ETSI STC SMG2 Plenary Tdoc xxxx/00Meeting Number #37 Ag
Seattle, USA
28th Aug – 1st Sept 2000

Source: Siemens
Title: GSM to Other Systems Handover and Cell Selection/Reselection (GSM 10.89 Version 0.0.6)

Source: Editor

GSM 10.89

Permanent Version: 0.0.6

Document 11 July 2000

Source: Editor Reference:

ETSI STC SMG2 Plenary
Meeting Number #37
Seattle,USA
28th Aug – 1st Sept 2000

Tdoc xxxx/00
Agenda item 6.5

Key words: Digital cellular telecommunications system, Global System for Mobile communications

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

Digital cellular telecommunications system (Phase 2+);
GSM to other Systems Handover and Cell Selection/Reselection Project scheduling and open issues;
(GSM 10.89, Version 0.0.6)

(GSM), GSM to other Systems Handover

ETSI

European Telecommunications Standards Institute

ETSI MCC

Postal address: F-06921 Sophia Antipolis CEDEX – FRANCE
Office address: 650 Route des Lucioles – Sophia Antipolis – Valbonne – FRANCE

Tel.: +33 4 92 94 42 66 – Fax: +33 4 93 65 28 17

Contents

Foreword

This document describes the schedules of the GSM to other Systems Handover and Cell Selection/Reselection standardisation process, points out important milestones and open issues that are still under work. It also lists the necessary amendments to the GSM/DCS phase 2+ specifications for the technical realisation of the work item.

This is an informative document resulting from ETSI TC-SMG studies, which are not appropriate for European Telecommunication Standard (TS)or ETSI Technical Report (TR) status.

Scope

The purpose of this document is to describe the schedules of the GSM to Other Systems standardisation process and to view it's current state and open issues that are still under discussion. It also lists the new standards and necessary amendments to the GSM/DCS phase 2+ specifications for the technical realisation of the function.

References

This TS incorporates by dated and undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this TS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] GSM 03.022; Functions related to Mobile Station (MS)in idle mode and group receive mode

[2] 3G TS 25.304:UE procedures in Idle Mode

[3] 3G TR 25.931 UTRAN Functions, Examples on Signalling Procedures

[4] GSM 03.09 Digital cellular telecommunications system (Phase 2+); Handover procedures

[5] GSM 04.18 Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification, Radio Resource Control Protocol

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

[7] 3G TS 22.011 Service Accessibility

[8] 3G TS 23.122 NAS Functions related to MS in idle mode

Comment [KI1]: Do I need version numbers ?

[9] 3G TS 25.331 **RRC Protocol Specification**

Abbreviations

RAT Radio Access Technology

TBD To be defined

Definitions

Handover: Procedure by which a MS is assigned another traffic channel whist a connection is in progress.

Support of specification work

This document is a 'living document' and permanently updated by the editor. Proposals for change shall be forwarded to the editor (editor direct contact details are on the last page), where the latest version can be obtained at any time. The GSM to other Systems Handover and Cell Selection/Reselection specification rapporteurs should make sure that this document always reflects the latest status of work.

Latest versions of the material are available to interested parties within SMG. Specification and Change Request rapporteurs should ensure the latest versions of their material is made available for review and comment by the following mechanisms:

TBD

1 General

It is envisaged that Release '99 of the GSM specification should allow provision for multi-mode mobile stations to perform cell selection and handover to other systems.

The other system is using a RAT which differs from the GSM system concept. Therefore the required information for a MS operated in GSM mode will contain more details, compared to the GSM multiband concept.

This document describes the concept designed to allow handover from GSM to other systems, e.g. UTRA FDD/TDD. This concept shall have a quality to allow extensions at a later date to allow handover to other 'new' systems. Cell selection and reselection from idle mode is also discussed for a multi-mode mobile.

A concept for incorporating neighbour lists of the cells to be measured for GSM, to hand-over to other systems is described.

The procedures involved in intra system handover/cell reselection for GSM systems and for systems for which a multi-mode MS operating in GSM mode may wish to connect are described. Having identified the procedures used in an intra system handover and cell reselection, the procedures required for a multi-band MS operating in GSM mode to handover to another system are identified.

2 Requirements

The key requirements are as follows:-

2.1 General Requirements:-

Flexibility:

GSM to other Systems Handover and Cell Selection/Reselection shall provide a general structure, which allow to incorporate the needed neighbour cell information, into the SI structure of GSM. It has been proposed to put the required neighbour cell information in extensions of the SI2 and SI5 messages. Examples of such extensions can be seen in Tdocs 1276/99 (SI2qua/2quin), Tdoc 1277/99 (SI5qua/5quin), Tdoc 08/00 (SI5gamma), Tdoc 435/00 (SI5gamma), and Tdoc 434/00 (SI2bis). The concept shall be prepared to facilitate modifications and enhancements of the other systems, without creating cross phase compatibility problems. GSM to other Systems Handover and Cell Selection/Reselection shall be a one phase approach.

The GSM to other Systems Handover and Cell Selection/Reselection concept shall not limit the capabilities of the other RAT, when the RAT is operated jointly with GSM in a PLMN.

GSM to other Systems Handover and Cell Selection/Reselection should not prevent roaming with 3rd generation system, e.g. UMTS, IS136HS

Mobile Terminal Types:

It should be considered a variety of mobile station types of varying system concepts and various radio access technologies, in order to satisfy the needs of different types of users.

Network Management:

Performance data relating to GSM to other Systems Handover and Cell Selection/Reselection based handovers should be provided in order to facilitate optimization of the network performance.

Security:

GSM to other Systems Handover and Cell Selection/Reselection should not degrade the level of security in authentication and ciphering as in current GSM.

Measurement Order Parameters:

A preliminary view of the requirements on the Measurement Order parameters sent to the MS for GSM to other Systems Handover and Cell Selection/Reselection is described in Annex 3.

2.2 GSM to UMTS Handover requirements

The requirements for GSM to UMTS handover have been split into the following categories:-

- Cell selection/reselection Requirements
- Handover Requirements

2.2.1 Cell selection/reselection Requirements

The MS shall be able to compare the quality of GSM with UMTS neighbour cells in order to determine the most suitable cell for cell selection/reselection. The quality of a cell is determined by the MS making measurements which are appropriate to the cell's Radio Access Technology. The BSC may provide the MS with the Qsearch parameter which is used by the MS to trigger measurement of other RATs and to indicate whether the UMTS measurements are triggered when the GSM RXLEV measurement for the current cell is below or above the threshold defined by Qsearch. This parameter may be provided in the SI2 quater or SI2 ter message The MS in a GSM cell shall be able to obtain system information of its UMTS neighbour cells. This may be achieved either by the BSC broadcasting all the required information in the GSM cell, or alternatively the BSC broadcasting some of the information (eg frequency and scrambling code) and allowing the MS to obtain the remaining information from the UMTS cell's BCCH.

Broadcasting UMTS cell information requires the definition of new System Information messages or the adaptation of existing System Information messages together with the transmission of area based UMTS

system information (e.g. UTRAN frequency/ies used in LA). The advantage of new SI messages is that the information about UMTS neighbour cells is maximised and thereby the performance of the MS optimised. The advantage of adapting existing SI messages to broadcasting limited UMTS neighbour cell information is that the network need not provide for additional broadcast capacity. Both possibilities shall be specified.

The MS may do a blind search for a suitable cell in another RAT. This may be useful if the BSC is not able to broadcast the SI2 quater message which contains details of UMTS neighbours. This may occur if the BSC does not have an extended BCCH

In order for a GPRS MS to perform cell reslection to another RAT, the BSC shall provide UMTS neighbour cell details in a PSI 3 bis message The BSC may provide the GPRS MS with the Qsearch parameter in the Packet Measurement Order message which is used by the MS to trigger measurements of other RATs. This parameter may be used to indicate whether the UMTS measurements are triggered when the GSM RXLEV measurement for the current cell is below or above a threshold defined by Qsearch.

Mechanisms for cell selection/reselection shall be specified in such a way to minimise power consumption of the MS.

The network may send to the MS in the Channel Release Message, a list of frequencies of the UMTS network. This neighbour cell information may be used by the MS during cell selection/reselection. The purpose of this mechanism is to reduce the amount of information that needs to be broadcast.

When the MS compares the quality of GSM with UMTS cells neighbour cells, it shall compare the RXLEV value in the GSM cell with the RSCP value in the UMTS cell together with Qoffset, where Qoffset is broadcast on the BCCH of the serving cell.

