

# Generations of Mobile Technologies

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Everyday new development and improvement in mobile technologies is now becoming necessary and fashion trend as well. And our 'Gen-Y' are crazy to have the latest mobile with newest technology. 3G has been ruling since previous decade and now 4G is struggling to either swap or succeed 3G. However it is said that 4G is the modified form of 3G and for courtesy the term 3.5G is applied to it. But do we know about these terms or the generations of wireless technology?

While an acronym sometimes is techno-gibber, the lay-persons do not need to know, others are important for everyday understanding of mobile or wireless technology. The letter 'G' denotes generations of wireless technologies. Though the terminologies 1G, 2.5G and 4G might not have ever popped into our mind but 2G and 3G have very likely given today's emphasis on high-speed data usage from our mobile phone. **3G** and **4G** are standards for mobile communication. Frequency standards specify how the airwaves must be used for transmitting the voice and data information. But what is the different between these technologies and how do they impact us?

## What is 1G?

Mobile phones began with 1G refers to the first generation of wireless telecommunication technology, popularly known as cellphones. It is one type of analog communication which used voice signalling only.

1G is a set of wireless standards developed in the 1980's, such technologies as Mobile Telephone System (MTS), Advanced Mobile Telephone System (AMTS), Improved Mobile Telephone Service (IMTS), and Push to Talk (PTT).

Do you ever heard about it 'analog voice signalling'?

It is a method of signalling in which transmitted signal is a wave of a reflection analogous to the original signal. So, the signal or the vice wave is transmitted and amplified through a speaker to produce the sound, resulting in communication.



## **What is 2G?**

The Cellphones received their first major upgrade when they went from 1G to 2G. This leap effectively took cell phones from analog to digital. 2G is second generation digital technology of wireless telephony for digital voice service only. This technology was based on binary codes like a series of zeros and ones. At the receiver's end, it was converted back to voice through switch on and switch off of the inbuilt circuit.

2G networks saw their first commercial light of day on the GSM standard. GSM stands for *Global System for Mobile* communications. 2G on GSM standards were first used in commercial practice in 1991 by Radiolinja, which was a Finnish GSM operator founded on Sept. 19, 1988. In addition to the GSM protocol, 2G also utilizes various other digital protocols including CDMA, TDMA, iDEN and PDC.



### What is 2.5G?

Before making the major leap from 2G to 3G wireless networks, the lesser-known 2.5G was an interim standard that bridged the gap. It is the packet switching technology intermediate between two paths 2G and 3G. It uses General Packet Radio Service (GPRS), an interim technology between GSM, 2G and Universal Mobile Telecommunication Service (UMTS) technologies. It is a data and voice transmission technology. 2.5G bridged 2G to 3G. It brings standards that are midway between 2G and 3G, including the GPRS, Enhanced Data rates for GSM Evolution (EDGE), Universal Mobile Telecommunications System (UMTS) etc.



### What is 3G?

Now-a-days using a 3G enabled mobile phone is the hotcake to us. It is the third generation advanced wireless packet switching technology with bandwidth and faster as compared to 2.5G. The technology allowed for video transmission apart from voice and data transmission on account of its high speed. Following 2.5G, 3G ushered in faster data-transmission speeds so we could use our cellphone in more data-demanding ways. This has meant streaming video, audio and much more.



3G has the following enhancements over 2.5G and previous networks:

- Several times higher data speed;
- Enhanced audio and video streaming;
- Video-conferencing support;
- Web and WAP browsing at higher speeds;
- IPTV (TV through the Internet) support.

### What is LTE?

Long-Term Evolution (LTE) is a standard for high-speed wireless communication for mobile phones and data terminals. It is based on the GSM/EDGE and UMTS/HSPA network technologies,

increasing the capacity and speed using a different radio interface together with core network improvements. LTE is commonly marketed as **4G LTE**, but it does not meet the technical criteria of a 4G wireless service. However, due to marketing pressures and the significant advancements that WiMAX, Evolved High Speed Packet Access and LTE bring to the original 3G technologies, ITU later decided that LTE together with the aforementioned technologies can be called 4G technologies.

**What is 4G?**

No technology would be complete without a looming upgrade for tomorrow. When talking about 4G, question comes to our mind is what is 4G Technology?

