ETSI TS 132 274 V15.3.0 (2020-01)

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 15.3.0 Release 15)

Reference
RTS/TSGS-0532274vf30

Keywords
GSM,LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Legal Notice

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. These shall be interpreted as being references to the corresponding ETSI deliverables.

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

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

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.

1 Scope

The present document is part of a series of Technical Specifications (TSs) that specify charging functionality and charging management in 3GPP networks. The 3GPP 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].
- The services, operations and procedures of charging, using Service Based Interface are specified in TS 32.290 [19].
- The charging service of 5G system is specified in TS 32.291 [20].

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] 3GPP TS 32.290: "Telecommunication management; Charging management; 5G system; Services, operations and procedures of charging using Service Based Interface (SBI)".

[20] 3GPP TS 32.291: " Telecommunication management; Charging management 5G system; Charging service, stage 3".

[21]-[99] Void.

[100]-[199] Void.

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

[201] 3GPP TS 23.501:"System Architecture for the 5G System".

[202] 3GPP TS 23.502:"Procedures for the 5G System".

[203] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

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, SMSF 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] and the following apply:

5GS	5G System
NCGI	NR Cell Global Identity

4 Architecture considerations

4.1 High level SMS architecture

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

4.2 SMS offline charging architecture

The architecture for SMS offline charging is described in figure 4.2.1

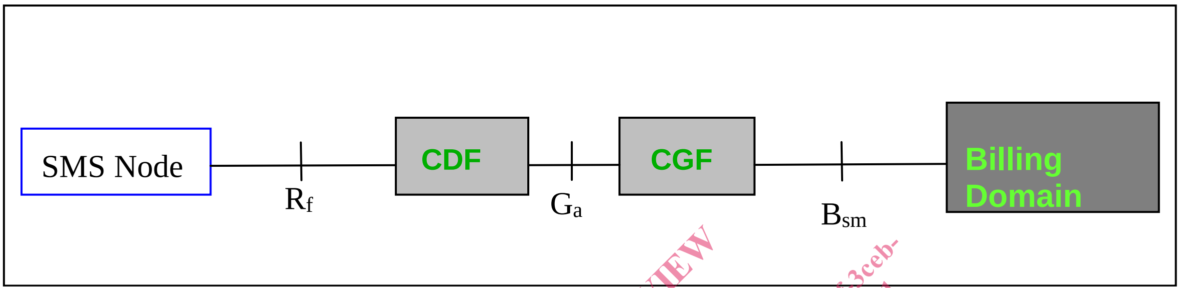

Figure 4.2.1: SMS offline charging architecture

The SMS Nodes for which this architecture applies are the SMS-SC and IP-SM-GW.

Details on the interfaces and functions can be found in TS 32.240 [2] for the general architecture components.
The Rf interface is described in clause 6.1.1, Ga in clause 6.1.2, and Bsm in clause 6.1.3 of this document.

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 4.3.1

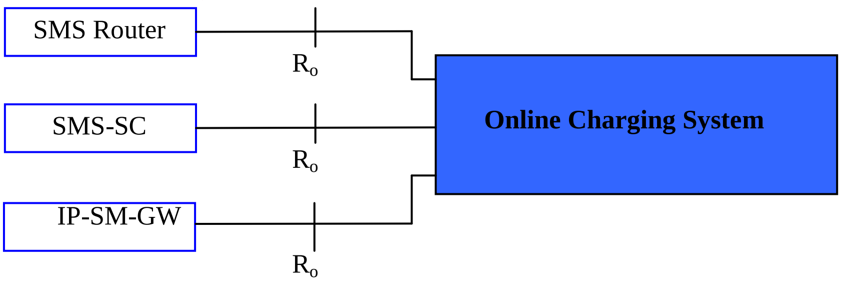

Figure 4.3.1: SMS online charging architecture

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 TS 32.299 [4] for the Ro application.

4.4 SMS converged charging architecture

The architectural options for SMS converged charging are depicted in figure 4.4.1

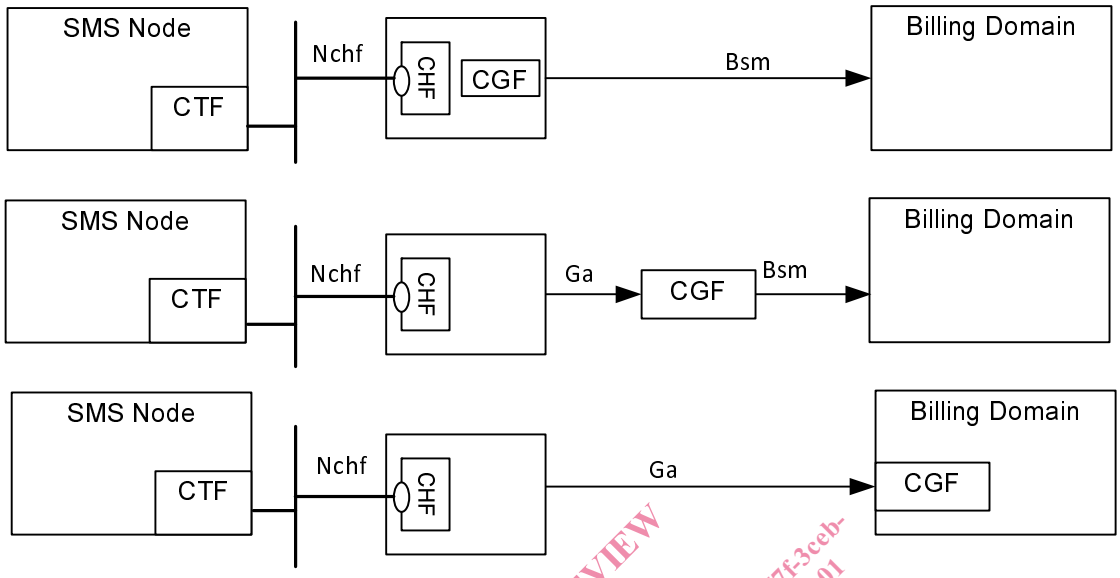

Figure 4.4.1: SMS converged charging architecture

The SMS Node for which this architecture applies is the SMSF.

The general architecture components can be found in TS 32.240 [2].

Ga is described in clause 5.2.4 and Bsm in clause 5.2.5 of this document, and Nchf is described in TS 32.290 [19].

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.