.2.3.2 Triggers for xxx-CDR Charging Information Addition

Editor's Note: For Further Study.

5.2.3.3 Triggers for xxx-CDR closure

Editor's Note: For Further Study.

5.2.4 Ga record transfer flows

Editor's Note: For Further Study.

5.2.5 B_{xx} CDR file transfer

Editor's Note: For Further Study.

5.3 SMS online charging scenarios

5.3.1 Basic principles

SMS online charging uses the Credit Control application as specified in 3GPP TS 32.299 [4].

SMS charging may use the Immediate Event Charging (IEC) principle or the Event Charging with Unit Reservation (ECUR) principle as specified in 3GPP TS 32.299 [4]. The chargeable events for subscriber charging are associated with SM transactions.

An implementation may use either IEC or ECUR for charging events based on operator configuration.

The units used for quota shall be service specific and based on an SM.

The selection of the OCS is implementation specific as there is no guaranteed means of providing the OCS address to the CTF.

In addition, SMS charging may use the Refund Account principle when the operation has not been successfully completed after an Immediate Event Charging (IEC).

NOTE: For SMSIP, the IP-SM-GW may receive information relevant for online charging through signalling in IMS.

5.3.2 Ro message flows

5.3.2.1 Simple Submission

This clause contains message flows for the different operation models IEC (figure 5.3.2.1-1) and ECUR (figure 5.3.2.1-2).

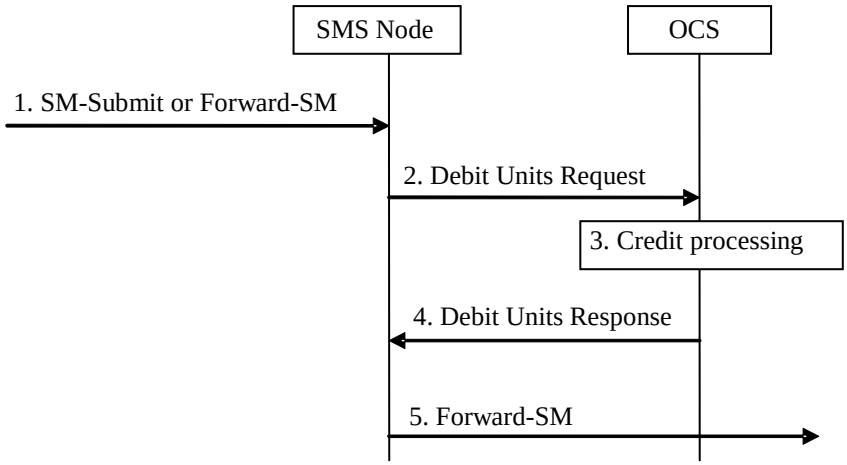

Figure 5.3.2.1-1: Online charging in simple submission for IEC

1) Depending on which SMS mechanism (i.e. SMS or SMSIP) is in operation, the SMS node receives an incoming SM-Submit or a MAP-Forward-SM.

2) The SMS node triggers a Debit Units Request message to the OCS.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Debit Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for the origination procedures.

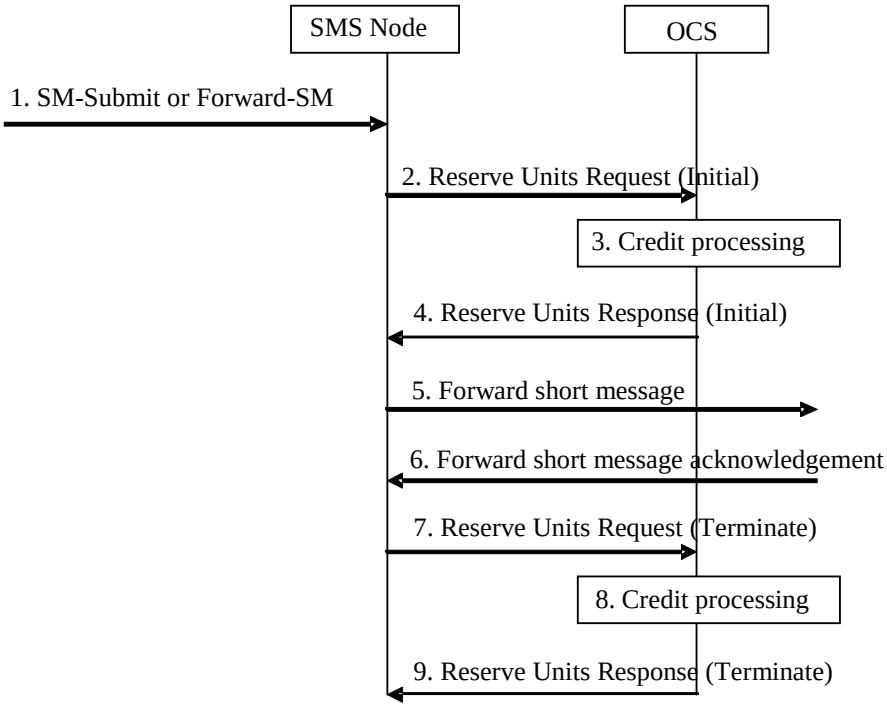

Figure 5.3.2.1-2: Online charging in simple submission for ECUR

1) Depending on which SMS mechanism (i.e. SMS or SMSIP) is in operation, the SMS node receives an incoming SM-Submit or a MAP-Forward-SM.

2) The SMS node triggers a Reserve Units Request (Initial) message to the OCS.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Reserve Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for the origination procedures.

6) The SM transaction is successfully acknowledged.

7) The SMS node triggers a Reserve Units Request (Terminate) message to the OCS reporting the successful event transaction.

8) The OCS performs the appropriate credit processing based on the received request.

9) The OCS responds with a Reserve Units Response message to the SMS node..

5.3.2.2 Enhanced Submission

The enhanced submission procedures are similar to the simple submission procedures using ECUR. However, the trigger for Reserve Units Request (Terminate) may be based on unsuccessful handling e.g. negative acknowledgement and with or without successful storage of the message for future redelivery attempts. See failure scenarios defined in clause 5.3.2.7.

5.3.2.3 Delivery Report

The origination of delivery reports use the same procedures as the simple submission procedures as described within clause 5.3.2.1. The delivery report itself is contained within a new SM.

5.3.2.4 Origination retry

This clause contains message flows for the different operation models IEC (figure 5.3.2.4-1) and ECUR (figure 5.3.2.4-2) for redelivery attempts in the origination direction.

