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APPLICATION OF 5G IN SMART CAMPUSES

EMERGING TECHNOLOGY ON NETWORK INFRASTRUCTURE

5G, Wi-Fi 6, AND EMERGING NETWORK TECHNOLOGIES

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APPLICATION OF 5G IN SMART CAMPUSES

Definitions

Smart Campus: a campus that uses advanced networks and devices connected to the internet to provide a supportive environment. It connects people, devices, and applications all together to create immersive and automated experiences, and it enables universities to make informed decisions to improve security and maximize resources.

5G: a 5th generation network that will revolutionize cellular networks with fast data downloads and uploads.

The application: 5G to create an inter-connected and seamless environment

The 5G-based smart campus uses intelligent terminal equipment to stably transmit the collected data to the cloud server, and conduct in-depth analysis of the data to provide high-definition video and accurate teaching and research, in addition to allowing everyone in the campus to enjoy the perks of lightning-speed internet connection.

Students not only study on campus, but also wherever possible. 5G can give universities the opportunity to extend their networks far beyond their area, and in some cases to the entire urban sector. Much of this depends on undefined costs, but the idea of providing students with wireless network access to off-campus apartments is phenomenal. Students can access their online learning materials and use other internet services anytime and anywhere, and they will face absolutely no trouble in doing so, thanks to 5G and its range.

Moreover, 5G offers 100 times higher data rates. The spectrum of prices is cheaper because this new generation of networks moves to a higher frequency range that includes the millimeter wave band. Therefore, this will help reduce costs by a factor of 100. Students may also find it cost effective as 5G offers increased speed at a reduced price.

Reflection

In our views, we believe that the implementation of 5G networks in smart campuses would upgrade both the students' and the teachers' experiences indefinitely. All people inside the campus would get to enjoy premium internet connection, seamless workflow, and wide-range network accessibility. Furthermore, there are tremendous financial perks that are too significant to ignore, including lower operation costs, greater savings and better cost management. All these plus points make a huge encouraging factor to invest into such a technology, and we really hope to see it happening in the near future.

EMERGING TECHNOLOGY ON NETWORK INFRASTRUCTURE

Description of network infrastructure

It is a huge part of Information Technology that is utilized to enable devices to communicate and connect, and allow them to make use of network services. It basically connects all the cogs and wheels behind the resources involved in forming the network of devices. As a part of a network infrastructure, there must be access points throughout the vicinity of the specific location to help connect the network from the main access device to the external devices.

Devices used

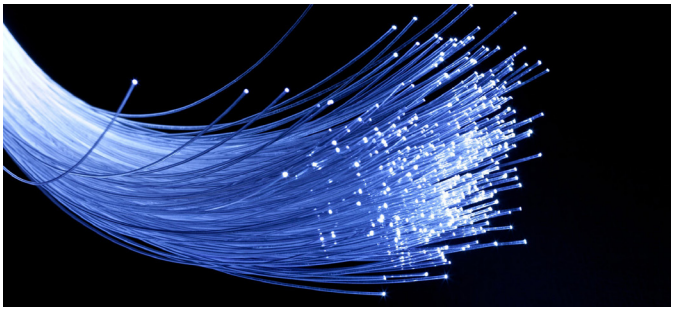
Network infrastructure has a very wide array of utilized devices, including hubs, switches, wireless access points, routers, optical fibers, and so on.

Devices such as electronic door handles, security cameras, sensory machines, and LED devices will see a rise in quantity moving forward with IoT-improved infrastructures. Network connectivity will also see newer developments with how they operate, with faster connectivity and a more stable transmission. With newer additions to how we can improve things such as wireless access points, we will be able to see a rise in higher performances, throughput, and capacity with the devices we will operate with in the future.

Examples of domains

Big examples of domains exist all around us. Starting from our own homes, school computer labs, and buildings, all the way to multi-building companies, small towns, cities, and even the whole globe.

Lets take optical fibers for example. The most common use we know of is that it connects home users to their respective internet service providers, but it is really surprising that it gets as significant as linking whole cities with each other overseas (literally overseas).



Reflection

We can understand the various ways in which the world of wireless technology works around us. It is simple to be able to recognize that our devices are connected to the internet, but we must also realize the importance of the steps behind how different devices can connect and how they all come together to form a 'digital ecosystem' with other devices and systems. More than ever, we are now more driven to cooperate with higher qualities of technology that comes with the market, all thanks to better network infrastructure. Understanding the way that new-age devices can upgrade and improve our lives significantly. Going from the mentioned advantages of how varying innovative technologies can improve our life in school, it is clear to us that the world is adapting towards a safer, efficient, and compact state with technology. Recognizing that these devices can perform at degrees higher than we previously thought, we see that change towards our environment is extraordinary, but possible in the hands of those who are willing to.

