



IS THE 5G WIRELESS SYSTEM THE FUTURE?

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Abstract:

The key initiatives for 5G wireless communication networks are outlined in this article. The programme and project activities as well as recent literature are given priority. A thorough examination of numerous projects connected to 5G in the European Union is done. The literature review is limited to recent issues of the 5G-related IEEE Communications Magazine and pertinent white papers from various sources. The purpose is to clarify what 5G is all about, including the fundamental components of the system, the biggest problems, and solutions. The analysed references show that 5G must have features like reduced latency, ultra-reliable communications, and widespread connectivity in addition to technologies that increase capacity. The creation of a flexible enough system concept platform that enables the successful integration and management of multiple distinct technologies optimised for a variety of use cases will therefore be the most challenging aspect of 5G development.

I. INTRODUCTION

The fifth generation of mobile technology is known as 5G. Beyond the upcoming 4G standards, 5G represents the next significant stage in mobile telecommunication ethics. 5G technology is helping with electronic communications, product documentation, and other areas of product manufacturing. The buyer will seek out a good package that includes every cutting-edge function a cellular phone may offer as they grow more knowledgeable about mobile phone technology. Therefore, the top cell phone colossuses' constant pursuit of new technology serves as their primary impetus to innovate better than their rivals. The challenges that a 4G prototypical would present once it has become widely adopted would be perfectly addressed by a 5G-based telecommunications network.

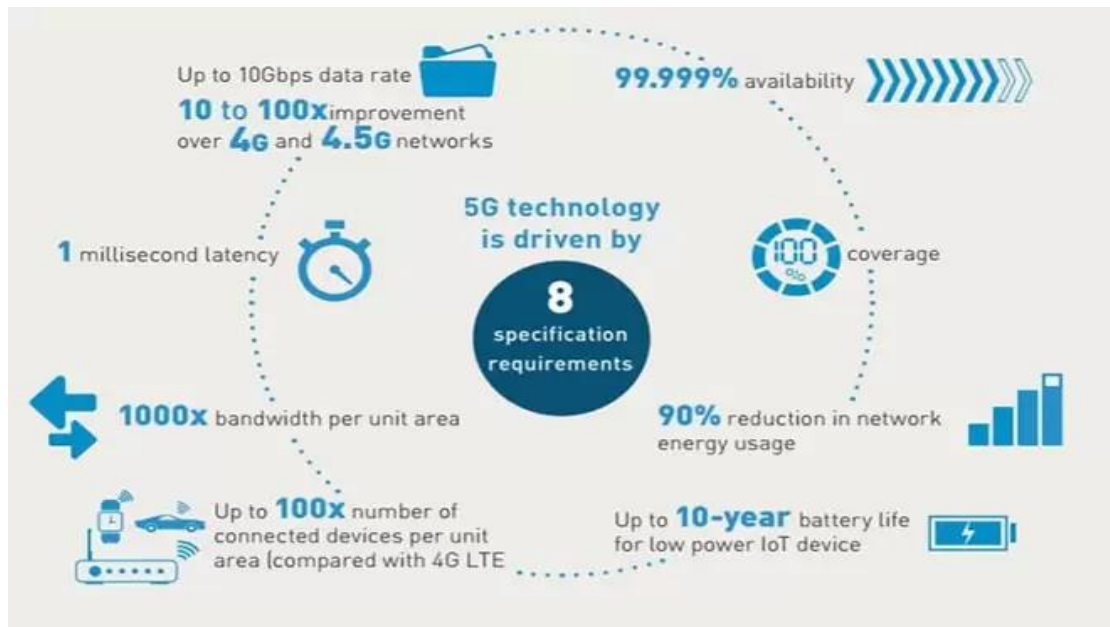
5G isn't owned by any one organisation or individual: rather, it's the result of many different players in the mobile ecosystem. The several pioneering technologies that propel the market forward and make up 5G, the upcoming wireless standard, were developed in large part by Qualcomm.

By 2025, it is anticipated that nearly 60% of mobile contributions in South Korea will be for 5G networks, making the country the leader in the adoption of the technology. South Korea was the first country to deploy 5G networks, and the state is expected to maintain its position as the market with the highest penetration. According to a new analysis, Huawei Technology Co. has the most copyrights on the next 5G technology, proving the Chinese corporation will be compensated despite efforts by the Trump administration to remove it from the supply chain.

With wide-ranging coverage, high amounts at millimetre waves (10 mm to 1 mm), covering a frequency range of 30 GHz to 300 GHz, and the ability to transmit data at a rate of 20 Mbps over distances of up to 2 km, wireless systems using orthogonal frequency division multiplexing (OFDM) are used. The most active remedy for the current boom in wireless Internet consumption is the millimetre-wave spectrum. These capabilities allow for the delivery of wireless World Wide Web (WWW) applications.

