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5G AND WI-FI 6

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EMERGING TECHNOLOGY ON NETWORK INFRASTRUCTURE

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5G in a smart campus



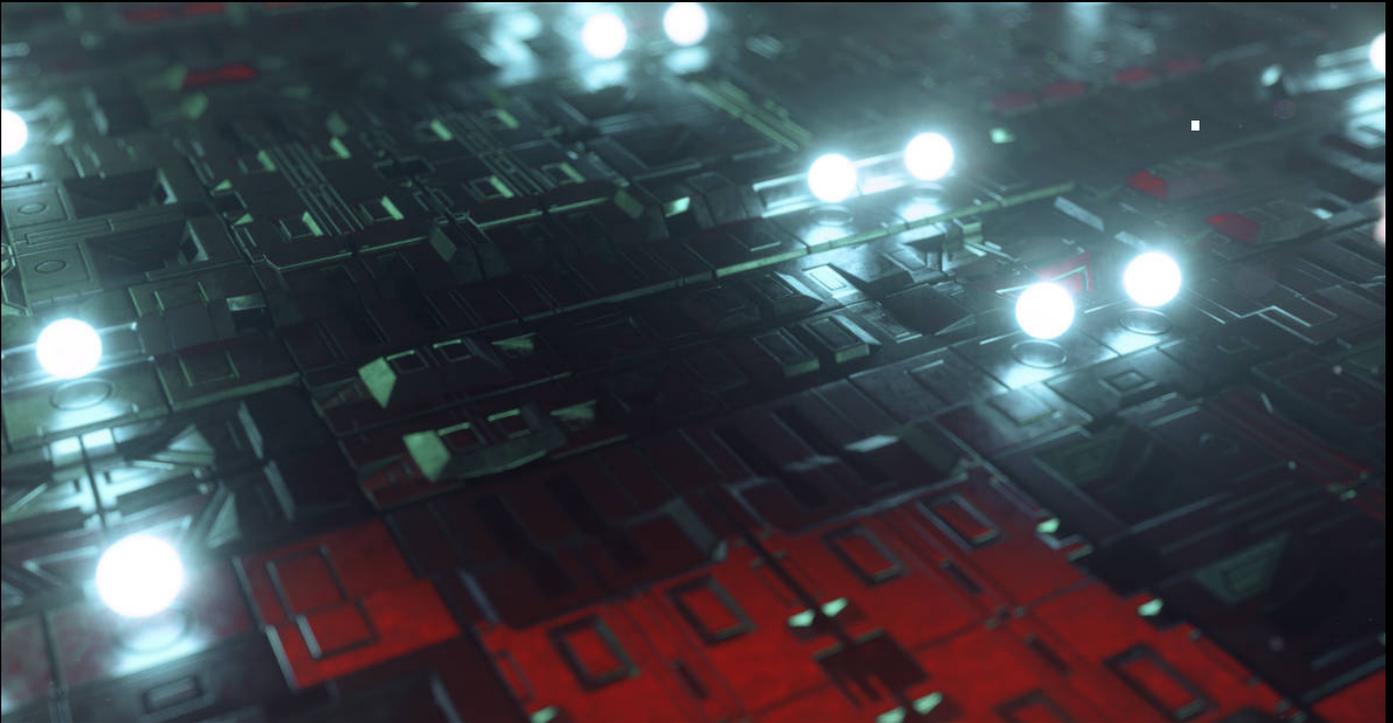
A smart campus is a campus where advanced surveillance and security systems are used, Surveillance Cameras are placed everywhere to track and see everything that happens, a card reader, face recognition, and Fire sensors are there to keep students and staff safe. With the introduction of 5G in such a campus, the machines can work faster and more efficiently for example the fire alarm system. The fire alarm system works to detect in case a fire happens on the campus. The sensors detect the heat, Raise the Alarm, calls firefighters, and send the location of the fire. Using traditional internet this process would take up to 10 minutes and in a matter of life and death like this, every second matters and so the 5G helps in making things faster because the network itself can have a very high load of traffic while working fast at the same hence reducing the time of the process much more.

Reflection

We think the application of 5G in all the aspects of the smart campus is Magnificent by itself but what is more Magnificent than everything is the safety of the people. A smart campus already ensures that a safe educational environment is provided for the teachers and students but the 5G helps make it more efficient and secure than ever which by itself will provide a better education for the next generations who are the future of Humanity. All in All, 5G is going to make everything easier for humanity.

EMERGING TECHNOLOGY ON NETWORK INFRASTRUCTURES

Get to know the description of the infrastructure discussed in the talk



Network infrastructure consist of wi-fi device, access point, switches, and data center. All of them work together so that we can access the internet.

