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5G Wireless Technology

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Abstract: ***This 5G stands for fifth generation wireless technology. It is the latest version of cellular technology that has main features: Grater speed, lower latency, and ability to connect a lot more devices simultaneously. A commercial 5G wireless network is expected to be deployed by 2021.***
Keywords: WLAN;5G; WWW; WMAN; DAWN

I. INTRODUCTION

A. 1G—1G was analog telecommunications standard introduced in the 1980s for voice communications with a data rate up to 2.4 Kbps. It used FM and FDMA and a bandwidth of 30 KHz. The major problems with 1G are poor voice quality, poor battery quality, and large phone size.
B. 2G—2G was digital standard, circuit switched technology introduced in 1980s. It used CDMA, GSM, and TDMA technologies. It could only transmit digital voice at 64 kbps, and not data such as emails.
C. 3G—3G wireless systems developed in late 1990's & early 2000s, which was used for Code Division Multiple Access Technique (CDMA). It introduced high-speed internet access. It used technologies such as W-CDMA and HSPA (high speed packet access). It provided IP connectivity for real-time and non-real-time services.
D. 4G—4G works the same as 3G and may be regarded as the extension of 3G but with a faster internet connection, more bandwidth, and a lower latency, developed in 2010. 4G technologies, such as WiMAX and LTE (Long-Term Evolution). It used technologies like Coded Orthogonal Frequency Division Multiplexing (COFDM), Multiple Input Multiple Output (MIMO) and link adaptation.

II. HOW 5G WORKS

A. 5G networks will consist of cells divided into sectors and send data through radio waves.
B. Each cell is connected to a network backbone through a wired or wireless connection.
C. 5G may transmit data over the unlicensed frequencies currently used for Wi-Fi.
D. It promises a smarter, faster, and efficient network.
E. The goal of 5G is to have far higher speeds available, at higher capacity per sector, and at far lower latency than 4G.
F. In order to increase network efficiency, the cell is subdivided into micro and Pico cells.
G. 5G provides gigabit-per-second data rates anytime, anywhere.
H. In a 5G wireless network, every mobile phone will have an IPv6 address depending on the location and network being used.
I. 5G utilizes user-centric network concept World Wide Wireless Web instead of operator- centric as in 3G or service-centric as in 4G. WWWW will be capable of supporting applications and services and interconnected the whole world.
J. 5G includes the latest technologies such cognitive radio, Internet of things, nanotechnology, and cloud computing.

III. 5G TECHNOLOGY ADVANCED FEATURES

A. All Architecture will be device-centric, distributed, programmable, and cloud-based.
B. High data rates.
C. One to 10 Gbps connections to end points.
D. One millisecond end-to-end round-trip delay.
E. Low battery consumption.
F. Better connectivity irrespective of location.
G. Larger number of supporting devices.
H. Lower cost of infrastructure development.

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IV. CHALLENGES

A. Design of cellular architecture.
B. It is incompatible with the previous generations.
C. Fentocells.
D. Stringent latency.
E. Network scalability.
F. Very long battery life.
G. Green communications.
H. Challenges to minimize cost.

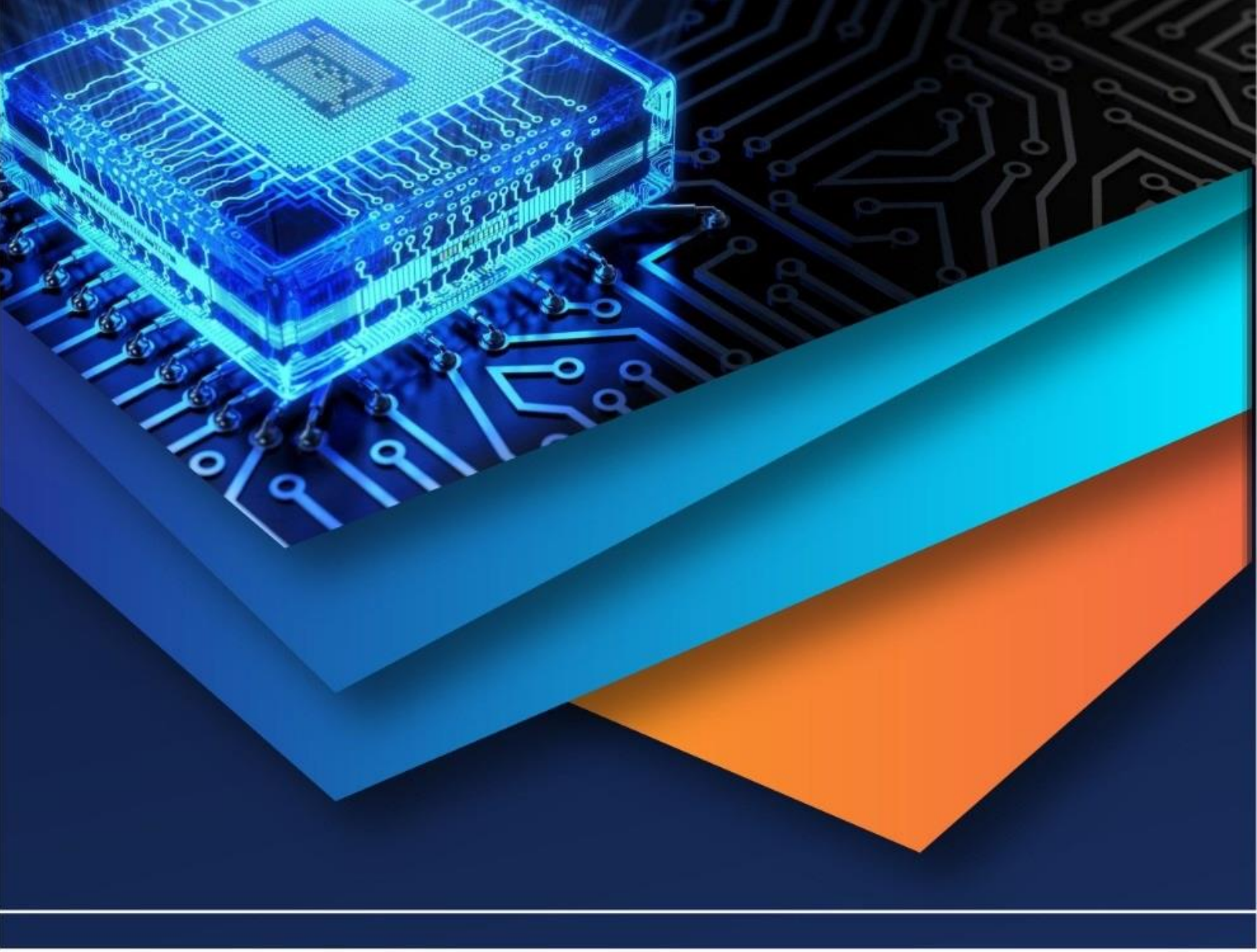
V. CONCLUSION

A. The 5G wireless technology is a multipurpose wireless network for mobile, fixed and enterprise wireless applications.
B. It incorporates all type of advanced features that makes it powerful and in huge demand in near future.
C. 5G technology is still in development stage. It has a bright future and will be a revolution in the mobile market.

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