ISEL

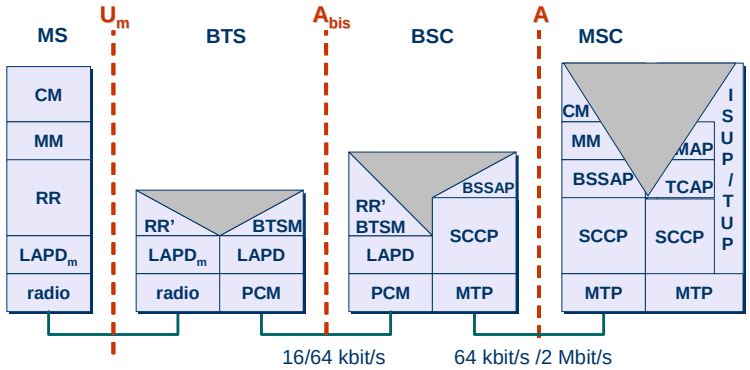
INSTITUTO SUPERIOR DE ENGENHARIA DE LISBOA

LICENCIATURA EM ENGENHARIA DE SISTEMAS DE TELECOMUNICAÇÕES E ELECTRÓNICA

Secção de Sistemas de Telecomunicações

Sistemas de Telecomunicações III

Layer 3 GSM signaling protocols messages



CM – Connection Management
MM – Mobility Management
RR – Radio Resource management
LAPDm – Link Access Protocol on the Dm channel
BTSM – BTS Management
BSSAP - Base Station System Application Part

SCCP – Signalling Connection Control Part
TCAP – Transaction Capabilities Application Part
MAP – Mobile Application Part
ISUP - ISDN User Part
TUP – Telephony User Part
MTP – Message Transfer Part

1 Um Interface

1.1 Radio resources management (RR)

1.1.1 Channel establishment messages

Message	Description	Origin	Dest.	Message Contents
ADDITIONAL ASSIGNMENT	This message is sent on the main DCCH by the network to the mobile station to allocate an additional dedicated channel while keeping the previously allocated channels.	*Network*	*MS*	Channel Description Mobile Allocation Starting Time
IMMEDIATE ASSIGNMENT	This message is sent on the CCCH by the network to the mobile station in idle mode to change the channel configuration to a dedicated configuration while staying in the same cell.	*Network*	*MS*	Immediate assignment message type Page mode Spare half octet Channel description Request reference Timing advance Mobile allocation Starting time IA Rest octets (frequency parameters, before time)
IMMEDIATE ASSIGNMENT EXTENDED	This message is sent on the CCCH by the network to two mobile stations in idle mode to change their channel configurations to different dedicated configurations while they stay in the same cell.	*Network*	*MS*	Immediate assignment Extended message type Page mode Spare Half octet Channel description 1 Request reference 1 Timing advance 1 Channel description 2 Request reference 2 Timing advance 2 Mobile allocation Starting time IAX rest octets
IMMEDIATE ASSIGNMENT REJECT	This message is sent on the CCCH by the network to up to four mobile stations to indicate that no channel is available for assignment.	*Network*	*MS*	Immediate assignment reject message type Page mode Spare half octet Request reference 1 Wait indication 1 Request reference 2 Wait indication 2 Request reference 3 Wait indication 3 Request reference 4 Wait indication 4 IAR rest octets

1.1.2 Ciphering messages

Message	Description	Origin	Dest.	Message Contents
CIPHERING MODE COMMAND	This message is sent on the main DCCH from the network to the mobile station to indicate that the network has started deciphering and that enciphering and deciphering shall be started in the mobile station, or to indicate that ciphering will not be performed.	*Network*	*MS*	Cipher Mode Command message type Ciphering mode setting Cipher response
CIPHERING MODE COMPLETE	This message is sent on the main DCCH from the mobile station to the network to indicate that enciphering and deciphering has been started in the mobile station.	*MS*	*Network*	Cipher mode complete Message type Mobile equipment identity

1.1.3 Handover messages

Message	Description	Origin	Dest.	Message Contents
ASSIGNMENT COMMAND	This message is sent on the main DCCH by the network to the mobile station to change the channel configuration to another independent dedicated channel configuration, when no timing adjustment is needed	*Network*	*MS*	Description of the first channel, after time Power command Frequency list, after time Cell channel description Mode of the first channel Description of the second channel, after time Mode of the second channel Mobile allocation, after time Starting time Frequency Llist, before time Description of the first channel, before time Description of the second channel, before time Frequency channel Sequence before time Mobile allocation, before time Cipher mode setting
ASSIGNMENT COMPLETE	This message is sent on the main DCCH from the mobile station to the network to indicate that the mobile station has established the main signalling link successfully.	*MS*	*Network*	Assignment complete message type RR cause

ASSIGNMENT FAILURE	This message is sent on the main DCCH on the old channel from the mobile station to the network to indicate that the mobile station has failed to seize the new channel.	*MS*	*Network*	Assignment failure message type RR cause
HANDOVER ACCESS	This message is sent in random mode on the main DCCH during a handover procedure. It does not follow the basic format.	*Network*	*MS*	Handover Reference
HANDOVER COMMAND	This message is sent on the main DCCH by the network to the mobile station to change the dedicated channel configuration, timing adjustment needed.	*Network*	*MS*	Handover command message type Cell description Description of the first channel, after time Handover reference Power command and type Synchronization indication Frequency short list, after time Frequency list, after time Cell channel description Mode of the first channel Description of the second channel, after time Mode of the second channel Frequency channel Sequence, after time Mobile allocation, after time Starting time Real time difference Timing advance Frequency short list, before time Frequency list, before time Description of the first channel, before time Description of the second channel, before time Frequency channel sequence before time Mobile allocation, before time Cipher mode setting
HANDOVER COMPLETE	This message is sent on the main DCCH from the mobile station to the network to indicate that the mobile station has established the main signalling link successfully.	*MS*	*Network*	Handover complete message type RR cause Mobile observed time Difference
HANDOVER FAILURE	This message is sent on the main DCCH on the old channel from the mobile station to the network to indicate that the mobile station has failed to seize the new channel.	*MS*	*Network*	Handover Failure Message Type RR Cause

PHYSICAL INFORMATION	This message is sent on the main DCCH by the network to the mobile station to stop the sending of access bursts from the mobile station.	*Network*	*Mobile*	Physical Information Message Type Timing advance

1.1.4 Channel release messages

Message	Description	Origin	Dest.	Message Contents
CHANNEL RELEASE	This message is sent on the main DCCH from the network to the mobile station to initiate deactivation of the dedicated channel used.	*Network*	*MS*	Channel release message type RR cause BA range
PARTIAL RELEASE	This message is sent on the main DCCH by the network to the mobile station to deactivate part of the dedicated channels in use.	*Network*	*MS*	Partial release message type Channel description
PARTIAL RELEASE COMPLETE	This message is sent on the main DCCH by the mobile station to the network to indicate that a part of the dedicated channels has been deactivated.	*MS*	*Network*	Partial release complete message type

1.1.5 Paging messages

Message	Description	Origin	Dest.	Message Contents
PAGING REQUEST TYPE 1	This message is sent on the CCCH by the network to up to two mobile stations to trigger channel access by these. The mobile stations are identified by their TMSI or IMSI.	*Network*	*MS*	Paging request type Message type Page mode Channels needed for mobiles 1 and 2 Mobile identity 1 Mobile identity 2 P1 rest octets
PAGING REQUEST TYPE 2	This message is sent on the CCCH by the network to two or three mobile stations to trigger channel access by these. Two of the mobile stations are identified by their TMSI while the third is identified by its TMSI or IMSI.	*Network*	*MS*	Paging request type 2 Message type Page mode Channels needed for mobiles 1 and 2 Mobile identity 1 Mobile identity 2 Mobile identity 3 P2 rest octets

