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Technical Specification

Digital cellular telecommunications system (Phase 2+); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; General aspects (GSM 08.01 version 6.0.0 Release 1997)

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Contents

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Foreword

This Technical Specification (TS) has been produced by the Special Mobile Group (SMG).

The present document gives the general aspects Base Station System (BSS) to Mobile–services Switching Centre (MSC) interface within the digital cellular telecommunications system (Phase 2/Phase 2+).

The contents of the present document is subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of the present document it will be re-released with an identifying change of release date and an increase in version number as follows:

Version 6.x.y

where:

- 6 indicates Release 1997 of GSM Phase 2+
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated in the specification.

0 Introduction

0.1 Scope

The present document is an introduction to the GSM 08.0X series of Technical Specifications and deals with the definition of the base station system (BSS) to mobile switching centre (MSC) (referred to as the A-interface) defined for the GSM system.

It also introduces Technical Specifications in the GSM 08.20 series, dealing with the support of data services on this interface.

The present document gives an overview of the content of the GSM 08.0X and GSM 08.20 series of Technical Specifications explaining how the detailed content of the Technical Specifications is partitioned and how the Technical Specifications can be used to support a full BSS-MSC interface.

0.2 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1997 document, references to GSM documents are for Release 1997 versions (version 6.x.y).

[1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] CCITT Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".

[3] GSM 02.01: "Digital cellular telecommunications system (Phase 2+); Principles of telecommunications services supported by a GSM Public Land Mobile Network (PLMN)".

[4] GSM 02.02: "Digital cellular telecommunications system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[5] GSM 02.03: "Digital cellular telecommunications system (Phase 2+); Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[6] GSM 02.04: "Digital cellular telecommunications system (Phase 2+); General on supplementary services".

[7] GSM 02.06: "Digital cellular telecommunications system (Phase 2+); Types of Mobile Stations (MS)".

[8] GSM 02.07: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) features".

[9] GSM 02.08: "Digital cellular telecommunications system (Phase 2+); Quality of service".

[10] GSM 02.09: "Digital cellular telecommunications system (Phase 2+); Security aspects".

[11] GSM 02.11: "Digital cellular telecommunications system (Phase 2+); Service accessibility".

[12] GSM 02.16: "Digital cellular telecommunications system (Phase 2+); International Mobile station Equipment Identities (IMEI)".

[13] GSM 02.17: "Digital cellular telecommunications system (Phase 2+); Subscriber identity modules Functional characteristics".

[14] GSM 02.24: "Digital cellular telecommunications system (Phase 2+); Description of Charge Advice Information (CAI)".

[15] GSM 02.30: "Digital cellular telecommunications system (Phase 2+); Man-Machine Interface (MMI) of the Mobile Station (MS)".

[16] GSM 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".

[17] GSM 02.41: "Digital cellular telecommunications system (Phase 2+); Operator determined barring".

[18] GSM 02.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 1".

[19] GSM 02.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 1".

[20] GSM 02.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[21] GSM 02.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 1".

[22] GSM 02.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 1".

[23] GSM 02.86: "Digital cellular telecommunications system (Phase 2+); Advice of charge (AoC) supplementary services - Stage 1".

[24] GSM 02.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 1".

[25] GSM 04.08: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".

[26] GSM 04.21: "Digital cellular telecommunications system (Phase 2+); Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".

[27] GSM 08.02: "Digital cellular telecommunications system (Phase 2+); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Interface principles".

[28] GSM 08.04: "Digital cellular telecommunications system (Phase 2+); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification".

[29] GSM 08.06: "Digital cellular telecommunications system (Phase 2+); Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[30] GSM 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification".

[31] GSM 08.20: "Digital cellular telecommunications system (Phase 2+); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[32] GSM 12.00: "Digital cellular telecommunications system (Phase 2+); Objectives and structure of Network Management (NM)".

[33] GSM 12.01: "Digital cellular telecommunications system (Phase 2+); Common aspects of GSM Network Management (NM)".

[34] GSM 12.07: "Digital cellular telecommunications system (Phase 2+); Operations and performance management".

[35] GSM 12.02: "Digital cellular telecommunications system (Phase 2+); Subscriber, Mobile Equipment (ME) and services data administration".

[36] GSM 12.03: "Digital cellular telecommunications system (Phase 2+); Security management".

[37] GSM 12.04: "Digital cellular telecommunications system (Phase 2+); Performance data measurements".

[38] GSM 12.05: "Digital cellular telecommunications system (Phase 2+); Subscriber related event and call data".

[39] GSM 12.06: "Digital cellular telecommunications system (Phase 2+); GSM Network change control".

[40] GSM 12.10: "Digital cellular telecommunications system (Phase 2+); Maintenance provisions for operational integrity of Mobile Stations (MS)".

[41] GSM 12.11: "Digital cellular telecommunications system (Phase 2+); Maintenance of the Base Station System (BSS)".

[42] GSM 12.13: "Digital cellular telecommunications system (Phase 2+); Maintenance of the Mobile-services Switching Centre (MSC)".

[43] GSM 12.14: "Digital cellular telecommunications system (Phase 2+); Maintenance of location registers".

[44] GSM 12.20: "Digital cellular telecommunications system (Phase 2+); Network Management (NM) procedures and messages".