Wi-fi device is the wireless tool that the end user use to access the internet like smartphones, laptop, and tablet.

Meanwhile, access point play the role to provide the connectivity of those wi-fi devices to the internet. For your information, nowadays access point also embedded with other wireless protocol like bluetooth and zigbee protocol.

In addition, the switches will connect all of the devices in that area to create a network such as printer, the wi-fi devices , the desktop, and the telephone.

The data from the switches then will be sent to the core switch that located at the data center, this is where the internet get terminated and the client can access the internet

"The Internet gave us access to everything; but it also gave everything access to us."
-James Veitch

THE DEVICE USING NETWORK INFRASTRUCTURE



SMART UTILITY METER

The smart metre is a popular IoT device among utility companies. These devices are attached to buildings and link to a smart energy infrastructure, allowing utility providers to better regulate energy flow. Smart metres also enable consumers to monitor their energy use, which has a big cost impact.

A smart city places physical infrastructure on its network infrastructure. Create situational awareness for new services, lower costs, and public safety Using IoT to connect buildings, vehicles, people, and things

SMART CITY

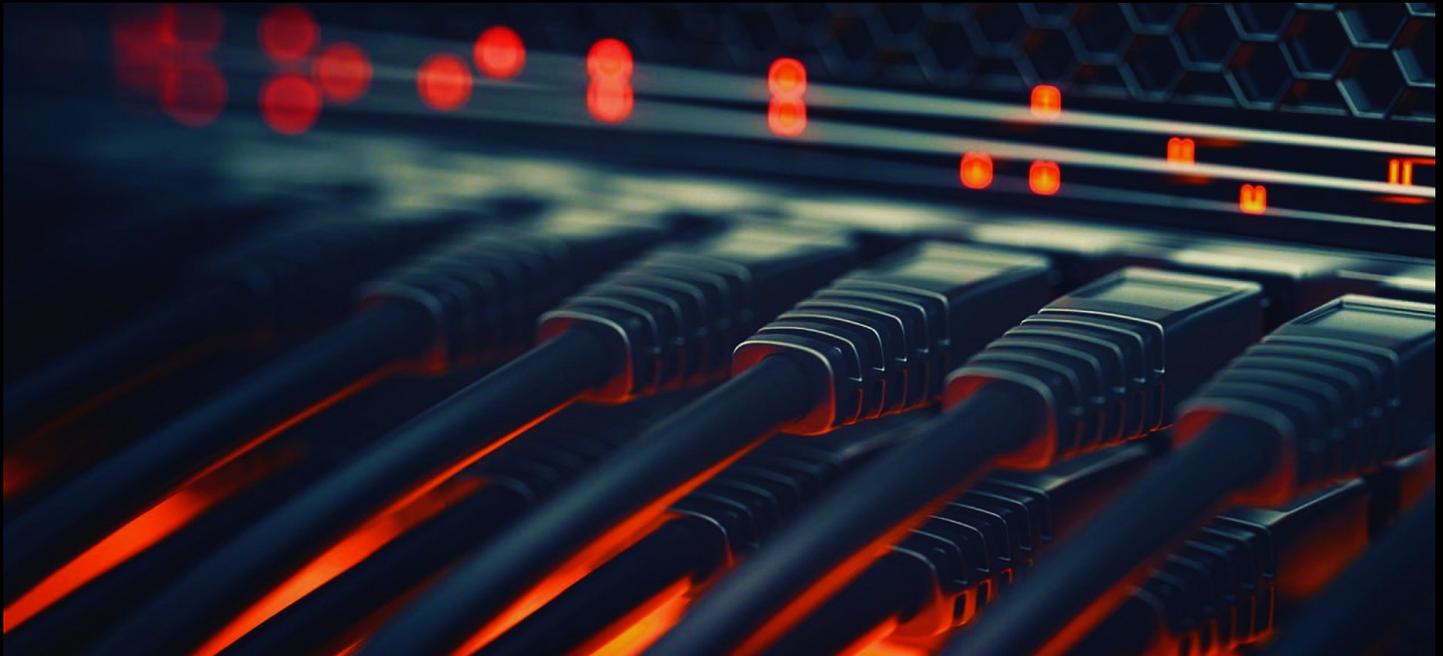


REFLECTION

We think that emerging technology on network infrastructure can improve everybody's life. It is because these technologies can help humans to do daily basis. for example, nowadays we can control many utilities in our home by using our smartphones only. The student can use this technology to help them to study better so that they can obtain a better grade.