PAGING REQUEST TYPE 3	This message is sent on the CCCH by the network to four mobile stations to trigger channel access by these. The mobile stations are identified by their TMSIs.	*Network*	*MS*	Paging request type 3 message type Page mode Channels needed for mobiles 1 and 2 Mobile identity 1 Mobile identity 2 Mobile identity 3 Mobile identity 4 P3 rest octets
PAGING RESPONSE	This message is sent on the main DCCH by the mobile station to the network in connection with establishment of the main signalling link as a response to the paging request message.	*MS*	*Network*	Paging response message type Ciphering key sequence number Spare half octet Mobile station classmark Mobile identity

1.1.6 System Information messages

Message	Description	Origin	Dest.	Message Contents
SYSTEM INFORMATION TYPE 1	This message is sent on the BCCH by the network to all mobile stations within the cell giving information of control of the RACH and of the cell allocation.	*Network*	*MS*	System information type 1 message type Cell channel description RACH control parameter SI 1 rest octets
SYSTEM INFORMATION TYPE 2	This message is sent on the BCCH by the network to all mobile stations within the cell giving information of control of the RACH and of the BCCH allocation in the neighbour cells.	*Network*	*MS*	System information type 2 message type BCCH frequency list NCC permitted RACH control parameter
SYSTEM INFORMATION TYPE 2bis	This message is sent optionally on the BCCH by the network to all mobile stations within the cell giving information on control of the RACH and of the extension of the BCCH allocation in the neighbour cells A GSM 900 mobile station which only supports the primary GSM band P-GSM 900 may ignore this message.	*Network*	*MS*	System information type 2bis message type Extended BCCH Frequency list RACH control parameters SI 2bis rest octets
SYSTEM INFORMATION TYPE 2ter	This message is sent optionally on the BCCH by the network to all mobile stations within the cell giving information on the extension of the BCCH allocation in the neighbour cells. A mobile station that supports either: only the primary GSM band P-GSM 900, or only the DCS	*Network*	*MS*	System information type 2ter message type Extended BCCH Frequency list SI 2ter rest octets

	1 800 band may ignore this message.			
SYSTEM INFORMATION TYPE 3	This message is sent on the BCCH by the network giving information of control on the RACH, the location area identification, the cell identity and various other information about the cell.	*Network*	*MS*	System information type 3 message type Cell identity Location area identification Control channel description Cell options Cell selection parameters RACH control parameters SI 3 rest octets
SYSTEM INFORMATION TYPE 4	This message is sent on the BCCH by the network giving information on control of the RACH, the location area identification, the cell identity and various other information about the cell.	*Network*	*MS*	System information type 4 message type Location area identification Cell selection parameters RACH control parameters CBCH channel description CBCH mobile allocation SI 4 rest octets
SYSTEM INFORMATION TYPE 5	This message is sent on the SACCH by the network to mobile stations within the cell giving information on the BCCH allocation in the neighbour cells. When received this information shall be used as the list of BCCH frequencies of the neighbouring cells to be reported on. Any change in the neighbour cells description must overwrite any old data held by the mobile station. The mobile station must analyse all correctly received system information type 5 messages.	*Network*	*MS*	System information type 5 message type BCCH frequency list
SYSTEM INFORMATION TYPE 5bis	This message is sent optionally on the SACCH by the network to mobile stations within the cell giving information on the extension of the BCCH allocation in the neighbour cells. A GSM 900 mobile station which only supports the primary GSM band P-GSM 900 may ignore this message. When received (and not ignored) this information must be used as the list of neighbouring cells to be reported on. Any change in the neighbour cells description must overwrite any old data held by the mobile station. The mobile station must, with the exception stated above, analyse all correctly received system information type 5 messages.	*Network*	*MS*	System information type 5 bis message type Extension of the BCCH Frequency list description

SYSTEM INFORMATION TYPE 5ter	This message is sent optionally on the SACCH by the network to mobile stations within the cell giving information on the extension of the BCCH allocation in the neighbour cells. A mobile station that supports either: only the primary GSM band P-GSM 900 or only the DCS 1 800 band may ignore this message, When received (and not ignored) this information must be used as part of the list of neighbouring cells to be reported on. Any change in the neighbour cells description must overwrite this part of any old data held by the mobile station. The mobile station shall, with the exception stated above, analyse all correctly received system information type 5ter messages.	*Network*	*MS*	System information type 5ter message type Extended BCCH frequency list
SYSTEM INFORMATION TYPE 6	This message is sent on the SACCH by the network to mobile stations within the cell giving information of location area identification, of cell identity and various other information.	*Network*	*MS*	System information type 6 Message type Cell identity Location area identification Cell options NCC permitted
SYSTEM INFORMATION TYPE 7	This message is sent on the BCCH by the network giving information about cell reselection parameters to be used in that cell.	*Network*	*MS*	System information type 7 message type SI 7 rest octets
SYSTEM INFORMATION TYPE 8	This message is sent on the BCCH by the network giving information about cell reselection parameters to be used in that cell.	*Network*	*MS*	System information type 8 message type SI 8 rest octets

1.1.7 Miscellaneous messages

Message	Description	Origin	Dest.	Message Contents
CHANNEL MODE MODIFY	This message is sent on the main DCCH by the network to the mobile station to request the setting of the mode for the indicated channel.	*Network*	*MS*	Channel mode modify message type Channel description Channel mode

CHANNEL MODE MODIFY ACKNOWLEDGE	This message is sent on the main DCCH by the mobile station to the network to indicate the successful or unsuccessful execution of a channel mode modify request.	*MS*	*Network*	Channel mode modify ack-nowledge message type Channel description Channel mode
CHANNEL REQUEST	This message is sent in random mode on the RACH. It does not follow the basic format. The possible formats are presented directly below, without reference to information fields.	*Network*	*MS*	ESTABLISHMENT CAUSE RANDOM REFERENCE
CLASSMARK CHANGE	This message is sent on the main DCCH by the mobile station to the network to indicate a classmark change or as a response to a classmark enquiry.	*MS*	*Network*	Classmark change message type Mobile station classmark Additional mobile station classmark information
CLASSMARK ENQUIRY	This message is sent on the main DCCH by the network to the mobile station to request classmark information.	*Network*	*MS*	Classmark enquiry message type
FREQUENCY REDEFINITION	This message is sent on the main DCCH from the network to the mobile station to indicate that the frequencies and the hopping sequence of the allocated channels shall be changed.	*Network*	*MS*	Frequency redefinition message type Channel description Mobile allocation Starting time Cell channel description
MEASUREMENT REPORT	This message is sent on the SACCH by the mobile station to the network to report measurement results about the dedicated channel and about neighbour cells.	*MS*	*Network*	Measurement report message type Measurement results
RR STATUS	This message is sent by the mobile station or the network at any time to report certain error conditions.	*Both*	*Both*	RR status Message type RR cause
SYNCHRONIZATION CHANNEL INFORMATION	This message is sent on the SCH, which is one of the broadcast channels. Its purpose is to support the synchronization of a mobile station to a BSS. It does not follow the basic format.	*Network*	*MS*	BSIC T1 T2 T3