[45] GSM 12.21: "Digital cellular telecommunications system (Phase 2+); Network Management (NM) procedures and message on the A-bis interface".

[46] GSM 12.22: "Digital cellular telecommunications system (Phase 2+); Interworking of GSM Network Management (NM) procedures and messages at the Base Station Controller (BSC)".

0.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04

1 A-Interface capabilities

The BSS-MSC interface shall be capable of supporting all the services offered to GSM users and subscribers. In addition it also allows for the allocation of suitable radio resources within the PLMN, and the operation and maintenance of those resources.

2 A-Interface specification objectives

The MSC to BSS interface specifications shall allow the following:

i) Connection of various manufacturers BSSs to the same MSC;
ii) The use of several manufacturers MSCs to the same type of BSS;
iii) The use of the same BSS in any PLMN;
iv) The use of the same MSC in any PLMN;
v) The separate evolution of MSC and BSS technology, and;
vi) The separate evolution of O&M facilities;
vii) Evolution towards lower speech coding rates;
viii) Support of all services defined in the GSM 02 series of Technical Specifications.

3 A-Interface characteristics

The interface is defined to be at the boundary of the MSC.

The MSC to BSS interface is specified by a set of characteristics, including:

i) Physical and electromagnetic parameters;
ii) Channel structures;
iii) Network operating procedures;
iv) Operation and Maintenance information support.

The definition of the MSC to BSS interface follows a layered approach similar to that in the ISDN. Layer 3 is for the most part based on Technical Specification GSM 04.08 with additional procedures added for the control of radio resources and the identification of transactions using the SCCP. Layer 2 is based on the signalling system No.7 (SS No.7) Message Transfer Part (MTP). Layer 1 is either digital (at 2048 kbit/s, based on CCITT Rec. G703 section 6) or analogue with the data being passed by the use of modems (this latter case is a national option).

4 Other specifications on the MSC-BSS interface

The full structure of the Technical Specifications specifying the MSC to BSS link are as follows:

4.1 Technical Specification GSM 08.02 Interface Principles

The present document deals with the functional split between the BSS and the MSC. This functional split is then supported by the other Technical Specifications in the GSM 08.0X series.

Technical Specification GSM 08.02 also contains some information on the placement of transcoders/rate adapters, these being functionally part of the BSS though a degree of freedom is allowed in their geographical location.

Lastly Technical Specification GSM 08.02 explains the use of transparent and non transparent signalling information across the interface. The key point is that the majority of call related signalling from the MS is passed in a fairly transparent way through the BSS.

4.2 Technical Specification GSM 08.04 Layer 1 - Specification

The present document defines the physical layer at the BSS-MSC interface point. The physical interface chosen is a 2Mbits/s (32*64kbits/s) interface according to the standard CCITT recommendations.

The speech coding called up in the present document is standard A-law, coding of the traffic bit streams for data calls is dealt with in Technical Specifications GSM 04.21 & GSM 08.20.

4.3 Technical Specification GSM 08.06 Signalling Transport Mechanism - Specification

In order to pass the signalling information between BSS and MSC some reliable transport mechanism has to be used. The basis of the transport mechanism is an internationally agreed protocol known as signalling system No.7.

Several services are required from this protocol but two key requirements are that messages can be transferred between the BSS and MSC without corruption, and secondly that a transaction with a particular mobile can be identified.

The correct transfer of messages without corruption is handled by the "Message Transfer Part" of SS No.7 and this is documented in Technical Specification GSM 08.06 which is an exceptions document to the CCITT specification. The subset so formed is designed so that it is compatible with a "full" MTP such as might be provided at an MSC.

The identification of the transaction involved implies some form of logical connection. This is achieved by using the signalling connection control part (SCCP) of SS No.7. Again a minimum subset is formed in order to ease implementation.

4.4 Technical Specification GSM 08.08 Layer 3 Specification

In the present document the application parts are described. There are two currently identified in the BSS to MSC interface protocol, these are the:

BSSOMAP;

BSSAP.

The BSSAP is further subdivided into two subprotocols, the BSSMAP and the DTAP.

The BSSMAP and DTAP are fully defined, the BSSOMAP is only supported in terms of a signalling transport ability.

The DTAP text is split between Technical Specifications GSM 08.06 and GSM 08.08 but the text in GSM 08.08 defines which layer 3 air interface messages are passed transparently through the BSS and which are analysed at the BSS.

The BSSMAP (base station system management application part) is that part of the protocol responsible for all aspects of the radio resource handling at the BSS. The text is structured as a set of procedures which are defined separately and can be employed as felt appropriate by the operator/manufacturer to meet the requirements of the application in which it is being used. The procedures themselves can be driven in different modes depending upon the input parameters received from the MSC or sent from the OMC.

The BSSOMAP (base station system operation and maintenance application part) supports all of the O and M communications for the BSS with either the MSC or the BSS. The actual detailed protocol at layer 3 is defined in the 12-series of GSM Technical Specification.

4.5 Technical Specification GSM 08.20 Rate adaption on the BSS-MSC interface

The present document describes the means by which the radio interface data rates are adapted to the 64 kbits/s needed at the MSC and vice versa, down to the bit level.

History

Document history		
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