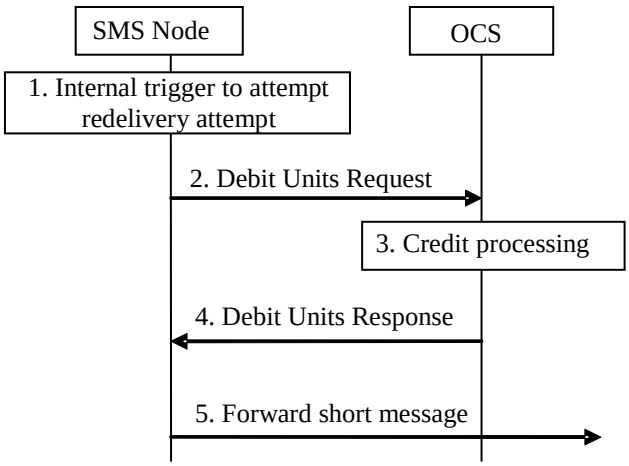

Figure 5.3.2.4-1: Online charging in origination redelivery attempt for IEC

1) An SMS node internal trigger occurs to attempt a redelivery of a previously failed and stored SM.
2) The SMS node triggers a Debit Units Request message to the OCS.
3) The OCS performs the appropriate credit processing based on the received request.
4) The OCS responds with a Debit Units Response message to the SMS node.
5) If authorised, the SMS node continues the SM processing as appropriate for the origination procedures.

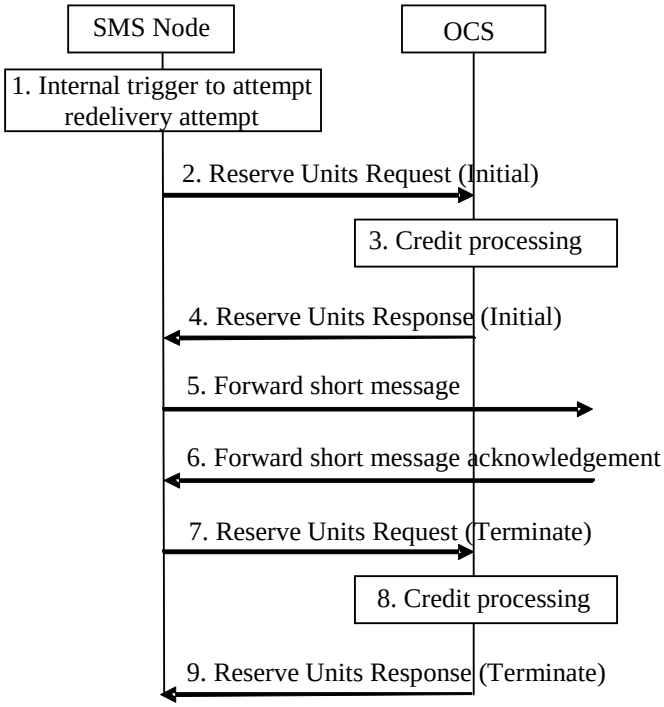

Figure 5.3.2.4-2: Online charging in origination redelivery attempt for ECUR

1) An SMS node internal trigger occurs to attempt a redelivery of a previously failed and stored SM.
2) The SMS node triggers a Reserve Units Request (Initial) message to the OCS.
3) The OCS performs the appropriate credit processing based on the received request.
4) The OCS responds with a Reserve Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for the origination or termination procedures.

6) The SM transaction is successfully acknowledged.

7) The SMS node triggers a Reserve Units Request (Terminate) message to the OCS reporting the successful event transaction.

8) The OCS performs the appropriate credit processing based on the received request.

9) The OCS responds with a Reserve Units Response message to the SMS node.

5.3.2.5 Termination charge

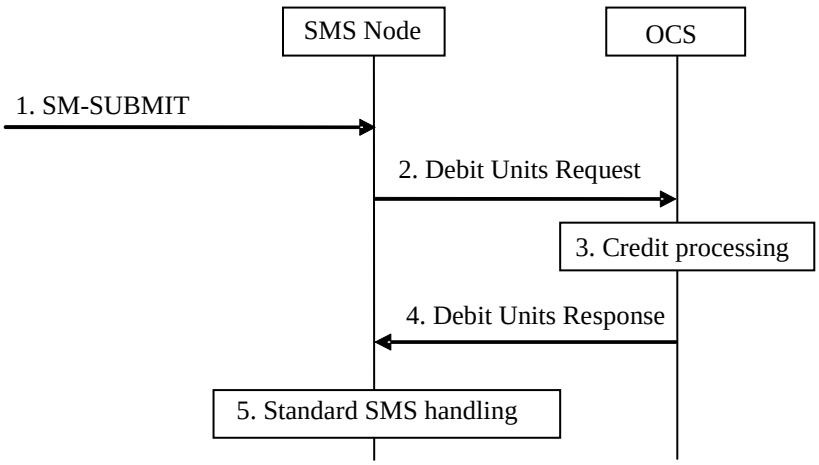

Figure 5.3.2.5-1: Online charging in termination for IEC

1) The SMS node receives an incoming SM-SUBMIT from an application destined for a mobile recipient.

NOTE: This scenario differs from simple submission charging as described in subclause 5.3.2.1 in that typically the mobile recipient (instead of originator or both parties) will be charged for such a short message.

2) The SMS node triggers a Debit Units Request message to the OCS.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Debit Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for the termination procedures.

