

Cell phones can carry tales!

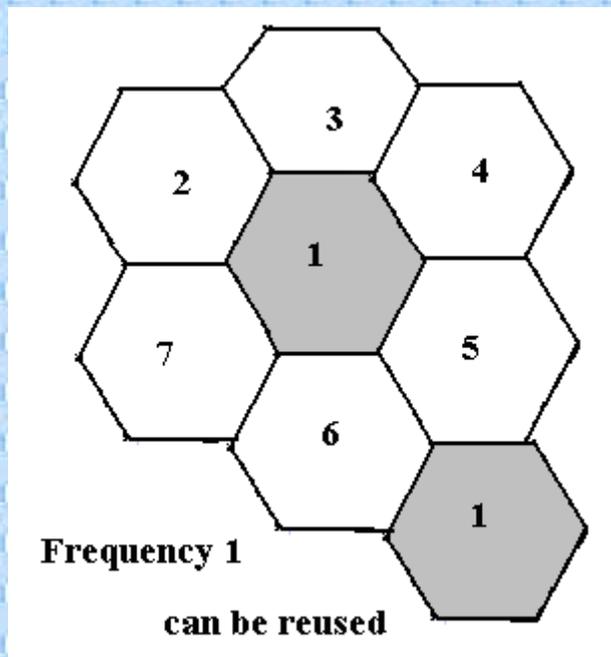
The mobile phone is now a way to track the user's movements, even if she never makes a call, says S. Ananthanarayanan.

A person could wear disguise and go out only in the dark, but if she carried a cell phone, she would keep making announcements of where she was.

How cell phones work

What users need in communications is mobility and privacy, at the same time. The radio set, like police radio, is portable (although heavy) but not private, as many users use the same radio frequencies and can listen into all conversations. The regular DOT telephone call is private, but the phone needs to be connected to the telephone cable.

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Cell phones satisfy the mobility need by being short-range radio sets. To provide a separate frequency to each phone, the cellular method 'reuses frequencies' by dividing the city into a series of hexagonal 'cells', as shown in the picture

One seventh of the available frequencies is provided to each cell and the remaining frequencies are divided among the six surrounding cells. Now, as the phones are low power devices, the frequencies of each cell is available for use again outside the circle of six surrounding cells.

Base Stations

In the middle of each cell is a 'base station', with which the cell phones in that cell communicate. The base stations are all connected by cable to a central computer called the Mobile Station Switching Office (MSTO) which passes on calls from any cell or landline phone to the base station of the cell phone being called. As the communication by any cell phone is only with the base station in that cell, each cell phone can have a private frequency.

Details

When a user inserts the 'provider's' SIM card into her phone, the phone identifies a unique signal (System **I**dentification Code) that the provider's base stations would transmit within the cells. The phone also generates a 10-digit **M**obile **I**dentification Number, derived from the assigned telephone number, and this serves to identify the phone to the base station. As soon as a user switches on her cell phone, the phone listens for the signal from the base station. When it receives the signal, it starts transmitting its unique identifier, to inform the base station that it is in that cell. The base station conveys this to the MTSO, which stores the information in a database, so that it knows where to send any calls or messages intended for that phone.

If the user starts moving to the periphery of the cell, as if to move into the next cell, both the base stations concerned begin to sense this by the falling/rising of the SID/MIN signal strength. The two base stations then communicate with each other and the MTSO administers the changeover, should it occur, from one cell to the other. It is the MTSO that assigns to each cell phone the frequency that it would use when it makes or receives a call within a cell, or as it changes cells.

Keeping track of location

The main thing in all this is that the MTSO has a continuous record of which cell a cell phone user was in, every minute that the cell phone was switched on. This information could be of use to commercial houses, to know the broad localities that possible customers frequent, or for several other harmless purposes. It could also be used to trail people, for surveillance. A recent instance was when one of the suspects of assault on the Swedish diplomat in New Delhi was cleared of .the charge based on the cell phone service provider's data, which showed that the suspect was not at the spot of the crime.
