Source: **SA5**

Presentation of Specification to TSG SA

Presentation to:	TSG SA Meeting #6
Document for presentation:	3G TS 32.105 V0.0.1 *3G Charging; Call event data*
Presented for:	information Note: This is the first draft of 31.105. It has not yet been raised to version 1.0.0 because SA5 did not consider that it had reached a sufficient level of stablity. It is expected that v1.0.0 will be presented to SA #6 for information in March 2000.

Abstract of document:

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;
- to define a method for the transmission of CDRs over an open interface.

In order to maintain compatibility with GSM, 32.105 will not duplicate CDR definitions specified for GSM. Where appropriate, it will contain references to the transfered GSM specifications GSM 12.05 and GSM 12.15 i.e.
- 3G TS 32.005 "GSM charging for the circuit switched domain"   and
- 3G TS 32.015 "GSM charging for the packet switched domain"

Changes since last presentation to TSG-SA Meeting # 5

Outstanding Issues:

See list of outstanding R99 issues on the following page

Contentious Issues:

none identified

Release 1999 Submission form

Work Area / Item:		3G charging				
Affects:	**UE/MS:**	**CN:**	**UTRAN:**	**Compatibility Issues:**	**Yes:**	**No:**
Expected Completion Date:		June 2000				
Services impacted:						
Specifications affected:		3G TS 32.005 - GSM charging for the circuit switched domain 3G TS 32.015 - GSM charging for the packet switched domain 3G TS 32.105 - 3G charging; Call event data				
Tasks within work which are not complete:		1. addition of CDRs for new or modified R99 services 2. incorporate references to 3G TS 32.005 and 32.015				
Consequences if not included in Release 1999:		Call Detail Records that are not compatible between operators				
Accepted by TSG: SA #6 for late inclusion in Release 1999:						

3G TS 32.105 V0.0.1 (1999-12)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Services and system Aspects;
3G charging;
Call event data
(3G TS 31.105 version 0.0.1)

Reference
3TS/TSGS-0532105U

Keywords
charging, call event, billing,

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Contents

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.

The present document describes the interfaces and functions required for charging and billing in terms of the Telecommunications Management Network (TMN) information model defined by [3] 3G TS 32.101 "3G Telecom Management principles and high level requirements"

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:

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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]   3G TS 22.101 "Service aspects; Service Principles"

[2]   3G TS 22.115 "Service aspects; Charging and Billing";

[3]   3G TS 32.101 "3G Telecom Management principles and high level requirements"

[4]   3G TS 32.005 "Subscriber related event and call data";

[5]   3G TS 32.015 "General Packet Radio Service (GPRS); GPRS Charging";

[9]   3G TS 32.102 "3G Telecom Management architecture"