1.2 Mobility management (MM)

1.2.1 Registration messages

Message	Description	Origin	Dest.	Message Contents
IMSI DETACH INDICATION	This message is sent by the mobile station to the network to set a deactivation indication in the network.	*MS*	*Network*	IMSI Detach Indication message type Mobile station classmark Mobile identity
LOCATION UPDATING ACCEPT	This message is sent by the network to the mobile station to indicate that updating or IMSI attach in the network has been completed.	*Network*	*MS*	Location Updating Accept message type Location area identification Mobile identity Follow on proceed
LOCATION UPDATING REJECT	This message is sent by the network to the mobile station to indicate that updating or IMSI attach has failed.	*Network*	*MS*	Location Updating Reject message type Reject cause
LOCATION UPDATING REQUEST	This message is sent by the mobile station to the network either to request update of its location file (normal updating or periodic updating) or to request IMSI attach.	*MS*	*Network*	Location Updating Request message type Location updating type Ciphering key sequence number Location area identification Mobile station classmark Mobile identity

1.2.2 Security messages

Message	Description	Origin	Dest.	Message Contents
AUTHENTICATION REJECT	This message is sent by the network to the mobile station to indicate that authentication has failed (and that the receiving mobile station shall abort all activities).	*Network*	*MS*	Authentication Reject message type
AUTHENTICATION REQUEST	This message is sent by the network to the mobile station to initiate authentication of the mobile station identity.	*Network*	*MS*	Authentication Request message type Ciphering key sequence number Spare half octet Authentication parameter RAND
AUTHENTICATION RESPONSE	This message is sent by the mobile station to the network to deliver a calculated response to the network.	*MS*	*Network*	Authentication Response message type Authentication parameter SRES

IDENTITY REQUEST	This message is sent by the network to the mobile station to request a mobile station to submit the specified identity to the network.	*Network*	*MS*	Identity Request message type Identity type Spare half octet
IDENTITY RESPONSE	This message is sent by the mobile station to the network in response to an IDENTITY REQUEST message providing the requested identity.	*MS*	*Network*	Identity Response message type Mobile identity
TMSI REALLOCATION COMMAND	This message is sent by the network to the mobile station to reallocate or delete a TMSI.	*Network*	*MS*	TMSI Reallocation Command message type Location area identification Mobile identity
TMSI REALLOCATION COMPLETE	This message is sent by the mobile station to the network to indicate that reallocation or deletion of a TMSI has taken place.	*MS*	*Network*	TMSI Reallocation Complete message type

1.2.3 Connection management messages

Message	Description	Origin	Dest.	Message Contents
CM RE-ESTABLISHMENT REQUEST	This message is sent by the mobile station to the network to request re-establishment of a connection if the previous one has failed.	*MS*	*Network*	CM Re-Establishment Request message Ciphering key sequence number Spare half octet Mobile station classmark Mobile identity Location area identification
CM SERVICE ACCEPT	This message is sent by the network to the mobile station to indicate that the requested service has been accepted.	*Network*	*MS*	CM Service Accept message type
CM SERVICE REJECT	This message is sent by the network to the mobile station to indicate that the requested service cannot provided.	*Network*	*MS*	CM Service Reject message type Reject cause
CM SERVICE ABORT	This message is sent by the mobile station to the network to request the abortion of the first MM connection establishment in progress and the release of the RR connection.	*MS*	*Network*	CM Service Abort message type
ABORT	This message is sent by the network to the mobile station to initiate the abortion of all MM connections and to indicate the reason for the abortion.	*Network*	*MS*	Abort message type Reject cause
CM SERVICE REQUEST	This message is sent by the mobile station to the network to request a service for the connection management sublayer entities, e.g. circuit switched connection establishment, supplementary services activation, short message transfer.	*MS*	*Network*	CM Service Request message type CM service type Ciphering key sequence number Mobile station classmark Mobile identity

1.2.4 Miscellaneous message

Message	Description	Origin	Dest.	Message Contents
MM STATUS	This message is sent by the mobile station or the network at any time to report certain error conditions.	*Both*	*Both*	MM Status message type Reject cause

1.3 Circuit-switched call control

1.3.1 Call establishment messages

Message	Description	Origin	Dest.	Message Contents
ALERTING	This message is sent by the network to the calling mobile station to indicate that the called user alerting has been initiated.	*Network*	*MS*	Alerting message type Facility Progress indicator User-user
		MS	*Network*	Alerting message type Facility User-user SS version
CALL CONFIRMED	This message is sent by the called mobile station to confirm an incoming call request.	*MS*	*Network*	Call confirmed message type Repeat Indicator Bearer capability Bearer capability Cause CC Capabilities
CALL PROCEEDING	This message is sent by the network to the calling mobile station to indicate that the requested call establishment information has been received, and no more call establishment information will be accepted.	*Network*	*MS*	Call proceeding message type Repeat Indicator Bearer capability 1 Bearer capability 2 Facility Progress indicator
CONNECT	This message is sent by the network to the calling mobile station to indicate call acceptance by the called user.	*Network*	*MS*	Connect message type Facility Progress indicator Connected number Connected subaddress User-user
		MS	*Network*	Connect message type Facility Connected subaddress User-user SS version
CONNECT ACKNOWLEDGE	This message is sent by the network to the called mobile station to indicate that the mobile station has been awarded the call. It shall also be sent by the calling mobile station to the network to acknowledge the offered connection.	*Both*	*Both*	Connect acknowledge message type
EMERGENCY SETUP	This message is sent from the mobile station to initiate emergency call establishment.	*MS*	*Network*	Emergency setup message type Bearer capability
PROGRESS	This message is sent from the network to the mobile station to indicate the progress of a call in the event of interworking or in connection with the	*Network*	*MS*	Progress message type Progress indicator User-user

	provision of in-band information/patterns.			
SETUP	This message is sent by the network to the mobile station to initiate a mobile terminated call establishment.	*Network*	*MS*	Setup message type BC repeat indicator Bearer capability 1 Bearer capability 2 Facility Progress indicator Signal Calling party BCD number Calling party sub-Address Called party BCD number Called party sub- address LLC repeat indicator Low layer compatibility I Low layer compatibility II HLC repeat indicator High layer compatibility i High layer compatibility ii User-user
	This message is sent from the mobile station to the network to initiate a mobile originating call establishment.	*MS*	*Network*	Setup message type BC repeat indicator Bearer capability 1 Bearer capability 2 Facility Calling party sub- address Called party BCD number Called party sub-address LLC repeat indicator Low layer compatibility I Low layer compatibility II HLC repeat indicator High layer compatibility i High layer compatibility ii User-user SS version CLIR suppression CLIR invocation CC capabilities

1.3.2 Call information phase messages

Message	Description	Origin	Dest.	Message Contents
MODIFY	This message is sent by the mobile station to the network or by the network to the mobile station to request a change in bearer capability for a call.	*Both*	*Both*	Modify message type Bearer capability Low layer comp. High layer comp. Reverse call setup direction
MODIFY COMPLETE	This message is sent by the mobile station to the network or by the network to the mobile station to indicate completion of a request to change bearer capability for a call.	*Both*	*Both*	Modify complete message type Bearer capability Low layer comp. High layer comp. Reverse call setup Direction
MODIFY REJECT	This message is sent by the mobile station to the network or by the network to the mobile station to indicate failure of a request to change the bearer capability for a call.	*Both*	*Both*	Modify reject message type Bearer capability Cause Low layer comp. High layer comp.
USER INFORMATION	This message is sent by the mobile station to the network to transfer information to the remote user. This message is also sent by the network to the mobile station to deliver information transferred from the remote user.	*Both*	*Both*	User Information message type User-user More data

