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**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Charging management;
Short Message Service (SMS) charging
(3GPP TS 32.274 version 14.1.0 Release 14)**



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Foreword

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1 Scope

The present document is part of a series of Technical Specifications (TSs) that specify charging functionality and charging management in GSM/UMTS and EPS networks. The GSM/UMTS and EPS core network charging architecture and principles are specified in 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 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 TS 23.040 [7], TS 23.204 [8] for SMS over IP, and TS 23.682 [17] for SMS procedures using T4. The present document does not replace existing offline SMS charging functionality defined for Circuit Switched in TS 32.250 [9] and for Packet Switched in TS 32.251 [10], and therefore is in addition to those specifications. 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 TS 32.240 [2] 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 TS 32.240 [2];
- The parameters, abstract syntax and encoding rules for the CDRs are specified in 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 TS 32.297 [5];
- The 3GPP Diameter application that is used for SMS offline and online charging is specified in TS 32.299 [4].

Furthermore, requirements that govern the charging work are specified in 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".
- [17] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".
- [18] 3GPP TS 29.337: "Diameter-based T4 interface for communications with packet data networks and applications".
- [19]-[99] Void.
- [100]-[199] Void.

[200] 3GPP TS 29.338: "Diameter based protocols to support Short Message Service (SMS) capable Mobile Management Entities (MMEs)".

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 the present document, refers to either an SMS router, IP-SM-GW, SMS-SC or a combination of these nodes.

3.2 Symbols

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

Bsm	Reference point for the CDR file transfer from SMS CGF to the BD,
Ga	Reference point for CDR transfer between a CDF and the CGF.
Rf	Offline charging reference point between a 3G network element and the CDF.
Ro	Online charging reference point between a 3G network element and the OCS.T4 Reference point used between MTC-IWF and the SMS-SC in the HPLMN.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1], TS 32.240 [2] apply.

5 SMS charging principles and scenarios

5.1 SMS charging principles

5.1.1 General principles

The Short Message Service (SMS) comprises 5 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.
- **Device Triggering:** the message is sent on behalf of an application as originator and received by a device as destination.
- **MSISDN-less UE to Application via T4:** the message is sent by a MSISDN-less UE as originator and received by a third party application as destination (e.g. SCS/AS) in MSISDN-less MO-SMS via T4 scenario.

In addition SMS nodes may apply services such as Value Added Services (VAS) specified in 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 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, except for device triggering – 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, except for device triggering – based on delivery from the SMS node.

- Delivery report – reports based on the delivery to Person.
- 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.
- Submission to SMS-SC for device triggering;
- Delivery from SMS-SC for device triggering;
- Delivery report for device triggering;
- MSISDN-less MO-SMS delivery via T4.

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

See clause 5.2 and 5.3 for detailed procedures associated with the triggers above for offline charging and online charging respectively.

5.1.4 SMS via T4

For the following TS 23.682 [17] procedures using T4 interface and relying on SMS capability, online and offline charging functionalities are based on SMS-SC reporting chargeable events associated with the corresponding SM transactions:

- Device Triggering Function;
- MSISDN-less MO-SMS via T4.

For Device Triggering functionality, following chargeable events are considered:

- Device Trigger submitted to the SMS-SC from MTC-IWF;
- SMS transferred from the SMS-SC towards the UE;
- Delivery report transferred from the SMS-SC to the MTC-IWF.

The protocol description for Device Triggering functionality is detailed in TS 29.337 [18].

For MSISDN-less MO-SMS via T4 functionality, allowing MSISDN-less UE to send small data to an SCS/AS (i.e. destination SME) using SMS-MO, the completion of the transaction at the SMS-SC is considered, since SMS-SC store and forward capability for MO-SMS is not used. Instead, the SMS-MO received by the SMS-SC through MO submission TS 23.040 [12]) procedures, is directly forwarded to the MTC-IWF through appropriate protocol for further transfer to the recipient SCS/AS. Also, the SMS-MO delivery answer status from MTC-IWF received by the SMS-SC is directly conveyed back to the UE.

The protocol description for MSISDN-less MO-SMS via T4 functionality is detailed in TS 29.338 [200].