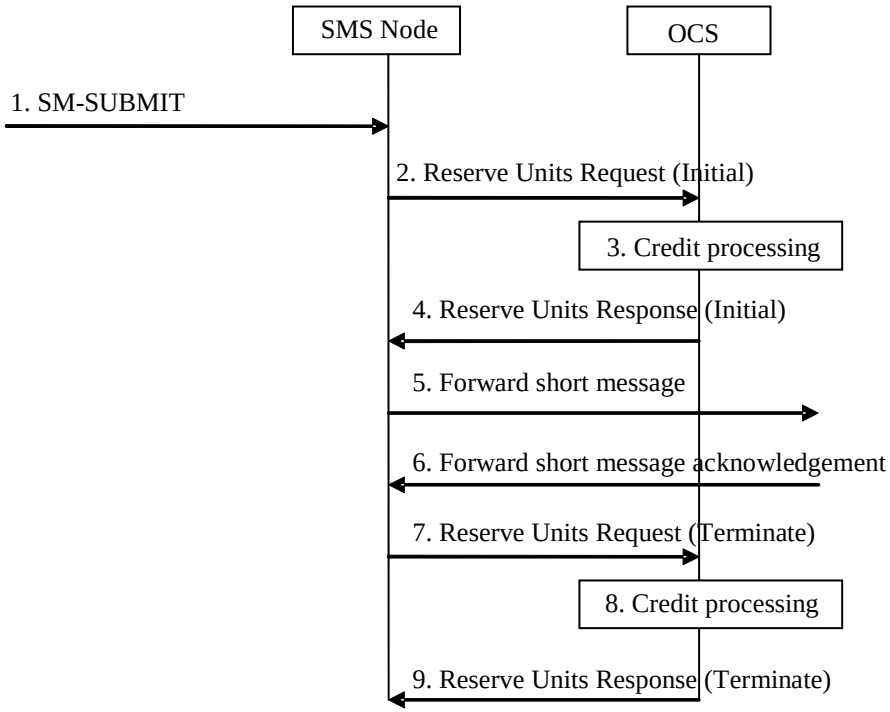

Figure 5.3.2.5-2: Online charging in termination for ECUR

1) The SMS node receives an incoming SM-SUBMIT from an application destined for a mobile recipient.

NOTE: This scenario differs from simple submission charging as described in subclause 5.3.2.1 in that typically the mobile recipient (instead of originator or both parties) will be charged for such a short message.

2) The SMS node triggers a Reserve Units Request (Initial) message to the OCS.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Reserve Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for the termination procedures.

6) The SM transaction is successfully acknowledged.

7) The SMS node triggers a Reserve Units Request (Terminate) message to the OCS reporting the successful event transaction.

8) The OCS performs the appropriate credit processing based on the received request.

9) The OCS responds with a Reserve Units Response message to the SMS node.

5.3.2.6 Termination charge retry

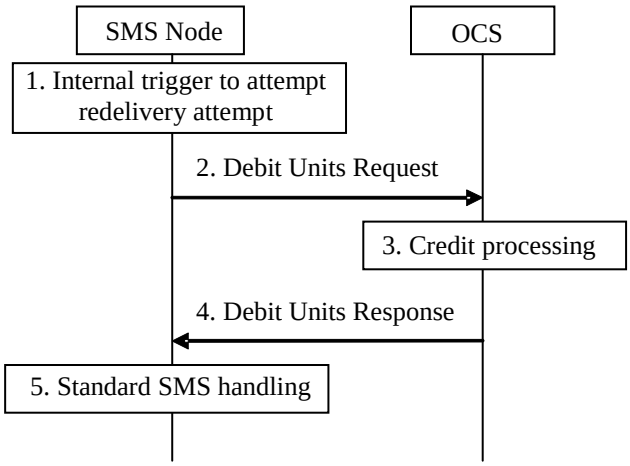

Figure 5.3.2.6-1: Online charging in termination redelivery attempt for IEC

1) An SMS node internal trigger occurs to attempt a redelivery of a previously failed and stored SM.
2) The SMS node triggers a Debit Units Request message to the OCS.
3) The OCS performs the appropriate credit processing based on the received request.
4) The OCS responds with a Debit Units Response message to the SMS node.
5) If authorised, the SMS node continues the SM processing as appropriate for the termination procedures.

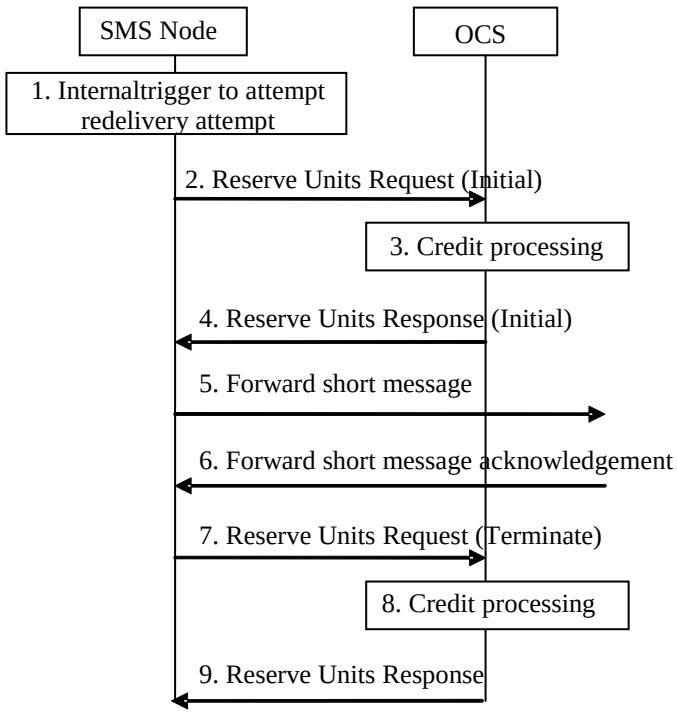

Figure 5.3.2.6-2: Online charging in termination redelivery attempt for ECUR

1) An SMS node internal trigger occurs to attempt a redelivery of a previously failed and stored SM.
2) The SMS node triggers a Reserve Units Request (Initial) message to the OCS.
3) The OCS performs the appropriate credit processing based on the received request.
4) The OCS responds with a Reserve Units Response message to the SMS node.
5) If authorised, the SMS node continues the SM processing as appropriate for the termination procedures.
6) The SM transaction is successfully acknowledged.
7) The SMS node triggers a Reserve Units Request (Terminate) message to the OCS reporting the successful event transaction.
8) The OCS performs the appropriate credit processing based on the received request.
9) The OCS responds with a Reserve Units Response message to the SMS node.

5.3.2.7 Unsuccessful transaction

Unsuccessful transaction after IEC

The following flow in figure 5.3.2.7-1 only applies where a refund action is required for unsuccessful delivery.

