ETSI TS 100 626 V8.1.0 (2000-12)

Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Application of the Base Station System Application Part (BSSAP) on the E-interface
(3GPP TS 09.08 version 8.1.0 Release 1999)**

Reference
RTS/TSGN-010908Q8R1

Keywords
GSM

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

Intellectual Property Rights

IPRs essential or potentially essential to the present document 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 (http://www.etsi.org/ipr).

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.

Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under www.etsi.org/key .

Contents

Foreword

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

The present document provides a mechanism giving reliable transfer of signalling messages within the 3GPP system.

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 describes the subset of Base Station System Application Part (BSSAP) messages and procedures, defined in 3GPP TS 08.06 and 3GPP TS 08.08, which is used on the E-interface. A general description can be found in 3GPP TS 03.02 and 3GPP TS 03.09.

For the initiation and execution of handover between MSCs a subset of BSSMAP procedures are used. For the subsequent control of resources allocated to the Mobile Station (MS) BSSMAP procedures are used. DTAP is used for the transfer of connection management and mobility management messages between the MS and the controlling MSC.

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*,
- 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 1999 document, references to GSM documents are for Release 1999 versions (version 8.x.y).

[1] 3GPP TS 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] 3GPP TS 03.09: "Digital cellular telecommunications system (Phase 2+); Handover procedures".

[3] 3GPP TS 08.06: "Digital cellular telecommunications system (Phase 2+); Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".

[4] 3GPP TS 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".

[5] 3GPP TS 09.02: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[6] 3GPP TS 09.10: "Digital cellular telecommunications system (Phase 2+); Information element mapping between Mobile Station - Base Station System and BSS - Mobile-services Switching Centre (MS - BSS - MSC); Signalling procedures and the Mobile Application Part (MAP)".

3 Abbreviations

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

BSS	Base Station System
BSSAP	Base Station System Application Part
BSSMAP	Base Station System Management Application Part
CCCH	Common Control CHannel
DLCI	Data Link Connection Identifier
DTAP	Direct Transfer Application Part
MSC	Mobile-services Switching Centre
MSC-A	Mobile-services Switching Centre, Anchor (Anchor MSC)
MSC-I	Mobile-services Switching Centre, Intermediate (Intermediate MSC)
MSC-T	Mobile-services Switching Centre, Target (Target MSC)
SAPI	Service Access Point Identifier
SCCP	Signalling Connection Control Part
TCAP	Transaction Capabilities Application Part

Other abbreviation used in the GSM specifications are listed in 3GPP TS 01.04.

4 Principles for the use of BSSAP on the E-interface

4.1 General

The mechanisms for the transfer of the BSSAP messages on the E-interface is defined in 3GPP TS 09.02. The operation of the handover procedures between MSCs and the use of the BSSMAP messages for those procedures is described in 3GPP TS 03.09 and 3GPP TS 09.10.

In the same way as a SCCP signalling connection is used for the messages relating to one MS on the MSC-BSS interface a TCAP dialogue is used on the E-interface for messages relating to one MS. As no correspondence to the connectionless service on the MSC-BSS interface is used on the E-interface none of the global procedures (see 3GPP TS 08.08 subclause 3.1) are applicable.

The management of the terrestrial circuits between the MSCs is outside the scope of the E-interface (see 3GPP TS 03.09), therefore all procedures, messages and information elements relating to terrestrial circuits are also excluded from the BSSMAP procedures and messages used on the E-interface.

4.2 Transfer of DTAP and BSSMAP layer 3 messages on the E-interface

The BSSAP data which on the MSC-BSS interface is contained in the user data field of the exchanged SCCP frames (see 3GPP TS 08.06) is on the E-interface transferred as the contents of the signalling info in a BSS-APDU parameter as described in 3GPP TS 09.02.

The BSSAP data consists of a BSSAP header and a DTAP or BSSMAP layer 3 message. The BSSAP header contains, as specified in 3GPP TS 08.06 (subclauses 6.3.1, 6.3.2 and 6.3.3), of a discrimination parameter, possibly a Data Link Connection Identification (DLCI) parameter, and a length indicator.

4.3 Roles of MSC-A, MSC-I and MSC-T

For the description in this ETS, the MSC's functionality related to the handover between MSCs has been split into three logical parts, MSC-A, MSC-T and MSC-I. The different roles need not necessarily be performed by different MSCs.

