

3GPP TS 32.105 V0.0.4 (2000-10)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
3G Charging and Billing;
Stage 2 description
(Release 1999)**



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Reference

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3GPP

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

<http://www.3gpp.org>

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Foreword

This Technical Specification has been produced by the 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 this TS, 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 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 specification;

Introduction

This Technical Specification (TS) is part of a set of TSs which describe the requirements and information necessary for the standardised charging of 3G system.

1 Scope

This Technical Specification describes the Architecture, Principals and Call Event specifications of charging and billing for the provision of service and services by a 3G system.

This standard is not intended to duplicate existing standards or standards being developed by other groups on these topics, and will reference these where appropriate. This standard will elaborate on the charging requirements described in the Charging Principles in UMTS 22.01 Service Principles. It will allow the generation of accurate charging information to be used in the commercial and contractual relationships between the parties concerned.

The call and event data generated by the network elements of the 3G network, is required for a number of telecom management activities including, but not limited to, the following:

- the billing of home subscribers, either directly or via service providers, for network utilisation charges;
- the settlement of accounts for traffic carried or services performed by fixed network and other operators;
- the settlement of accounts with other PLMNs for roaming traffic via the transferred account procedure;
- statistical analysis of service usage;
- as historical evidence in dealing with customer service and billing complaints;

In addition to the information collected from these network elements, network management functions are required for the administration of charging data.

For the purpose of the present document, the call and event data is considered to be collected, in real-time, by network element function (NEF) blocks located within the recording entities.

The data collected by the NEFs is sent to, or collected by, the appropriate Operations System Function (OSF) blocks for storage and further processing.

The location of the OSF is implementation specific and may, for example, be provided either by an Administration Centre (ADC) or integrated within the network elements themselves.

The following is beyond the scope of this TS, and therefore this TS does not describe:

-

The objectives of this standardisation are:

- to provide the descriptions of events and triggers for the generation of Call detail records;
 - to provide the descriptions for Call and event Call detail records;
 - to produce a description of the collection techniques for accounting administration and CDR generation;
- and
- to define a method for the transmission of CDRs over an open interface.

2 References

The following documents contains 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

2.1 Normative references

Editor's note: Please support with contributions

- [1] 3GPP TS 22.101 "Service aspects; Service Principles";
- [2] 3GPP TS 22.115 "Service aspects; Charging and Billing";
- [3] 3GPP TS 32.101 "3G Telecom Management principles and high level requirements"
- [4] 3GPP TS 32.102 "3G Telecom Management architecture"
- [5] 3GPP TS 32.005: "3G call and event data for the Circuit Switched (CS) domain".
- [6] 3GPP TS 32.015: "3G call and event data for the Packet Switched (PS) domain".

3 Definitions and Abbreviations

3.1 Definitions

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

Editor's note: Please support with contributions

3.2 Abbreviations

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

Editor's note: Please support with contributions.

3G	3 rd Generation
3GPP	3G Partnership Project
CDR	Call Detail Record
ETS	European Telecommunication Standard
ETSI	European Telecommunications Standards Institute
FTAM	File Transfer Access and Management
FTP	File Transfer Protocol
GGSN	Gateway GPRS Service Node
GSN	GPRS Service Node
Itf	Interface
ITU-T	International Telecommunication Union - Telecommunications Standardisation Sector

MSC	Mobile Services Switching Centre
NE	Network Element
NMC	Network Management Centre
OA&M	Operation, Administration and Maintenance
OMC	Operation & Maintenance Centre
QoS	Quality of Service
RNC	Radio Network Controller
SGSN	Serving GPRS Service Node
TS	Technical Specification
UTRAN	UMTS Terrestrial Radio Access Network

4 Architecture

The following figures 1 and 2 show the 3G logical architecture and 3G charging logical architecture.