5.2 SMS offline charging scenarios

5.2.1 Basic principles

SMS offline charging functionality is based on SMS Nodes reporting chargeable events associated with SM transactions.

The SMS offline charging applies to the SMS-SC.

SMS offline charging uses the Diameter Offline Charging as specified in TS 32.299 [4].

Event based charging applies, with reporting achieved by sending *Charging Data Request* [Event] to the CDF.

SMS transactions are collected independently by the SMS-SC, or on completion handling at SMS-SC (enhanced submission) .

5.2.2 Rf message flows

5.2.2.0 Introduction

The different scenarios below focus on the different message exchanges from/to the SMS-SC and the corresponding message flows between the SMS-SC and the CDF.

The sequence of messages exchanged between the SMS-SC and the other nodes are described with generic names (i.e SMS submit, SMS deliver), to reflect SMS reception or sending by/from the SMS-SC, independently from the protocol conveying the SMS.

5.2.2.1 SMS Submission to SMS-SC

Figure 5.2.2.1.1 describes the scenario where UE or a third party application originates SMS-MO destined to a recipient UE:

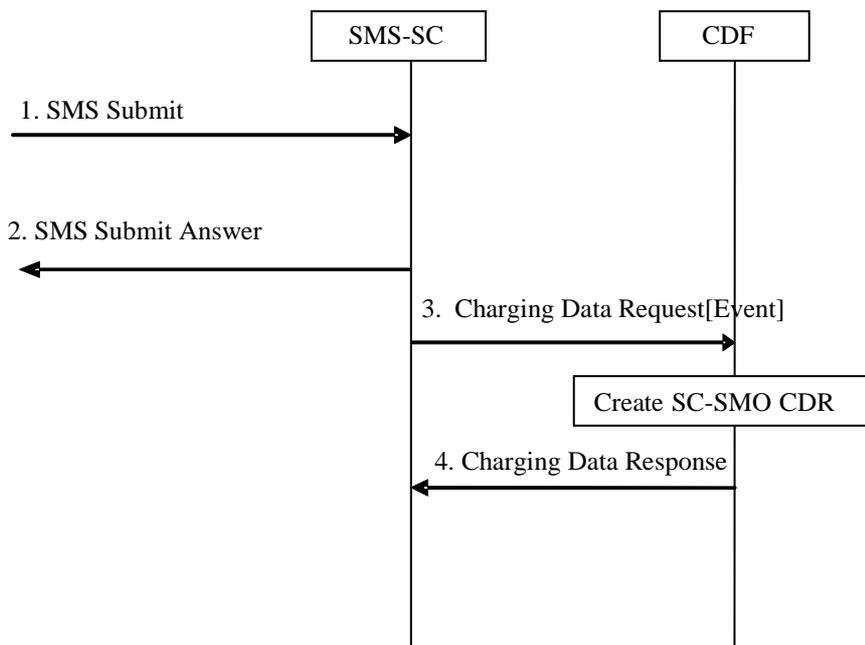


Figure 5.2.2.1.1: Offline charging - SMS submission to SMS-SC

- 1) The SMS-SC receives a "SMS Submit" incoming message originated by a UE or a third party application.
- 2) The SMS-SC returns "SMS Submit Answer" with appropriate result associated to the reception of the SM: successfully received by SMS-SC or failed due to error at SMS-SC.
- 3) The SMS-SC triggers a *Charging Data Charging Data Request* with *Operation Type* indicating *EVENT_RECORD* to record successful or unsuccessful reception of the SM, with originator identified as UE or as a third party application, depending on the scenario.

NOTE: In the scenario where a third party application is originator, sending application identification to the CDF allows to apply accurate charging model of Termination scenario, i.e. recipient UE to be charged for the delivered SM, instead of originator or both parties.

- 4) The CDF creates a SC-SMO CDR and acknowledges the reception of the data.

5.2.2.2 SMS Delivery from SMS-SC

Figure 5.2.2.2.1 describes the scenario where SMS-SC originates SM transfer towards the receiving party.