1.3.3 Call clearing messages

Message	Description	Origin	Dest.	Message Contents
DISCONNECT	This message is sent by the network to indicate that the end-to-end connection is cleared.	*Network*	*MS*	Disconnect message type Cause Facility Progress indicator User-user
RELEASE	This message is sent, from the network to the mobile station to indicate that the network intends to release the transaction identifier, and that the receiving equipment shall release the transaction identifier after sending RELEASE COMPLETE.	*Network*	*MS*	Release message type Cause Second cause Facility User-user
	This message is sent from the mobile station to the network to indicate that the mobile station intends to release the transaction identifier, and that the receiving equipment shall release the transaction identifier after sending RELEASE COMPLETE.	*MS*	*Network*	Release message type Cause Second cause Facility User-user SS version
RELEASE COMPLETE	This message is sent from the network to the mobile station to indicate that the network has released the transaction identifier and that the mobile station shall release the transaction identifier.	*Network*	*MS*	Release complete message type Cause Facility User-user

	This message is sent from the mobile station to the network to indicate that the mobile station has released the transaction identifier and that the network shall release the transaction identifier.	*MS*	*Network*	Release complete message type Cause Facility User-user SS version

1.3.4 Messages for supplementary service control

Message	Description	Origin	Dest.	Message Contents
FACILITY	This message is sent by the network to the mobile station to request or acknowledge a supplementary service. The supplementary service to be invoked and its associated parameters are specified in the facility information element.	*Network*	*MS*	Facility message type Facility
	This message is sent by the mobile station to the network to request or acknowledge a supplementary service. The supplementary service to be invoked and its associated parameters are specified in the facility information element.	*MS*	*Network*	Facility message type Facility SS version
HOLD	This message is sent by the mobile user to request the hold function for an existing call.	*MS*	*Network*	Hold message type
HOLD ACKNOWLEDGE	This message is sent by the network to indicate that the hold function has been successfully performed.	*Network*	*MS*	Hold Acknowledge message type
HOLD REJECT	This message is sent by the network to indicate the denial of a request to hold a call.	*Network*	*MS*	Hold Reject message type Cause
RETRIEVE	This message is sent by the mobile user to request the retrieval of a held call.	*MS*	*Network*	Retrieve message type
RETRIEVE ACKNOWLEDGE	This message is sent by the network to indicate that the retrieve function has been successfully performed.	*Network*	*MS*	Retrieve Acknowledge message type
RETRIEVE REJECT	This message is sent by the network to indicate the inability to perform the requested retrieve function.	*Network*	*MS*	Retrieve Reject message type Cause

1.3.5 Miscellaneous messages

Message	Description	Origin	Dest.	Message Contents
CONGESTION CONTROL	This message is sent by the mobile station or the network to indicate the establishment or termination of flow control on the transmission of USER INFORMATION messages.	*Both*	*Both*	Congestion control message type Congestion level Spare half octet Cause
NOTIFY	This message is sent either from the mobile station or from the network to indicate information pertaining to a call, such as user suspended.	*Both*	*Both*	Notify message type Notification indicator
START DTMF	This message is sent by the mobile station to the network and contains the digit the network should reconvert back into a DTMF tone which is then applied towards the remote user.	*MS*	*Network*	Start DTMF message type Keypad facility
START DTMF ACKNOWLEDGE	This message is sent by the network to the mobile station to indicate the successful initiation of the action requested by the START DTMF message (conversion of the digit contained in this message into a DTMF tone).	*Network*	*MS*	Start DTMF acknowledge message type Keypad facility
START DTMF REJECT	This message is sent by the network to the mobile station, if the network can not accept the START DTMF message.	*Network*	*MS*	Start DTMF reject message type Cause
STATUS	This message is sent by the mobile station or the network at any time during a call to report certain error conditions listed in clause 8. It shall also be sent in response to a STATUS ENQUIRY message.	*Both*	*Both*	Status message type Cause Call state Auxiliary states
STATUS ENQUIRY	This message is sent by the mobile station or the network at any time to solicit a STATUS message from the peer layer 3 entity. Sending of STATUS message in response to a STATUS ENQUIRY message is mandatory.	*Both*	*Both*	Status enquiry message type
STOP DTMF	This message is sent by a mobile station to the network and is used to stop the DTMF tone sent towards the remote user.	*MS*	*Network*	Stop DTMF message type
STOP DTMF ACKNOWLEDGE	This message is sent by the network to the mobile station to indicate that the sending of the DTMF tone has been stopped.	*Network*	*MS*	Stop DTMF acknowledge message type

2 Abis Interface

2.1 BTS Management (BTSM) – Radio signaling link

2.1.1 Radio link management

Message	Description	Origin	Dest.	Message Contents
DATA REQUEST	This message is sent from BSC to BTS to request the sending of a message in acknowledged mode on a radio link layer connection.	BSC	BTS	Channel number Link Identifier L3 Information
DATA INDICATION	This message is sent from BTS to BSC to indicate the reception of a message in acknowledged mode on a radio link layer connection.	BTS	BSC	Channel number Link Identifier L3 Information
ERROR INDICATION	This message is sent from BTS to BSC to indicate an abnormal case for a radio link layer connection.	BTS	BSC	Channel number Link Identifier RLM Cause
ESTABLISH REQUEST	This message is sent from BSC to BTS to request the establishment of a multi-frame mode (acknowledged mode) link layer connection on the radio path.	BSC	BTS	Channel number Link Identifier
ESTABLISH CONFIRM	This message is sent from BTS to BSC to confirm the establishment of a radio link layer connection in multi-frame (acknowledged) mode.	BTS	BSC	Channel number Link Identifier
ESTABLISH INDICATION	This message is sent from BTS to BSC to indicate the establishment of a radio link layer connection in multi-frame mode, initiated by an MS.	BTS	BSC	Channel number Link Identifier L3 Information
RELEASE REQUEST	This message is sent from BSC to BTS to request the release of multi-frame mode of a radio link layer connection.	BSC	BTS	Channel number Link Identifier Release Mode
RELEASE CONFIRM	This message is sent from BTS to BSC to confirm the release of multi-frame mode of a radio link layer connection.	BTS	BSC	Channel number Link Identifier

RELEASE INDICATION	This message is sent from BTS to BSC to indicate the release of a radio link layer connection (initiated by MS).	BTS	BSC	Channel number Link Identifier
UNIT DATA REQUEST	This message is sent from BSC to BTS to request the sending of a message in unacknowledged mode on a radio link layer connection.	BSC	BTS	Channel number Link Identifier L3 Information
UNIT DATA INDICATION	This message is sent from BTS to BSC to indicate the reception of a message in unacknowledged mode on a radio link layer connection.	BSC	BTS	Channel number Link Identifier L3 Information