5G, Wi-Fi 6, & EMERGING NETWORK TECHNOLOGIES

Intro - 5G

5G is the latest and 5th generation of wireless mobile network which enables much faster speeds than previous generations and is compatible with a growing range of devices

With 5G, the data transmission rate could go up to 10 Gbps, with 1ms of E2E latency and could accommodate a number of 1 million connections per 1 square kilometers.

Devices used - 5G

5G is compatible with a wide range of devices like smart PCs, mobile phones like Huawei Mate 40 pro+ and Huawei Mate 20x 5G, and laptops like HUAWEI MateBook 13. Apart from that, Huawei provides devices like 5G routers to connect your devices to the 5G network.

Additionally, 5G can be utilized by IoT devices like sensors and smart wearables, as well as VR and AR sets.

Examples of domains - 5G

One of the biggest applications of 5G is in Virtual Reality and Augmented Reality. VR and AR allow the addition of extra digital layers to the real world, and are utilized in numerous fields, including shopping, education, and medicine.

Another area where 5G is perfect for is in the Internet of Things, especially that 5G integrates fast speed and massive device connectivity which will further strengthen the capabilities of IoT.

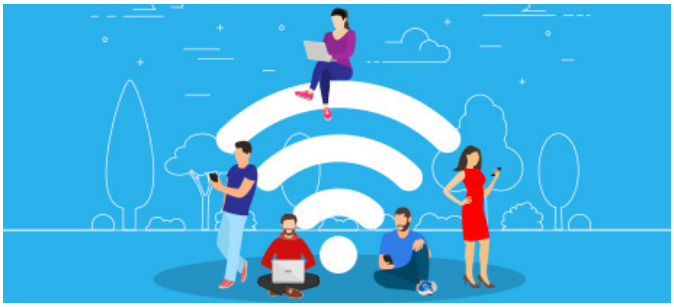
The internet of things is a network of devices connected wirelessly and has numerous applications for example in smart homes were home appliances and security systems can be connected and controlled remotely using the internet.

Intro Wi-fi 6

Wi-Fi 6 (also known as wireless standard 802.11ax) has been around for almost 3 years and is the 6th & latest generation of Wi-Fi. Wi-fi 6 has larger bandwidth and lower latency allowing for top speeds. Its expected speed is 40% more than that that of Wi-Fi 5. Wi-fi 6 also contributes to lower power usage as it can activate sleep mode and reduce the battery life of the devices connected.

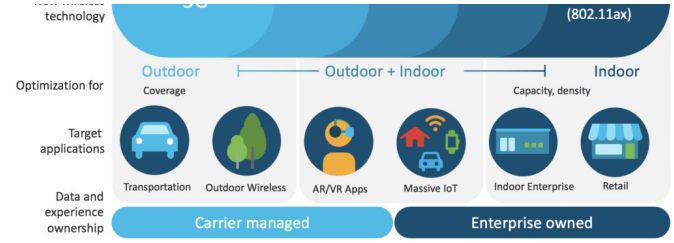
Devices used - Wi-Fi 6

Apart from routers that support Wi-Fi 6 , phones like the Huawei P40 Pro were among the first devices to support Wi-Fi 6. Some laptops and tablets are also amongst Wi-Fi 6 compatible devices.



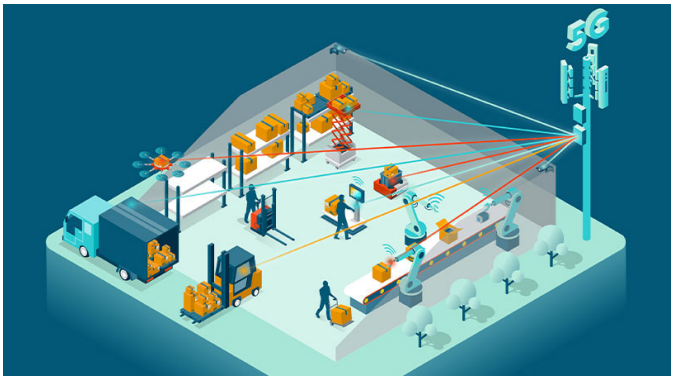
Examples of domains - Wi-Fi 6

Like 5G, Wi-Fi 6 would have a huge impact on the IoT and the VR & AR industries. Wi-Fi 6 is particularly beneficial in the manufacturing field. Being used for wireless connection of machinery (IoT) with Wi-Fi 6 high bandwidth, low latency, and ability to reduce power consumption, smart manufacturing will be further improved.



Reflection

There is no doubt that 5G and Wi-Fi 6 are expected to play a great role in the economy and completely transform the digital world. In my opinion, I believe 5G and Wi-Fi 6 together will be implemented in almost all fields soon, from education, entertainment, and medicine, to manufacturing and agriculture. 5G and Wi-Fi 6 have the potential to dominate the digital world. Not only will it provide leisure, but it will also improve our lives directly, making jobs and daily tasks like shopping, driving, and communication more convenient. Also, it will largely impact VR, AR and IoT making transmissions faster and more efficient. Undoubtedly, 5G and Wi-Fi 6 are the future of technological advancements.



Resources

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