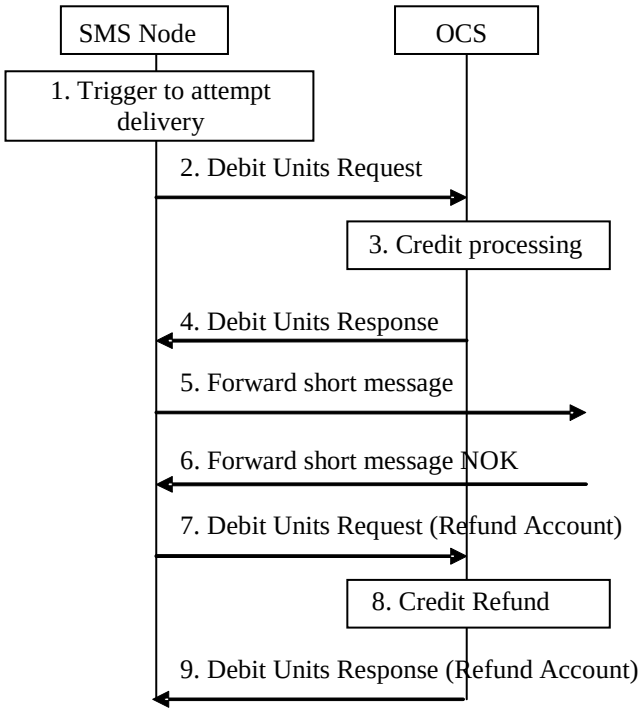

Figure 5.3.2.7-1: Unsuccessful transaction after IEC

1) The SMS node receives a trigger to attempt delivery of an SM. This may be for origination, termination or redelivery attempt.

2) The SMS node triggers a Debit Units Request message to the OCS.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Debit Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for origination or termination procedures.

6) The SM transaction is acknowledged as an unsuccessful transaction (either via explicit signalling or an internal trigger).

7) The SMS node triggers a Debit Units Request (Refund Account) message to the OCS.

8) The OCS performs the appropriate refund processing based on the received request.

9) The OCS responds with a Debit Units Response (Refund Account) message to the SMS node.

Unsuccessful transaction in ECUR

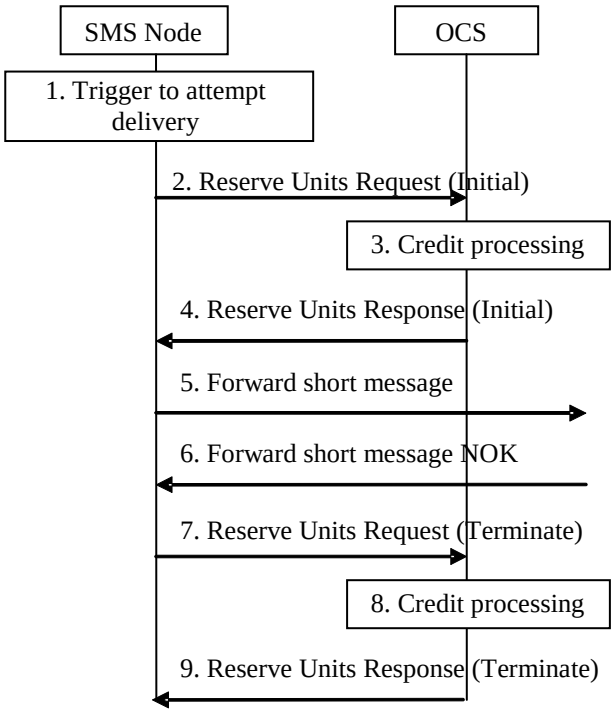

Figure 5.3.2.7-2: Unsuccessful transaction for ECUR

1) The SMS node receives a trigger occurs to attempt delivery of an SM. This may be for origination, termination or redelivery attempt.

2) The SMS node triggers a Reserve Units Request (Initial) message to the OCS.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Reserve Units Response message to the SMS node.

5) If authorised, the SMS node continues the SM processing as appropriate for the origination or termination procedures.

6) The SM transaction is acknowledged as an unsuccessful transaction (either via explicit signalling or an internal trigger).

7) The SMS node triggers a Reserve Units Request (Terminate) message to the OCS reporting the used unit for the service to zero. This characterizes the unsuccessful event transaction.

8) The OCS performs the appropriate credit processing based on the received request.

9) The OCS responds with a Reserve Units Response message to the SMS node.

5.3.2.8 IMS/SMS Interworking Messages Charging

This clause contains message flows for the different operation models IEC (figure 5.3.2.8-1) and ECUR (figure 5.3.2.8-2) for IMS/SMS Interworking messages in the origination direction.

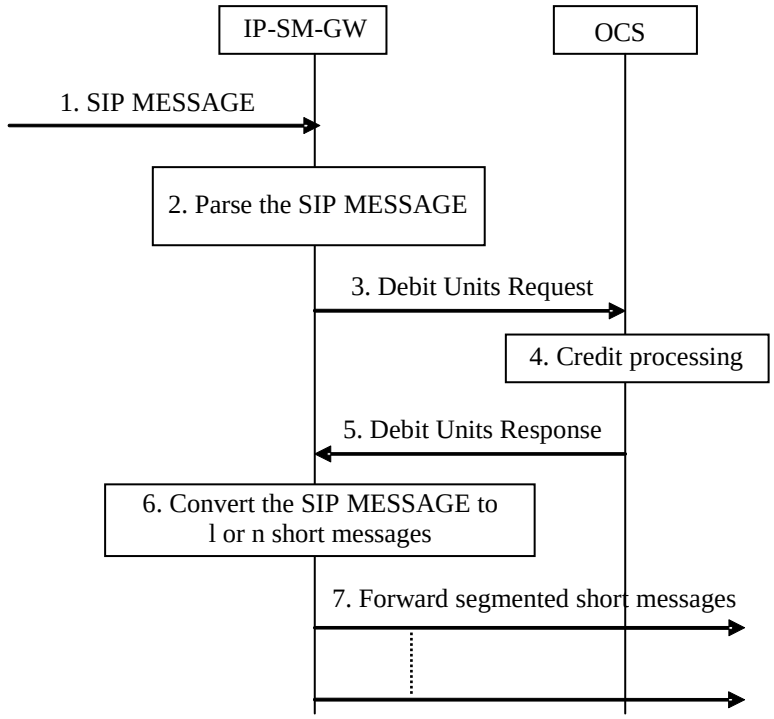

Figure 5.3.2.8-1: Online charging in origination IMS/SMS Interworking Messages for IEC

1) The IP-SM-GW receives an incoming SIP MESSAGE.
2) The IP-SM-GW parses the SIP MESSAGE.
3) The IP-SM-GW triggers a Debit Units Request message to the OCS.
4) The OCS performs the appropriate credit processing based on the received Debit Units Request.
5) The OCS responds with a Debit Units Response message to the IP-SM-GW.
6) IP-SM-GW converts the SIP MESSAGE to 1 or n (n>=1) short messages.
7) If authorised, the IP-SM-GW forwards the segmented short messages.