2.1.2 Dedicated Channel Management

Message	Description	Origin	Dest.	Message Contents
CHANNEL ACTIVATION	This message is sent from BSC to BTS in order to activate a radio channel. The attributes of the channel are defined in the message.	BSC	BTS	Channel number Activation Type Channel Mode Channel Identification Encryption information Handover Reference BS Power MS Power Timing Advance BS Power Parameters MS Power Parameters Physical Context SACCH Information
CHANNEL ACTIVATION ACKNOWLEDGE	This message is sent from BSC to BTS to acknowledge that the requested channel activation has been completed correctly.	BTS	BSC	Channel number Frame number
CHANNEL ACTIVATION NEGATIVE ACK	This message is sent from BTS to BSC to indicate that the channel activation could not be performed as requested.	BTS	BSC	Channel number Cause
CONNECTION FAILURE	This message is sent from BTS to BSC to indicate that an active connection has been broken for some reason.	BTS	BSC	Channel number Cause
DEACTIVATE SACCH	This message is sent from BSC to BTS in order to deactivate the SACCH of an active channel.	BSC	BTS	Channel number

ENCRYPTION COMMAND	This message is sent from BSC to BTS to start ciphering mode operation.	BSC	BTS	Channel number Encryption information Link Identifier L3 Info (CIPH MOD CMD)
HANDOVER DETECTION	This message is sent from BTS to BSC when BTS correctly receives information from an MS on the handover activated channel.	BTS	BSC	Channel number Access Delay
MEASUREMENT RESULT	This message from BTS to BSC is used to report to BSC the results of radio channel measurements made by BTS (uplink) and to convey the measurement reports from MS received on SACCH and in the L1 headers.	BTS	BSC	Channel number Measurement result number Uplink Measurements BS Power L1 Information L3 Info (MEAS REP) MS Timing Offset
MODE MODIFY REQUEST	This message is sent from BSC to BTS to request a change of channel mode of an active channel.	BSC	BTS	Channel number Channel Mode
MODE MODIFY ACKNOWLEDGE	This message is sent from BTS to BSC to confirm the change of channel mode of an active channel.	BTS	BSC	Channel number
MODE MODIFY NEGATIVE ACKNOWLEDGE	This message is sent from BTS to BSC to indicate that the channel mode modification could not be performed as requested.	BTS	BSC	Channel number Cause
RF CHANNEL RELEASE	This message is sent from BSC to BTS to inform that a radio channel is no longer needed.	BSC	BTS	Channel number
RF CHANNEL RELEASE ACKNOWLEDGE	This message is sent from BTS to BSC as an acknowledge to a RF CHANnel RELease message.	BTS	BSC	Channel number
MS POWER CONTROL	This message is sent from BSC to BTS to change the MS power level or the parameters used by TRX to control the MS power.	BSC	BTS	Channel number MS Power MS Power Parameters
BS POWER CONTROL	This message is sent from BSC to BTS to change the TRX transmission power level or the parameters used by TRX to control its transmission power.	BSC	BTS	Channel number BS Power BS Power Parameters

2.1.3 Common channel management

Message	Description	Origin	Dest.	Message Contents
BCCH INFORMATION	This message is sent from BSC to BTS to indicate new information to be broadcast on BCCH.	BSC	BTS	Channel number System Info Type Full BCCH Info (SYS INFO) Starting Time
CCCH LOAD INDICATION	This message is sent from BTS to BSC to report the current load on the indicated CCCH timeslot (random access, RACH, and paging, PCH).	BTS	BSC	Channel number RACH Load Paging Load
CHANNEL REQUIRED	This message is sent from BTS to BSC to indicate the reception of a CHANnel REQuest message (special access burst message) from an MS.	BTS	BSC	Channel number Request Reference Access Delay Physical Context
DELETE INDICATION	This message is sent from BTS to BSC to indicate the deletion of an access grant message (IMMediate ASSIGN) due to overload of downlink CCCH.	BTS	BSC	Channel number Full Imm. Assign Info
PAGING COMMAND	This message is sent from BSC to BTS to request the paging of an MS.	BSC	BTS	Channel number Paging Group MS Identity Channel Needed
IMMEDIATE ASSIGN COMMAND	This message is sent from BSC to BTS to request the transmission of an immediate assignment message.	BSC	BTS	Channel number Full Imm. Assign Info
SMS BROADCAST REQUEST	This message is sent from BSC to BTS to request the sending of a Short Message Service Cell Broadcast message.	BSC	BTS	Channel number SMSCB Information
SMS BROADCAST COMMAND	This message is sent from BSC to BTS to command Short Message Service Cell Broadcast.	BSC	BTS	Channel number CB Command type SMSCB message

2.1.4 TRX management

Message	Description	Origin	Dest.	Message Contents
RF RESOURCE INDICATION	This message is sent from BTS to BSC to indicate the interference level on idle channels of a TRX.	BSC	BTS	Resource Information
SACCH FILLING	This message is sent from BSC to BTS to indicate the new broadcast information to be used as filling information on downlink SACCH.	BTS	BSC	System Info Type L3 Info (SYS INFO) Starting Time
OVERLOAD	This message is sent from BTS to BSC to indicate an overload situation. Possible cause values include: - CCCH overload, - ACCH overload, - processor overload.	BTS	BSC	Cause
ERROR REPORT	This message is sent from BTS to BSC to report a detected error which cannot be reported in any other message.	BTS	BSC	Cause Message Identifier Channel Number Link identifier Erroneous Message

3 A Interface

3.1 Base Station System Application Part (BSSAP)

Message	Description	Origin	Dest.	Message Contents
ASSIGNMENT REQUEST	This message is sent from the MSC to the BSS via the relevant SCCP connection in order to request the BSS to assign radio resource, the attributes of which are defined within the message.	*MSC*	*BSS*	Channel type Layer 3 header information Priority Circuit identity code Downlink DTX flag Interference band to be used Classmark information 2
ASSIGNMENT COMPLETE	The ASSIGNMENT COMPLETE message is sent from the BSS to the MSC and indicates that the requested assignment has been completed correctly.	*BSS*	*MSC*	RR cause Cell identifier Chosen channel Chosen encryption algorithm Circuit pool
ASSIGNMENT FAILURE	The ASSIGNMENT FAILURE message is sent from the BSS to the MSC via the relevant SCCP connection. It indicates that there has been a failure in the assignment process at the BSS and that the assignment procedure has been aborted.	*BSS*	*MSC*	RR cause Circuit pool Circuit pool list
BLOCK	This message is sent from the BSS to the MSC to indicate that a particular terrestrial resource (i.e. a particular timeslot within a 2Mbit system) must be blocked at the MSC, and cannot therefore be used for traffic. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Circuit identity code Cause
BLOCKING ACKNOWLEDGE	This message is sent from the MSC to the BSS to acknowledge the receipt of an earlier BLOCK message, and to indicate that the circuit concerned has been removed from service. This message is sent as a connectionless SCCP message.	*MSC*	*BSS*	Circuit identity code
UNBLOCK	This message is sent from the BSS to the MSC to indicate that a particular terrestrial resource (ie a particular timeslot within a 2Mbit system) may be returned to service at the MSC, and can therefore be	*BSS*	*MSC*	Circuit identity code

	used for traffic. This message is sent as a connectionless SCCP message.			
UNBLOCKING ACKNOWLEDGE	This message is sent from the MSC to the BSS to acknowledge the receipt of an earlier UNBLOCK message, and to indicate that the circuit concerned has been returned to service. This message is sent as a connectionless SCCP message.	*MSC*	*BSS*	Circuit identity code
HANDOVER REQUEST	This message is sent from the MSC to the BSS via the relevant SCCP connection to indicate that the MS is to be handed over to that BSS.	*MSC*	*BSS*	Channel type Encryption information Classmark information 1 or Classmark information 2 Priority Circuit identity code Downlink DTX flag Cell identifier (target) Interference band to be used Cause Classmark information 3 Current Channel
HANDOVER REQUIRED	This message is sent from the BSS to the MSC to indicate that for a given MS which already has a dedicated radio resource assigned, a handover is required for the reason given by the cause element. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	Cause Response request Cell identifier list (preferred) Circuit pool list Current channel
HANDOVER REQUEST ACKNOWLEDGE	This message is sent from the BSS to the MSC and indicates that the request to support a handover at the target BSS can be supported by the BSS, and also to which radio channel the MS should be directed. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	Layer 3 information Chosen channel Chosen encryption algorithm Circuit pool
HANDOVER COMMAND	This message is sent from the MSC to the BSS via the relevant SCCP connection and contains the target channel to which the MS should retune.	*MSC*	*BSS*	Layer 3 information Cell identifier