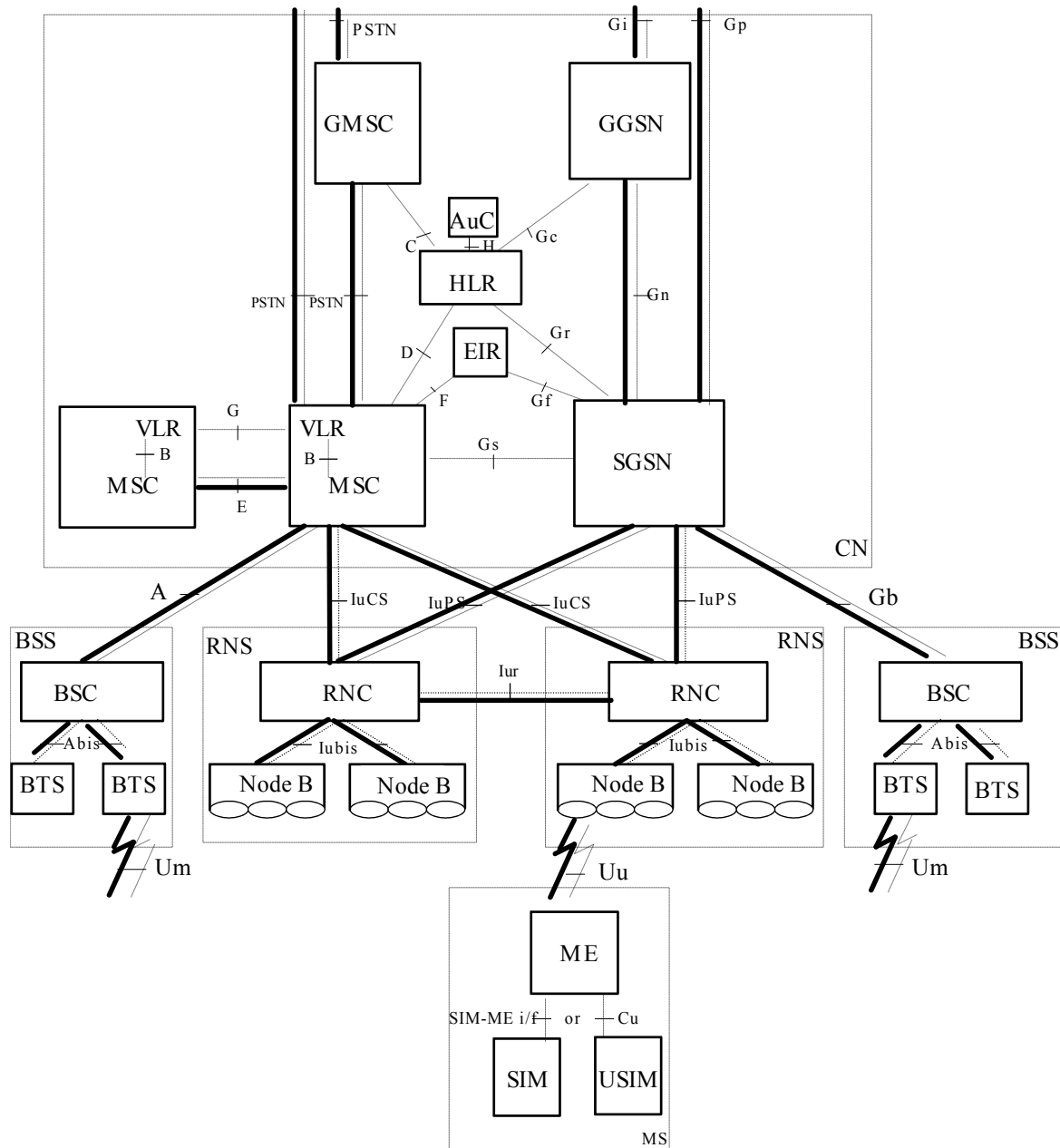


Figure 1: Overview of the 3G Logical Architecture

The 3rd Generation Mobile system is logically implemented on the GSM/GPRS structure through the addition of a new air interface supported by two network nodes, the RNC and the Node B. No inference should be drawn about the physical configuration on an interface from Figure 1.