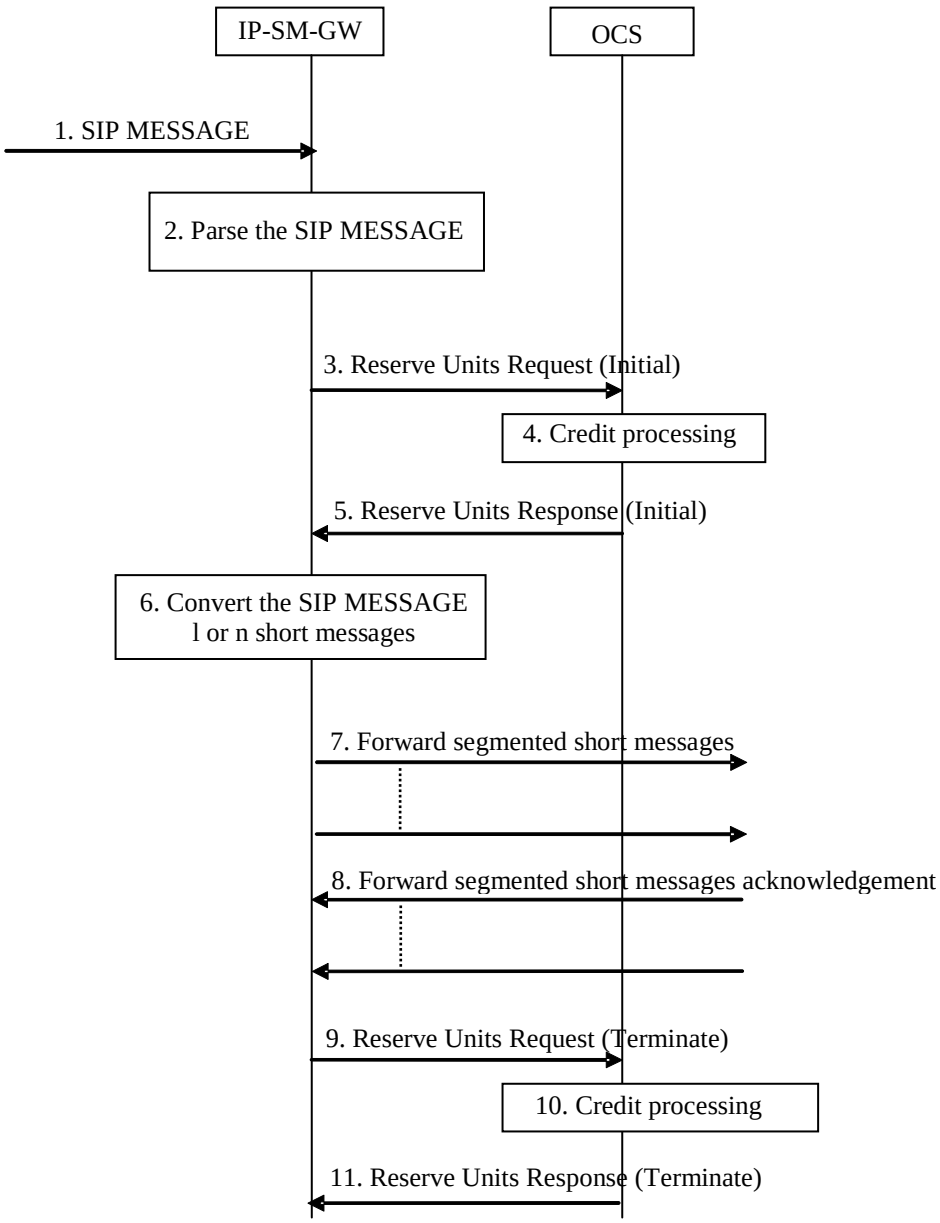

Figure 5.3.2.8-2: Online charging in origination IMS/SMS Interworking Messages for ECUR

1) The IP-SM-GW receives an incoming SIP MESSAGE.
2) The IP-SM-GW parses the SIP MESSAGE.
3) The IP-SM-GW triggers a Reserve Units Request (Initial) message to the OCS.
4) The OCS performs the appropriate credit processing based on the received Reserve Units Request.
5) The OCS responds with a Reserve Units Response message to the IP-SM-GW.
6) IP-SM-GW converts the SIP MESSAGE to 1 or n (n>=1) short messages.
7) If authorised, the IP-SM-GW forwards segmented short messages.
8) All the short messages transactions are successfully acknowledged.
9) The IP-SM-GW triggers a Reserve Units Request (Terminate) message to the OCS reporting the successful event transaction.
10) The OCS performs the appropriate credit processing based on the received request.

11) The OCS responds with a Reserve Units Response message to the IP-SM-GW.

5.3.2.9 Simple Submission with SM service request

This clause contains message flows for operation models IEC (figure 5.3.2.9-1) where application of a SM service is subject to charging independent from the SM submission.

Editors Note: Simple SM submission with SM service request for operation model ECUR is FFS.