HANDOVER COMPLETE	This message is sent from the BSS to the MSC via the relevant SCCP connection. It indicates that the correct MS has successfully accessed the target cell.	*BSS*	*MSC*	RR cause
HANDOVER CANDIDATE ENQUIRE	This message is sent from the MSC to the BSS, using the connectionless services of the SCCP.	*MSC*	*BSS*	Number of MSs Cell identifier list Cell identifier
HANDOVER CANDIDATE RESPONSE	This message is sent from the BSS to the MSC in response to receipt of a HANDOVER CANDIDATE ENQUIRE message. It contains the number of MSs for which HANDOVER REQUIRED messages have been sent.This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Number of MSs Cell identifier
HANDOVER FAILURE	This message is sent from the BSS to the MSC via the relevant SCCP connection. It indicates to the MSC that there has been a failure in the resource allocation process on handover, and that the handover has been aborted.	*BSS*	*MSC*	Cause RR cause Circuit pool Circuit pool list
RESOURCE REQUEST	This message is sent from the MSC to the BSS and requests the current spare and optionally the total accessible resource on a particular cell. This message is sent as a connectionless SCCP message.	*MSC*	*BSS*	Periodicity Resource indication method Cell identifier Extended Resource Indicator
RESOURCE INDICATION	This message is sent from the BSS to the MSC in response to a resource request message, the message includes an explicit indication of the cell concerned. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Resource indication method Resource available Cell identifier Total resource acessible
PAGING	This message is sent from the MSC to the BSS and contains sufficient information to allow the paging message to be transmitted by the correct cells at the correct time. This message is sent as a connectionless SCCP message.	*MSC*	*BSS*	IMSI TMSI Cell identifier list Channel needed

CLEAR REQUEST	This message is sent from the BSS to the MSC to indicate to the MSC that the BSS wishes to release the associated dedicated resource. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	Cause
CLEAR COMMAND	This message is sent from the MSC to the BSS to instruct the BSS to release the associated dedicated resource. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*MSC*	*BSS*	Layer 3 header information Cause
CLEAR COMPLETE	This message is sent from the BSS to the MSC to inform the MSC that the associated dedicated resource has been successfully cleared. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	
RESET	This message can be sent either from the BSS to the MSC or from the MSC to the BSS. It indicates to the receiving entity that the transmitting entity has suffered a failure and has lost memory of the calls in progress, calls set up, and associated references. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Cause
RESET ACKNOWLEDGE	This message can be sent either from the BSS to the MSC or from the MSC to the BSS. It indicates to the receiving entity that the transmitting entity has cleared all calls and reset all references, and is ready to resume service. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	
HANDOVER PERFORMED	This message is sent from the BSS to the MSC in order to indicate that the BSS has performed an internal handover. The cell identifier and (if required for O and M reasons) optionally the new channel identity is included. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	Cause Cell identifier Chosen channel Chosen encryption algorithm

OVERLOAD	This message is sent from the BSS to the MSC or from the MSC to the BSS. When sent from the BSS tothe MSC it indicates either processor overload of the whole BSS (cell identifier field not present) or overload of a CCCH downlink in which case the relevant cell is identified. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Cause Cell identifier
MSC INVOKE TRACE	This message is sent from the MSC to the BSS in order to start production of a trace record at the BSS. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*MSC*	*BSS*	Trace type Trigger Id Trace reference Transaction Id Mobile Identity OMC Id
BSS INVOKE TRACE	This message is sent from the BSS to the MSC in order to start production of a trace record at the MSC and/or from the MSC to BSS to target BSSs after a handover. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	Trace type Forward Indicator Trigger Id Trace reference Transaction Id OMC Id
CLASSMARK UPDATE	This message is sent from the BSS to the MSC or from the MSC to the BSS via the relevant SCCP connection associated with that MS transaction. It updates the classmark parameters for the concerned MS.	*BSS*	*MSC*	Classmark information type 2 Classmark information type 3
CIPHER MODE COMMAND	This message is sent from the MSC to the BSS via the relevant SCCP connection associated with that MS transaction. It updates the encryption parameters for the concerned MS.	*MSC*	*BSS*	Layer 3 header information Encryption information Cipher response mode
CIPHER MODE COMPLETE	This message is sent from the BSS to the MSC via the relevant SCCP connection. It indicates that a successful cipher synchronisation has been achieved across the radio interface.	*BSS*	*MSC*	Layer 3 message contents Chosen encryption algorithm
COMPLETE LAYER 3 INFORMATION	The message is sent from the BSS to the MSC as described in section 3.1.16 (on receipt of the initial layer 3 message on a dedicated channel, e.g. PAGING RESPONSE, LOCATION UPDATING REQUEST, CM	*BSS*	*MSC*	Cell identifier Layer 3 information Chosen channel

	REESTABLISHMENT REQUEST, CM SERVICE REQUEST, IMSI DETACH). The message is sent via the BSSAP SCCP connection established for the associated dedicated resource.			
QUEUEING INDICATION	This message is sent from the BSS to the MSC in order to indicate a delay in the assignment of the required TCH. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	
SAPI "n" REJECT	This message is sent from the BSS to the MSC in order to indicate that a message with a SAPI value other than "0" has been rejected. The message is sent via the BSSAP SCCP connection associated with the dedicated resource.	*BSS*	*MSC*	DLCI Cause
HANDOVER REQUIRED REJECT	This message is sent from the MSC to the BSS via the relevant SCCP connection. It indicates to the BSS that the HANDOVER REQUIRED message has not resulted in handover.	*MSC*	*BSS*	Cause
RESET CIRCUIT	This message is sent either from the BSS to the MSC or from the MSC to the BSS. It indicates to the receiving entity that the state of the circuit indicated in the message is unknown, due to a failure. This message is sent as a SCCP connectionless message.	*BSS*	*MSC*	Circuit identity code Cause
RESET CIRCUIT ACKNOWLEDGE	This message is sent either from the BSS to the MSC or from the MSC to the BSS. It indicates to the receiving entity that the transmitting entity has cleared a possible call using the circuit, and is ready to resume service. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Circuit identity
HANDOVER DETECT	This message is sent from the BSS to the MSC via the relevant SCCP connection. It indicates that the correct MS has successfully accessed the target cell.	*BSS*	*MSC*	