2.2.2 Handover Requirements

The requirements for GSM to UMTS Handover may be categorised into:-

- Synchronisation requirements
- GSM MS requirements
- GSM Network requirements
- UMTS measurements to be performed by MS
- Measurement reports
-

1. Synchronisation requirements

   -
   - A MS shall be able to synchronise to a UTRAN cell using GSM idle frame(s)
   - A MS shall not reject a handover command to an UMTS or GSM cell which it has not reported and to which it is not synchronised (i.e. ‘blind’ handover shall be possible)

2. GSM MS requirements

- R99 and newer MS shall support a 'Blind Handover' to GSM .
- R99 and newer Multimode MS which support UMTS, shall support a 'Blind Handover' to UMTS.
- In the event of a Handover failure, the MS shall return to the original cell, and continue its measurement reporting as defined prior to the attempted handover.
- A Multimode MS which supports UMTS, shall provide the network on request, the UE capabilities and/or RAB pre-configuration.
- R99 and newer MS shall accept inter PLMN handover

3. GSM Network requirements

- The call should be directed to the most suitable cell for the service that the user requested..
- The BSC needs to know the service that is in progress in order to determine suitable cells to direct the call to.
- The BSC shall provide the MS with parameters in the Measurement Information message which enable the MS to compare cells of different Radio Access Technologies in order to obtain the set of most suitable cells for the measurement report.
- The BSC may provide the MS with the Qsearch parameter in the Measurement Information message which is used by the MS to trigger measurement of other RATs. This parameter may be used to indicate whether the UMTS measurements are triggered when the GSM RXLEV measurement for the current cell is below or above a threshold defined by Qsearch.
- In GSM to UMTS handover, the source GSM BSC shall provide the id of the target RNC. The source RNC to Target RNC transparent container shall be created by the BSC.
- In order to optimise non-synchonised ('blind') handover, the GSM BSC shall provide additional information about the target cell (e.g. scrambling code, synchronisation?, others tbd)
- The network may send to the MS UTRAN RAB configuration data. This may be triggered as a result of the network receiving a UTRAN Classmark Change Request, a Measurement Information message or a location Update. The RAB configuration data is needed by the MS on handover to UTRAN.
- The network shall request the MS to handover to UTRAN by sending it a Handover to UTRAN Command message. This message shall contain all of the information necessary for the MS to handover to UTRAN nb the details of the UTRAN information are defined in TS 25.331 [9].
- The GSM system shall provide the UMTS system with the target id of the RNC to which the call is being directed.

4. UMTS measurements from GSM MS

The requirements on the measurements made by the MS are as follows:-

- The measurement on UTRAN cells by the MS shall not have a significant impact on the measurement ability and performance of the MS for support of GSM to GSM handover. It is assumed that the MS uses search frames for UTRAN measurements and that the UTRAN cells are only monitored during idle search frames.
- The maximum time for detecting a new suitable UTRAN cell is related to the number of UTRAN frequencies being monitored.
- The time it takes to detect, confirm BSIC and report a new suitable GSM cell is appropriate also for detecting and reporting a new suitable UTRAN cell when one UTRAN frequency only is being monitored.

-

- The operator should be able to provide the UE with information that enables the UE to activate the actual physical measurements only when considered needed. E.g. when the quality of the GSM cell falls below a certain threshold. Alternatively, it may be preferable for the network to initiate the physical measurements. (FFS)

- When the MS makes measurements in the UTRAN FDD cells, it shall measure the CPICH Ec/Io and CPICH RSCP values. The Ec/Io value is used to ensure that the cell meets the minimum quality criterion. The RSCP value is the reported measurement for FDD UTRAN cells.

- When the MS makes measurements in the UTRAN TDD cells, it shall measure the PCCPCH RSCP value. The RSCP value is the reported measurement for TDD UTRAN cells.

5. Measurement Reports

The requirements on the measurement reporting are as follows:

- The UE shall be able to include both UTRAN and GSM measurements in the periodic measurement reports which are sent to the BSS

- The Operator shall be able to control the minimum number of GSM cells in the serving band, the minimum number of cells in UMTS, and the minimum number of cells in other GSM bands which are included in the Measurement Report.

- If there is any space remaining in the Measurement Report after inserting the minimum number of entries for each reporting type, the MS shall use this space to insert further measurements in decreasing order of priority. The relative priority of the cells is determined by a comparison of the actual measurements together with the offsets (Qoffset) of the cells being measured. These offsets are transmitted in the Measurement Information and Packet Measurement Order messages.

- Both the existing format measurement report and the extended format measurement report (eg 76/00 and 2B00-009) shall be supported by the MS.

- Release 99 and newer MS shall support Extended Measurement Reporting.

- The network shall inform the MS if Extended Measurement Reporting is required. This request may be in the Measurement Information message, or in the case of GPRS MS, in the PSI5 or Packet Measurement Order message . The default measurement reporting type is the normal measurement reporting. Following handover, the MS shall revert to the default reporting type as the new network may not support Extended Measurement Reporting.

3 Handovers to be supported

Table 1 below, (as defined in Tdoc SMG2 1784/99), shows the handover cases that should be considered for Release 99 of the GSM specifications. It is anticipated that this table will be revised following further inputs to SMG2 #34.

	GSM CS	GSM GPRS	GSM ECSD	GSM EGPRS nRT	GPRS	UTRA FDD	UTRA TDD	Multi-Carrier CDMA	IS-136
GSM CS	4	8	4	8	8	4	4	4	8
GSM GPRS	8	8	8	8	8	8	8	8	8
GSM ECSD	4	8	4	8	8	4	4	4	8
GSM EGPRS nRT	8	8	8	8	8	8	8	8	8
GSM GPRS COMPACT	8	8	8	8	8	8	8	8	8

Table 1 Allowed Handovers for GSM Release 99

4 Handover permitted

8 Handover not permitted

Table of Handovers for Release 2000 TBD.

4 Functional description

In order to identify the procedures necessary for GSM to Other System Handover, the processing involved in intra system handover (ie GSM to GSM and UMTS to UMTS) is firstly outlined.

4.1 GSM to GSM Handover

The following types of handover are possible

- Intra BTS handover – new channel on BTS
- Intra BSC handover – change of BTS, but same BSC
- Intra MSC handover – change of BSC, but same MSC

- Inter MSC handover – change of MSC

In the first 3 cases the MSC does not have to involved in the handover (although it is possible), but it is essential for the later case. In a inter MSC handover, the original MSC is in charge of the handover, and remains in control of the call even after the handover.

An example of the signalling involved in a intra MSC handover is shown in Figure 1, as detailed in [4].

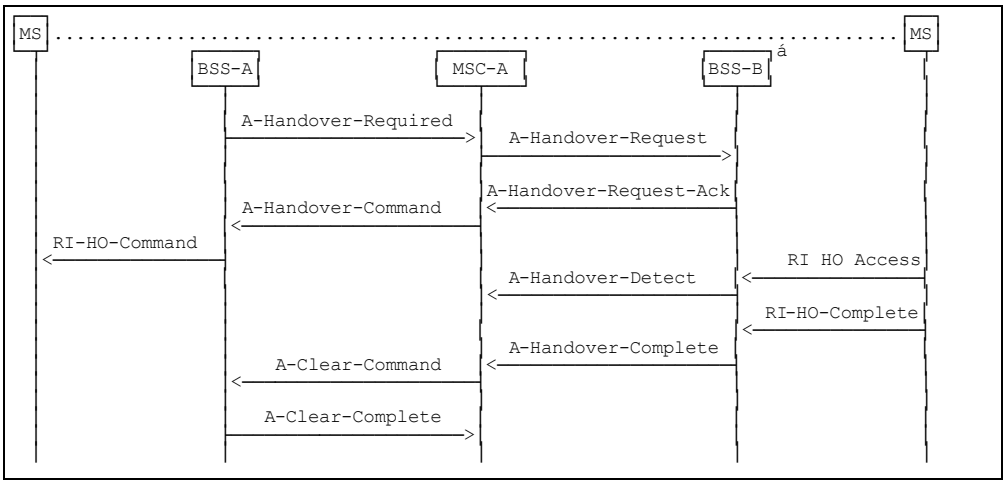

Figure 1 Basic External Intra-MSC Handover Procedure

An example of the signalling involved in a inter MSC handover is shown inFigure 2, as detailed in [4].