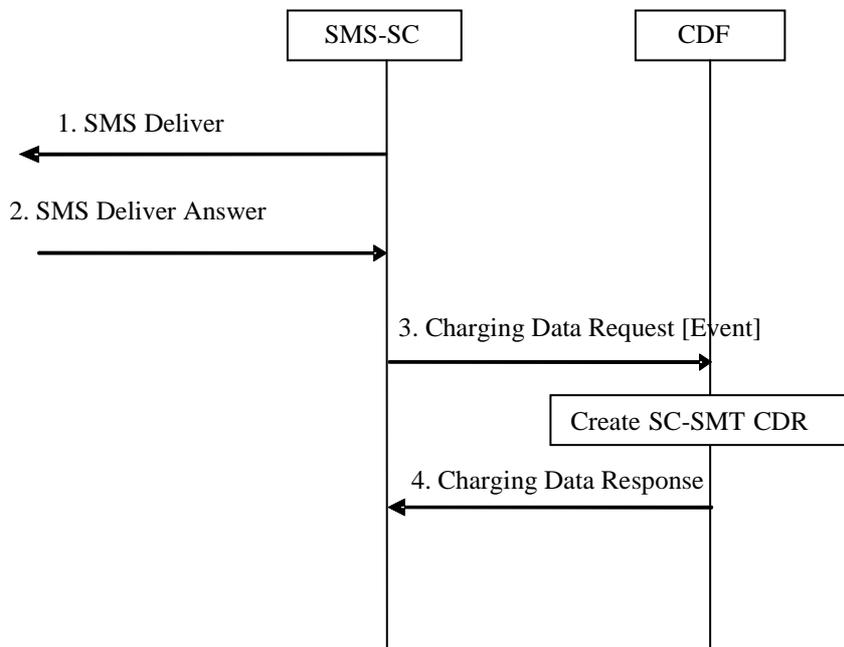


Figure 5.2.2.2.1: Offline charging SMS Transfer from SMS-SC

- 1) The SMS-SC forwards "SMS Deliver" message towards the receiving party, as a first attempt or due to internal trigger for a retry delivery of a previously failed and stored SM.
- 2) The SMS-SC receives "SMS Deliver Answer" message as the delivery success or failure of the SM transfer attempt.
- 3) The SMS-SC triggers a Charging Data Request[Event] to record successful or unsuccessful result of SM delivery.
- 4) The CDF creates a SC-SMT CDR and acknowledges the reception of the data.

5.2.2.3 Delivery Report

Delivery Report or Status Report (SC informing the originating UE of the delivery outcome of a previously submitted short message) issued by the SMS-SC uses the same procedures as the "SMS Delivery from the SMS-SC" described within clause 5.2.2.2, as it is contained within a new SM.

5.2.2.4 Device Triggering using T4

5.2.2.4.1 SMS submission to SMS-SC for Device Triggering

Figure 5.2.2.4.1.1 describes the scenario where the MTC-IWF submits a request to SMS-SC for SM transfer towards the UE for Device Triggering purpose.