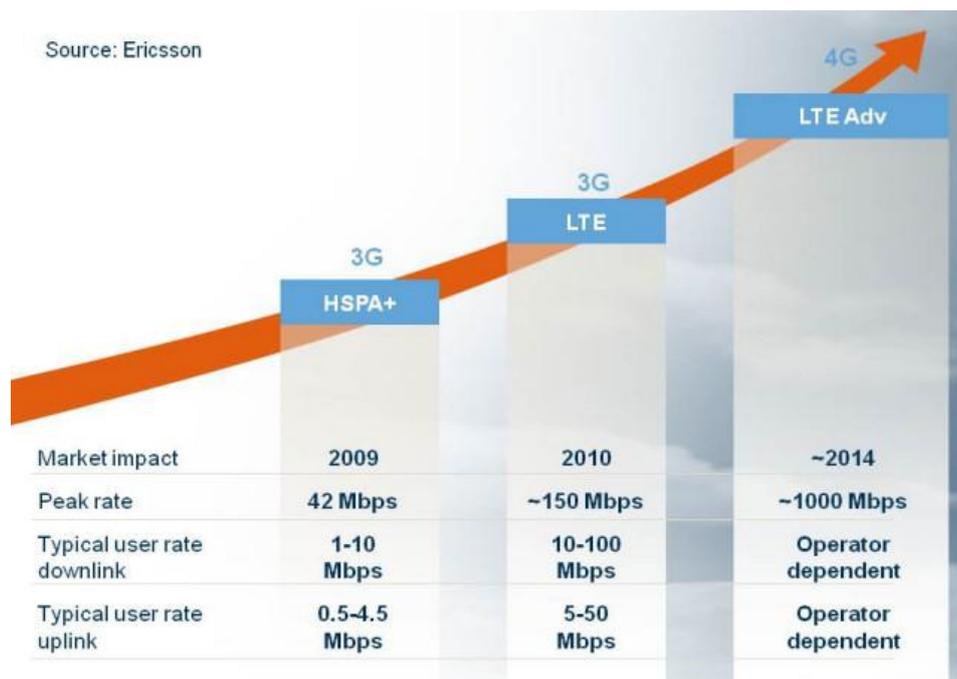
But at this time nobody exactly knows the true definition of 4G. 4G is the fourth generation wireless technology of telephony, a descendant to 2G and 3G technologies aiming to provide the very high data transfer rates (offering divergent levels of data transfer from sources to a device with a speed of 100 MB/s). It provides very speedy wireless internet access to not only stationary users but also to the mobile users. This technology is expected to beat the deficiencies of 3G technology in terms of speed and quality.



4G can be best described in one word “MAGIC”, which stands for Mobile multimedia Anytime Anywhere Global mobility support, integrated wireless and personalized services.

**Difference between 3G and 4G (3G Vs 4G)**

The difference between 3G and 4G is quite obvious and anyone who has shifted from 3G to 4G can better tell that 4G is amazingly superior. The primary difference between 3G and 4G is the difference of sophistication. Where 3G is loaded with technology and multiple wireless networking supports, 4G comes up with its own network having a clear distinction of accessing internet for 24 Hours. I am giving here a comparison chart and a table of 3G, LTE and 4G technologies to simply understand the difference between them.



**Comparison table of 3G and 4G technology**

	<b>3G</b>	<b>4G</b>
Data Throughput	Up to 3.1 Mbps	Practically speaking, 3 to 5 Mbps but potential estimated at a range of 100 to 300 Mbps.
Peak Upload Rate	50 Mbps	500 Mbps
Peak Download Rate	100 Mbps	1 Gbps
Switching Technique	packet switching	Packet switching, message switching
Network Architecture	Wide Area Cell Based	Integration of wireless LAN and Wide area
Services And Applications	CDMA 2000, UMTS, EDGE etc	Wimax2 and LTE-Advance
Forward error correction (FEC)	3G uses Turbo codes for error correction.	Concatenated codes are used for error corrections in 4G.
Frequency Band	1.8 – 2.5GHz	2 – 8GHz

### **Conclusion**

4G technology keeps full potential to make us forget the way we use internet today, on our laptops and on moving devices such as mobile phones and tablet devices. It is going to remove all the barriers of speed and bandwidth which will reward every user with high stream data. In 4G HD data will be made available without much of a problem over the internet. These days, websites are designed keeping internet speeds of users in mind. When 4G technology has been deployed, web will be full of High Definition (HD) content and downloading or high quality streaming will not consider any issue at all. All we have to wait and see how this technology is going to come and bring the change in our daily life internet activity. The flexibility of 4G technologies to be used in combination with GSM and CDMA has provided it an edge over other technologies. The reason is that the high broadband capability of 4G not only increases data streaming for stationary users but also for mobile users. 4G can be efficiently combined with cellular technologies to make consistent use of smart phones. The digital cameras attached in smart phones can be used to establish video blogs in scattered geographical regions. This gives the manufactures the opportunity to produce more affordable user friendly 4G compatible devices. Famous iPod is one such device that supports the working of video blogs. Hence 4G is capable of providing new horizon of opportunity for both existing and startup telephone companies.