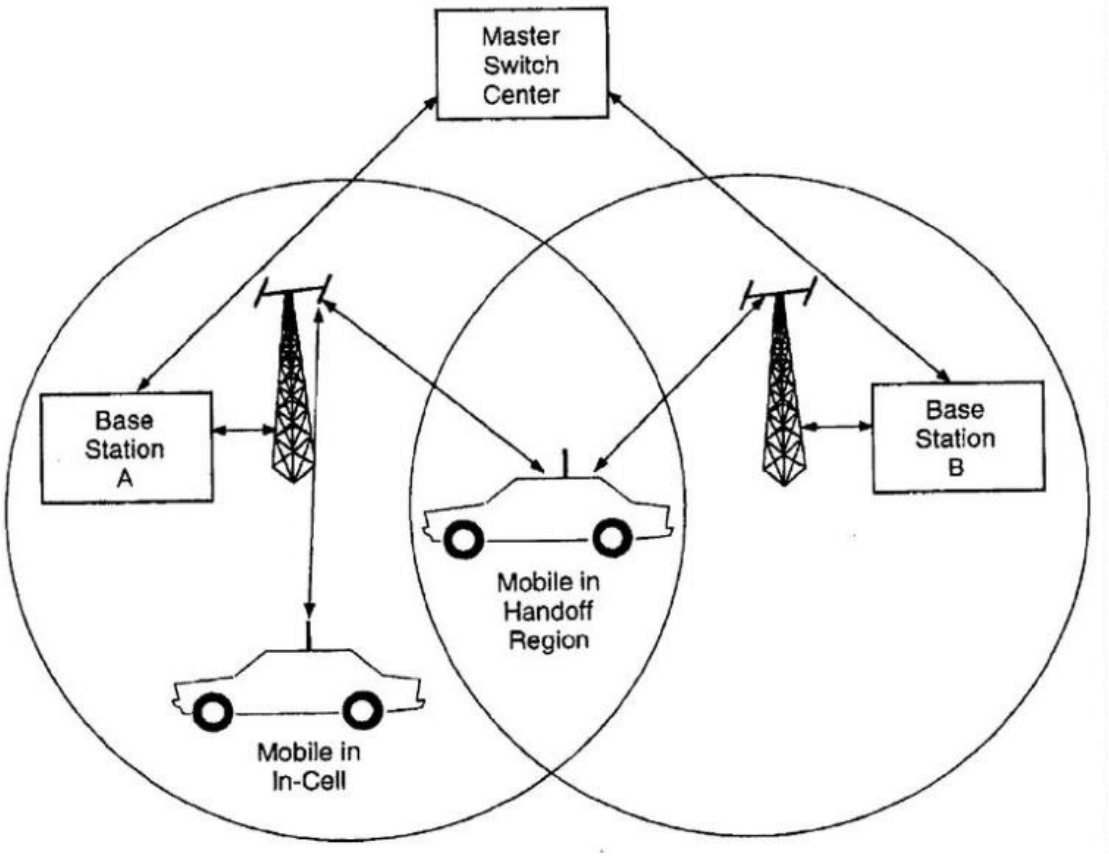
Handoff

It may happen that, during a conversation, the mobile station moves from one cell to another. When it does, the signal may become weak. To solve this problem, the MSC monitors the level of the signal every few seconds. If the strength of the signal diminishes, the MSC seeks a new cell that can better accommodate the communication. The MSC then changes the channel carrying the call (hands the signal off from the old channel to a new one).

The terms handover or handoff refers to the process of transferring ongoing call or data connectivity from one Base Station to other Base Station. When a mobile moves into the different cell while the conversation is in progress then the MSC (Mobile Switching Centre) transfer the call to a new channel belonging to the new Base Station.



Need for Handoff

- As the user (MS) moves away from the cell of one tower (BS), the signal strength of that BS reduces. However, the signal from another (now closer) BS grows, and a handoff is imminent.
- One of the building blocks of cellular communication is mobility, which refers to providing users with the freedom of movement while they still are connected to the network.

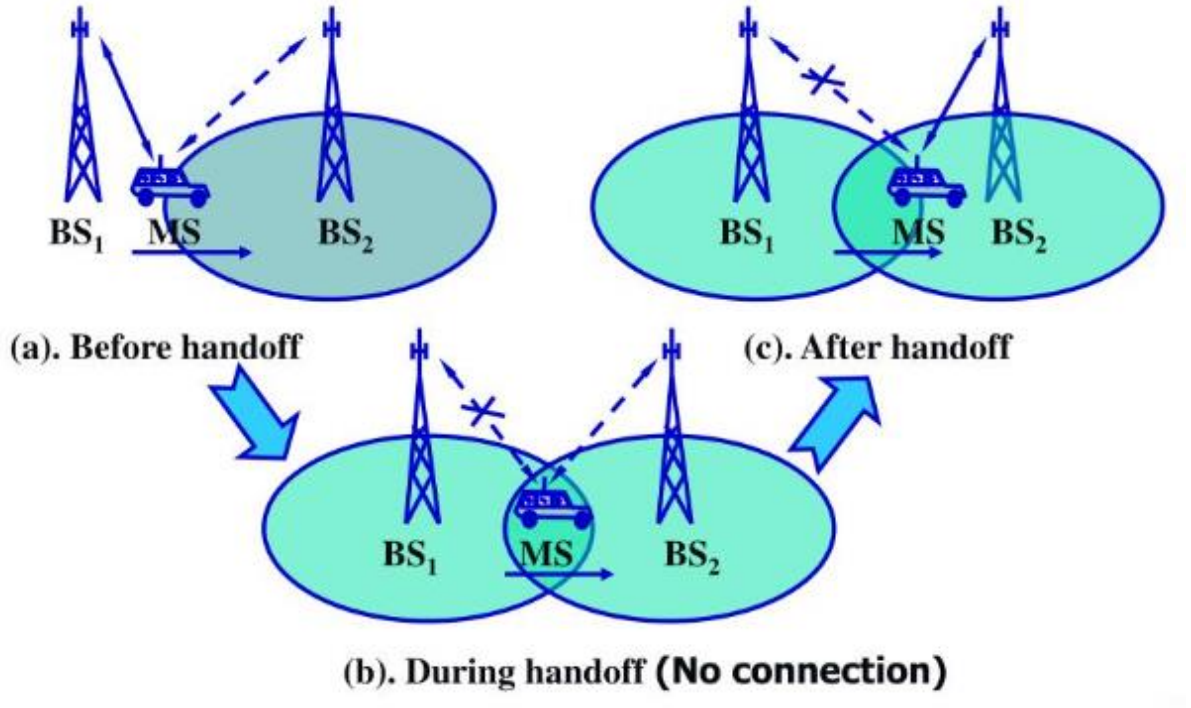
- One of the building blocks of cellular communication is mobility, which refers to providing users with the freedom of movement while they still are connected to the network.
- If a MS who is in a call or a data session moves out of coverage of one cell and enters coverage area of another cell, a handoff is triggered for a continuum of service
- Each cell has a pre-defined capacity, i.e. it can handle only a specific number of MS. If the number of users using a particular cell reaches its maximum capacity, then a handoff occurs. Some of the calls are transferred to adjoining cells, provided that the MS is in the overlapping coverage area of both the cells.