5G AND WI-FI 6

Get to know the description of the infrastructure discussed in the talk



5G is the fifth generation of wireless technology system that provides faster speed than previous generation like 3G and 4G.

The speed that 5G wireless technology can provide is up to 10 Gbps as 5G devices can get low latency so it enable faster transmission of larger data streams.

In addition, virtual reality will be a killer application of 5G because to get ultra resolution, the required speed is about 4.2 Gbps which only can be achieved by using 5G wireless technology system.

Wi-Fi 6

Wi-fi 6 has been officially certified by Wi-Fi Alliance since October 2018, the obvious changes from previous Wi-Fi series is on the speed that this Wi-fi provides. The max rate speed that can be provided is 9.6 Gbps, compatible to 5G technology.

In short, Wi-Fi 6 able to carry, transfer, and transmit more data than Wi-Fi 5.

The difference between 5G technology and Wi-Fi 6 can be seen based on the deployment scenarios. Wi-Fi 6 usually for indoor high-density such as building and house but 5G technology more suitable for outdoor wide coverage such as at commercial street and highway.

Devices that used 5G and Wifi 6



The next generation of mobile networks, 5G, offers substantially faster data download and upload rates, more coverage, and more consistent connectivity. A dependable 5G network will aid in the advancement of VR and AR applications. Some even believe that 5G will be critical to the future of immersion.

The Latency

Latency is defined as the time gap between a request and a response. According to Qualcomm-commissioned ABI Research, 5G will result in a 10X drop in latency. 5G will also enhance the data rate, which is the time taken to send you the requested data. This implies that a webpage will load entirely in one second; the days of waiting many seconds are over. While the impact of reduced latency on online sites is obvious, the benefits for VR are a little more complicated. The basic minimum for playing non-VR games is 50 milliseconds of latency. When the delay in VR exceeds 20 milliseconds, consumers will suffer nausea as low latency can avoid motion sickness. The user experience will be great with 5G's sub-5 or sub-2 ms latency. In other words, it will be natural and smooth. This is critical because VR is all about immersion - feeling as if you are in the virtual environment. Many industries will reap the benefits of VR, ranging from healthcare to entertainment.

Connectivity and reliability

AR and VR apps may be extremely sensitive to network speed, with any disruption having a substantial adverse impact on user experience. We are using more data than ever before, especially as the popularity of video and music streaming grows. Existing spectrum bands are getting overloaded as a result of their inability to cope. This causes service outages, especially when several users in the same region attempt to use online mobile services at the same time. More devices on the network will necessitate more connections, which 4G cannot accommodate. 5G is significantly better at managing thousands of devices at once, from mobile phones to equipment sensors, video cameras, and smart street lighting. "A 5G network enables up to a million connections per square kilometer," according to Huawei. Millions, if not billions, of connections, are required for technologies such as VR and AR to thrive.

Domain of 5G and WIFI 6



Wi-Fi 6 improve coverage

By using Wi-Fi 6 technologies, full-house 5G coverage can be achieved. Wi-Fi 6 features can boost data rates over a certain distance by bringing more radio chains, improving sensitivity, and smaller channels in the form of resource units. All of these features lead to the capacity to increase usability while also increasing data speeds.

Smart Home

With smart security systems, you can monitor, manage, and customize your security system whenever and wherever you want.

Smart Security

With the help of a smartphone, homeowners can control appliances, lights, thermostats, and other devices remotely

Reflections

What Benefit Can Be Taken And Learnt?

5G

5G is going to drastically change our daily lives, as we can see. With the speed upgrades, students will have no interruptions during any of their online sessions since they can download any source of information easily. The low latency feature ensures that our works will be smoother since the algorithm is faster than human processing and can synchronize effectively during real-time to enhance the capabilities of future computer software.

The advent of 5G will lead to a new revolution, so as to fully take advantage of its capabilities and to facilitate the modernization of infrastructure within our country and communities. We must be ready to engage in that revolution and embrace the changes it will bring.

Therefore, we need to educate our youth in the field of technology, so that we can develop more technologically-savvy people who can utilize the technology with full knowledge of its capabilities.

WIFI 6

The WIFI 6 standard brings a number of good changes to help with the mass on the problem that burdens the previous versions of Wifi users.

In the past, the bigger the network was, the slower it was. Frequency-division multiple access (FDMA) is used to solve this problem and make efficient use of network bandwidth. It also improves the reliability and security of the system, but some flaws should concern users. In addition to costing more, devices fitted with WiFi 6 have a smaller range where obstructions could cause interference.

We must consider carefully how we would like to integrate these new innovations into our daily lives in the future. Smart Cities and technological advances will revolutionize our nation if we are able to withstand the waves of change.