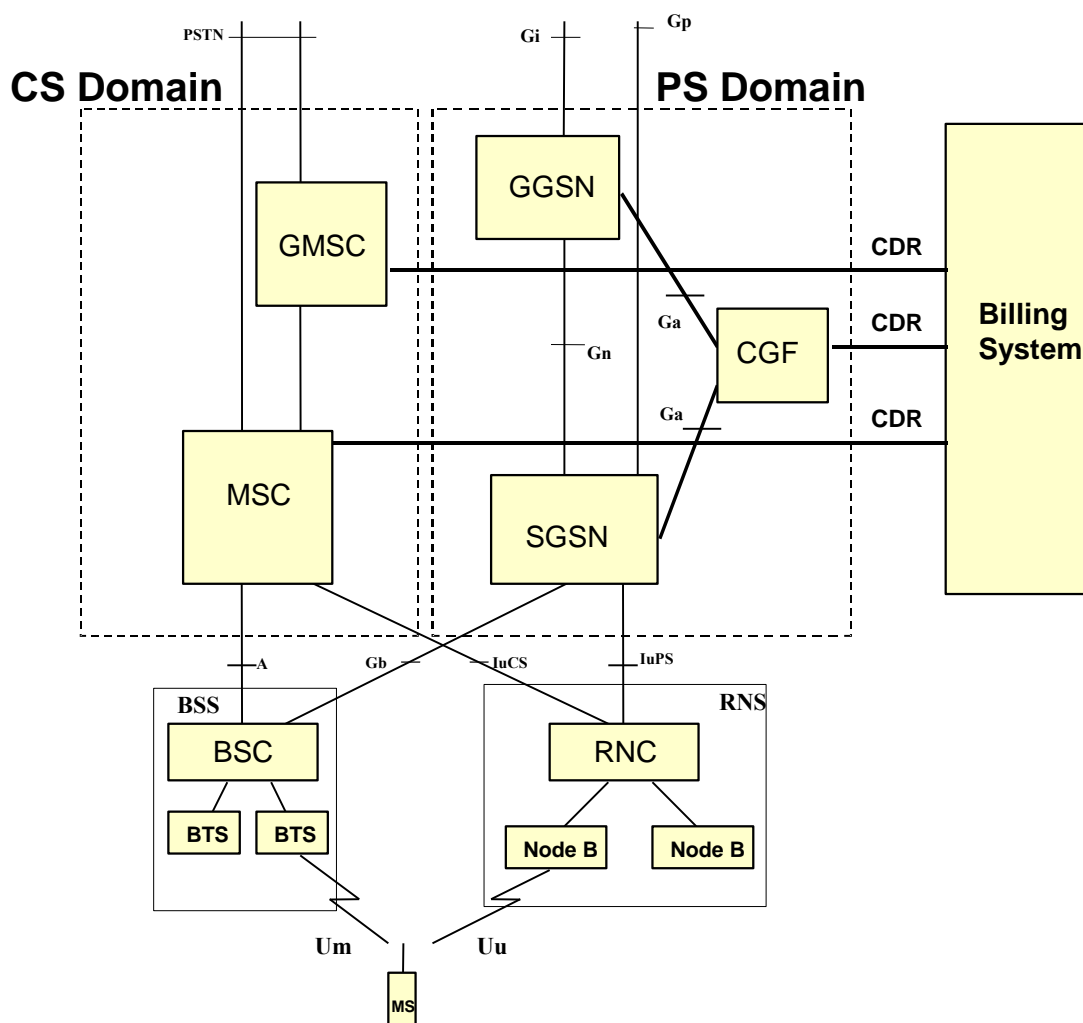


Figure 2: 3G charging logical architecture

Figure 2: illustrates the 3rd Generation Charging architecture is subdivided by the two transmission planes, the Circuit Switched (CS) domain and the Packet Switched (PS) domain. The call detail records generated by the serving nodes for the appropriate domain are forwarded via the Charging Gateway Functionality (CGF) entities to the Billing System (BS) for processing.

5. 3G Charging Principles

5.1 Requirements

- Every 3G operator collects and processes their own charging information.
- Time and Volume

- As much as is possible the 3G charging functions should support standardised interfaces for possible use in future cellular digital based networks.
- It shall be possible to provide reverse charging as a subscription option. However, reverse charging may not be applicable to certain external data network protocols.
- A unique identity number shall be assigned for every CS call and PS session for billing purpose.