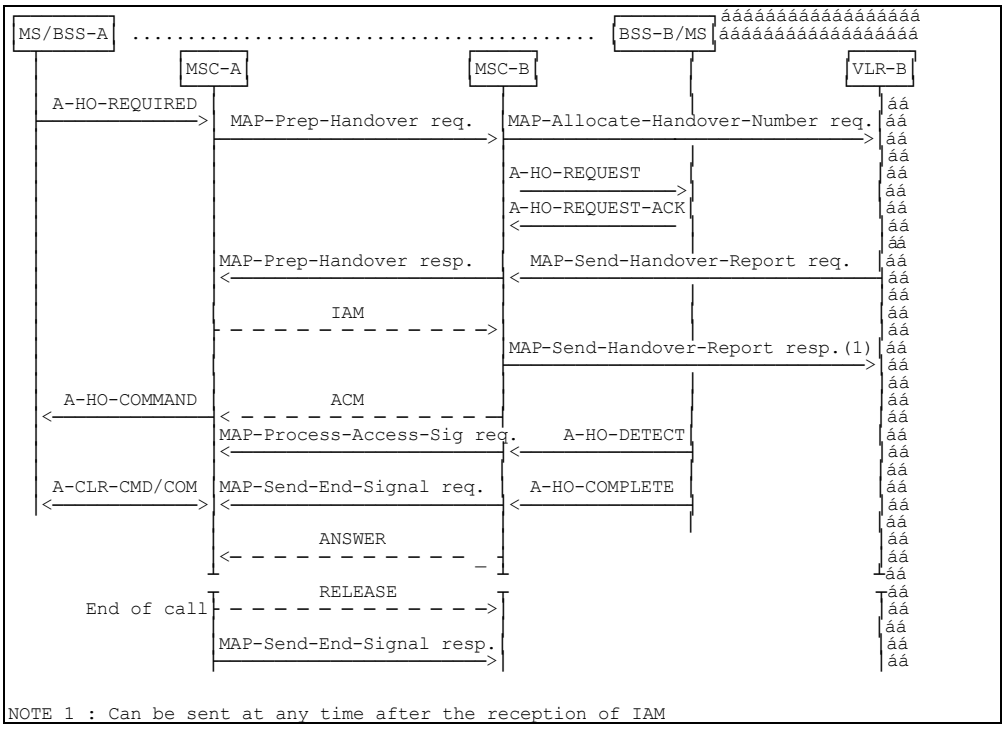

Figure 2 Basic Handover Procedure requiring a circuit connection

4.2 UMTS to UMTS Handover

An example of the signalling procedures involved during a UMTS to UMTS handover is shown inFigure 3, as detailed in [3]. The procedures are still for further study and their definition is out of the scope of WG2. The example of the signalling involved during handover is included for information only.

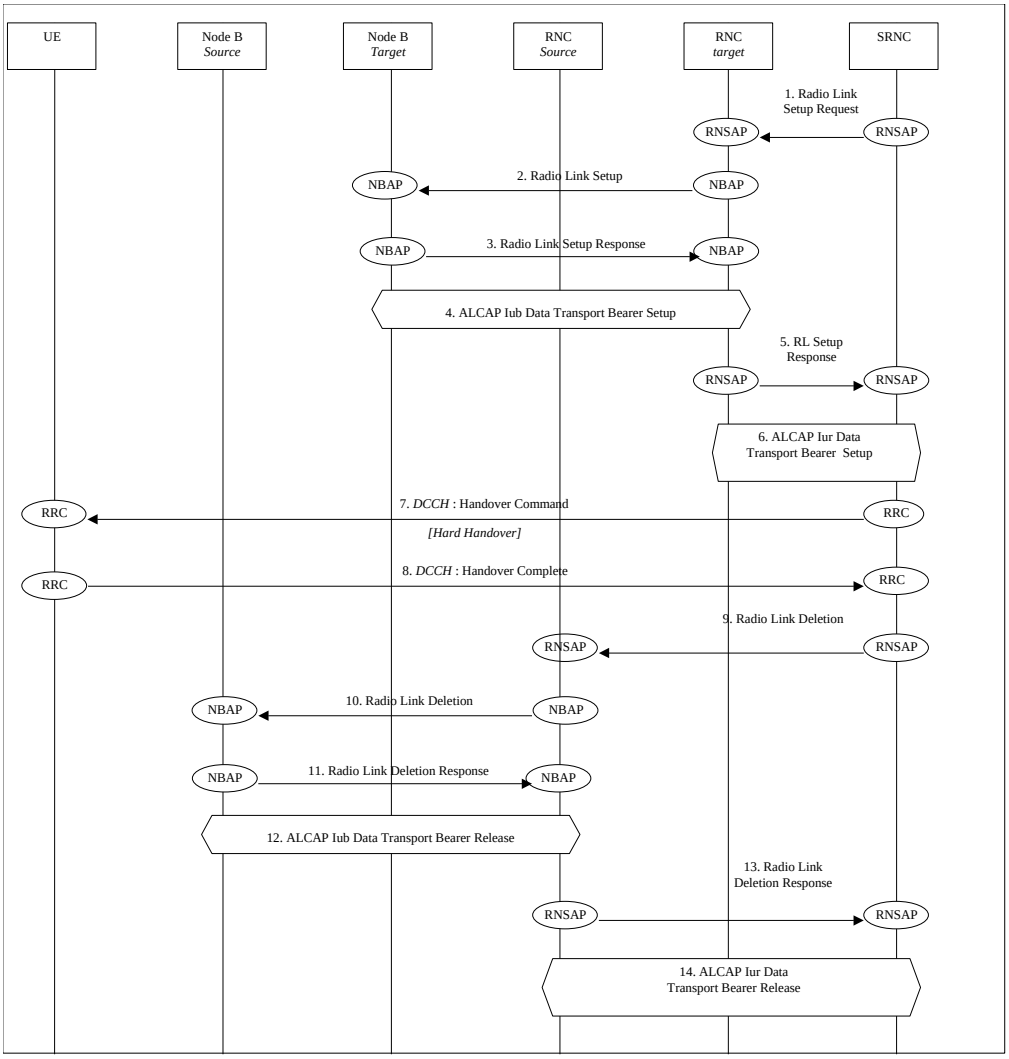

Figure 3 Hard Handover via Iur (DCH on Iur)

4.3 GSM to UMTS Handover

The signalling procedures during a GSM to UMTS handover as shown inFigure 4, as detailed in [3].

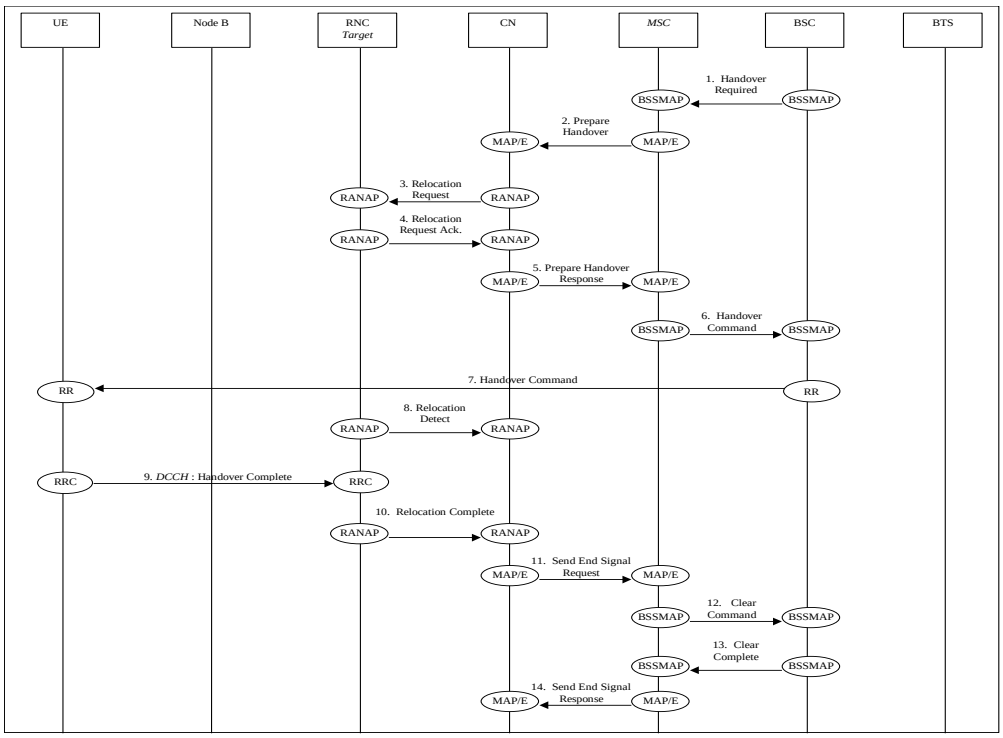

Figure 4 GSM to UMTS Handover

1. The BSC sends Handover Required message to the GSM MSC.
2. The MSC sends MAP/E message **Prepare Handover** to the UMTS CN.
3. The CN sends RANAP message **Relocation Request** to the Target RNC.
4. Response **Relocation Request Acknowledge** is returned to the CN by the target RNC via RANAP.
5. MAP/E message **Prepare Handover Response** is sent by the UMTS CN to the MSC.

Note: Step 6&7 follow normal GSM procedures and are shown only for clarity.

8. When target RNC has detected the UE, **RelocationDetect** message is sent to the CN node.
9. When the RRC connection is established with the target RNC and necessary radio resources have been allocated the UE sends RRC message **Handover complete** to the target RNC.
10. Once complete the target RNC sends RANAP message **Relocation Complete** to the CN.
11. CN sends MAP/E message **Send End Signal Request** to the MSC.
12. The MSC sends **Clear Command** message to the BSC.
13. The BSC responds with **Clear Complete** message to the GSM

14. The MSC sends MAP/E message Send End Signal Response to the UMTS CN to conclude the procedure (this message is not sent until the end of the call).

Note: The possibility to perform handover from GSM/BSS=>UMTS going directly in macrodiversity state (i.e.establishing directly multiple macrodiversity paths) is FFS

GPRS ⇒ UTRAN Handover

Editors Note: GPRS/UTRAN handover only applies to releases beyond R99. For R99 and for previous release of GPRS, cell reselection is possible.

The UTRAN signalling procedures for GPRS to UTRAN handover are shown inFigure 5.