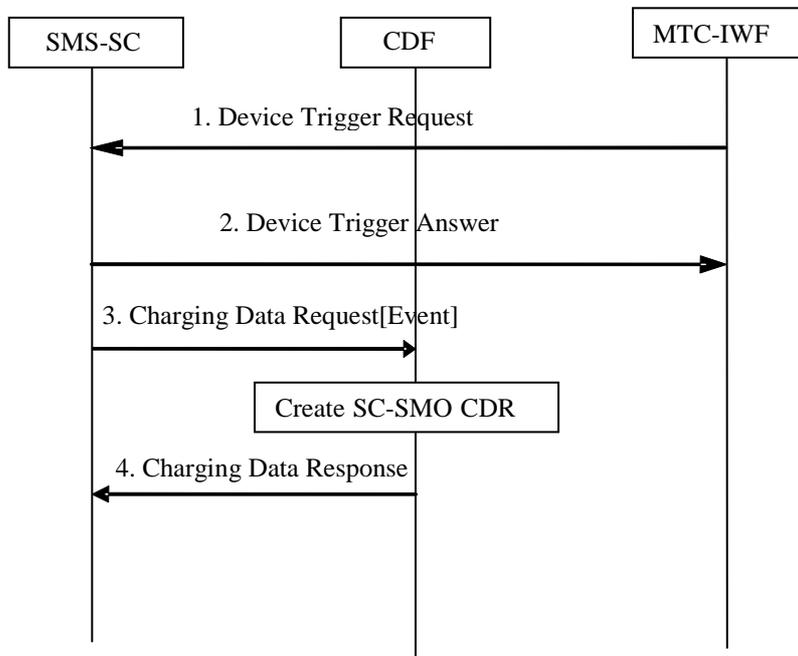


Figure 5.2.2.4.1.1: Offline charging - SMS submission to SMS-SC for Device Triggering

- 1) The SMS-SC receives an incoming "Device Trigger Request" from an MTC-IWF over T₄, destined to a UE recipient.
- 2) The SMS-SC returns "Device Trigger Answer" with appropriate result associated to the reception of the trigger request: successfully received by SMS-SC or failed due to error at SMS-SC.
- 3) The SMS-SC triggers a *Charging Data Request* with *Operation Type* indicating EVENT_RECORD to record successful or unsuccessful reception of the SM from the MTC-IWF, with originator identified as SCS Identity.
- 4) The CDF creates a SC-SMO CDR and acknowledges the reception of the data.

5.2.2.4.2 SMS Delivery from SMS-SC for Device Triggering

The scenario where SMS-SC originates the SMS Device Triggering transfer towards the UE is the same as "SMS Delivery from SMS-SC" described in clause 5.2.2.2, except the *Charging Data Request* with *Operation Type* indicating EVENT_RECORD includes a value for "Device Triggering indication".

5.3 SMS online charging scenarios

5.3.1 Basic principles

SMS online charging uses the Credit-Control application as specified in 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 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 IIEC.

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

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.

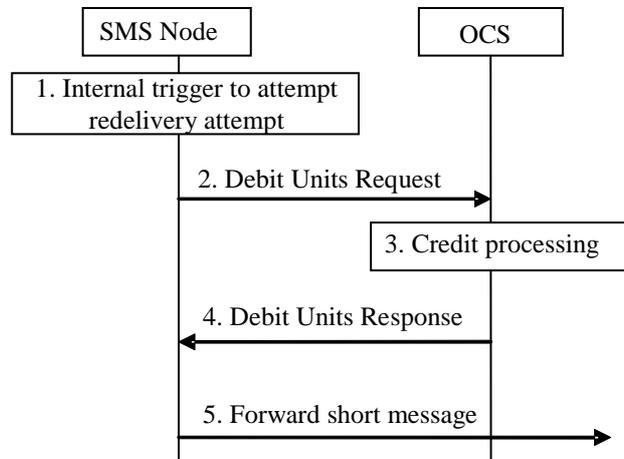


Figure 5.3.2.4.1: Online charging in origination redelivery attempt for IEC

- 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 authorized, the SMS node continues the SM processing as appropriate for the origination procedures.

5.3.2.6 Termination charge retry

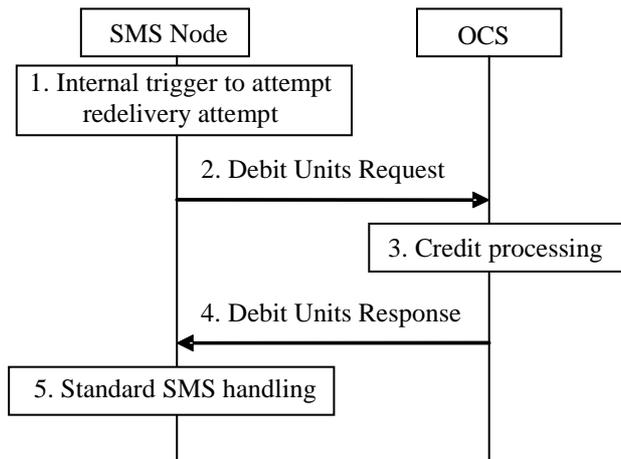


Figure 5.3.2.6.1: Online charging in termination redelivery attempt for IEC

- 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 authorized, the SMS node continues the SM processing as appropriate for the termination procedures.