5.1.1 CS Domain Charging Requirements

This section describes the CS Domain specific requirements, which are not covered by the specification 32.005 'GSM Charging & Billing Call Event Data'.

-
- It shall be possible for the operator to differentiate the radio access technology used during the provision of a CS call. I.e. GSM, UTRA. This includes the change of access technology during the period of a call caused by system handover.
- The specific CODEC used by the MS for the duration of the call shall be
- ?? The selection of air interface TDD/FDD mode.

5.1.2 PS Domain Charging Requirements

This section describes the PS Domain specific requirements, which are not covered by the specification 32.015 'GSM/GPRS Charging and Billing'.

-
- Data volumes on both the uplink and downlink direction shall be counted separately.
 - A, The data volumes shall reflect the application data as precisely as possible as delivered to and from the external network.
 - B, The data volumes shall reflect the transmission of data as precisely as possible as delivered to and from the MS over the air interface after compression has been applied.
- Usage of the radio interface: the charging information shall describe the amount of data transmitted in both directions categorised with QoS and user protocols;
- Air interface selection mode FDD/TDD.

5.1.3. Service Related Charging Requirements

The operator will be provided with service specific details by the responsible 3G application for each of the following 3G services;

- Multimedia
- MexE
- WAP
- LCS

5.2 Charging Information

Charging information in the 3G network is collected for each MS by either the serving MSC, GMSC or SGSNs and GGSNs which are serving that MS. The information that the operator uses to generate an invoice to the subscriber is operator-specific. Billing aspects, e.g., a regular fee for a fixed period, are outside the scope of this specification.

Charging information will be generated for the provision of 3G Network specific applications to the MS.

5.3 Charging Data Collection Principles

Tariff switch

Charging data transfer

5.4 Event Generation

This subclause describes the typical requirements for Event and call data to be produced by the NE's, which comprise a 3G system. It is important to note that an actual information generated by the network may be used to satisfy requirements in more than one category of measurement described below.

5.4.1 Radio Location dependant information for campus or home environment.

Change in Radio technology RNS(3G) to and from BSS (GSM)

Mode of operation FDD/TDD

5.4.2 Network

Start and end of a call

-
-

5.4.3 Service

Provision of specific service.

5.4.4 Quality of Service (QoS)

Change in Qos

5.5 Charging administration

6 Call Event Data

6.1 Introduction

This subclause describes the 3G specific Events and Call Detail Record Structures.

6.2 CS Domain CDRs

The CS Domain specific CDRs are defined in the specification 32.005 'GSM Charging & Billing Call Event Data'.

6.3 PS Domain CDRs

The PS Domain specific CDRs are defined in the specification 32.015 'GSM/GPRS Charging and Billing'.

Annex A (Informative): Title to be added

A.1 Service Related CDRs

As well as the 3G Network specific services i.e. MExE, applications/services will be provided to the 3G subscribers by service nodes outside the scope of the 3G network. These servers (service nodes) responsible for the provision of an application services to a subscriber via the 3G network, can generate a service related CDR to record the details of the service transaction provided.

A single service specific CDR is defined to support the following groups of application services;

Content

- E.g. Music and Video.

Information

- E.g. Weather, Stock, Road/travel.

Transaction

- Tickets (Theatre, Train) and Produce (Vending).

A CDR can be generated by a server positioned either internal or outside the scope Network operators network i.e. Services from a VASP. Where the server is positioned outside the 3G Operators network, compliance, security and financial arrangements between the two parties will need to be agreed.

A.1.1 Service CDR Structure

Annex B (Normative):
To be added

History

Document history		
0.0.1	1999-11-23	Initial draft (S5-000008)
0.0.2	2000-01-14	As agreed by SA5.CH/ Bonn, Dec 1999 (S5-000015)
0.0.3	2000-09-20	Cleaned-up by MCC (az).
0.0.4	2000-10-09	Title Changed: "3G Charging and Accounting" into "3G Charging and Billing"