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	3rd Generation
3GPP	3G Partnership Project
CDR	Call Detail Record
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.
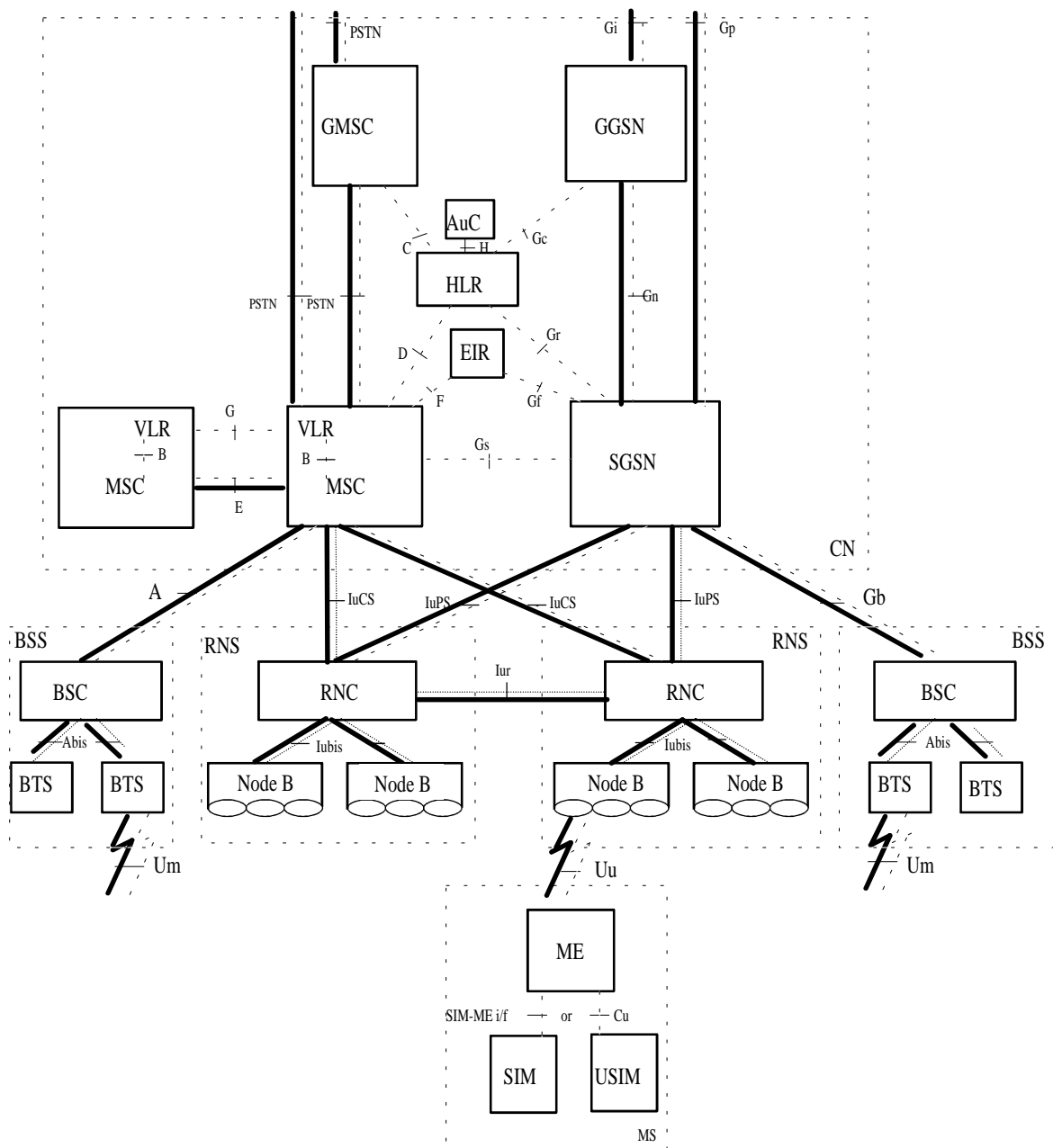

Figure 1: Overview of the 3G Logical Architecture

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.
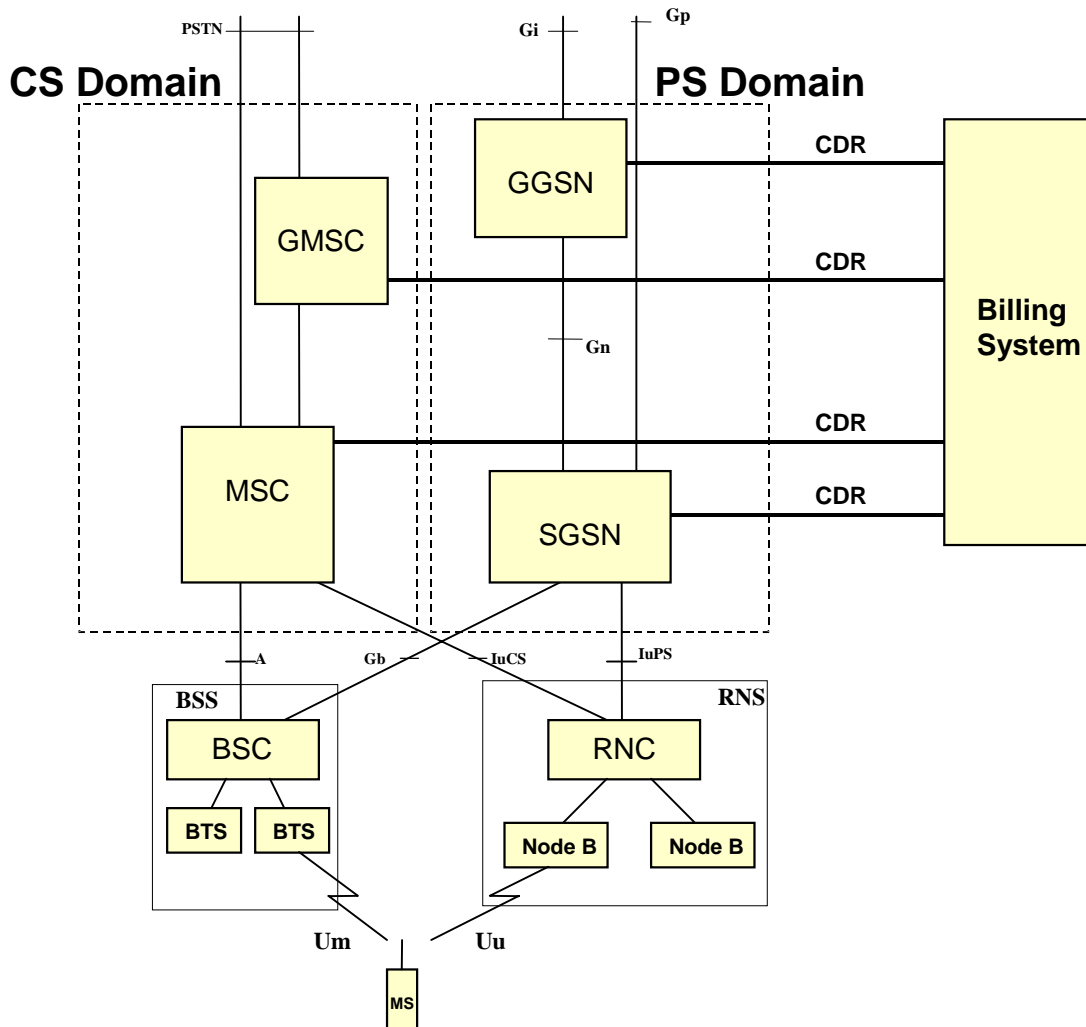
Figure 2: 3G charging logical architecture