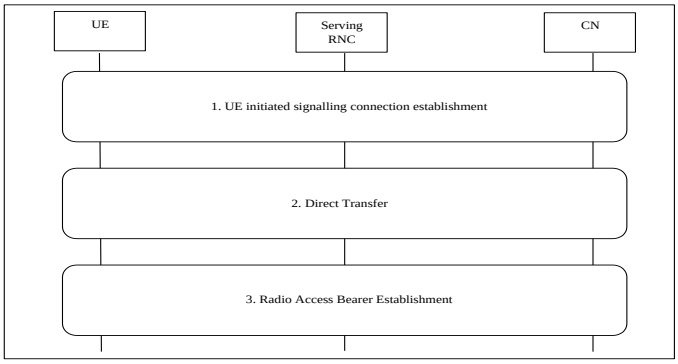

Figure 5 GPRS/UTRAN Handover

1. The UE selects a UTRAN cell, reads system information, and initiates establishment of a NAS signalling connection..

2. The NAS signalling connection between UE and CN can now be used for NAS message transfer (e.g. execution of security functions).

3. After necessary CN-GPRS preparations (e.g. UE context information retrieval), CN initiates establishment of RAB(s).

5 GSM to Other Systems Handover general idle Mode procedures:

5.1 Idle Mode Selection / Reselection

The idle mode selection and reselection processes for a multi-mode mobile are based on those in section 4 of 03.22 and section 4 of 23.122.

The following sections describe the processes required for idle mode selection and reselection.

5.2 PLMN Selection

The PLMN selection strategies given in the following specifications:-

03.22 section PLMN selection

22.011 section Network selection

23.122 section PLMN selection process

are also applicable for dual-mode mobiles.

The MS may have on its SIM a PLMN Selector List to indicate a preference for network selection. The list may contain a list of PLMNs and associated Radio Access Technologies in priority order. A PLMN may appear in the list multiple times with a separate entry for each supported Radio Access technology. The MS may have a User Controlled Selector List or an Operator Controlled Selector List, or both.

The rules for selecting the PLMN are defined in 03.22[1], TS22.011 [7], and TS23.122 [8].

The MS firstly searches on the registered PLMN for each of the RATs supported by that PLMN. The list of supported RATs may be downloaded to the mobile at location update.

In the case where the registered PLMN is not found, the MS will next search for the HPLMN.

In the case when the PLMN to be searched is not the RPLMN or the HPLMN the MS will search for each PLMN in the list in priority order until a suitable cell has been found.

If no suitable cell is found, the process will indicate this fact to the PLMN selection process.

5.3 Cell Selection Process

5.4 Cell selection is the same as described in 03.22 section 4.5 . Location Registration Process

The location registration process is identical to that described in 23.122 section 4.5.

6 Changes to System Information Messages:

The following messages contain an indication of whether the stated core network component is release 98 or older, or Release 99 onwards: -

SI3 needs to contain release of MSC (as defined in Tdoc 1733/99).

SI13 needs to contain release of SGSN (as defined in Tdoc 1733/99).

PSI13 needs to contain release of SGSN (as defined in Tdoc 1735/99).

PSI1 to contain release of MSC and SGSN (as defined in Tdoc 1735/99).

This information is required by the MS following handover in order for it to determine the characteristics of the network (eg layer 3 window size).

The following extensions and adaptations of the SI2, SI5 PSI 3, PSI 5 and Packet Measurement Order messages are required to provide details of the UMTS neighbours and parameters for comparison of neighbour cell measurements:-

- Adaptation of SI2 to provide minimum neighbour cell information (e.g. adaptation of SI2 ter)
- New SI2 quater message to contain full details of UMTS neighbours
- New Measurement Information message to contain full details of UMTS neighbours and parameters for comparison of neighbour cell measurements
- Adaptation of PSI3 bis to contain details of UMTS neighbours .
- Adaptation of PSI5 message to give information regarding measurement reporting
- Adaptation of Packet Measurement Order message to give information regarding measurement reporting

7 Format of Handover Command Sent to MS in GSM to GSM Handover

The format of the handover command that is sent to the MS is defined in [5].

8 Messages exchanged between MSCs and BSS's during GSM to GSM Handover

Full details of the messages exchanged between the BSSs and MSCs during handover can be found in [6]. A summary of the likely parameters in each of the messages is given below:-

- Handover Required (BSS -> MSC)

Contains Message Type, Cause, Cell Identifier List (preferred). Also should contain the information elements: "Current channel type 1", "old BSS to new BSS information" and, in case the current channel mode is speech, "Speech version (used)".

- Handover Command (MSC -> BSS)

This message contains the Message Type and the target channel to which the MS should retune.

- Handover Request (MSC -> BSS)

This message contains the Message Type, Channel Type, Encryption information, Serving Cell identifier, Target Cell Identifier, “Old to New BSS information”. It also contains some optional fields.

- Handover Request Ack (BSS -> MSC)

This message contains the Message Type, and also to which radio channel(s) the MS should be directed.

- Handover Detect (BSS -> MSC)

Contains message type.

- Handover Complete (BSS -> MSC)

Contains Message Type

- Handover Failure (BSC -> MSC)

Contains Message Type and Cause for Handover Failure

- Handover Succeeded (MSC -> old BSC)

Contains Message Type

Technical realisation and amendments

Documentation Structure Overview

With the introduction of GSM to other Systems Handover and Cell Selection/Reselection in GSM phase 2+, the System Information elements provided in idle and connected mode have to be enhanced, to contain needed information of other systems.

The GSM/GPRS/EDGE services itself are not modified. Therefore GSM to other Systems Handover and Cell Selection/Reselection will be introduced in the existing specifications and stage descriptions rather then creating new ones.

This section will list new specifications and change requests for GSM to other Systems Handover and Cell Selection/Reselection.

Time frame for different STCs

to be added

New Specifications

No new specifications are foreseen.

Change Requests

A list of approved change requests being handled on STC level are given below:-

GSM No.	TDOC	CR	Subject	CR rapporteur/company	STC	Completion Date / Target Date
04.18	1733/99	A042	Introduction of two 'Release Indication' bits in the BCCH	Vodafone	SMG2	
04.18	377/0	A043	Uplink L3 message sequencing V8.20	Vodafone	SMG2	
04.18	644/00	A091	A RR Intersystem Handover Command	Ericsson	SMG2	SMG#31bis
04.18	848/00	A101r1	Downlink and Uplink information for Measurement Reporting and Enhanced Measurement Reporting on 3G Cells	Vodafone	SMG2	SMG#31bis
04.18	906/00	A092	Support Handover from GSM to cdma2000	Qualcomm	SMG2	SMG#31bis
04.18	934/00	A090	New measurement order - Idle mode	Ericsson	SMG2	SMG#31bis
04.18	938/00	A057 rev 2	Blind search Idle mode - SI2ter	Ericsson	SMG2	SMG#31bis
04.18	950/00	A062 rev 4	RR UTRAN Classmark Change	Ericsson	SMG2	SMG#31bis
04.18	951/00	A089 rev 1	RR UE pre-configuration Command	Ericsson	SMG2	SMG#31bis
04.18	952/00	A095 rev 1	UMTS information in channel release	Nokia	SMG2	SMG#31bis
04.18	953/00	A104 rev 1	UE Classmark Enquiry	Ericsson	SMG2	SMG#31bis
04.18	1182/00	A117 rev 2	GSM to 3G Handovers: Various Corrections and Clarifications (R99)	Vodafone AirTouch	SMG2	SMG#32
04.60	1735/99	A685	Introduction of two 'Release Indication' bits in the PBCCH	Vodafone	SMG2	
04.60	849/00	A205 rev 3	Enhanced measurement reporting capability	Nokia	SMG2	SMG#31bis
05.02	837/00	A148rev1	New measurement order – Idle mode	Ericsson	SMG2	SMG#31bis

05.08	945/00	A242 rev 6	Inter System Handover and Cell re-selection	Ericsson	SMG2	SMG#31bis
05.08	1215/00	A278 rev 3	Corrections to Inter System Handover and Cell re-selection (R99)	Ericsson	SMG2	SMG#32
08.08	852/00	A205r1	Service based handover	Vodafone	SMG2	SMG#31bis
08.08	907/00	A199	BSSAP aspects	Ericsson	SMG2	SMG#31bis
08.08	925/00	A200	**Support Handover from GSM to cdma2000**	Qualcomm	SMG2	SMG#31bis
08.08	1045/00	A208	Corrections to GSM - 3G handover (R99)	Nokia	SMG2	SMG#32
08.08	1060/00	A207	Correction of the Service Handover information coding (R99)	Vodafone AirTouch	SMG2	SMG#32
08.08	1181/00	A209 rev 1	Correction of IEI values of transparent containers for UMTS and cdma2000 (R99)	Nokia	SMG2	SMG#32
08.58	640/00	A052 rev 1,	New System Information message	Ericsson	SMG2	SMG#31bis
24.008	792/00		Introduction of 3G MS capabilities in MS Classmark 3	Vodafone		SMG#31bis

Backwards compatibility

The completion of GSM to other Systems Handover and Cell Selection/Reselection standards shall not cause compatibility problems to existing phase 1, phase 2 and phase 2+ implementations.