MSC-A is the call/connection controlling part of the MSC where the call/connection was originally established and the switching point for handover between MSCs. (This corresponds to MSC-A as defined in 3GPP TS 03.09 and 09.02). The MSC that is the MSC-A will not be changed during the duration of a call/connection.

MSC-T is the part relating to the transitory state during the handover for the MSC to which the MS is handed over when Basic handover or Subsequent handover (see 3GPP TS 03.09) take place. (This corresponds, depending on the type of handover to MSC-A, MSC-B or MSC-B' in 3GPP TS 03.09 and 09.02).

MSC-I is the part of an MSC through which the MSC-A, via an E-interface (or an internal interface) is in contact with the MS. (This corresponds, depending on the type of handover to MSC-A, MSC-B or MSC-B' in 3GPP TS 03.09 and 09.02).

The MSC that is the MSC-A can also have the role of either the MSC-I or the MSC-T during a period of the call/connection.

The following is applicable for the involved MSCs concerning the exchange of BSSAP data on an E-interface before and after a successful inter MSC handover:

1) At Basic handover, two MSCs are involved, one MSC being MSC-A and one being MSC-T. When this handover has been performed, the two MSCs interworking on the E-interface have the roles of MSC-A and MSC-I respectively, i.e. the MSC that is the MSC-T during the handover is now the MSC-I.

2) At Subsequent handover back to MSC-A, two MSCs are involved. The MSC having the role of MSC-A has also the role of MSC-T. The other MSC involved has the role of MSC-I. When this handover has been completed, there is no exchange of BSS data on the E-interface, i.e. the MSC being the MSC-I before and during the handover is now no longer taking part.

3) At subsequent handover to an MSC not being MSC-A, three MSCs are involved. The roles of these MSCs are MSC-A, MSC-I, and MSC-T respectively. When this handover has been performed, the two MSCs interworking on an E-interface have the roles of MSC-A and MSC-I respectively, i.e. the MSC that is the MSC-T during the handover is now the MSC-I and the MSC being MSC-I during the handover is now no longer taking part.

5 Use of the BSSAP on the E-interface

DTAP is used on the E-interface for the transfer of messages between the MSC-A and the MS.

The dedicated BSSMAP procedures (3GPP TS 08.08 subclause 3.1) used on the E-interface to some extent are:

- assignment;
- handover resource allocation;
- handover execution;
- internal handover indication;
- release due to BSS generated reasons;
- classmark handling;
- cipher mode control;
- trace invocation;
- queuing indication;
- data link control SAPI not equal to "0";
- Location Acquisition.

- LSA handling.
- Common ID.

5.1 DTAP

For the exchange of the DTAP messages (3GPP TS 08.08 subclause 2.2), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.2 Assignment

The Assignment procedure (3GPP TS 08.08 subclause 3.1.1) is applied on the E-interface with following conditions:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

The handling of terrestrial resources is not applicable.

5.3 Handover resource allocation

At Basic Inter-MSC Handover (3GPP TS 03.09) the Handover resource allocation procedure (3GPP TS 08.08 subclause 3.1.5.2) is applied on the E-interface with the following conditions:

- the MSC-A acts as the MSC;
- the MSC-T acts as the target BSS.

At Subsequent Inter-MSC Handover (3GPP TS 03.09) the Handover resource allocation procedure (3GPP TS 08.08 subclause 3.1.5.2) is applied on the E-interface with the following conditions:

- the MSC-I acts as the MSC;
- the MSC-T acts as the BSS;
- if the MSC that is the MSC-A is not also the MSC-T, then this MSC shall act as the target BSS towards the MSC-I and as the MSC towards the MSC-T.

The handling of terrestrial resources is not applicable.

5.4 Handover execution

For the Handover execution procedure (3GPP TS 08.08 subclause 3.1.5.3) the applicable parts on the E-interface are the transfer of HANDOVER DETECT, HANDOVER COMPLETE and HANDOVER FAILURE messages at inter MSC handover. For those parts, the involved MSCs shall act according to the following:

- the MSC that is the MSC-A, acts as the MSC;
- the MSC that is the MSC-I, if it is not also the MSC-A, acts as the serving BSS;
- the MSC that is the MSC-T, if it is not also the MSC-A, acts as the target BSS.