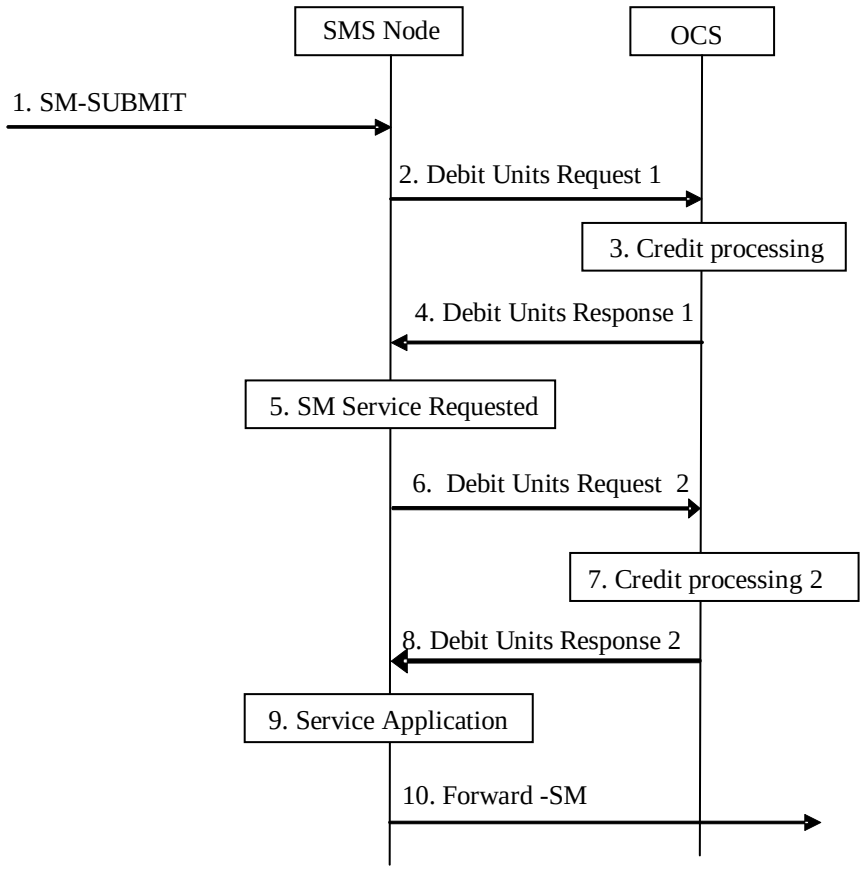

Figure 5.3.2.9-1: Online charging in simple submission with SM service request for IEC

1) Depending on which SMS mechanism (i.e. SMS or SMSIP) is in operation, the SMS node receives an incoming SM-Submit or a MAP-Forward-SM which includes a SM service request (such as forwarding or SM copy).

2) The SMS node triggers a Debit Units Request message to the OCS for the SM submission.

3) The OCS performs the appropriate credit processing based on the received request.

4) The OCS responds with a Debit Units Response message for the SM submission to the SMS node.

5) If normal SM processing is authorized in step 4, the SMS Node analyzes the SM and detects that a SM service must be applied that is subject to charging.

6) If a SM service subject to charging is detected in step 5, the SMS node triggers an additional Debit Units Request message to the OCS for the requested SM service.

7) The OCS performs the appropriate credit processing based on the received request.

8) The OCS responds with a Debit Units Response message for the requested SM service to the SMS node.

9) If authorised in step 7, the SMS node applies the requested SM service.

NOTE 1: Depending on the nature of the requested SM service, "service application" may involve creating additional messages (for example in case of a SM copy service). This is deemed part of step 9 and not otherwise shown in this diagram.

10) If authorised in step 4, the SMS node continues the SM processing as appropriate for the origination procedures.

NOTE 2: Authorization of SM processing is independent of the authorization for application of a SM service. I.e. If authorization is for SM processing is granted in step 4 but authorization for SM service is refused in step 8 SM processing appropriate for the originating service continues without applying the requested SM service.

5.3.3 Credit Control related

5.3.3.1 Triggers for stopping for an SMS Credit Control session

Used in ECUR only, a Debit / Reserve Units Request message to terminate the credit control session is sent to OCS when:

- Validity time for granted quota expires
- Granted quota runs out (i.e. a successful event has occurred)
- Abort-Session-Request is received from the OCS

The expiration of the validity time for quota does not require the SMS procedures to be terminated. The CTF shall be configurable as to whether on expiration of validity time, the service should be aborted or not; i.e. whether the stored message should be deleted and no further (re-)delivery attempt should be made.

5.3.3.2 Triggers for providing interim information for a SMS Credit Control session

The provision of interim information for credit control is not used in this release of the specification, due to the use of IEC and ECUR.

6 Definition of charging information

6.1 Data description for SMS offline charging

6.1.1 Rf message contents

6.1.1.1 Summary of Offline Charging Message Formats

Editor's Note: For Further Study.

6.1.1.2 Structure for the Accounting Message Formats

6.1.1.2.1 Accounting-Request Message

Editor's Note: For Further Study.

6.1.1.2.2 Accounting-Answer Message

Editor's Note: For Further Study.

6.1.2 Ga message contents

Editor's Note: For Further Study.

6.1.3 CDR description on the B_{xx} interface

Editor's Note: For Further Study.

6.2 Data description for SMS online charging

6.2.1 Ro message contents

6.2.1.0 General

The SMS node generates Debit / Reserve Units information that can be transferred from the CTF to the OCF. For this purpose, SMS online charging utilises the *Debit Units and Reserve Units* procedure that is specified in the 3GPP Debit / Reserve Units operation in 3GPP TS 32.299 [4].

The SMS node generates refund information that can be transferred from the CTF to the OCF. For this purpose, it uses REFUND procedure defined in IETF RFC 4006 [12] with extended AVPs.

The *Debit / Reserve Units* procedure employs the *Debit / Reserve Units Request* and *Debit / Reserve Units Response* messages.

The Refund Account procedure employs the Debit Units Request (Refund Account) request and response messages.

Table 6.2.1 describes the use of these messages for SMS online charging.

Table 6.2.1: SMS Online Charging Messages contents

Command-Name	Source	Destination
Debit / Reserve Units Request	CTF	OCS
Debit / Reserve Units Response	OCS	CTF

This clause 6.2.1 describes the different fields used in the credit control messages.

Detailed descriptions of the fields are provided in 3GPP TS 32.299 [4].

6.2.1.1 Summary of Message Formats

6.2.1.2 Structure for the Credit Control Message Formats

6.2.1.2.1 Debit/Reserve Units Request Message

Table 6.2.1.2.1 illustrates the basic structure of a *Debit / Reserve Units Request* message from SMS node as used for SMS online charging.

Table 6.2.1.2.1: *Debit / Reserve Units Request* Message Contents for SMS

Field	Category	Description
Session Identifier	M	This field identifies the operation session.
Originator Host	M	This field contains the identification of the source point of the operation.
Originator Domain	M	This field contains the realm of the operation originator.
Destination Domain	M	This field contains the realm of the operation destination.
Operation Identifier	M	This field is a unique operation identifier.
Operation Token	M	This field contains the service context, i.e. SMS charging.
Operation Type	M	This field defines the transfer type: event for immediate event based charging and initial, terminate for ECUR based charging.
Operation Number	M	This field contains the sequence number of the transferred messages.
Destination Host	O_C	This field contains the identification of the destination point of the operation.
User Name	O_C	This field contains the identification of the source node.
Origination State	O_C	Used for ECUR only.
Origination Timestamp	O_C	This field contains the time when the operation is requested.
Subscriber Identifier	O_M	This field contains the identification of the subscriber (i.e. MSISDN) that uses the requested service.
Termination Cause	O_C	This field contains information about the cause for termination of a credit control session. Used for terminating credit control sessions in ECUR only.
Requested-Action	O_C	This field contains the requested action, used for IEC only.
Multiple Operation	O_M	This field indicate the occurrence of multiple operations. Used for ECUR only
Multiple Unit Operation	O_C	This field contains the parameter for the quota management. Used for ECUR only
Subscriber Equipment Number	O_C	This field contains the identification of the user equipment used to access service. Included if information is made available to the node.
Proxy Information	O_C	This field contains the parameter of the proxy.
Route Information	O_C	This field contains the parameter of the route.
Service Information	O_M	This field holds the SMS specific parameter and is described in clause 6.3.

