

EVOLUTION IN MOBILE COMMUNICATION

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Introduction:

Nowadays, mobile plays an important role in our day to day life. Before the devices that are now referred to as mobile phones existed, there were some precursors. In 1908, a professor Albert Johnke and the Okland Transcontinental Aerial Telephone and Power Company claimed to have developed a wireless telephone.

Early services were:

1. MTS (Mobile Telephone Service 1949)
2. IMTS (Improved Mobile Telephone Service 1965).

There are supposed mobile to have six generations till today. They are:

1. 0G
2. 1G
3. 2G
4. 3G
- 5 4G
6. 5G

0G (Zero Generation):

Zero generation is preferably referred as Mobile Radio Telephone System. It preceded modern cellular mobile telephony technology. Since they were the predecessors of the first generation of cellular telephones, these systems are sometimes retroactively referred to as precellular systems.

Technologies used in precellular systems included the Push To Talk (PTT or manual), Mobile Telephone System (MTS), Improved Mobile Telephone Service (IMTS), Advanced Mobile Telephone System (AMTS).

1G (First Generation):

The first commercially automated cellular network (the 1G generations) was launched in Japan by NTT in 1979, initially in metropolitan area of Tokyo. Within 5 years, the NTT network had been expanded to cover the whole population of Japan and became the first nationwide 1G network. 1G network are analog.

In 1981, this was followed by the simultaneous launch of the Nordic Mobile Telephone (NMT) system in Denmark, Finland, Norway and Sweden. NMT was the first mobile phone network featuring international roaming. The first 1G network launched in the USA was Chicago based Ameritech in 1983 using the Motorola DynaTAC mobile phone. Several countries then followed in early to mid 1980's including the UK, Mexico and Canada.

2G (Second Generation):

2G is short for second generation wireless telephone technology. 2G networks are digital. 2G technologies can be divided into Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA) based standards depending on type of multiplexing used.

2G cellular networks were commercially launched on the GSM standard in Finland by Radiolinja in 1991.

3 benefits of 2G over 1G:

1. Phone conversations were digitally encrypted.
2. They were more efficient of the spectrum allowing for far greater mobile phone penetration levels .
3. 2G introduced data services for mobile, starting with SMS text messages.

3G (Third Generation):

3G i.e. Third generation of mobile communication technology is based on the set of standards used for mobile devices and mobile telecommunications use services and networks that comply with the International Mobile Telecommunications 2000 (IMT 2000) specifications by the International Telecommunication union. 3G gives data rate of 2 mbits/s for stationary or walking users and 384 kbits/s in a moving vehicle.

Applications of 3G:

1. Global Positioning System.
2. Location Based Services.
3. Mobile TV.
4. Telemedicine.
5. Video Conferencing.
6. Video on demand.

4G (Fourth Generation):

4G technology was invented in 2008. A 4G system, in addition to the usual voice and other services of 3G, provides mobile broadband internet access, for example to laptops with wireless modems, to smartphones and to other mobile devices.

Applications of 4G:

1. IP telephony, gaming services.
2. High Definition mobile TV.
3. Cloud Computing.

5G (fifth Generation):

5G denotes the next major phase of mobile telecommunications standards beyond the current 4G or IMT advanced standards.

5G network requirements are:

1. Data rates of several tens of mb/s should be supported for tens of thousands of users.

2. 1 gbits/s to be offered, simultaneously to tens of workers on the same office floor.
3. Upto several 100000s simultaneous connections to be supported for massive sensor deployments.
4. Spectral efficiency should be enhanced compared to 4G.
5. Coverage should be improved.
6. Signaling efficiency should be enhanced.