

SECOND GENERATION(2G)

- 2G refers to the second generation of mobile networks.
- It is popularly based on GSM(Global System for Mobile communications) architecture.
- It uses digital signal. (circuit switching tech.)

Features of 2G network as improvement over 1G are:

- Data speeds of up to 64 kbps (1G = 2.4 kbps) (data in the form of sms)
- Use of digital signals(data and voice digitally encrypted: more security) instead of analog.
- digital signals consume less battery power compared to 1g
- Enabled services such as SMS and MMS
- Provided better quality voice calls (Reduced Noise as compared to 1G)
- It used a bandwidth of 30 to 200 KHz (Better Bandwidth Utilization)

Drawback

- It cannot handle complex data such as videos
- strong digital signal requirements

THIRD GENERATION (3G)

- 3G refers to the third generation of mobile networks.
- It is popularly based on UMTS(Universal Mobile Telecommunications System) architecture.
- 3G network upgrades 2G network with new technologies and protocols to deliver faster data rate. (packet switching technology)

Features of 3G network as improvement over 2G are:

- Data speeds 144 Kbps to 2 Mbps
- Send/receive large email messages
- Increased bandwidth : 15-20 MHz
- faster communication
- web based application can run(surfing webpages with audio and video) youtube with buffering, GPS etc

Drawback

- Expensive
- High Bandwidth requirement

FOURTH GENERATION (4G)

- 4G refers to the fourth generation of mobile networks
- The most important 4G standard :4G LTE
- 4G LTE is a “fourth generation long term evolution”, capable of delivering a very fast and secure internet connection by using IP protocols.
- The main difference between 3G and 4G is the data rate

Features of 4G network are:

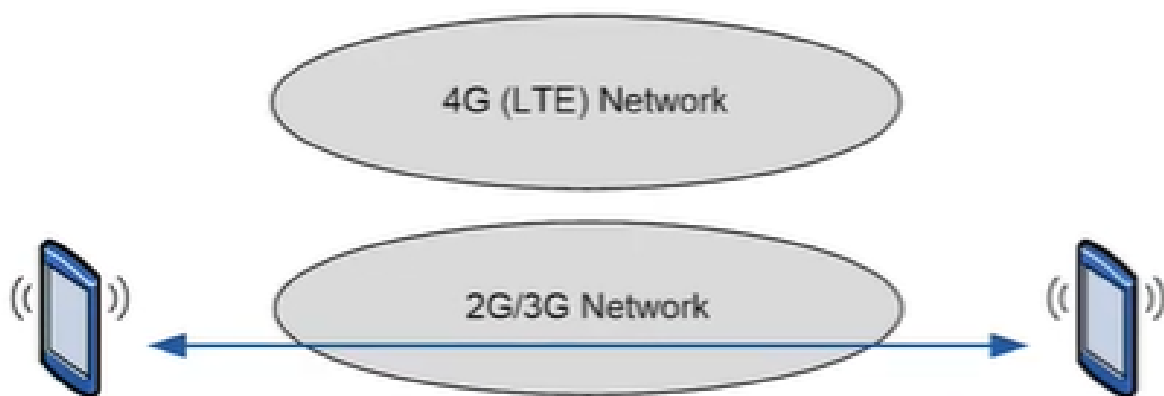
- Data speeds of up to 100 Mbps to 1 Gbps
- Support interactive multimedia, voice, video.
- Increased bandwidth : 100 MHz
- supports HD mobile tv, video conferencing , and other services that requires high data speed

Drawback

- Expensive
- Complicated Hardware Requirements
- The only service 4G LTE provides Broadband data connection
- it doesn't support voice services.

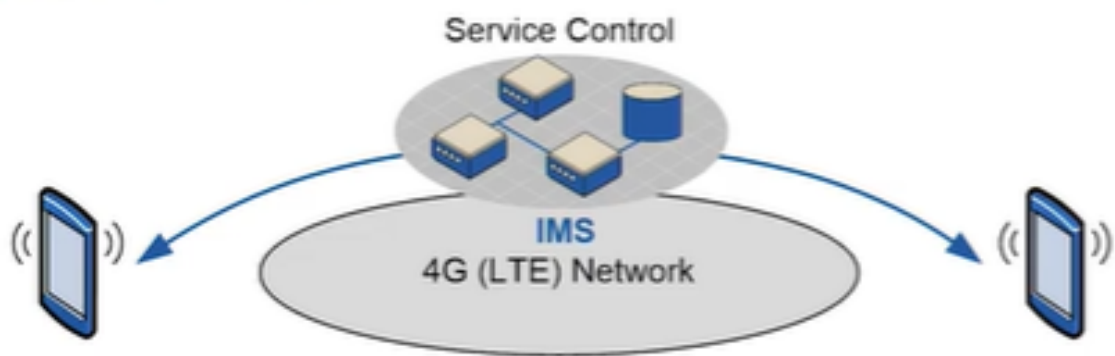
solution: 2 ways:

- 1. either pushing system to 2g/3g architecture



Without VoLTE, the mobile will have to disconnect from 4G and make a normal 2G/3G call (termed Circuit Switched Fallback)

or using VoLTE



The technology is termed “VoLTE” and requires a separate network called an IP Multimedia Subsystem to provide service control