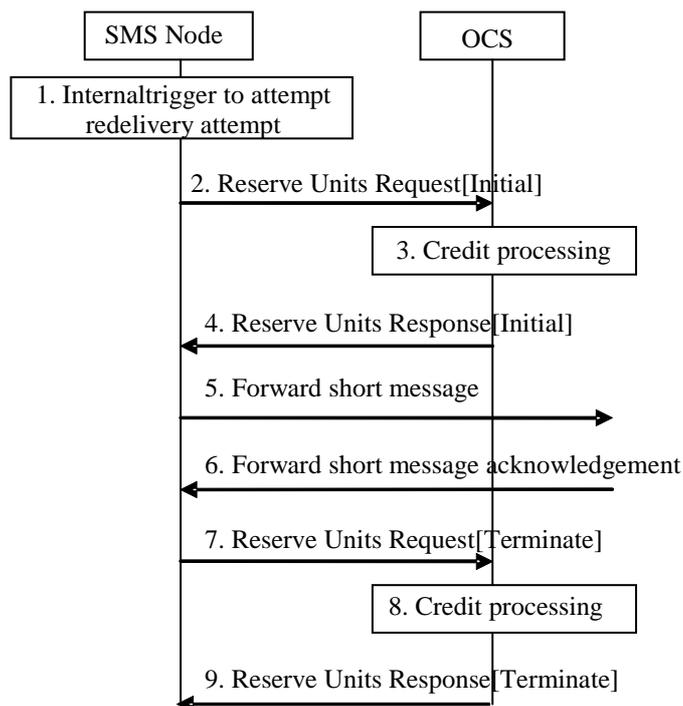


Figure 5.3.2.6.2: Online charging in termination redelivery attempt for ECUR

- 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 authorized, 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

Figure 5.3.2.7.1 only applies where a refund action is required for unsuccessful delivery.

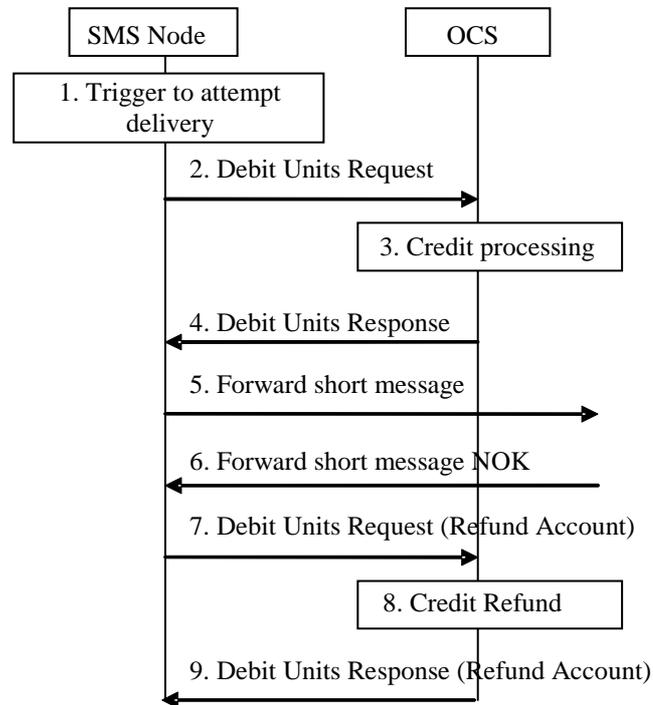


Figure 5.3.2.7.1: Unsuccessful transaction after IEC

- 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 authorized, 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.

