MSC_VLR Interfaces (GSM Originating Call)


This scenario describes the call setup for a GSM originating call. A mobile user calling a land line subscriber is covered here.

Begin RR Connection Establishment

Call related information needs to be transported from the mobile phone to the Mobile Switching Center (MSC). This requires the establishment of a Radio Resource (RR) connection to MSC. The first phase of the call setup just sets up this RR connection.

Note: The RR CHANNEL REQUEST is sent on a Random Access Channel (RACH). This is a slotted aloha channel that can be used at random, without any coordination between the mobiles. Any mobile can transmit on this channel whenever it wishes. If two mobiles transmit on the channel at the same time, their messages will be lost in a collision. The mobiles will detect the collision via a timeout and retransmit the message after a random back off.

SCCP CONNECTION REQUEST + MM CM SERVICE REQUEST

The BSS receives the CM Service Request message from the mobile and forms a "BSSMAP COMPLETE LAYER 3 INFORMATION". The BSS then piggybacks the message on the SCCP connection request message.

LEG: Skip Authentication Procedure

MSC checks if the subscriber has been authenticated. In this case, the subscriber has already been authenticated, so the authentication procedure is skipped.

Enable Ciphering

Since the subscriber has been successfully authenticated, the MSC initiates ciphering of the data being sent on the channel. The channel is ciphered so as to protect the call from eavesdropping.

BSSMAP CIPHER MODE COMPLETE

BSS replies back to the MSC, indicating that ciphering has been successfully enabled.

RR Connection Establishment Completed

At this point a connection has been setup between the Mobile and the MSC. From this point onward, the BSS is just acting as a conduit for transporting the signaling messages between the Mobile and the MSC.

Call Setup

The Mobile sends the setup message to establish a voice call. The message contains the dialed digits and other information needed for call establishment.

Mode Modify

The MSC allocates a voice circuit on one of the digital trunks between the MSC and the BSS. MSC informs the BSS about the allocated voice circuit. The call is also switched from signaling to voice.

BSSMAP ASSIGNMENT REQUEST

BSSMAP ASSIGNMENT COMPLETE

The BSS responds back to the MSC.

ISUP INITIAL ADDRESS MESSAGE

The PSTN indicates to the MSC that it has received all the digits and the called subscriber is being rung.

ISUP ADDRESS COMPLETE MESSAGE

The MSC routes the call and sends the call towards the called subscriber.

SS7, Dialed Digits

The PSTN indicates to the MSC that it has received all the digits and the called subscriber is being rung.
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<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CC ALERTING</strong></td>
<td>The MSC informs the mobile that the called subscriber is being alerted via a ring. The called subscriber answers the call.</td>
</tr>
<tr>
<td><strong>ISUP ANSWER</strong></td>
<td>The MSC informs the mobile that the call has been answered. Acknowledge the receipt of CC CONNECT.</td>
</tr>
<tr>
<td><strong>CC CONNECT</strong></td>
<td>The MSC informs the mobile that the call has been answered. Acknowledge the receipt of CC CONNECT.</td>
</tr>
<tr>
<td><strong>ISUP RELEASE</strong></td>
<td>The MSC initiates release on the PSTN side. The MSC disconnects the voice path and also releases the voice circuit between the BSS and the MSC.</td>
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<tr>
<td><strong>CC RELEASE</strong></td>
<td>The MSC informs the Mobile that it has initiated call release. The MSC informs the PSTN that the call release has been completed. The PSTN informs that call release has been completed at its end. Mobile indicates that the call has been released.</td>
</tr>
<tr>
<td><strong>ISUP RELEASE COMPLETE</strong></td>
<td>Call release has been completed, now the RR connection is released by the MSC. The BSS informs the MSC that the RR connection has been released.</td>
</tr>
</tbody>
</table>

### Conversation

#### Call Release

- **CC DISCONNECT**
- **ISUP RELEASE**
- **ISUP RELEASED**
- **ISUP RELEASE COMPLETE**

### RR Connection Release

- **BSSMAP CLEAR COMMAND**
- **BSSMAP CLEAR COMPLETE**