Annex 1: GSM to other Systems Handover and Cell Selection/Reselection related documents

Filename	Title	Author	Prepared for
Tdoc SMG2 225/99	Answer to Liaison statement on UMTS Simultaneous Mode from SMG12	3GPP TSG SA WG1	SMG2 #30
Tdoc SMG2 226/99	Study of handover between UMTS and GSM/GPRS	3GPP TSG SA WG2/SMG 12	SMG2 #30
Tdoc SMG2 323/99	LS regarding handover between UMTS and GPRS	3GPP TSG RAN WG2	SMG2 #30
Tdoc SMG2 331/99	GSM-UMTS handover	Vodafone	SMG2 #30
Tdoc SMG2 544/99	Liaison statement on usage of GSM-only SIM Cards	3GPP TSG SA	SMG2 #31
Tdoc SMG2 587/99	GSM to UMTS Hand-over – Radio Interface Requirements	Siemens	SMG2 #31
Tdoc SMG2-99-588	GSM to UMTS Hand-over – Radio Interface Concept	Siemens	SMG2 #31
Tdoc SMG2 960/99	LS to SMG2-WPA regarding Relocation and GSM-UMTS handover	3GPP RAN3	SMG2 #32
Tdoc SMG2 1145/99	Aspects of GSM to UMTS	Ericsson	SMG2 #32
Tdoc SMG2 1160/99	GSM to UMTS Handover: Radio Interface Concept	Siemens	SMG2 #32
Tdoc SMG2 1275/99	GSM to UMTS Handover (version 2)	Vodafone	SMG2 #32
Tdoc SMG2 1276/99	CR 04-18-A020 Introduction of the System Information 2qua/2quin for UMTS or other non-GSM systems	Vodafone	SMG2 #32
Tdoc SMG2 1277/99	CR 04-18-A021 Introduction of the System Information 5qua/5quin for UMTS or other non-GSM systems	Vodafone	SMG2 #32
Tdoc SMG2 1288/99	Handover from GSM to UMTS	Vodafone	SMG2 #32
Tdoc SMG2 1427/99	Proposed Liaison Statement on measurement order parameters sent to the MS for GSM to UMTS handovers	SMG2-WPB	SMG2 #32
Tdoc SMG2 1448/99	Proposed Liaison Statement on measurement order parameters sent to the MS for GSM to MC handovers	SMG2-WPB	SMG2 #32
Tdoc SMG2 1459/99	Proposed Liaison Statement on measurement order parameters sent to the MS for GSM to MC handovers	SMG2	SMG2 #32

2e99-475	Handover of Real-Time Services in RT-EGPRS	Lucent	Edge #11
2e99-494	Intra GSM/Edge RAN Handovers	Nokia	Edge #11
2e99-502	Support of legacy GPRS terminals in EGPRS phase 2	Lucent	Edge #11
Tdoc SMG2 1649/99	Liaison Statement on UMTS PLMN selection	3GPP RAN WG2	SMG2 #33
Tdoc SMG2 1509/99	GSM to Other Systems Handover	Siemens	SMG2 #33
Tdoc SMG2 1521/99	Broadcast information in multi-mode systems	Motorola	SMG2 #33
Tdoc SMG2 1694/99	Indication of mobile station Release 99 protocol capability	Motorola	SMG2 #33
Tdoc SMG2 1681/99	Aspects on GSM to UMTS handover	Ericsson	SMG2 #33
Tdoc SMG2 1784/99	Handovers to be Supported from GSM	Siemens	SMG2 #33
Tdoc SMG2 1781/99	GSM to UMTS handover: SACCH Signalling	Vodafone Airtouch	SMG2 #33
Tdoc SMG2 1810/99	New messages for introduction of GSM to UMTS HO	Ericsson	SMG2 #33
Tdoc SMG2 1816/99	Handover from GSM to other Systems Concepts	Siemens	SMG2 #33
Tdoc SMG2 1733/99	CR 04.18-A042 Introduction of two 'Release Indication' bits in the BCCH"	Vodafone Airtouch	SMG2 #33
Tdoc SMG2 1734/99	CR 04.18-A043 Uplink L3 Message Sequencing	Vodafone Airtouch	SMG2 #33
Tdoc SMG2 1735/99	CR 04.60-A685 Introduction of two 'Release Indication' bits in the PBCCH"	Vodafone Airtouch and Ericsson	SMG2 #33
Tdoc SMG2 1679/99	Response (to TSG-RAN WG1, SMG2) to LS on Additional GSM measurement abilities for the UE	3GPP RAN WG2	SMG2 #33
Tdoc SMG2 1680/99	Response (to SMG2) to LS on measurement order parameters sent to the MS, for GSM to UMTS handovers	3GPP RAN WG2	SMG2 #33
1910/99	LS on Uplink L3 Message Sequencing, (Vodafone Airtouch.)	SMG2	SMG2 #33
2013/99	Reply to LS on measurement order parameters sent to the MS, for GSM to UMTS handover	SMG2	SMG2 #33
8/00	CR 08.58-A052 New System Information message ver 1	Ericcson	SMG2#34
10/00	CR 04.18-A057 Measurement order Idle mode.	Ericsson.	SMG2#34
12/00	CR 04.18-A059 Measurement order for Connected mode ver 1	Ericsson.	SMG2#34
14/00	CR 08.08-A182 BSSMAP Handover Command	Ericsson.	SMG2#34
15/00	CR 04.18-A061 Introduction of UMTS measurements in measurement results IE	Ericsson.	SMG2#34
16/00	CR 04.18-A062 Adding UE capabilities to Handover Required BSSMAP	Ericsson.	SMG2#34
17/00	CR 08.08-A183 Adding UE to Classmark Change	Ericsson.	SMG2#34
18/00	Handover Command message for handover to UMTS	Ericsson.	SMG2#34

71/00	CR 08.08-A184 Transparent Containers in Intersystem Handover from GSM to UMTS	Nokia.	SMG2#34
72/00	CR 08.08-A185 Target Identification in Intersystem Handover from GSM to UMTS	Nokia.	SMG2#34
73/00	CR 08.08-A186 UMTS Security Information in BSSAP	Nokia.	SMG2#34
75/00	GSM to Other Systems Handover	Siemens	SMG2#34
130/00	LS to SMG2-WPA on UMTS PLMN selection	TSG-N WG1	SMG2#34
131/00	CR on removal of CN procedures from 03.22 (03.22 split)	(03.22 split) group	SMG2#34
132/00	Proposed TS 23.122 (03.22 & 23.022 split)	(03.22 spit) group	SMG2#34
133/00	CR 03.22-A039 rev1 Correction of Figure A.2 in Annex A (WI PCS1900 Harmonisation)	TSG-N WG1	SMG2#34
134/00	"GSM 03.22 version 7.3.0 – For information and reference"	MCC	SMG2#34
137/00	"LS to SMG2 on the measurement requirements for GSM in UMTS"	TSG-RAN WG2	SMG2#34
170/00	Response to LS regarding Relocation and GSM-UMTS handover (To RAN3 cc SMG2 WPA)	TSG RAN WG2.	SMG2#34
351/00	"CR 05.08-A242 Intersystem handover and cell reselection"	Ericsson	SMG2#34
377/00	CR04.18-A043 rev 1 Uplink L3 message sequencing V8.2.0.	Vodafone	SMG2#34
381/00	CR 04.18-A059 Measurement order for Connected mode ver 1	Ericsson	SMG2#34
405/00	CR 08.08-Axxx Handover Request UE Capability	Ericsson.	SMG2#34
434/00	CR 04.18-A057 Measurement order Idle mode.	Ericsson	SMG2#34
435/00	CR 04.18-A059 Measurement order for Connected mode ver 1	Ericsson	SMG2#34
436/00	CR 04.18-A061 Introduction of UMTS measurements in measurement results IE	Ericsson	SMG2#34
440/00	CR 04.18-A062 Adding UE capabilities to Handover Required BSSMAP	Ericsson	SMG2#34
463/00	"Draft Liaison Statement on the measurement requirements for GSM in UMTS"	SMG2-WPB	SMG2#34
476/00	CR 08.08-A183 rev 1 Adding UE to Classmark Change	Ericcson	SMG2#34
518/00	"Draft Liaison Statement on the measurement requirements for GSM in UMTS"	SMG2-WPB	SMG2#34

RPA000009	(R2-000266) Open Topics related to Cell Reselection	TSG-RAN WG2	RRM Ad-Hoc
RPA000016	Triggering Criteria for Cell re-selection	Ericsson	RRM Ad-Hoc
RPA000018	Principles for GSM vs UMTS cell selection/reselection	Ericsson	RRM Ad-Hoc
RPA000019	Measurement order Idle mode	Ericsson	RRM Ad-Hoc
RPA000020	Scenarios and Requirements for measurements supporting GSM to UTRAN Handover	Ericsson	RRM Ad-Hoc

