CSE DEPARTMENT, IIT KANPUR

Mobile Channel Handover Simulation

CS634 Sem-II 2013-14

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1 PROBLEM STATEMENT

Handover has three distinct steps: measurements, decision, and execution. MS measures signal strength of 16 neighboring stations and reports six strongest signals every 480ms to BSC. Then BSC makes a decision for handover and send request to MSC. MSC transmits the handover request to new BSC. New BSC does resource allocation then sends a channel activation message to new BS under it. Ack is sent by new BS to its BSC which then sends an ack to handover request from MSC. The ack will contain information about allocated radio resources. MSC then send handover command to old BSC of MS which is relayed via old BS to MS. Then MS accesses new BS via the allocated channel and establishes link. After link establishment message is received handover is complete, handover completion message is sent to new BS. New BS relays the completion message to MSC via BSC which was also sent to old BSC for flushing the data structures and allocated resources from old BSC including the traffic channel. Idea is to write socket program for handover in GSM. For implementing this, use the following parameters.

1. Two cluster of cells have 100 channels each, where each cluster is associated with a different Base Station (BS) and 14 traffic channels (TCH) are allocated per cell while remaining 2 channels are control channels (CCH) per cluster.
2. One of the two control channels is SACCH on which MS reports measurements every 480ms while the call is active.
3. On the basis of reported measurements, BSC can take a decision about handover when signal falls below a required strength.

4. We will call other control channel as AGCH (Access Grant Channel) which is purely downlink channel. Using AGCH, old BSC can send the details of the information regarding handover as mentioned earlier. Of course, in actual GSM operation AGCH is used for other purpose.

5. MS then uses TCH allocated by new BSC.

6. If a TCH is not available at new BSC, the handover command from the BSC will indicate handover request can not be granted to the MSC and the call will drop.

7. The concept of borrowing has been discussed in the class. It is explained as follows. In case a TCH is not available for the handover call at the new BS, new BSC will see if a channel can be borrowed from an adjacent cell. Channel borrowing will lead to locking of the borrowed channel in all co-channel cells of the lending cell. The details of locking and releasing the loc can be found from the lecture notes. Also implement the channel switching policies mentioned therein.

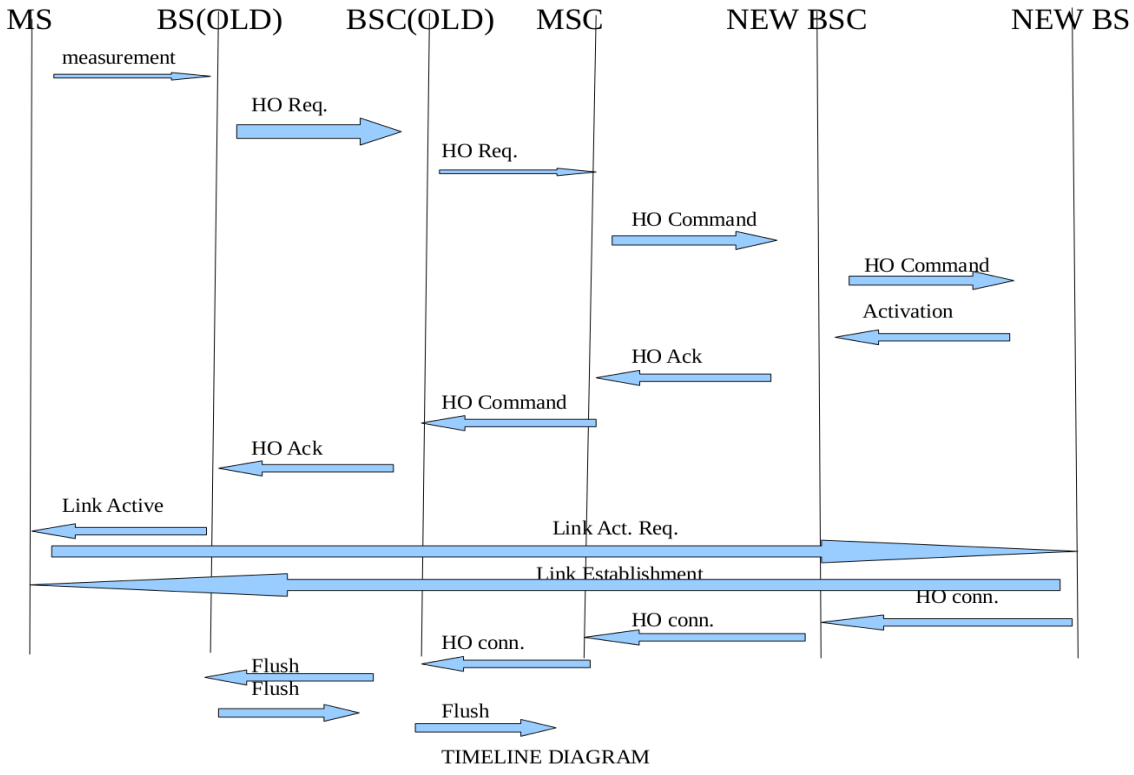

Figure 1.1: Handover Mechanism