CIRCUIT GROUP BLOCK	This message is sent from the BSS to the MSC to indicate that a set of terrestrial resources (ie some timeslots within a system of 2Mbit PCM multiplex) must be blocked at the MSC, and cannot therefore used for traffic. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Cause Circuit identity code Circuit identity code list
CIRCUIT GROUP BLOCKING ACKNOWLEDGE	This message is sent from the MSC to the BSS to acknowledge the receipt of an earlier CIRCUIT GROUP BLOCK message, and to indicate that the circuits indicated in the status subfield of the Circuit Identity Code List have been removed from service. This message is sent as a connectionless SCCP message.	*MSC*	*BSS*	Circuit identity code Circuit identity code list
CIRCUIT GROUP UNBLOCK	This message is sent from the BSS to the MSC to indicate that a set of terrestrial resources (ie some timeslots within a system of 2Mbit PCM multiplex) may be returned to service at the MSC, and can therefore be used for traffic. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Circuit identity code Circuit identity code list
CIRCUIT GROUP UNBLOCKING ACKNOWLEDGE	This message is sent from the MSC to the BSS to acknowledge the receipt of an earlier CIRCUIT GROUP UNBLOCK message, and to indicate that the circuits indicated in the status subfield of the Circuit Identity Code List have been returned to service. This message is sent as a connectionless SCCP message.	*MSC*	*BSS*	Circuit identity code Circuit identity code list
CONFUSION	This message is sent in either direction in response to a message which cannot be treated correctly for some reason, and for which another failure message cannot substitute. The use of this message may be under operator control.	*Both*	*Both*	Cause Diagnostics

CLASSMARK REQUEST	This message is sent from the MSC to the BSS via the relevant SCCP connection associated with that MS transaction. It requests an update of the classmark parameters for the concerned MS.	*MSC*	*BSS*	
UNEQUIPPED CIRCUIT	This message is sent from the BSS to the MSC or vice versa to indicate to the partner entity that it is utilising one or several circuit identity codes which are unknown and which therefore should be locally blocked immediately and taken out of service. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Circuit identity code Circuit identity code list
CIPHER MODE REJECT	This message is sent from the BSS to the MSC via the relevant SCCP connection associated with that MS transaction. It indicates that the BSS is unable to perform the requested ciphering.	*BSS*	*MSC*	Cause
LOAD INDICATION	The LOAD INDICATION message is sent from the BSS to the MSC and from the MSC to the BSS. It indicates to the receiving entity that the transmitting BSS has detected a load situation in the concerned cell. This message is sent as a connectionless SCCP message.	*BSS*	*MSC*	Time indication Cell identifier Cell identifier list (target) Resource situation Cause

4 Mobile Application Part (MAP)

4.1 Mobility services

4.1.1 Location management services

Message	Description	Origin	Dest.	Message Contents
MAP_UPDATE_LOCATION_AREA	This service is used between MSC and VLR to update location information in the network. It is initiated by an MS when changing the location area or at first registration.	MSC	VLR	Location Update Type IMSI TMSI Previous location area ID CKSN
MAP_UPDATE_LOCATION	This service is used by the VLR to update the location information stored in the HLR.	VLR	HLR	IMSI MSC Address VLR number LMSI HLR number
MAP_CANCEL_LOCATION	This service is used between HLR and VLR to delete a subscriber record from the VLR. It may be invoked automatically when an MS moves from one VLR area to another, to remove the subscriber record from the old VLR, or by the HLR operator to enforce a location updating from the VLR to the HLR, e.g. on withdrawal of a subscription.	HLR	VLR	IMSI LMSI
MAP_SEND_IDENTIFICATION	The MAP_SEND_IDENTIFICATION service is used between a VLR and a previous VLR to retrieve IMSI and authentication sets for a subscriber registering afresh in that VLR.	VLR	VLR	TMSI
MAP_DETACH_IMSI	The MAP_DETACH_IMSI service is used by the MSC to indicate to the VLR that an MS is no longer reachable. The network needs this information e.g. to reject an incoming call without initiating paging on the radio path.	MSC	VLR	IMSI TMSI
MAP_PURGE_MS	This service is used between the VLR and the HLR to cause the HLR to mark its data for an MS so that any request for routing information for a mobile terminated call or a mobile terminated short message be treated as if the MS is not reachable. It is invoked when the subscriber record for the MS is to deleted in the VLR, either by MMI interaction or automatically,	VLR	HLR	IMSI VLR number

	e.g. because the MS has been inactive several days.			

4.1.2 Paging and search

Message	Description	Origin	Dest.	Message Contents
MAP_PAGE	This service is used between VLR and MSC to initiate paging of an MS for mobile terminated call set-up, mobile terminated short message or unstructured SS notification.	VLR	MSC	IMSI Stored location area Id TMSI
MAP_SEARCH_FOR_MS	This service is used between VLR and MSC to initiate paging of an MS in all location areas of that VLR. It is used if the VLR does not hold location area information confirmed by radio contact.	VLR	MSC	IMSI

4.1.3 Access management services

Message	Description	Origin	Dest.	Message Contents
MAP_PROCESS_ACCESS_REQUEST	This service is used between MSC and VLR to initiate processing of an MS access to the network, e.g. in case of mobile originated call set-up or after being paged by the network.	MSC	VLR	CM service type Access connection status Current Location Area Id TMSI Cksn IMSI IMEI

4.1.4 Handover services

Message	Description	Origin	Dest.	Message Contents
MAP_PREPARE_HANDOVER	This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over from MSC-A to MSC-B.	MSC-A	MSC-B	Target Cell Id HO-NumberNotRequired BSS-APDU

MAP_SEND_END_SIGNAL	This service is used between MSC-B and MSC-A (E-interface) indicating that the radio path has been established by MSC-B to the MS. MSC-A retains then the main control of the call until it clears. The response is used by MSC-A to inform MSC-B that all resources for the call can be released in MSCB, either because the call has been released in MSC-A or because the call has been successfully handed over from MSC-B to another MSC.	MSC-B	MSC-A	BSS-APDU
MAP_PROCESS_ACCESS_SIGNALLING	This service is used between MSC-B and MSC-A (E-interface) to pass information received on the A-interface in MSC-B to MSC-A.	MSC-B	MSC-A	BSS-APDU
MAP_FORWARD_ACCESS_SIGNALLING	This service is used between MSC-A and MSC-B (E-interface) to pass information to be forwarded to the A-interface of MSC-B.	MSC-A	MSC-B	BSS-APDU
MAP_PREPARE_SUBSEQUENT_HANDOVER	This service is used between MSC-B and MSC-A (E-interface) to inform MSC-A that it has been decided that a handover to either MSC-A or a third MSC (MSC-B') is required.	MSC-B	MSC-A	Target Cell Id Target MSC Number BSS-APDU
MAP_ALLOCATE_HANDOVER_NUMBER	This service is used between MSC and VLR (B-interface) to request a handover number.	MSC	VLR	
MAP_SEND_HANDOVER_REPORT	This service is used between VLR and MSC-B (B-interface) to transfer the handover number to be forwarded to and used by MSC-A.	VLR	MSC-B	Handover Number

4.1.5 Authentication management services

Message	Description	Origin	Dest.	Message Contents
MAP_AUTHENTICATE	This service is used between the VLR and the MSC when the VLR receives a MAP service indication from the MSC concerning a location registration, call set-up, operation on a supplementary service or a request from the MSC to initiate authentication.	VLR	MSC	RAND CKSN

MAP_SEND_AUTHENTICATION_INFO	This service is used between the VLR and the HLR for the VLR to retrieve authentication information from the HLR. The VLR requests some sets of RAND/SRES/Kc vectors. If the HLR cannot provide the VLR with triplets, an empty response is returned. The VLR may then re-use old authentication triplets.	VLR	HLR	IMSI