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

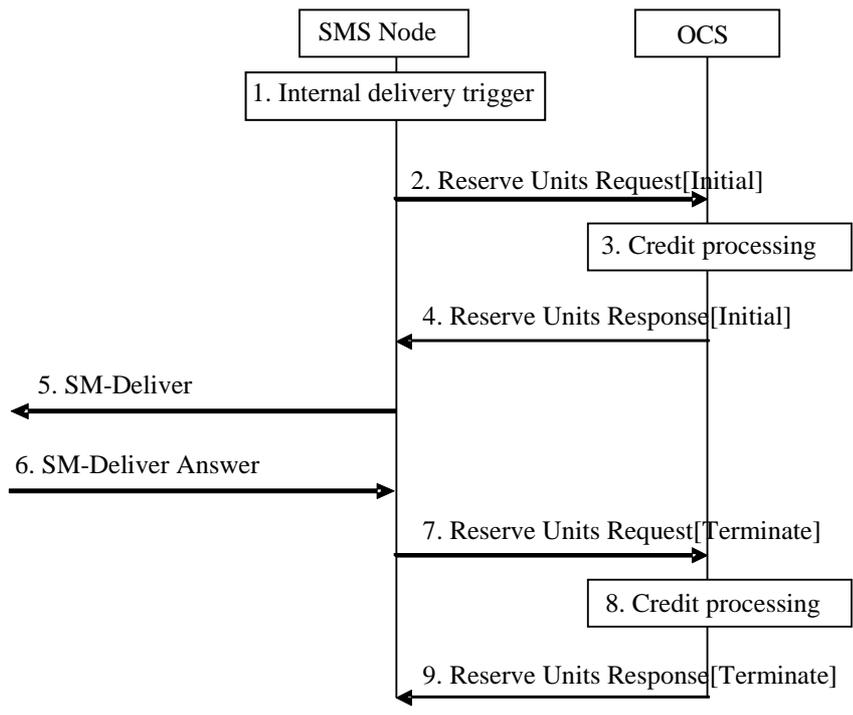


Figure 5.3.2.10-2: Online charging in delivery for ECUR

- 1) The SMS node decides to forward the "SMS Deliver" message towards the receiving party, as a first attempt or due to internal trigger for a retry delivery 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 authorized, the SMS node forwards the "SMS Deliver" message towards the receiving party.
- 6) The SMS Node receives "SMS Deliver Answer" message as the delivery success.
- 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.

5.3.3 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 R_f message contents

6.1.1.1 Summary of offline charging message formats

The SMS Node generates accounting information that can be transferred from the CTF to the CDF. For this purpose, SMS offline charging utilizes the *Charging Data Transfer Operation* that is specified in the 3GPP accounting application described in TS 32.299 [4].

The *Charging Data Transfer* operation employs the *Charging Data Request* and *Charging Data Response* messages. Table 6.1.1.1.1 describes the use of these messages for offline charging.

Table 6.1.1.1.1: Offline charging messages reference table

Command-Name	Source	Destination
<i>Charging Data Request</i>	CTF	CDF
<i>Charging Data Response</i>	CDF	CTF

This clause describes the different fields used in the Charging Data messages and the category in the tables are used according to the charging data configuration defined in clause 5.4 of TS 32.240 [2].

6.1.1.2 Structure for the offline charging message formats

6.1.1.2.1 Charging Data Request message

Table 6.1.1.2.1.1 illustrates the basic structure of a *Charging Data Request* message as used for SMS offline charging.

Table 6.1.1.2.1.1: Charging Data Request message contents

Information Element	Category	Description
Session Identifier	M	Described in TS 32.299 [4]
Originator Host	M	Described in TS 32.299 [4]
Originator Domain	M	Described in TS 32.299 [4]
Destination Domain	M	Described in TS 32.299 [4]
Operation Type	M	This field contains event type transfer (immediate event based charging).
Operation Number	M	Described in TS 32.299 [4]
Operation Identifier	O _M	Described in TS 32.299 [4]
User Name	O _C	This field contains the identification of the source node.
Origination Timestamp	O _C	Described in TS 32.299 [4]
Proxy Information	O _C	Described in TS 32.299 [4]
Route Information	O _C	Described in TS 32.299 [4]
Operation Token	O _M	This field contains the service context, i.e. SMS charging.
Service Information	O _M	This field holds the 3GPP specific SMS parameter. Described in clause 6.3.

6.1.1.2.2 Charging Data Response message

Table 6.1.1.2.2.1 illustrates the basic structure of a *Charging Data Response* message as used for SMS offline charging.

