4G / LTE Evolution

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Abstract

Cellular internet technology has the potential to trigger innovations in all fields globally. Network performance plays a key role in the way our society runs and will continue to hold a significant societal impact for years to come. Regarding packet loss and latency, these facets of network technology are still being optimized. This paper aims to identify the specific fields that see benefit to 4G and LTE technology, as well as define a developing technology and its potential to catalyze a new revolution in technology.

4G / LTE Evolution

Since its inception in the early 2000’s, mobile broadband has altered the way people interact, work and complete daily tasks. Cell phone companies started branding new products with 2G and eventually 3G capabilities, which sparked the interest of people everywhere. The idea that internet access was possible outside of the home became a phenomenon, because of the potential uses. Several years later, mobile Internet technology has improved significantly and expanded worldwide. Cloud computing, social media and the Internet of Things are now becoming the focal points of the web and as mobile network connection is enhanced, emerging tech will change the ways we live in fields relating to business, medicine, lifestyle, etc. The scope of this technology’s uses are growing exponentially as companies begin to pivot their focus towards an economy based on information technology, known as the Digital Age.

# Cost of Implementation

More than 393 4G/LTE networks have been commercially launched in 138 countries by March 2015 (GSA 2015).

# Effects on Society

Today, 4G/LTE are expected capabilities in all mobile devices among top companies because of the many uses that this technology adds. These capabilities play a crucial role in the increasing popularity of social media platforms, such as Snapchat, Instagram and Facebook. Modern society has taken a particular interest in these uses of network technology and coined the phrase “millennials”, vaguely described as avid users of the Internet and the social realm in a digital sense. Network technology changed the way millennials and the rest of society interact with social media, due to its ability to access and post to sites from remote locations without the need of a Wi-Fi connection.

The ability to access the web on the go meant that people could now effectively multitask and increase their productivity. While on a personal level 4G/LTE technology raises the speed of access and communication, wireless network technology also revolutionized productivity in businesses. Through improved communication, enterprise functions such as intracompany communication and transfer of data can be executed much more quickly. Companies now have the opportunity to expand with remote facilities. Data transfer is used frequently between branches of a business and through 4G/LTE communication, monitoring company practices can be done with ease, even when remote sites are spread across the world. Additionally, 4G/LTE connectivity provides added security. Some businesses have adopted infrastructure management systems, which “facilitate proactive monitoring even if fiber or Ethernet connections are compromised” (Opengear 2018).

Not only does productivity in businesses see improvement, but employees lives are also affected by 4G. Employees are no longer limited to completing work related tasks within the bounds of a company owned building. 4G/LTE in smartphones has allowed for employees to communicate and work from nearly anywhere as though they are in the office. Multitasking in businesses removes stress off employees without a loss in revenue. Most employees could agree that “what’s exciting for me as a young entrepreneur is that faster mobile internet makes it even more possible for me to live my life how I want to,” Fraser Doherty, founder of the U.K.-based fruit jam making company SuperJam, “If I can work from anywhere, I want to work from everywhere, completely blurring the lines between travel, fun and work.” (Opengear 2018).

Online shopping has also been made easier through improved network speeds. E-commerce businesses thrive off 4G/LTE technology, as they can bring more traffic to webpages and apps. The increased download speeds also mean that companies like Amazon can add more content to their sites, without sacrificing loading time.

With so many technological advancements in modern day society, Internet users are never satisfied with speed or accessibility. With such a high demand for further innovations in the field of wireless networks, there are high hopes that the iteration of network technology to follow 4G/LTE will have great effects on society.

# Potential of 5G

## The latest innovations in cellular technology have improved the speed and responsiveness of wireless networks to the extent that a fifth-generation has been introduced. While still unavailable to the general public, 5G technology is reported to exceed rates of 20 Gbps by some estimates, with latency under 1 millisecond (Puranik 2017).

Applications of 5G will likely be similar to those of the current uses of wireless internet technology. An obvious use for 5G will be to replace 4G as an internet service in homes. Some telecommunications companies such as Verizon and AT&T have begun trials of 5G technology in the US and expect its arrival within the next year (Cheng 2017). According to the technical specifications for 5G technology, users will be able to have a dependable connection nearly anywhere.

5G will specifically benefit the field of medicine in many ways. Apart from having quicker access to medical records stored digitally, surgeries will now be improved. Surgeons are required to go through rigorous training to fine-tune their skill. This has created an extremely high demand for doctors that can complete specific tasks. 5G internet speeds will revolutionize this issue because it will make telesurgery viable. Although some of these remotely done operations have been completed over current internet technology, 5G reduces the margin of error in these high risk procedures. Remote telesurgery could save money and time, seeing as it “has a potential to provide extreme and urgent health care services and bring unprecedented opportunities to deliver highly specialized skills globally” (Zhang 2018).

Access to remotely stored data will become easier as 5G download and upload times will improve. Cloud computing is becoming a large factor in productivity. Storing documents in the cloud for future access from any other device is a powerful tool which will be made faster and easier with fifth-generation network technology. In addition, 5G technologies will impact other components of cloud computing such as Internet of Things. Overall, with improved network speeds, Internet use will continue to surge in parallel with human productivity, as this technology is considered to be the next revolution.

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