ETSI TS 148 001 V15.0.0 (2018-07)

**Digital cellular telecommunications system (Phase 2+) (GSM);
Base Station System - Mobile-services
Switching Centre (BSS - MSC) interface;
General aspects
(3GPP TS 48.001 version 15.0.0 Release 15)**

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GSM® GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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Version x.y.z

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  - 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 an introduction to the 3GPP TS 48.0xx 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 3GPP TS 48.020 series, dealing with the support of data services on this interface.

The present document gives an overview of the content of the 3GPP TS 48.0xx and 3GPP TS 48.020 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.

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] Void.

[3] Void.

[4] Void.

[5] Void.

[6] Void.

[7] Void.

[8] Void.

[9] Void.

[10] Void.

[11] Void.

[12] Void.

[13] Void.

[14] Void.

[15] Void.

[16] Void.

[17] Void.

[18] Void.

[19] Void.

[20] Void.

[21] Void.

[22] Void.

[23] Void.

[24] Void.

[25] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[26] 3GPP TS 44.021: "Rate adaption on the Mobile Station - Base Station System (MS - BSS) interface".

[27] 3GPP TS 48.002: "Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; Interface principles".

[28] 3GPP TS 48.004: "Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; Layer 1 specification".

[29] 3GPP TS 48.006: "Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[30] 3GPP TS 48.008: "Mobile Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".

[31] 3GPP TS 48.020: "Rate adaption on the Base Station System - Mobile-service Switching Centre (BSS - MSC) interface".

[32] Void.

[33] Void.

[34] Void.

[35] Void.

[36] Void.

[37] Void.

[38] Void.

[39] Void.

[40] Void.

[41] Void.

[42] Void.

[43] Void.

[44] Void.

[45] Void.

[46] Void.

[47] ITU-T Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".

3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 apply.

4 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.

5 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 3GPP TS 02.series.

6 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 3GPP TS 44.018 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 (SS7) Message Transfer Part (MTP) , or in the case of IP-based signalling transport - M3UA and SCTP. In case of SS7 MTP, layer 1 is either digital (at 2 048 kbit/s, based on ITU-T Recommendation G.703 clause 6) or analogue with the data being passed by the use of modems (this latter case is a national option).

7 Other specifications on the MSC-BSS interface

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

7.1 3GPP TS 48.002 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 3GPP TS 48.0xx series.

3GPP TS 48.002 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.

In the case of A interface user plane over IP, transcoders in the BSS may not be needed.

Lastly 3GPP TS 48.002 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.

7.2 3GPP TS 48.004 Layer 1 - Specification

The present document defines the physical layer at the BSS-MSC interface point. The physical interface chosen is either a 2 Mbits/s (32 x 64kbits/s) interface according to the standard ITU-T recommendations or an IP transport based interface according to the standard IETF RFCs.

The speech coding called up in the present document is either according to ITU-T G.711 or according to Codecs listed in 3GPP TS 26.103. The coding of the traffic bit streams for data calls is dealt with in 3GPP TS 44.021 and 3GPP TS 48.020.

7.3 3GPP TS 48.006 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", or in the case of IP-based signalling transport - M3UA and SCTP, of SS7 and this is documented in 3GPP TS 48.006 which is an exceptions document to the ITU-T, ANSI and IETF specifications. The subset so formed is designed so that it is compatible with a "full" MTP (M3UA/SCTP) such as might be provided at an MSC.

For IP-based signalling transport, the involved nodes may take the role of a client or a server with respect to establishing the end-to-end communication. The particular role of the nodes is either determined by configuration or is depending on which peer is acting first in establishing the communication, by that acting as the client.

The identification of the transaction involved implies some form of logical connection. This is achieved by using the Signalling Connection Control Part (SCCP) of SS7. Again a minimum subset is formed in order to ease implementation.

7.4 3GPP TS 48.008 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 3GPP TS 48.006 and 3GPP TS 48.008 but the text in 3GPP TS 48.008 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 3GPP TS 52.xxx-series.

7.5 3GPP TS 48.020 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.

Annex A (informative): Change History

TSG #	Doc.	CR	Rev	Subject/Comment	New
January 2016	-	-	-	Version 13.0.0 based on version 12.0.0	13.0.0

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2017-03	75					Version for Release 14 (frozen at TSG-75)	14.0.0
2018-06	SA-80	-	-	-	-	Update to Rel-15 version (MCC)	15.0.0

History

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