II. WHAT IS 5G?

A breakthrough is 5G technology. By the end of 2018, the fifth generation (5G) of telecom networks had already begun to outpace the market. This trend will continue globally. With the correct trade-off between speed, latency, and cost, the technology is predicted to accelerate development and create a vast 5G IoT (Internet of Things) ecosystem that will support the communication needs of billions of linked objects.



- ✓ A speed improvement of 10 to 100 times over 4G and 4.5G networks, up to 10Gbps.
- ✓ bandwidth density of 1,000,000x per square inch.
- ✓ There are up to a hundred times more linked devices than there are square feet (compared with 4G LTE).
- ✓ 9.999% availability.
- ✓ One millisecond of delay, 100% coverage, and a 90% reduction in network energy use.

III. WHAT MAKES 5G MORE RAPID?

5G networks can operate at shorter frequencies (millimetre waves between 30GHz and 300GHz), which makes them quicker. This high band 5G spectrum provides the anticipated increase in capacity, low latency, and quality in addition to speed. However, the 5G download speed may differ significantly by location.

The average 5G speed travelled in Q3/Q4 2019 ranged from 220 megabytes per second (Mbps) in Las Vegas, 350 in New York, 380 in Los Angeles, 450 in Dallas, to 550 in Chicago, and over 950 in Minneapolis and Providence approximatively, according to the February 2020 issue of Prosperity Magazine.

IV. WILL THE 5G NETWORK BE SAFE?

To ensure strong mutual authentication between the user, the connected devices, and the networks, 4G networks employ the USIM tender. An inbuilt UICC chip or a removable SIM card can both introduce the USIM application. To allow trusted services, strong mutual authentication is essential. Security at the device and security at the network are already combined in today's security solutions. Future security frameworks may coexist, and it's likely that 5G will reuse any existing solutions already utilised for 4G networks and the cloud (SEs, HSM, certification, Over-The-Air provisioning, and KMS). 2018 saw the adoption of the strong mutual authentication standard for 5G networks. With the growing importance of IoT services, the demand for 5G security, privacy, and trust will be just as significant as it was for 4G, if not more so. Local SEs in devices can control network access and offer secure services like managing emergency calls and IoT virtual networks.

V. BENEFITS OF THE 5G TECHNOLOG

- ✓ High tenacity and bi-directional shaping of big bandwidth.
- ✓ All networks can be connected together using technology.
- ✓ more dynamic and efficient.
- ✓ Utilizing technology to streamline subscriber administrative tools. Most likely, will offer a significant amount of broadcasting data (in Gigabit), supporting over 60,000 connections.
- ✓ Simple to handle for earlier generations.
- ✓ Sound technological foundation to serve a diverse service area.
- ✓ It is possible to pay for global connectivity that is constant, unbroken, and reliable.

VI. DISADVANTAGE OF THE 5G TECHNOLOG

Although 5G technology is being researched and designed to address all radio signal issues and difficulties in the mobile world, it has the following limitations because to security concerns and a lack of technological advancement in most geographic regions.

- ✓ Technology is still in development, and study into its potential is ongoing.
- ✓ Due to the lack of useful technological assistance in the majority of the globe, the speed that this technology is delightful to use seems difficult to accomplish (in the future, it may be).
- ✓ Many of the older gadgets won't work with 5G, therefore every one of them needs to be replaced with an expensive new one.
- ✓ Infrastructure development is expensive.
- ✓ Problems with security and privacy remain unresolved.

VII. FUTURE SCOPE

In the near future, 5G will provide greater service quality, reduced latency, and increased bandwidth, all of which will enhance user experiences in both the consumer and corporate sectors, ranging from telemedicine use cases to cloud gaming. By Sergey Seletskyi, Senior Solution Architect, and IoT Practice Leader at Intellias. The Internet of Things will change thanks to 5G networks (IoT). However, it will take some time until the majority of the earth is covered by technology.

Wi-Fi will manage the local wireless connection for the majority of users, while 5G will handle wide-area wireless connections. However, there may eventually come a time when only one of them will be necessary. Given how commonplace Wi-Fi is today, it may seem illogical to imagine that it could disappear. Greater capacity, more users, and faster speed on the improved spectrum. The initial 5G frequency bands are below 6 GHz and close to the frequencies of the current mobile and Wi-Fi networks in several countries.

VIII. CONCLUSION

The term "5G Technology" refers to fifth-generation mobile technology. The way that mobile devices can be used in extremely high bandwidth has changed thanks to 5G mobile technology. Users had never before routinely experienced a technology of such high value.

Today's mobile users are quite knowledgeable about cell phone (mobile) technology. The 5G technologies cover all the different sorts of cutting-edge architectures that will make 5G mobile technology the most potent and in high demand in the near future. To access broadband internet, a user can also connect their laptop to their 5G-enabled cell phone. With 5G technology, you can get a camera, an MP3 player, a huge phone memory, an audio player, and much more. Incredible Bluetooth technologies and Piconets are now available for kids.

IX. REFERENCES

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