

# Comprehensive survey study on fifth-generation wireless network and the Internet of Things

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## Abstract

Internet of Things is the interconnection of different components so that it should be able to communicate to each other to achieve a common goal. Therefore, for these components to communicate there will be a need of the communication Technologies. With the coming in of 5G wireless Network which provide more ability over the 2G,3G, 4G and other communication technologies. In this survey paper focuses much on what have been done before with 5G wireless Network in relation to Internet of Things, Application of 5G IoT, it also describes the various challenges which may arise when implementing it and the research questions. The next-generation protocol that will help to alleviate the current challenges which have been encountered. This paper will analyze the comprehensive survey on fifth-generation wireless network and Internet of Things from different papers and this will help to map the way forward on what best can apply 5G and other protocols in Internet of things.

**Keywords:** Internet of Things (IoT), 5G, Next-generation protocol, communication Technologies

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## 1. Introduction

The Internet of Things is an exciting and innovative technology that has the potential to transform the world by connecting physical objects which is called Things together in a network. It is concerned much with devices that use low power to communicate with one another over the Internet[1]. For these devices to be able to communicate to each other, they need to be connected to each other. The interconnection of the devices is possible using the communication technologies, therefore this makes the communication technology the main component and most of them are wireless technologies[2]. There are many wireless communication technologies which can be used in Internet of Things for instance Bluetooth, Zigbee, Z-wave, Wi-Fi, 4G, 3G, 2G, 5G and other [3] and Cellular technology is classified into short-range and wide-area technologies. Short-range cellular technologies use unlicensed spectrum like Wi-Fi and Bluetooth whereas

wide-area cellular technologies use licensed spectrum like GSM, LTE, and 5G [4]. IoT relies heavily on the new 5G communication technology that has recently been created. This is so, because the future IoT devices will need to meet new performance standards, such as vast connectivity, security and dependability, as well as wireless communication coverage and coverage of ultra-low latency and throughput, as well as ultra-reliable operation, among other things [5].

There will be even more than 500 billion Internet-enabled gadgets worldwide by 2030 as it is predicted by Cisco, Therefore IoT modules will be built into these devices, allowing them to communicate with each other and build IoT networks[6]. The Internet of Things (IoT) will be used in nearly every aspect of human life, especially smart cities, smart homes, smart agriculture and smart transportation[7]. This paper will provide the comprehensive survey of different works which put too much attention on combination of fifth-generation and Internet of Things. This survey paper contribution can be

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