20XW61 - MOBILE COMPUTING

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CALL DELIVERY PROCEDURES

Lets do a small puppy time travel.. All the concepts that we have learned so far…pretty interesting right?? Have you ever wondered what are all the background processes that work for us just when we need to call a friend for just saying *"Send me the answer"* and keep it down? So if yes the document that you have is the right place! This session tells us about the important tasks that happens when we *call* to our callees

DEFINITION :

There are some certain procedures that are undertaken for placing a call and these procedures are called as *call delivery procedure.* Let's describe this, **call delivery refers to the process of connecting a call from the calling party to the called party.**

This following procedures vary or differ completely from internet calling procedures need not to confuse with it.

THE PROCEDURE:

Welcome to the main section. This process involves several steps, including:

- **Calling MS sends a call initiation signal to MSC through BS.**
  Let us break this down. First of all whats *call initialisation signal?* This is a **digital signal** that has information such as The signal consists of digital data that includes the identity of the calling MS, the phone number of the called party, and other information required for call setup. This also assigned by the BS

- **The BS forwards the call initiation signal to the Mobile Switching Center (MSC) along with the identity of the calling MS.**
  Once the mobile phone has been assigned a frequency and time slot, it sends a call initiation signal to the BS, which forwards it to the Mobile Switching Center (MSC).

- **The MSC sends a location request to the Home Location Register (HLR) of the called MS to retrieve the current location of the called MS**. When the HLR receives the location request message, it looks up the subscriber's current location in its database for the phone number and sends a response message(**Location update message)** back to the VLR with the location information and the VLR updates the information in its record.

- **The MSC allocates a temporary identity (Temporary Mobile Subscriber Identity, TMSI) to the calling MS and sends it to the calling MS.** The MSC generates a random number for the TMSI to ensure its uniqueness and security. MSC sends it to HLR

- **HLR forwards the ID to MSC of the calling MS** After allocating the TMSI to the calling MS, the MSC sends this TMSI to the Home Location Register (HLR) of the calling MS as part of the location update message. The HLR then stores this TMSI along with the identity of the calling MS in its database.
- **Calling MSC requests a call set up to the called MSC** The calling MSC, which is the MSC that initiates the call, sends a request to the called MSC, which is the MSC that serves the mobile device being called. This request is known as a "Call Setup Request."

- **Paging messages are sent to cells within the LA.**the paging process is an essential part of the cellular network's call and message delivery system, allowing mobile devices to receive calls and messages even when they are not actively communicating with the network.

THE PING PONG EFFECT

In some cases, a mobile device may be on the boundary between two or more cells, and its signal strength may be fluctuating between the cells. This can happen, for example, when the mobile device is moving in a car or train, and its position is constantly changing.

In such situations, the network may attempt to maintain the best possible signal strength for the mobile device by switching it between the cells. However, if the switching occurs too frequently, it can result in a **ping pong effect**, where the mobile device switches back and forth between the cells repeatedly, like a **ping pong** ball.

The ping pong effect can have **several negative effects** on the network and the mobile device. For example, the frequent handover can cause a **significant amount of signaling traffic**, which can overload the network and **reduce its efficiency**. It can also lead to **dropped calls or poor call quality**, as the mobile device may not have enough time to establish a stable connection with the network.

How to reduce? Adjusting the cell reselection parameters, optimizing the handover algorithms, and improving the network planning are some examples of mitigation techniques that can be used to reduce the ping pong effect. By adjusting the parameters that control the cell reselection and handover processes, the network can ensure that the mobile device remains connected to the most suitable cell, and minimize the number of unnecessary handovers.