Type of Handoff

1. Hard handoff
2. Soft handoff

Hard Handoff

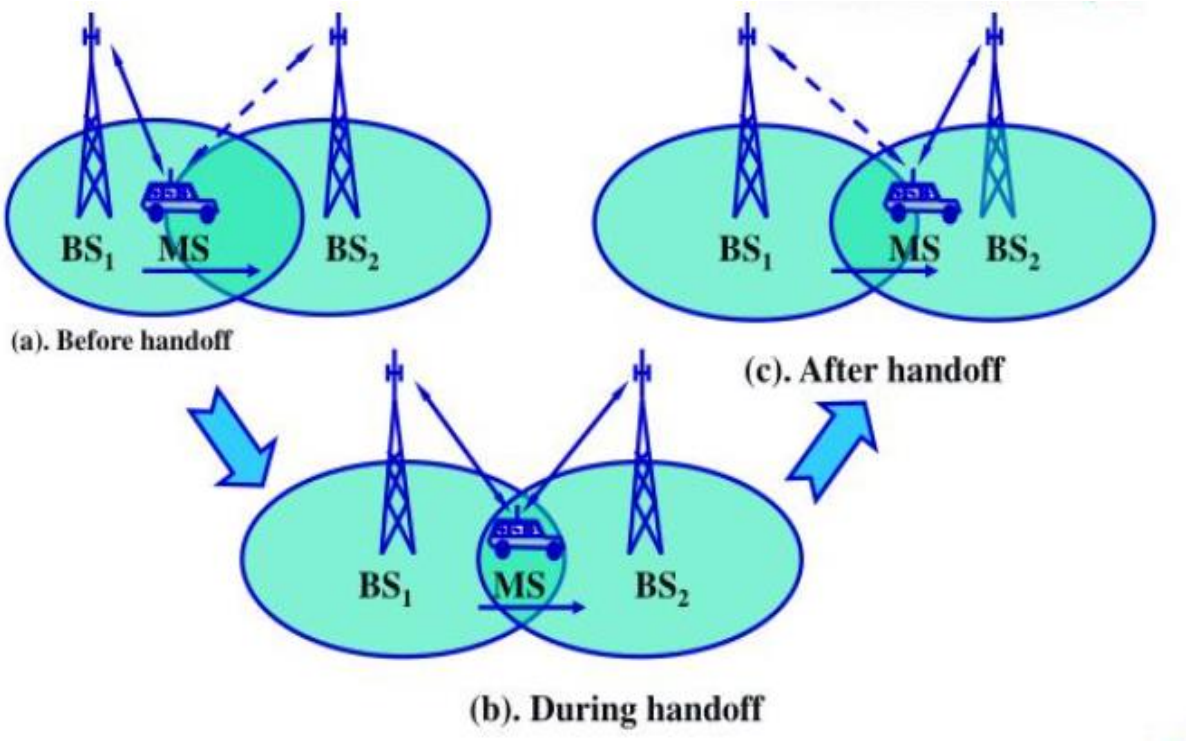
Hard Handoff is a technique that requires the user's connection to be broken before connecting to another while switching between two BTS and hence is equivalent to "breaking before making". There is no burden on the Base Station and MSC because the switching takes place so quickly that it can hardly be noticed by the users. There is no connection when breaking the connection because of that there is slight disturbance almost negligible



Soft Handoff

Systems use a soft handoff. In this case, a mobile station can communicate with two base stations at the same time. This means that, during handoff, a mobile station may continue with the new base station before breaking off from the old one.

In Soft Handoff, at least one of the links is kept when radio signals are added or removed to the Base Station. Soft Handoff adopted the 'make before break' policy. Soft Handoff is more costly than Hard Handoff.



Difference between Hard and Soft Handoff

Hard Handoff	Soft Handoff
It is defined as hand-off where an existing connection must be broken when the new one is established.	It is defined as hand-off where a new connection is established before old one is released.
Only one connection at a time (some time no connection)	Always have at least one or more connection at a time
Slight Disturbance	No disturbance
Less complex when compared to soft hand-off.	It is more complex than hard hand-off.
Cheaper in cost	Cheaper in cost
It allocates different frequency.	It allocates same frequency.