RPA000021	Measurement order Connected Mode	Ericsson	RRM Ad-Hoc
RPA000022	Measurement Reporting	Ericsson	RRM Ad-Hoc
RPA000023	Inter System Handover Command	Ericsson	RRM Ad-Hoc
RPA000024	Target Id for Handover to UMTS	Ericsson	RRM Ad-Hoc
RPA000025	Handover to UTRAN A-interface signalling	Ericsson	RRM Ad-Hoc
RPA000026	Adding UE Capabilities to Handover Request Message	Ericsson	RRM Ad-Hoc
RPA000027	Adding UE capabilities to Handover Required BSSMAP message	Ericsson	RRM Ad-Hoc
RPA000028	Adding UE capbilities to Classmark Change	Ericsson	RRM Ad-Hoc
RPA000029	Concepts on GSM to UMTS handover and UMTS Intersystem Cell-reselection	Ericsson	RRM Ad-Hoc
RPA000031	BSSMAP Handover Command for handover to UMTS	Ericsson	RRM Ad-Hoc
RPA000032	Inter System Handover and Cell re-selection	Ericsson	RRM Ad-Hoc
RPA000033	Requirements for GSM to UMTS cell re-selection	VodafoneAirtouch	RRM Ad-Hoc
RPA000034	Cell re-selection from GSM to UMTS	VodafoneAirtouch	RRM Ad-Hoc
RPA000035	Requirements for GSM to UMTS handovers	VodafoneAirtouch	RRM Ad-Hoc
RPA000036	Aspects of GSM to UMTS handover	VodafoneAirtouch	RRM Ad-Hoc
RPA000037	GSM to Other Systems Handover (GSM 10.89 v 0.0.1)	Roke Manor Research	RRM Ad-Hoc
RPA000038	GSM-3G Handover: BSSAP aspects	Nokia	RRM Ad-Hoc
RPA000045	Cell Reselection in HCS	Nokia	RRM Ad-Hoc
RPA000047	Open Topics Related to Cell Reselection	Nokia	RRM Ad-Hoc
RPA000048	Proposal for Cell Selection / Reselection in HCS	Siemens	RRM Ad-Hoc
RPA000050	Update of test parameters for Cell Selection / Reselection	Siemens	RRM Ad-Hoc
RPA000052	Issues and possible solutions for handovers between UTRA FDD and GSM	Nortel Networks	RRM Ad-Hoc
RPA000054	Open Topics related to Inter system Cell Reselection	Nokia	RRM Ad-Hoc
RPA000055	Flexible Mapping Function to Compare GSM and UMTS Measurements	Nokia	RRM Ad-Hoc
RPA000056	UMTS Security parameters in BSSMAP messages	Siemens	RRM Ad-Hoc
RPA000057	Supported/Selected Codec information in BSSMAP messages	Siemens	RRM Ad-Hoc
RPA000058	Source Identification in Intersystem handover from UMTS to GSM	Siemens	RRM Ad-Hoc
RPA000059	adding of Stream Identifier IE to BSSMAP messages	Siemens	RRM Ad-Hoc
RPA000060	Handover command for handover to UMTS	Ericsson	RRM Ad-Hoc
RPA000061	Transportation RNC specific information	Ericsson	RRM Ad-Hoc
RPA000062	Reconfiguration of UTRAN Radio Access Bearer	Ericsson	RRM Ad-Hoc

RPA000063	Measurement channels for compressed mode	VodafoneAirtouch	RRM Ad-Hoc
1/00	Draft Agenda	SMG2 chairman	SMG2 –Hoc
2/00	GSM 10.89 GSM to Other Systems Handover' v0.0.2	Rapporteur (Siemens)	SMG2 –Hoc
3/00	GSM-3G Handover: BSSAP aspects	Nokia	SMG2 –Hoc
4/00	Handover from GSM to cdma2000 MC-MAP	Qualcomm	SMG2 –Hoc
5/00	Changes to Measurement Order for Handover from GSM to cdma2000 MC-MAP – Replaced by Tdoc SMG2 WPB 43/00	Qualcomm	SMG2 –Hoc
6/00	Changes to Measurement Results for Handover from GSM to cdma2000 MC-MAP – Replaced by Tdoc SMG2 WPB 44/00	Qualcomm	SMG2 –Hoc
7/00	Handover from cdma2000 MC-MAP to GSM	Qualcomm	SMG2 –Hoc
8/00	Adding cdma2000 Capabilities to Classmark Change RR message	Qualcomm	SMG2 –Hoc
9/00	Enhanced Measurement Reporting with UMTS neighbours	Nokia	SMG2 –Hoc
10/00	GSM to UMTS handover measurements	Nokia	SMG2 –Hoc
11/00	GSM to 3G handovers: Radio Interface Signalling Concept	Vodafone Airtouch	SMG2 –Hoc
12/00	CR 04.18-A076 3G Measurement Command 1 - Connected Mode	Vodafone Airtouch	SMG2 –Hoc
13/00	CR 04.18-A077 3G Measurement Command 2 - Connected Mode	Vodafone Airtouch	SMG2 –Hoc
14/00	CR 04.18-A078 3G Measurement Order 1 - Idle Mode	Vodafone Airtouch	SMG2 –Hoc
15/00	CR 04.18-A079 3G Measurement Order 2 - Idle Mode	Vodafone Airtouch	SMG2 –Hoc
16/00	CR 04.18-A059 rev 2 Measurement command - Connected mode	Siemens, Ericsson, Nokia, Vodafone Airtouch	SMG2 –Hoc
17/00	CR 04.18-A061 rev 2 Introduction of UMTS measurements in Measurement Results information element	Siemens, Ericsson, Nokia, Vodafone Airtouch	SMG2 –Hoc
18/00	Procedure for a reduced TFCI signalling in GSM to UMTS HO cases	Siemens	SMG2 –Hoc
19/00	Target Id for Handover to UMTS	Ericsson	SMG2 –Hoc
20/00	Transport of target cell info in Handover	Ericsson	SMG2 –Hoc

	signalling		
21/00	Adding UE Capabilities to Handover Request message	Ericsson	SMG2 –Hoc
22/00	Adding UE Capabilities to Handover Required message	Ericsson	SMG2 –Hoc
23/00	Adding UE Capabilities to RR Classmark Change	Ericsson	SMG2 –Hoc
24/00	Concept for GSM to UMTS handover	Ericsson	SMG2 –Hoc
25/00	BSSMAP Handover Command for handover to UTRAN	Ericsson	SMG2 –Hoc
26/00	Handover Command message for handover to UMTS	Ericsson	SMG2 –Hoc
27/00	Pre-configuration of UTRAN RABs - Handover GSM to UMTS	Ericsson	SMG2 –Hoc
28/00	Measurement result	Ericsson	SMG2 –Hoc
29/00	New system info measurement order	Ericsson	SMG2 –Hoc
30/00	Intersystem cell selection and handover (CR-0508-A242 rev 2)	Ericsson	SMG2 –Hoc
31/00	Mapping RSSI and Ec/Io	Ericsson	SMG2 –Hoc
32/00	GSM to UMTS cell selection - Withdrawn	Ericsson	SMG2 –Hoc
33/00	GSM to UMTS Ho security discussion paper	Ericsson	SMG2 –Hoc
34/00	GPRS cell re-selection CR 04.60 and some text in 04.18 to cover BCCH only cells	Ericsson	SMG2 –Hoc
35/00	Measurement Order Idle mode	Ericsson, Siemens	SMG2 –Hoc
36/00	Measurement Order Connected Mode	Ericsson	SMG2 –Hoc
37/00	RR Intersystem Handover Command	Ericsson	SMG2 –Hoc
38/00	GSM - 3G Handover: Service based handover	Vodafone Airtouch	SMG2 –Hoc
39/00	Transportation of Source to Target RNC in BSSMAP	Ericsson	SMG2 –Hoc
40/00	Liaison Statement on UMTS synchronisation channel detection	3GPP TSG RAN WG1	SMG2 –Hoc
41/00	Proposed Liaison Statement to Clarify the Relationship between PLMNs and RATS	Siemens	SMG2 –Hoc
42/00	Proposed Liaison Statement on Handover from GPRS to UTRAN for R99	Siemens	SMG2 –Hoc