6.2.1.2.2 Debit / Reserve Units Response Message

Table 6.2.1.2.2 illustrates the basic structure of a Debit / Reserve Units Response message as used for SMS charging. This message is always used by the OCS as specified below, independent of the receiving SMS node and the operation type that is being replied to.

Table 6.2.1.2.2: Debit / Reserve Units Response Message Contents for SMS

Field	Category	Description
Session Identifier	M	This field identifies the operation session.
Operation Result	M	This field identifies the result of the operation.
Originator Host	M	This field contains the identification of the source point of the operation.
Originator Domain	M	This field contains the realm of the operation originator.
Operation Identifier	M	This field is a unique operation identifier.
Operation Type	M	This field defines the transfer type: event for event based charging and start, interim, stop for session based charging.
Operation Number	M	This field contains the sequence number of the transferred messages.
Operation Failover	-	Not used for SMS in 3GPP.
Multiple Unit Operation	O_C	This field contains the parameter for the quota management. Used in IEC for refund purpose and in ECUR.
Operation Failure Action	O_C	This field defines the resulting operation at the SMS node if a failure has occurred at the OCS for ECUR.
Operation Event Failure Action	O_C	This field defines the resulting operation at the SMS node if a failure has occurred at the OCS for IEC.
Redirection Host	O_C	
Redirection Host Usage	O_C	
Redirection Cache Time	O_C	
Proxy Information	O_C	This field contains the parameter of the proxy.
Route Information	O_C	This field contains the parameter of the route.
Failed parameter	O_C	This field contains missing and/or unsupported parameter that caused the failure.
Service Information	O_C	This field contains SMS specific information.

Editor's Note: The mechanism to carry refund information is For Future Study.

6.3 SMS charging specific parameters

6.3.1 Definition of the SMS charging information

6.3.1.1 SMS charging information assignment for Service-Information

The components in the Service Information that are use for SMS charging can be found in table 6.3.1.1.

Table 6.3.1.1: Service Information used for SMS Charging

Field	Category	Description
Service Information	O_M	This is a structured field and holds the 3GPP specific parameter as defined in TS 32.299 [50]. For SMS Charging the SMS-Information and selected parameters of MMS Information,PS-Information and IMS information are used.
SMS Information	O_M	This is a structured field and holds the SMS specific parameters. The details are defined in table 6.3.1.2.
MMS Information	O_M	This is a structure field and the following parameters are specific to SMS. The complete structure is defined in 3GPP TS 32.270 [13]
Originator Address	O_M	This field holds the address of the originator of the SM. This will typically be an E.164 number or a shortcode. Multiple addresses may be carried if additional information is available, e.g. IMSI and E.164 number.
Submission Time	O_C	This field holds the timestamp of when the submitted SM arrived at the originating SMS Node. The information to populate this field is obtained from the TP-Service-Center-Time-Stamp (TP-SCTS) as defined in 3GPP TS 23.040 [7]. If a refund or retransmission is required, the timestamp carries the timestamp associated with the original submitted SM.
Priority	O_C	This field holds any priority information associated with an SM. Applicable to terminating procedures only. Priority handling is defined in 3GPP TS 23.040 [13]. The value 'low' is not applicable.
Message Id	O_M	This field carries the identity used to identify an SM in the SMS node associated with entity that submitted it. The information to populate this field is obtained from the TP-Message-Reference (TP-MR) as defined in 3GPP TS 23.040 [7].
Message Size	O_M	This field carries the length of the user data part of the SM. The information to populate this field is obtained from the TP-User-Data-Length (TP-UDL) as defined in 3GPP TS 23.040 [7]
Message Class	O_M	Used as defined in 3GPP TS 32.270 [13]. It is implementation dependent the value selected for a specific transaction.
Delivery Report Requested	O_C	This field indicates whether a delivery report is requested by the SM originator. The information to populate this field is obtained from the TP-Status-Report-Request (TP-SRR) as defined in 3GPP TS 23.040 [7]
PS Information	O_C	This is a structured field and the following parameters are specific to SMS. The complete structure is defined in TS 32.251 [11].
PDP Address	O_C	This field holds the IP address used by the subscriber for the SMS transaction. Included if the SMS node is the IP-SM-GW.
3GPP User Location Info	O_C	This field holds the information about the location of the subscriber during the SMS transaction.
3GPP RAT Type	O_C	This field holds information about the radio access technology used for the SMS transaction.
IMS Information	O_C	This is a structured field and the following parameters are specific to SMS. The complete structure is defined in TS 32.260 [15].
User Session Id	O_C	This field holds the session identifier. For a SIP session the Session-ID contains the SIP Call ID.
Number Portability routing information	O_C	This field includes information on number portability after DNS/ENUM request from S-CSCF in the calling user"s home network.
Carrier Select routing information	O_C	This field includes information on carrier select after DNS/ENUM request from S-CSCF in the calling user"s home network.

6.3.1.2 Definition of the SMS Information

The components in the SMS Information that are used for SMS charging can be found in table 6.3.1.2.