5.5 Internal handover indication

For the Internal handover indication (3GPP TS 08.08 subclause 3.1.6 and 3.1.7), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

MSC internal handovers (inter-BSS and intra-BSS handover) at the MSC-I are decided and executed autonomously by that MSC together with the connected BSSs. At completion of the handover execution the MSC-I initiates the internal handover indication procedure.

5.6 Release due to BSS generated reasons

For the Release due to BSS generated reasons procedure (3GPP TS 08.08 subclause 3.1.9.2) the involved MSCs shall act according to the following:

- the MSC-I acts as the BSS;
- no further action is taken by the MSC-A.

5.7 Classmark handling

For the Classmark handling (3GPP TS 08.08 subclause 3.1.13), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.8 Cipher mode control

For the Cipher mode control (3GPP TS 08.08 subclause 3.1.14), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.9 Trace invocation

For the Trace invocation (3GPP TS 08.08 subclause 3.1.11), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.10 Queuing indication

For the Queuing Indication (3GPP TS 08.08 subclause 3.1.17), the involved MSCs shall act according to the following:

- at Assignment and at Basic Inter-MSC handover:
  - the MSC-A acts as the MSC;
  - the MSC-I acts as the BSS.
- at Subsequent Inter-MSC handover:
  - the MSC-I acts as the MSC;
  - the MSC-T acts as the BSS;
  - if the MSC that is the MSC-A is not also the MSC-T, then this MSC acts as the target BSS towards the MSC-I and as the MSC towards the MSC-T.

5.11 Data link control SAPI not equal to "0"

For the Data Link Control SAPI not Equal to "0" (3GPP TS 08.08 subclause 3.1.18), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.12 Location Acquisition

For the Location Acquisition procedure (3GPP TS 08.08 subclause 3.1.28), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.13 LSA handling

For the LSA handling (3GPP TS 08.08 subclause 3.1.27), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

5.14 Common ID

For the Common Id (3GPP TS TS 08.08), the involved MSCs shall act according to the following:

- the MSC-A acts as the MSC;
- the MSC-I acts as the BSS.

6 BSSMAP messages transferred on the E-interface

The following BSSMAP messages, defined in 3GPP TS 08.08 subclause 3.2.1, are transferred on the E-interface:

ASSIGNMENT REQUEST (MSC-A -> MSC-I)

Excluded information element: CIRCUIT IDENTITY CODE

ASSIGNMENT COMPLETE (MSC-I -> MSC-A)

Excluded information element: CIRCUIT POOL, CIRCUIT IDENTITY CODE

ASSIGNMENT FAILURE (MSC-I -> MSC-A)

Excluded information elements: CIRCUIT POOL, CIRCUIT POOL LIST

* HANDOVER REQUEST (MSC-A -> MSC-T and MSC-I -> MSC-A)

Excluded information element: CIRCUIT IDENTITY CODE

* HANDOVER REQUEST ACKNOWLEDGE (MSC-T -> MSC-A and MSC-A -> MSC-I)

Excluded information element: CIRCUIT POOL, CIRCUIT IDENTITY CODE

* HANDOVER COMPLETE (MSC-T -> MSC-A)

* HANDOVER FAILURE (MSC-T -> MSC-A and MSC-I -> MSC-A)

Excluded information elements: CIRCUIT POOL, CIRCUIT POOL LIST

	HANDOVER PERFORMED	(MSC-I -> MSC-A)
*	HANDOVER DETECT	(MSC-T -> MSC-A)
	CLEAR REQUEST	(MSC-I -> MSC-A)
	SAPI "n" REJECT	(MSC-I -> MSC-A)
	CONFUSION	(MSC-T -> MSC-A, MSC-A -> MSC-T, MSC-I -> MSC-A and MSC-A -> MSC-I)
#	MSC INVOKE TRACE	(MSC-A -> MSC-I)
#	BSS INVOKE TRACE	(MSC-I -> MSC-A and MSC-A -> MSC-T)
	CIPHER MODE COMMAND	(MSC-A -> MSC-I)
	CIPHER MODE COMPLETE	(MSC-I -> MSC-A)
	CIPHER MODE REJECT	(MSC-I -> MSC-A)
**	QUEUING INDICATION	(MSC-T -> MSC-A, MSC-I -> MSC-A, and MSC-A -> MSC-I)
	CLASSMARK UPDATE	(MSC-I -> MSC-A and MSC-A -> MSC-T)
	CLASSMARK REQUEST	(MSC-A -> MSC-I)
	CONNECTION ORIENTED INFORMATION	(MSC-I -> MSC-A, MSC-A->MSC-I)
	LSA INFORMATION	(MSC-A -> MSC-I)
	PERFORM LOCATION REQUEST	(MSC-I->MSC-A, MSC-A -> MSC-I)
	PERFORM LOCATION ABORT	(MSC-I->MSC-A, MSC-A -> MSC-I)
	PERFORM LOCATION RESPONSE	(MSC-I -> MSC-A, MSC-A->MSC-I)
	COMMON ID	(MSC-A -> MSC-I)

All other BSSMAP messages shall be considered as non-existent on the E-interface.