43/00	Changes to Measurement Order for Handover from GSM to cdma2000 MC-MAP	Qualcomm	SMG2 –Hoc
44/00	Changes to Measurement Results for Handover from GSM to cdma2000 MC-MAP	Qualcomm	SMG2 –Hoc
45/00	Measurement performance for support of GSM to UMTS handover	Ericsson	SMG2 –Hoc
536/00	GSM 10.89 GSM to Other Systems Handover v0.03	Rapporteur (Siemens)	SMG2#35
592/00	Approved Report of the TSG-RAN Ad Hoc meeting on RRM (Torino, Italy, 9-11 February 2000)	MCC	SMG2#35
593/00	Draft Report of the SMG2 Ad Hoc meeting on RRM (Copenhagen, Denmark, 6-8 March 2000)	MCC	SMG2#35
595/00	LS on inter-RAT cell re-selection and handover performance requirements	TSG-R4	SMG2#35
602/00	Response Liaison Statement on Usage of RANAP over MAP/E i/f for UMTS to UMTS Inter-MSC SRNS Relocation	TSG-N1	SMG2#35
605/00	Liaison statement on the use of RANAP for intra-UMTS inter-MSC Handover/Relocation	TSG-N2	SMG2#35
607/00	LS on UMTS synchronisation channel detection	TSG-R1	SMG2#35
609/00	Liaison Statement on usage of RANAP over MAP/E at intra UMTS inter MSC handover/relocation	TSG-R3	SMG2#35
610/00	LS on UE/MS idle mode operation	TSG-S1	SMG2#35
611/00	Response Liaison Statement on Usage of RANAP over MAP/E i/f for UMTS to UMTS Inter-MSC SRNS Relocation (N1-000138)	TSG-S2	SMG2#35
612/00	Liaison statement on the use of RANAP for intra-UMTS inter-MSC Handover/Relocation	TSG-S2	SMG2#35
636/00	Concept for GSM to UMTS handover	Ericsson	SMG2#35
637/00	Measurement performance for Handover to UTRAN	Ericsson	SMG2#35
638/00	Cell ranking properties for GSM to UTRAN cell reselection	Ericsson	SMG2#35
639/00	CR 05.08-A242 rev 3, Inter System Handover and Cell re-selection	Ericsson	SMG2#35

640/00	CR 08.58-A052 rev 1, New System Information message	Ericsson	SMG2#35
641/00	CR 04.18-A057 rev 2 Blind search Idle mode - SI2ter	Ericsson	SMG2#35
642/00	CR 04.18-A090 New measurement order - Idle mode	Ericsson	SMG2#35
643/00	CR 05.02-A148, New measurement order - Idle mode	Ericsson	SMG2#35
644/00	CR 04.18-A RR Intersystem Handover Command	Ericsson	SMG2#35
645/00	CR 04.18-A062 rev 2 RR UTRAN Classmark Change	Ericsson	SMG2#35
646/00	CR 04.60-819 GPRS to UMTS cell reselection	Ericsson	SMG2#35
647/00	CR 08.08-A199 GSM-3G Handover; BSSAP aspects	Ericsson	SMG2#35
648/00	CR 04.18-A089 RR UE pre-configuration Command	Ericsson	SMG2#35
685/00	CR 04.18-A044 rev 4 Enhanced measurement reporting capability	Nokia	SMG2#35
686/00	CR 04.60-A205 rev 3 Enhanced measurement reporting capability	Nokia	SMG2#35
709/00	Handover from GSM to cdma2000 MC-MAP	Qualcomm	SMG2#35
710/00	Handover from cdma2000 MC-MAP to GSM	Qualcomm	SMG2#35
711/00	CR 04.18-A092 Support Handover from GSM to cdma2000	Qualcomm	SMG2#35
712/00	CR 08.08-A200 Support Handover from GSM to cdma2000	Qualcomm	SMG2#35
713/00	CR 04.18-A093 Support Cell Reselection to cdma2000 (Withdrawn)	Qualcomm	SMG2#35
727/00	04.18-A095 UMTS information in channel release	Nokia	SMG2#35
788/00	CR 08.58-Axxx Enhanced measurement reporting capability	Nokia	SMG2#35
789/00	GSM to 3G handover in GSM 04.18. Signalling concept	Vodafone AirTouch	SMG2#35

790/00	CR 04.18-A101 Downlink and Uplink information for Measurement Reporting and Enhanced Measurement Reporting on 3G Cells	Vodafone AirTouch	SMG2#35
791/00	CR 04.18-A102 Handover Procedures	Vodafone AirTouch	SMG2#35
792/00	CR 24.008-Axxx Introduction of 3G MS capabilities in MS Classmark 3	Vodafone AirTouch	SMG2#35
793/00	CR 08.08-A205 GSM-3G Handover: 'Service based handover'	Vodafone AirTouch	SMG2#35
802/00	CR 05.08-A270 Procedures for inter-system handover and reselection (cdma2000)	Qualcomm	SMG2#35
811/00	CR 04.18-A104 UE classmark enquiry	Ericsson	SMG2#35
830/00	UE Classmark Enquiry (Revised as 926/00)	Ericsson	SMG2#35
832/00	CR 04.18-A092 rev 1 Support Handover from GSM to cdma2000	Qualcomm	SMG2#35
833/00	CR 05.08-A270 rev 1 Procedures for inter-system handover and reselection (cdma2000)	Qualcomm	SMG2#35
835/00	CR 05.08-A242 rev 4, Inter System Handover and Cell re-selection	Ericsson	SMG2#35
836/00	CR 05.08-A270 rev 2 Procedures for inter-system handover and reselection (cdma2000)	Qualcomm	SMG2#35
837/00	CR 05.02-A148 rev 1 New measurement order - Idle mode	Ericsson	SMG2#35
840/00	CR 04.18 A062 rev 4 UTRA classmark change	Ericsson	SMG2#35
841/00	Pre-configuration paper	Ericsson	SMG2#35
848/00	CR 04.18-A101 Downlink and Uplink information for Measurement Reporting and Enhanced Measurement Reporting on 3G Cells	Vodafone AirTouch	SMG2#35
849/00	CR 04.60-A205 rev 3 Enhanced measurement reporting capability	Nokia	SMG2#35
850/00	CR 04.18-A057 rev 2 Blind search Idle mode - SI2ter (Revised as 933/00)	Ericsson	SMG2#35
851/00	CR 04.18-A090 New measurement order - Idle mode (Revised as 934/00)	Ericsson	SMG2#35
852/00	CR 08.08-A205 GSM-3G Handover: 'Service based handover'	Vodafone AirTouch	SMG2#35

905/00	CR 04.18-A062 rev 3 RR UTRAN Classmark Change	Ericsson	SMG2#35
906/00	CR 04.18-A092 Support Handover from GSM to cdma2000	Qualcomm	SMG2#35
907/00	CR 08.08-A199 GSM-3G Handover; BSSAP aspects	Ericsson	SMG2#35
908/00	04.18-A095 UMTS information in channel release (Revised as 936/00)	Nokia	SMG2#35
909/00	CR 04.60-A Neighbour cells mask	Nokia	SMG2#35
910/00	Liaison statement for CR 24.008-A Introduction of 3G MS capabilities in MS Classmark 3	WPA	SMG2#35
914/00	CR 05.08-A242 rev 5, Inter System Handover and Cell re-selection	Ericsson	SMG2#35
922/00	Proposed liaison statement on GSM to UMTS cell reselection and handover solution	SMG2-WPB	SMG2#35
924/00	CR 04.18-A089 RR UE pre-configuration Command	Ericsson	SMG2#35
925/00	CR 08.08-A200 Support Handover from GSM to cdma2000	Qualcomm	SMG2#35
926/00	CR 04.18-A104 rev 1 UE Classmark Enquiry	Ericsson	SMG2#35
933/00	CR 04.18-A057 rev 2 Blind search Idle mode - SI2ter (Revised in 938/00)	Ericsson	SMG2#35
934/00	CR 04.18-A090 New measurement order - Idle mode	Ericsson	SMG2#35
936/00	04.18-A095 UMTS information in channel release	Nokia	SMG2#35
938/00	CR 04.18-A057 rev 2 Blind search Idle mode - SI2ter	Ericsson	SMG2#35
939/00	GSM 10.89 GSM to Other Systems Handover v0.04	Siemens	SMG2#35
945/00	CR 05.08-A242 rev 6, Inter System Handover and Cell re-selection	Ericsson	SMG2#35
950/00	CR 04.18-A062 rev 4 RR UTRAN Classmark Change	Ericsson	SMG2#35
951/00	CR 04.18-A089 rev 1 RR UE pre-configuration Command	Ericsson	SMG2#35

952/00	04.18-A095 rev 1 UMTS information in channel release	Nokia	SMG2#35
953/00	CR 04.18-A104 rev 1 UE Classmark Enquiry	Ericsson	SMG2#35
954/00	Liaison statement for CR 24.008-A Introduction of 3G MS capabilities in MS Classmark 3		SMG2#35
955/00	Proposed liaison statement on GSM to UMTS cell reselection and handover solution	SMG2-WPB	SMG2#35
960/00	GSM 10.89 GSM to Other Systems Handover ver 0.0.5	Rapporteur (Siemens)	SMG2#36
1001/00	CR 04.18-A112 Suspension of GPRS services at handover from UMTS to GSM (R99)	Ericsson	SMG2#36
1002/00	3G TS 23.060: Suspend at UMTS to GSM handover during CS call (for information) (R99)	Ericsson	SMG2#36
1008/00	CR 05.08-A278 Corrections to Inter System Handover and Cell re-selection (R99)	Ericsson	SMG2#36
1045/00	CR 08.08-A208 Corrections to GSM - 3G handover (R99)	Nokia	SMG2#36
1046/00	CR 08.08-A209 Correction of IEI values of transparent containers for UMTS and cdma2000 (R99)	Nokia	SMG2#36
1060/00	CR 08.08-A207 Correction of the Service Handover information coding (R99)	Vodafone AirTouch	SMG2#36
1061/00	CR 04.18-A117 GSM to 3G Handovers: Various Corrections and Clarifications (R99)	Vodafone AirTouch	SMG2#36
1111/00	LS on PLMN selection	TSG-SA WG1	SMG2#36
1112/00	Response (to SMG2, copy TSG-RAN WG4) to LS (2-00-955) on GSM to UMTS cell re-selection and handover solution	TSG-RAN WG2	SMG2#36
1113/00	Response to LS (S1-000103) on UE/MS idle mode operation	TSG-RAN WG2	SMG2#36
1128/00	Proposed reply to Liaison Statement on Guidance on future work for T2 SWG5, Multi-mode terminals	SMG2-WPB	SMG2#36
1132/00	Assisted blind search for mulit-mode terminals camping on GSM	France Telecom	SMG2#36
1133/00	CR 22.011-A015 rev 1 Network selection (for information)	3GPP TSG-SA WG1	SMG2#36