Table 6.3.1.2: SMS Information used for SMS Charging

Field	Category	Description
SMS Node	O_M	Identifies the SMS Node as IP-SM-GW or SMS Router or a combined IP-SM-GW / SMS Router or as SMS-SC.
SM Client Address	O_M	This field holds the address of the SMS node to which the charging system is connected to. This may be the same as the SMSC Address field.
Originator SCCP Address	O_C	This field holds the SCCP calling address used to receive the SM at the SMS node. Only present if SMSIP is not used for the inward connection.
Originator Received Address	O_C	This field holds the original, unmodified address of the originator of the SM, as received by the SMS node, in case address manipulation (such as number plan corrections) have been applied in the SMS node. This will typically be an E.164 number or a shortcode. Multiple addresses may be carried if additional information is available, e.g. IMSI and E.164 number.
Recipient Info	Oc	This field holds recipient information for the SM. Each occurrence of this field denotes a different recipient. Multiple occurrences of this field are allowed in case - multiple recipients are associated with the charged event and - all other charging information is identical for all recipients. In case the SM contains a Delivery Report, as described in subclause 5.3.2.3, this field identifies the recipient of this Delivery Report. This recipient information must correspond to the originator information of the message that triggered this Delivery Report. (Note 2)
Recipient Address	Oc	This field holds the address of the recipient of the SM. This will typically be an E.164 number or a shortcode. Multiple addresses may be carried if additional information is available, e.g. shortcode or IMSI and E.164 number.
Recipient Received Address	O_C	This field holds the original, unmodified address of the recipient of the SM, as received by the SMS node, in case address manipulation (such as number plan corrections) have been applied in the SMS node. This will typically be an E.164 number or a shortcode. Multiple addresses may be carried if additional information is available, e.g. shortcode or IMSI and E.164 number.
Recipient SCCP Address	O_C	This field holds the SCCP called address used by the SMS node to onward deliver the SM. Only present if SMSIP is not used for the outward connection.
SM Destination Interface	O_M	This is a structured field containing information describing the interface on which the SM is to be delivered (i.e. the next hop) In case the charging event is for person to application messaging or for application to application messaging (see subclause 5.1.1) this field holds the identification of the application. (See also Note 3)
SM Protocol Id	O_C	This field holds the TP-PROTOCOL-ID (TP-PID) as defined in 3GPP TS 23.040 [7]. This field relates to the recipient when charging MT SMS messages as specified in 32.240 [1].
SMSC Address	O_M	This field holds the address of the SMSC to which the originating or terminating SM is directed to.
SM Data Coding Scheme	O_M	This field holds the data coding scheme used within the SM. The information to populate this field is obtained from TP-DCS header.
SM Message Type	O_M	This field identifies the message that triggered the generation of charging information.
SM Originator Interface	O_M	This is a structured field containing information describing the interface on which the SM was received by the SMS node (i.e. the previous hop) In case the charging event is for application to person messaging or for application to application messaging (see subclause 5.1.1) this field holds the identification of the application. (See also Note 3)
SM Protocol Id	O_C	This field holds the TP-PROTOCOL-ID (TP-PID) as defined in 3GPP TS 23.040 [7] This field relates to the originator when charging MO SMS messages as specified in 32.240 [1].
SM Reply Path Requested	O_C	This field carries an indication of whether a reply SM to an original SM shall follow the same path as identified by the TP-Reply-Path (TP-RP) flag.
SM User Data Header	O_C	This field carries the user data header extracted from the user data of the SM. The user data header (TP-UDH) is specified in 3GPP TS 23.040 [7]

SM Status	O_C	This field holds the information from the TP-Status field in a Status-Report TPDU. This information is only applicable to delivery report charging procedures or where ECUR is employed.
SM Discharge Time	O_C	This field holds the time associated with the event being reported in the SM Status field. This information is only applicable to delivery report charging procedures.
Number of Messages Sent	O_C	Indicates the number of SMSs sent by the IMS application if applicable.
SM Service Type	O_C	This field indicates the type of SM service that caused the charging interaction. It is only applicable for SM supplementary service procedures.

NOTE 1: The case of multi-destinations of SMS refers to SMS and Internet Electronic Mail interworking as specified in subsclause 3.8 of TS 23.040 [7]

NOTE 2: Implementations vary as to the originator address that is presented to an end user for a Delivery Report. Typically the originator address either identifies the SMS node that generated the Delivery Report or the originator address of a Delivery Report identifies the recipient of the original message that triggered this Report. It is expected that the charging event contains the information presented to the end user.

NOTE 3: There is a distinction between short numbers (as conveyed in originator and/or recipient address fields) and the identification of SM applications (as carried in SM Originator Interface and/or SM Destination Interface). Short numbers are used by end users to address a service of an applications. Multiple short numbers may map to one application capable of multiple services. The identification of an application is how an application is know to the operator.

6.3.2 Formal parameter description

6.3.2.1 SMS charging information for CDRs

Editor"s Note: For Future Study.

6.3.2.2 SMS charging information for charging events

Editor"s Note: For Future Study.

Annex A (informative): Change history

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Cat**	**Old**	**New**
Sep 2007	SP-37	SP-070620	--	--	Submitted to TSG SA#37 for Information	--	1.0.0	
Dec 2007	SP-38	SP-070748	--	--	Submitted to TSG SA#38 for Approval	--	2.0.0	8.0.0
Dec 2007	--	--	--	--	editHelp: the figures are now visible in normal view	--	8.0.0	8.0.1
Mar 2008	SP-39	SP-080074	0001	--	Correction on Service Information for SMS Charging	F	8.0.1	8.1.0
Jun 2008	SP-40	SP-080330	0002	--	Support of Number Portability and Carrier Selection in SMS Online Charging	B	8.1.0	8.2.0
Sep 2008	SP-41	SP-081216	0003	--	Multiple SMS destination – Alignment with TS 23.040	C	8.2.0	8.3.0
Sep 2008	SP-41	SP-081224	0004	--	Introduce Online Charging from SMS-SC into 3GPP TS 32.274	B	8.2.0	8.3.0
Dec 2008	SP-42	SP-080706	0005	--	Correction on Multiple Unit Operation category	F	8.3.0	8.4.0
Dec 2008	SP-42	SP-080706	0006	--	Add SMS-SC as SMS node type	B	8.3.0	8.4.0
Dec 2008	SP-42	SP-080706	0007	--	Additional Address Info for SMS charging	B	8.3.0	8.4.0
Dec 2008	SP-42	SP-080706	0008	--	Add charging of SMS services to 32.274	B	8.3.0	8.4.0
Mar 2009	SP-43	SP-090045	0009	--	SMS IE structure alignment	F	8.4.0	8.5.0
Jun 2009	SP-44	SP-090293	0010	--	Clarification of "Termination charge" and application addressing	F	8.5.0	8.6.0
Sep 2009	SP-45	SP-090536	0011	--	IE usage for Delivery Reports and Application Identifiers	F	8.6.0	8.7.0

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