NOTE: Segmentation procedures for LCS CONNECTION ORIENTED INFORMATION message in 3GPP TS 08.08 apply to the corresponding message on the E-interface.

Some of the messages above are qualified by *, ** or #. This signifies whether the message, when sent on the E-interface, is considered as:

- handover related message (*);
- handover related when sent as a response to HANDOVER REQUEST (**); or
- trace related message (#).

7 Exceptions for BSSMAP message contents and information element coding when transferred on the E-interface

7.1 Message contents

For the applicable BSSMAP messages transferred on the E-interface the following exceptions to the descriptions in 3GPP TS 08.08 subclause 3.2.1 are valid:

Assignment request message:

- excluded information element:
  - circuit identity code.
- if received, the information element shall be treated as an information element with an unrecognisable identifier.

Assignment complete message:

- excluded information element:
  - circuit pool;
  - circuit identity code.
- if received, the information element shall be treated as an information element with an unrecognisable identifier.

Assignment failure message:

- excluded information elements:
  - circuit pool;
  - circuit pool list.
- if received, the information element shall be treated as an information element with an unrecognisable identifier.

Handover request message:

- excluded information element:
  - circuit identity code.
- if received, the information element shall be treated as an information element with an unrecognisable identifier.

Handover request acknowledge message:

- excluded information element:
  - circuit pool;
  - circuit identity code.
- if received, the information element shall be treated as an information element with an unrecognisable identifier.

Handover failure message:

- excluded information elements:
  - circuit pool;
  - circuit pool list.
- if received, the information element shall be treated as an information element with an unrecognisable identifier.

7.2 Information element coding

For the applicable BSSMAP information elements transferred on the E-interface the following exceptions to the description in 3GPP TS 08.08 subclause 3.2.2 are valid:

Cause information element:

- excluded causes:
  - call control;
  - CCCH overload;
  - handover successful;
  - requested terrestrial resource unavailable;
  - terrestrial circuit already allocated;
  - circuit pool mismatch;
  - switch circuit pool.

  The corresponding cause values shall be considered as reserved for national use.

Cell identifier information element:

- excluded format:
  - Cell Identity.

  The corresponding cell identification discriminator value shall be considered as reserved.

8 BSSAP message error handling when transferred on the E-interface

The handling of abnormal events related to the BSSAP header (3GPP TS 08.08 subclause 2.4) and the BSSMAP error handling (3GPP TS 08.08 subclause 3.1.19) are applicable with exception of the following:

- the handling of faults concerning the use of SCCP is not applicable.

The BSSMAP error messages sent on the E-interface shall only be sent as response to BSSAP messages received on the same interface.

Annex A (informative): Document change history

Meeting-1st-Level	Doc-1st-Level	Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New
s29	P-99-476	09.08	A133		R98	Application of the Base Station System Application Part (BSSAP) on the E-interface for LCS	B	6.0.0	7.0.0
s30	P-99-617	09.08	A134		R98	Addition of LSA Information message	B	7.0.0	7.1.0
NP-06	NP-99446	09.08	A137		R98	Changes due to LCS enhancements	C	7.0.0	7.2.0
NP-06	NP-99446	09.08	A139		R98	LCS CR for GSM 09.08	C	7.0.0	7.2.0
S31		09.08			R99	Version release upgrade 1999		7.2.0	8.0.0

TSGN	TSGN-number	WG Number	Spec	CR	Rev	Rel	Cat	Old vers	New ver	Title	WI	Notes
NP-10	NP-000673	N1-001319	09.08	A140		R99	F	8.0.0	8.1.0	Addition of Common Id procedure on the E-interface	TEI	Specification layout is changed to 3GPP

History

Document history		
V8.0.0	March 2000	Publication
V8.1.0	December 2000	Publication