1134/00	CR 22.011-A016 Reselection attempts of GPRS terminals (for information)	3GPP TSG-SA WG1	SMG2#36
1138/00	CR 04.18-A123 Controlling distribution of mobiles in the GSM/UMTS network (R99)	Nokia	SMG2#36
1157/00	CR 04.18-A117 rev 1 GSM to 3G Handovers: Various Corrections and Clarifications (R99)	Vodafone AirTouch	SMG2#36
1161/00	CR 05.08-A278 rev 1 Corrections to Inter System Handover and Cell re-selection (R99)	Ericsson	SMG2#36
1162/00	Proposed Answer to LS (R2-000911) on GSM to UMTS cell re-selection and handover solution	SMG2-WPB	SMG2#36
1181/00	CR 08.08-A209 rev 1 Correction of IEI values of transparent containers for UMTS and cdma2000 (R99)	Nokia	SMG2#36
1182/00	CR 04.18-A117 rev 2 GSM to 3G Handovers: Various Corrections and Clarifications (R99)	Vodafone AirTouch	SMG2#36
1213/00	CR 05.08-A278 rev 2 Corrections to Inter System Handover and Cell re-selection (R99)	Ericsson	SMG2#36
1215/00	CR 05.08-A278 rev 3 Corrections to Inter System Handover and Cell re-selection (R99)	Ericsson	SMG2#36

Annex 2: GSM to other Systems Handover and Cell Selection/Reselection issues

Annex 3: LS on measurement order parameters sent to the MS, for GSM to UMTS handover (SMG2 Tdoc 2013/99)

SMG2 would like to thank RAN WG2 for the LS on measurement order parameters sent to the MS, for GSM to UMTS handover. SMG2 have discussed the issues related to handover from GSM to other systems and vice versa. The following summarises the preliminary outcome of these discussions.

Assumptions

This contribution takes the following assumptions:

- Dual GSM/other system terminals are based on GSM Release 99 or later
- For reselection of UMTS and GSM networks belonging to different PLMNs, no additional broadcasting is required as periodic Home / Preferred PLMN search may be used.
- It is SMG2's view that handover /cell reselection from GSM should be generic in nature in order to accommodate coexistence with other systems as well as UMTS.

High level requirements

In the preparation of handover and reselection from GSM to other systems and vice versa, SMG2 identified the following issues for which an exchange between systems has to be co-ordinated:

1. System Broadcast
2. Measurement Reporting
3. Assignment/ handover

SMG2 have examined the above issues for both scenarios, i.e. GSM to UMTS handover preparation/cell reselection and UMTS to GSM handover preparation/cell reselection

A. GSM to UMTS

1. System broadcast

a) idle mode

System broadcast in GSM is limited by broadcast capacity. This limit is mainly due to the amount of information broadcast and the frequency of the broadcast. Several possibilities have been specified or proposed to extend the BCCH capacity, such as BCCH ext (GSM phase 2) and secondary BCCH (Tdoc SMG2 1530/99).

SMG 2 would like to bring the attention of RAN WG2 that at present bits on the GSM BCCH are hard coded which makes it impossible to accommodate efficiently future extensions of broadcast parameters. In particular, SMG2 would like RAN2 to confirm that the number of bits for the UARFCN can accommodate any future band extensions for UMTS.

Furthermore, in the interest of saving and optimising capacity on the GSM BCCH, efficient compression of the broadcast data shall be possible. This might entail different encoding depending on the various possible network configurations. The encoding rules can be sent to the mobile at e.g. registration.

b) circuit switched dedicated mode

Dedicated mode system information is based on point to point transmission for which a new message format can be defined for dual system terminals. Assuming that the neighbour cell information does not change with the location of the terminal within one particular cell, the message containing neighbour cell and measurement information may not need to be transmitted more than once after an assignment or handover.

However, taking into account the timing constraints for the terminal on CS dedicated mode, it seems necessary that neighbour cell measurement requirements are optimised in order to keep high service quality.

SMG2 has noted that potential degradations to the GSM tasks are due more to the number of UMTS frequencies in the neighbour list rather than the number of actual neighbour cells.

A potential drawback is the inherent latency of the message broadcast if the SACCH is used. SMG2 have also identified, for the purposes of directed retry and SDCCH handover, that these messages could be transferred faster on a DCCH.

c) Packet mode

SMG2 is at an early phase of studying the issues in packet mode. However, it is believed that in packet mode, limitations are similar as in idle mode, even if no limited amount of ressources is allocated to PACCH.

2. Measurement Reporting

SMG2 is currently studying the improvement of GSM measurement reporting (Tdoc SMG2 1616/99). The solution, which is under consideration, shall allow sending measurement reports, which include both GSM and other systems, measurements.

The operator shall be able to control the number of cells of different RATs, which are to be reported by the mobile. This would also allow the operator to minimise the potential degradation of GSM dedicated mode tasks.

SMG2 has considered the view of RAN WG2 regarding event triggered reporting. SMG2 feels that the threshold shall be set in the BSC and not in the mobile.

A first assumption of the number of bits available per measurement per cell is 6 bits, reported at most every 480 ms.

3. Assignment/handover

SMG2 could not identify a critical limit other than latency in sending the handover command or assignment message caused by segmentation of the message.

B. UMTS to GSM

1. System Broadcast

SMG2 identified the following information to be broadcast:

- BCCH allocation list which may contain BSIC
- Information about what GSM band the BA list refers to (450, 480, 850, 900, 1800, 1900), (note that today, context depending encoding is used)
- Synchronisation information of the GSM cell if available

2. Measurement Reporting

The operator shall be able to control the number of cells of different RAT that are to be reported by the mobile. SMG2 would like to draw the attention of RAN WG2 to the fact that GSM is a narrow band system which needs measurements to be averages over a certain period of time in order to ensure meaningful measurement values. In GSM, at least 3 measurements per frequency in the BA (SACCH) list per reporting period (480 ms). The measurements are uniformly distributed over the measurement period.

Extending this to UMTS to GSM handover measurements, the terminal has to be able to perform a reasonable amount of RSSI measurements. Typically the MS shall be capable of monitoring at least 20 GSM carriers and therefore, shall be capable of performing at least120 measurements per second (960 ms). Furthermore, typical handover algorithm in the BSC relies on around 5 seconds of RXLEV measurement filtering to perform a reliable decision.

The BSIC confirmation is necessary when the cells are identified as being in the top six (or more) stronger cells. It is important to note that the BSIC confirmation and RSSI measurements are essential tools for a reliable handover and should be handled together and not independently.

3. Assignment/handover

The existing GSM Handover or assignment message contains most necessary information, however, SMG2 has identified the following additional information to be sent in the case of UMTS to GSM handover:

- Information about what GSM band the assignment/handover command refers to (450, 480, 850, 900, 1800, 1900), (note that today, context depending encoding is used)
- Ciphering

SMG2 would like to draw attention of RAN 2 to the fact that it shall be a requirement to allow handover to cells which have not been measured by the mobile. In that case, the following additional information should be provided to the mobile:

- Synchronisation information of the GSM cell if available

History

Document history	
17th November 1999	First draft
6th January 2000	Second Issue – add reference to Measurement Order Parameters sent to MS; Change reference to 03.22 to 23.022; Add section on Issues; Update list of Tdocs on handover; Add Table of allowed handovers;
19th January 2000	Updates following SMG2#34; Update List of Tdocs; Provide key for allowed handover tables
31st January 2000	Align PLMN selection with 23.122, 22.011. Make official ETSI document. Correct table of allowed handovers.
18th Feb 2000	Incorporate conclusions from RRM ad-doc; Additions to requirements and issues sections.
14th Mar 2000	Incorporates conclusions from Copenhagen ad-hoc; Corrected references to TS23.022
6th Apr 2000	Incorporate conclusions from SMG2 #35 WPA and WPB.
14th Apr 2000	Incorporate conclusions from SMG2 plenary
11th July 2000	Incorpoarte conclusions from SMG2 #36

Rapporteur GSM to other Systems Handover and Cell Selection/Reselection: Kenneth Isaacs Roke Manor Research/SIEMENS AG

Email: Kenneth.Isaacs@roke.co.uk

Tel:

Fax: