

WHAT IS 5G & HOW WILL IT AFFECT ME?

The Next Generation of Mobile Communication

Few things have impacted the world as dramatically as the first mobile phone, which came out in 1973. It sparked a wireless revolution that dramatically changed the world. The 5G rollout is poised to be a similarly impactful moment in history that will advance the field of wireless technology like never before.

But how will this affect you? What can it do for you? What will it mean to the industry? Will all 5G networks be the same? This article addresses some key topics related to 5G and just how major an advancement it is for mobility.

A Brief History of Cellular Networks

- When cellular networks began populating the world, only 1G existed. 1G stands for first-generation, a naming convention that has continued with each subsequent generation.
- 1G was an analog signal used by handsets and handheld transceivers, and only capable of transmitting voice.
- This was gradually replaced by 2G, which was a digital network. It was now possible to introduce features like limited data service for SMS text messaging, encryption and better wireless penetration.
- By the time 3G was rolled out, more services required basic wireless connections. Telephony, failover solutions,

mobile applications, image sharing, streaming and others were included.

- As technology and the needs for connectivity grew, 4G was released to meet these demands. This meant higher speeds, more reliable service and a more robust platform to host such services as video streaming and web functionality. At the publication date of this article, 4G is currently the standard for most carriers, however that will almost certainly change to 5G in the near future.

The Necessity of 5G

While 5G may seem like a single advancement in the ever-evolving world of mobile technology, it will actually set the foundation for all future enhancements. The power and capabilities of 5G are essential to accommodate the growing need for faster, stronger, more stable wireless connectivity. Many carriers are feeling the strain as their 4G LTE networks near capacity. This decreases the quality and reliability of all connections within an area when that capacity is reached. The answer to these challenges is 5G. To put the capacity of 5G into perspective, consider the fact that 5G can support 1 million connected devices per square kilometer, while 4G is only able to support 100,000 devices per square kilometer.

5G is clearly far more than an incremental increase in capacity. It is a huge improvement, necessary to accommodate rapidly accelerating demands for more mobile devices and applications. By 2020, the



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average person will have 6-9 devices connected to a wireless network and will be carrying at least 3 of them throughout their day.

The Power of 5G

5G will rapidly become an essential technology and be fundamental to future opportunities and growth. In addition to taking smartphones to a totally new level, 5G will affect and improve all industries. It will increase revenue, enhance productivity and improve the bottom line for most companies that understand its power and apply its capabilities.

How powerful is 5G? Latency is defined as the time it takes for a source to send a packet of data to a receiver and is measured in milliseconds. For 4G LTE networks, latency is typically between 75 and 100 milliseconds. Verizon Wireless 5G is achieving single-digit millisecond latencies. As a comparison, it takes 300 milliseconds to blink and about 100 milliseconds to carry the information from your eye to your brain for processing. 5G latency is so low it is impossible to be detected by the human brain.

5G quite possibly will replace some cable internet services entirely, with estimated average speeds of 300Mbps. Some locations estimate speeds nearing 940Mbps. Because 5G utilizes multiple bands, it is able to simultaneously offer the reliability of lower bands and the fast speed of higher bands. It is also able to accommodate a higher capacity of traffic. This delivers functionality and capabilities that were unachievable in the past.

With the potential of speeds surpassing 20 times that of 4G LTE, it could be possible to download a movie faster than you can read this sentence.

Internet of Things (IoT) Improvements

Beyond smartphones, IoT is possibly the biggest segment of technology that 5G will impact. IoT is a broad category, but it generally refers to sensors (temperature, motion, moisture etc.) or machines that gather, receive and act on information.

For example, a farmer can use a capacity sensor on a silo to see how full it is or a moisture sensor in the soil that will automatically trigger an irrigation system if it becomes too dry. This increases productivity and enhances loss prevention. 5G can help increase food production and reduce world hunger.

The farming and agriculture industries are just two examples of how 5G can empower IoT – it can be beneficial for nearly any industry or vertical market. The value of IoT is just beginning to be recognized, so the number of complex applications and volume of information that will be wirelessly transferred will exponentially grow. The 5G network is expected to fully accommodate that growth well into the future.

Improving Quality of Life

There are many industries 5G will change and improve. Healthcare, for example, will have the ability to transmit large amounts of data extremely quickly over the cellular data network. This will enable patients to have their vitals monitored real-time while resting at home instead of in a hospital. Ambulances will be able to transmit large amounts of patient data straight to the hospital at lightning speeds, readying that facility for the patient beforehand so care is provided quicker and more efficiently. The ultra-low latency would allow for precise remote control of robotics for surgeons and remote surgeries, where latency must be within a 5-10 millisecond to ensure critical precision.



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Automated manufacturing is another industry where low latency and high reliability are essential. Substandard wireless performance can result in extremely costly errors and time-consuming reconfigurations. 5G will be able to meet these demands, lowering costs and reducing production time.

5G also has the ability to dramatically improve augmented reality – an enhanced version of reality created by overlaying digital information on an image of something being viewed through a device, such as a smartphone, tablet or computer. The existing LTE framework is a major limitation for augmented reality. With 5G, the experience will be smoother, cohesive and much more powerful. The potential engineering, troubleshooting, safety and many other applications will be significantly improved.

3G Network Sunset

Carriers are phasing out their 3G networks in preparation for 5G, and most are expected to fully shut down the 3G network by 2020-2021. For example, anything older than the iPhone 6, Galaxy S5, and Convoy 3 will no longer work. Some carriers, such as Verizon, have already stopped activating 3G devices. For a complete list of devices that will no longer work visit: [4G Non-HD Voice Smartphones](#) and [3G CDMA-Only Devices \(flip phones, MiFi, USB\)](#).

With these imminent network retirements at all carriers, businesses should proactively plan to replace their devices with newer equipment and upgrade their mobility to gain the full benefits of 5G.

All 5G is NOT the Same

It is important to know that there is no legal definition of 5G. Each carrier can define 5G and designate their network as they please. Because the “G” stands for “generation,” businesses, customers and others usually assume that all carriers calling a product 5G are offering the same technology. NOT true. It is important to get clear and detailed network specifications, capabilities and expected performance of the 5G network, then research the carrier’s network and see if it is comparable. When switching from 4G to 5G, you will need a 5G capable device. If your 4G device works on a carrier’s “5G network”, it may not be true 5G.

Summary

5G is a critical and far-reaching improvement to wireless services and mobility that provides companies and organizations with a powerful tool. Faster speeds, better reliability and higher device capacity (especially in urban settings and areas with high device concentrations) will create extraordinary new opportunities. There is no doubt that 5G will change the way we live and work.



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