

What are the differences between 2G, 3G, 4G networks?

- Simply, the "G" stands for "GENERATION".
- While connected to the internet, the speed of the connection depends upon the signal strength that is shown in abbreviations like 2G, 3G, 4G, etc. on any mobile device.
- Each generation of wireless broadband is defined as a set of telephone network standards that describe the technological implementation of the system.
- The aim of wireless communication is to provide high quality, reliable communication just like wired communication and each new generation represents a big leap in that direction.
- Mobile communication has become more popular in the last few years due to fast reform in mobile technology.

SECOND GENERATION (2G)

2G refers to the second generation of mobile networks based on GSM.

The radio signals used by the 1G network were analog, while 2G networks were digital.

2G capabilities were achieved by allowing multiple users on a single channel via multiplexing.

During 2G, cellular phones were used for data along with voice.

Features of 2G were:

- Data speeds of up to 64 kbps
- Use of digital signals instead of analog
- Enabled services such as SMS and MMS (Multimedia Message)
- Provided better quality voice calls
- Bandwidth of 30 to 200 KHz

THIRD GENERATION (3G)

The 3G standard utilises Universal Mobile Telecommunications System (UMTS) as its core network architecture.

3G network combines aspects of the 2G network with new technologies and protocols to deliver a significantly faster data rate.

By using packet switching, the original technology was improved to allow speeds up to 14 Mbps. It used Wide Band Wireless Network that increased clarity.

It operates at a range of 2100 MHz and has a bandwidth of 15-20 MHz.

Features of 3G are:

- Speed of up to 2 Mbps
- Increased bandwidth and data transfer rates
- Send/receive large email messages
- Large capacities and broadband capabilities

FOURTH GENERATION (4G)

The main difference between 3G and 4G is the data rate.

There is also a huge difference between 3G and 4G technology.

The key technologie that have made 4G possible are OFDM (Orthogonal Frequency Division Multiplexing).

The most important 4G standards are WiMAX and LTE.

While 4G LTE is a major improvement over 3G speeds, it is technically not 4G.

What is the difference between 4G and LTE?

Even after it was widely available, many networks were not up to the required speed of 4G.

4G LTE is a “fourth generation long term evolution”, capable of delivering a very fast and secure internet connection.

Basically, 4G is the predetermined standard for mobile network connections.

4G LTE is the term given to the path which has to be followed to achieve those predefined standards.

Features of 4G LTE are:

- Support interactive multimedia, voice, and video.
- High speed, high capacity and low cost per bit (Speeds of up to 20 Mbps or more.)
- Global and scalable mobile networks.
- Ad hoc and multi-hop networks.

2G vs 3G vs 4G

Each generation in some way has improved over its predecessor.

The comparison of 2G, 3G, 4G, clearly shows the differences in the technologies.

Comparison	2G	3G	4G
Introduced in year	1993	2001	2009
Technology	GSM	WDCMA	LTE, WiMax
Access system	TDMA, CDMA	CDMA	CDMA
Switching type	Circuit switching for voice for packet switching for data	Packet switching except for air interference	Packet switching
Internet service	Narrowband	Broadband	Ultraband
Bandwidth	25MHz	25MHz	100 MHz
Advantage	Multimedia features(SMS, MMS), internet access and SIM introduced	High security, international roaming	Speed, high speed handoffs, global mobility
Application	Voice call, SMS	Video conferencing, mobile TV, GPS	High speed applications, mobile TV, wearable devices