4.1.6 Security management services

Message	Description	Origin	Dest.	Message Contents
MAP_SET_CIPHERING_MODE	This service is used between the VLR and the MSC to set the ciphering mode and to start ciphering applicable. It is called when another service requires that information is to be sent on the radio path encrypted form.	VLR	MSC	Ciphering mode

4.1.7 International mobile equipment identities management services

Message	Description	Origin	Dest.	Message Contents
MAP_CHECK_IMEI	This service is used between the VLR and the MSC and between the MSC and the EIR to request check of IMEI. If the IMEI is not available in the MSC, it is requested from the MS and transferred to the EIR in the service request.	VLR MSC	MSC EIR	IMEI
MAP_OBTAIN_IMEI	This service is used between the VLR and the MSC to request the IMEI. If the IMEI is not available in the MSC, it is requested from the MS.	VLR	MSC	

4.1.8 Subscriber management services

Message	Description	Origin	Dest.	Message Contents
MAP-INSERT-SUBSCRIBER-DATA	This service is used by an HLR to update a VLR with certain subscriber data in the following occasions: - the operator has changed the subscription of one or more supplementary services, basic services or data of a subscriber. Note that in case of withdrawal of a Basic or Supplementary service this primitive shall not be used; - the operator has applied, changed or removed Operator Determined Barring; - the subscriber has changed data concerning one or more supplementary services by using a subscriber procedure; - the HLR provides the VLR with subscriber parameters at location updating of a subscriber or at restoration. In this case, this service is used to indicate explicitly that a supplementary service is not provisioned, if the supplementary service specification requires it. The only supplementary services which have this requirement are the CLIR and COLR services.	HLR	VLR	
MAP-DELETE-SUBSCRIBER-DATA	This service is used by an HLR to remove certain subscriber data from a VLR if the subscription of one or more supplementary services or basic services is withdrawn. Note that this service is not used in case of erasure or deactivation of supplementary services.	HLR	VLR	IMSI

4.1.9 Identity management services

Message	Description	Origin	Dest.	Message Contents
MAP-PROVIDE-IMSI	This service is used by a VLR in order to get, via the MSC, the IMSI of a subscriber (e.g. when a subscriber has identified itself with a TMSI not allocated to any subscriber in the VLR).	MSC	VLR	
MAP-FORWARD-NEW-TMSI	This service is used by a VLR to allocate, via MSC, a new TMSI to a subscriber during an ongoing transaction (e.g. call set-up, location updating or supplementary services operation).	MSC	VLR	TMSI

4.2 Call handling services

Message	Description	Origin	Dest.	Message Contents
MAP_SEND_INFO_FOR_INCOMING_CALL	This service is used between an MSC and VLR. It is invoked by an MSC receiving an incoming call (call to MS) to request the VLR for information to proceed and set up the call.	MSC	VLR	MSRN Bearer Service Tele Service Dialled Number CUG Interlock CUG Outgoing Access Number of Forwarding
MAP_SEND_INFO_FOR_OUTGOING_CALL	This service is used between an MSC and VLR. The service is invoked by an MSC to retrieve the required information from a VLR to enable an outgoing call set up request (call from an MS) to be actioned.	MSC	VLR	Called Number Bearer Service Tele Service CUG Index Suppress Pref CUG Suppress CUG OA
MAP_SEND_ROUTING_INFORMATION	This service is used between the Gateway MSC and the HLR. The service is invoked by the Gateway MSC to perform the interrogation of the HLR in order to route a call towards the called MS.	MSC	HLR	MSISDN CUG Interlock CUG Outgoing Access Number of Forwarding Network Signal Info
MAP_PROVIDE_ROAMING_NUMBER	This service is used between the HLR and VLR. The service is invoked by the HLR to request a VLR to send back a roaming number to enable the HLR to instruct the GMSC to route an incoming call to the called MS.	HLR	VLR	IMSI MSC Number MSISDN LMSI GSM Bearer Capability Network Signal Info
MAP_COMPLETE_CALL	This service is used between the VLR and MSC. The service is invoked by a VLR to request the MSC to set up a call to an MS in the case of an incoming call, and from an MS for an outgoing call.	VLR	MSC	MSISDN IMEI Category CUG Index GSM Bearer Capability Network Signal Info No Reply Condition Time SS-Data list CUG Interlock CUG Outgoing Access
MAP_PROCESS_CALL_WAITING	This service is used between the VLR and MSC. It is invoked by the VLR to request the MSC to invoke the Call Waiting service.	VLR	MSC	MSISDN NoReply Condition Time SS-Data List CUG Index GSM Bearer Capability Network Signal Info

4.3 Short message service management services

Message	Description	Origin	Dest.	Message Contents
MAP-SEND-ROUTING-INFO-FOR-SM	This service is used between the gateway MSC and the HLR to retrieve the routing information needed for routing the short message to the servicing MSC.	GMSC	HLR	MSISDN SM-RP-PRI Service Centre Address
MAP-FORWARD-SHORT-MESSAGE	This service is used between the gateway MSC and the servicing MSC to forward mobile originated or mobile terminated short messages.	GMSC	MSC	SM RP DA SM RP OA SM RP UI More Messages To Send
MAP-REPORT-SM-DELIVERY-STATUS	This service is used between the gateway MSC and the HLR. The MAP-REPORT-SM-DELIVERYSTATUS service is used to set the Message Waiting Data into the HLR or to inform the HLR of successful SM transfer after polling. This service is invoked by the gateway MSC.	GMSC	HLR	MSISDN Service Centre Address SM Delivery Outcome
MAP-READY-FOR-SM	This service is used between the MSC and VLR and as well between the VLR and the HLR. The MSC initiates this service if a subscriber indicates memory available situation. The VLR uses the service to indicate this to the HLR.	MSC VLR	VLR HLR	IMSI TMSI Alert Reason
MAP-ALERT-SERVICE-CENTRE	This service is used between the HLR and the interworking MSC. The HLR initiates this service, if the HLR detects that a subscriber, whose MSISDN is in the Message Waiting Data file, is active or the mobile station has memory available.	HLR	MSC	MSIsdn-Alert Service Centre Address
MAP-INFORM-SERVICE-CENTRE	This service is used between the HLR and the gateway MSC to inform the Service Centre which MSISDN number is stored in the Message Waiting Data file. If the stored MSISDN number is not the same than the one received from the gateway MSC in the MAP-SEND-ROUTING-INFO-FOR-SM service primitive the stored MSISDN number is included in the message. Additionally the status of MCEF and MNRF flags and the inclusion of the particular Service Centre address in the Message Waiting Data list is informed to the gateway MSC when appropriate.	HLR	GMSC	MSIsdn-Alert MWD Status
MAP-SEND-INFO-FOR-MT-SMS	This service is used between the MSC and the VLR. The service is invoked by the MSC receiving an mobile terminated short message to request subscriber related information from the VLR.	MSC	VLR	SM RP DA
MAP-SEND-INFO-FOR-MO-SMS	This service is used between the MSC and the VLR. The service is invoked by the MSC which has to handle a mobile originated short message request to request the subscriber related information from the VLR.	MSC	VLR	Service Centre Address

Sources

- GSM 04.08 (ETS 300 557): "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".
- GSM 08.58 (ETS 300 596): “Digital cellular telecommunications system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 3 specification”
- GSM 08.08 (ETS 300 590): “Digital cellular telecommunications system (Phase 2);Mobile-services Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification”
- GSM 09.02 (ETS 300 599): "Digital cellular telecommunications system (Phase 2); Mobile Application Part (MAP) specification".

Message Index