Table 6.1.1.2.2.1: Charging Data Response Message Contents

Information Element	Category	Description
Session Identifier	M	Described in TS 32.299 [4]
Operation Result	M	Described in TS 32.299 [4]
Originator Host	M	Described in TS 32.299 [4]
Originator Domain	M	Described in TS 32.299 [4]
Operation Type	M	This field contains event type transfer (immediate event based charging).
Operation Number	M	Described in TS 32.299 [4]
Operation Identifier	O _M	Described in TS 32.299 [4]
User Name	O _C	This field contains the identification of the source node.
Destination Host	O _C	Described in TS 32.299 [4]
Error Reporting Host	O _C	Described in TS 32.299 [4]
Origination Timestamp	O _C	Described in TS 32.299 [4]
Proxy Information	O _C	Described in TS 32.299 [4]

6.1.2 G_a message contents

Refer to clause 5.2.4 for further information.

6.1.3 CDR description on the B_{sm} interface

6.1.3.1 CDR field types

The following Standard CDR content and format are considered:

- SC-SMO CDR generated based on information from the SMS-SC;
- SC-SMT CDR generated based on information from the SMS-SC.

The content of each CDR type is defined in the tables in clauses 6.1.3.3 to 6.1.3.4.

For each CDR type the field definition includes the field name, category and description. The category in the tables are used according to the charging data configuration defined in clause 5.4 of TS 32.240 [2].

The detailed specification of the CDR parameters and their encoding is contained in TS 32.298 [3], while TS 32.297 [5] specifies the details of the CDR file transfer to the Billing Domain (BD). Additional CDR formats and contents may be available at the interface to the billing system to meet the requirements of the Billing System (BS), these are outside of the scope of 3GPP standardization.

6.1.3.2 CDR triggers

The generation of the SMS related CDRs is based on reception of Charging Data Request[Event] messages transferred from the SMS-SC node to the CDF. One CDR is created in the CDF for each Charging Data Request[Event] message received.

6.1.3.3 SC-SMO CDR content

The content of SC-SMO CDR is defined in the table 6.1.3.3.1.

Table 6.1.3.3.1: SC-SMO record

Field	Category	Description
User Location Info	O _c	This field holds the information about the location of the subscriber during the SMS transaction, in case of Mobile Originating message, if available.
RAT Type	O _c	This field holds the Radio Access Technology (RAT) type used for the SMS transaction, in case of Mobile Originating message, if available.
UE Time Zone	O _c	This field indicates the offset between universal time and local time in steps of 15 minutes of where the UE currently resides, in case of Mobile Originating message, if available.
SMS Result	C	The field holds the result of the attempted SM submission, if unsuccessful.
SM Device Trigger Indicator	O _c	This field holds indication whether the SM submission to SMS-SC is related to Device Trigger.
SM Device Trigger information	O _c	This field holds the set of information related to SMS submission to SMS-SC for Device Trigger.
MTC IWF Address	O _c	This field holds the MTC IWF address from which device trigger is received.
SM DT Reference Number	O _c	This field holds the Reference Number related to the device trigger request, if available.
SM Serving Node	O _c	This field holds the serving node identity, i.e. SGSN/MME/MSC identity serving the UE, as received from MTC-IWF, if available.
SM DT Validity Period	O _c	This field holds the validity period of the device trigger request, if available.
SM DT Priority Indication	O _c	This field holds the priority of the device trigger request, if available.
SMS Application Port ID	O _c	This field holds the Application Port ID of the triggering application for the device trigger request, if available.
Record extensions	O _c	A set of network/ manufacturer specific extensions to the record, when available.

6.1.3.4 SC-SMT CDR content

The content of SC-SMT CDR is defined in table 6.1.3.4.1.

Table 6.1.3.4.1: SC-SMT record

Field	Category	Description
User Location Info	O _c	This field holds the information about the location of the subscriber during the SMS transaction, in case of Mobile Terminating message, if available.
RAT Type	O _c	This field holds the Radio Access Technology (RAT) type used for the SMS transaction, in case of Mobile Terminating message, if available.
UE Time Zone	O _c	This field indicates the offset between universal time and local time in steps of 15 minutes of where the UE currently resides, in case of Mobile Terminating message, if available.
SMS Result	C	The field holds the result of the attempted SM delivery, if unsuccessful.
SM Device Trigger Indicator	O _c	This field holds indication whether the SM was transferred for the purpose of Device Trigger.
SM Device Trigger information	O _c	This field holds the set of information related to SMS submission to SMS-SC for Device Trigger.
MTC IWF Address	O _c	This field holds the MTC IWF address which originated the device trigger.
SM DT Reference Number	O _c	This field holds the Reference Number related to the device trigger request, if available.
SM Serving Node	O _c	This field holds the serving node identity, i.e. SGSN/MME/MSC identity serving the UE, as received from MTC-IWF, if available
SM DT Validity Period	O _c	This field holds the validity period of the device trigger request, if available.
SM DT Priority Indication	O _c	This field holds the priority of the device trigger request, if available.
SMS Application Port ID	O _c	This field holds the Application Port ID of the triggering application for the device trigger request, if available.
Record extensions	O _c	A set of network/ manufacturer specific extensions to the record, when available.

6.2 Data description for SMS online charging

6.2.1 R_o message contents

6.2.1.0 Introduction

The SMS node generates Debit / Reserve Units information that can be transferred from the CTF to the OCF. For this purpose, SMS online charging utilizes the *Debit Units and Reserve Units* procedure that is specified in the 3GPP Debit / Reserve Units operation in 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 6.2.1.0.1 describes the use of these messages for SMS online charging.

Table 6.2.1.0.1: SMS online charging messages contents

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

This clause describes the different fields used in the *Debit / Reserve Units Request* and *Debit / Reserve Units Response* messages and the category in the tables are used according to the charging data configuration defined in clause 5.4 of TS 32.240 [2].

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

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 6.3.1.2.1

Table 6.3.1.2.1: SMS Information used for SMS Charging

MTC IWF Address	O _C	This field holds the MTC IWF address which originated the device trigger.
SM DT Reference Number	O _C	This field holds the Reference Number related to the device trigger request, if available.
SM Serving Node	O _C	This field holds the serving node identity, i.e. SGSN/MME/MSC identity serving the UE, as received from MTC-IWF, if available.
SM DT Validity Period	O _C	This field holds the validity period of the device trigger request, if available.
SM DT Priority Indication	O _C	This field holds the priority of the device trigger request, if available.
SMS Application Port ID	O _C	This field holds the Application Port ID of the triggering application for the device trigger request, if available.

NOTE 1: The case of multi-destinations of SMS refers to SMS and Internet Electronic Mail interworking as specified in clause 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.

6.3.1A Detailed message format for offline charging

This clause specifies the charging data that are sent by the SMS-SC in the Charging Data Request, with [Event] Operation Type.

When a particular field is not supported, this field is marked with "-".

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.

6.4 Bindings for SMS charging

This clause describes the mapping between the Service Information fields, AVPs and CDR parameters for SMS charging.

Table 6.4.1 describes the mapping of the Information Element, AVP and CDR parameter of SC-SMO and SC-SMT CDRs in SMS charging.

Annex A (informative): Bibliography

This Annex is a placeholder for documents which are not explicitly cited in this specification.

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2016-09	SA#73	SP-160622	0032	1	F	Correction on use of Multiple Operation and Multiple Unit Operation for IEC	13.1.0
2016-12	SA#74	SP-160847	0033	1	F	Correction SMS Delivery handling	14.0.0
2017-03	SA#75	SP-170138	0034	1	D	Remove reference to RFC 3588	14.1.0
2017-03	SA#75	SP-170135	0035	1	B	Introduce charging principle for MSISDN-less MO-SMS via T4	14.1.0
2017-03	SA#75	SP-170135	0036	-	B	Introduce Message flows offline charging for MSISDN-less MO-SMS via T4	14.1.0
2017-03	SA#75	SP-170135	0037	1	B	Remove Editor's Note in clause 5.2.3, 5.2.4, 5.2.5, and 6.1.2	14.1.0

History

Document history		
V14.1.0	April 2017	Publication