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 servicing nodes for the appropriate domain are forwarded to the Billing system for processing.

5.   3G Charging Principles

5.1   Requirements

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

-     As much as is possible the 3G charging functions should support open 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.

-     As much as is possible the 3G charging functions should support open interfaces for possible use in future cellular digital based networks.

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'.

- Every CS call shall be assigned a unique identity number for billing purpose. (????)

- 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.

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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 '.

- Each PS context shall be assigned a unique identity number for billing purposes. (i.e. the charging id).

- 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.

5.1.2   Service Related Charging Requirements

The operator will be provided with service specific details from the by the responsible 3G application server 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 the either the serving MSC 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 for the provision of 3G Network specific applications provided to the MS will be generated by the NE specific server.

5.3 Charging Data Collection Principles

Call data record generation and contents should be flexible and unnecessary redundancy in data should be avoided.

Any evaluation of 3G system behaviour will require performance data collected and recorded by its NEs according to a schedule established by the OMC. This aspect of the management environment is termed Performance Management. The purpose of any performance management activity is to collect data which can be used to verify the physical and logical configuration of the network and to locate potential problems as early as possible. The type of data to be collected is defined by the equivalent measurements, refer to annex C. This TS concentrates on the requirements of 3G telecom management to produce this data. Any management actions performed at the OSs subsequently to analyse the performance data are not considered in this TS.

Data is required to be produced by the NEs to support the following areas of performance evaluation:

- traffic levels within the network, including the level of both the user traffic and the signalling traffic

- verification of the network configuration

- resource access measurements

- Quality of Service (e.g. delays during call set-up, packet throughput, etc) and

- resource availability (e.g. the recording of begin and end times of service unavailability).

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 Resource Utilisation

5.4.2 Network Resource Utilisation

Bearers:

- UMTS bearers for circuit and packet

- GSM CS data

- GSM GPRS data

- SMS & USSD

5.4.3 Service Provision

5.4.4 Quality of Service (QoS)

5.4.5 Resource availability

5.5 Charging administration

The range of measurements which will be available from the NEs are expected to cover all of the requirements described in subclause 4.1. However, not all of these measurements will be required all of the time, from every occurrence, of every relevant NE. With a highly distributed network like a 3G mobile telecommunication system it is also necessary to gather the measurement data so as to perform consistent analysis of the results and to evaluate the interactions between the NEs.

This subclause describes the requirements for the various areas of administration of measurements.

6 Call Event Data

6.1 Introduction

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

6.2 CS Domain CDRs

This clause describes the CS Domain specific CDRs and enhancements, which are not covered by the specification 32.005 'GSM Charging & Billing Call Event Data'.

6.3 PS Domain CDRs

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

6.4 Service Related CDRs

Annex A (Normative):

Annex B (Normative):

History

Document history		
0.0.1	23/11/99	Initial draft