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DECEMBER 2021

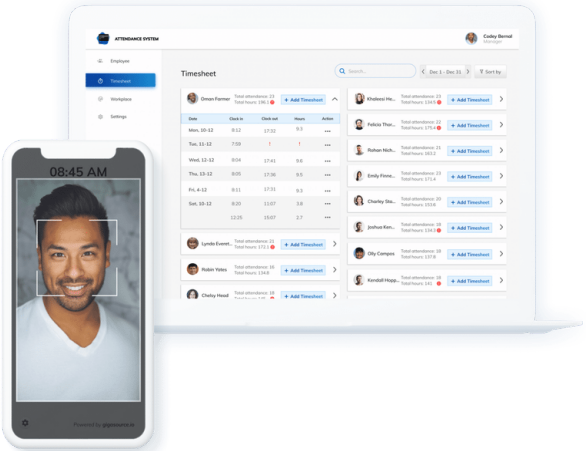
EMERGING TECHNOLOGIES

APPLICATION OF
in Smart Campus

FRIDAY | 10.12.21

Students Management: Facial Recognition System

With 5G technology, we are able to build a smooth and efficient system in the smart campus. By using facial recognition with a 5G network, the system can easily recognize university students and record their attendance in the database. The students no longer need to take attendance manually by filling the attendance form or scanning the QR code. This really helps students to save a lot of time and they can make use of their time into a more useful affair. The facial recognition system is allowed to store more than 100,000 different face images and identifies an individual face within 2 seconds.



The facial recognition system also can be applied at the lecture hall. For instance, the lecturer will book the lecture hall using mobile apps, where students that are only approved by the lecturer are allowed to enter the lecture hall by detecting their faces. This is to make sure there will be no intruders interrupting the lessons. Besides, the lecturer also can blacklist students that do not obey the rule from entering the lecture hall. So, the progress of learning will be smooth and productive all the while assisting the lecturer to manage their students effortlessly.

Reflection

5G technology can be widely used in different kinds of fields such as healthcare, education, transportation, manufacturing, and so on. It's bring everyone beneficial advantages because 5G has low latency and high bandwidth. The transmission speed of 5G is extremely fast in transferring big data and this will optimize our precious time. With low latency, we can control the logistics, manufacturing, surgical operations, and so on without any time delay We believe there will be huge changes in this era by adding the 5G technology in different areas.

INDUSTRIAL TALK 5:

FRIDAY | 10.12.21

Smart Campus: The Journey Starts Here (CommScope Malaysia)

What is Smart Campus ?

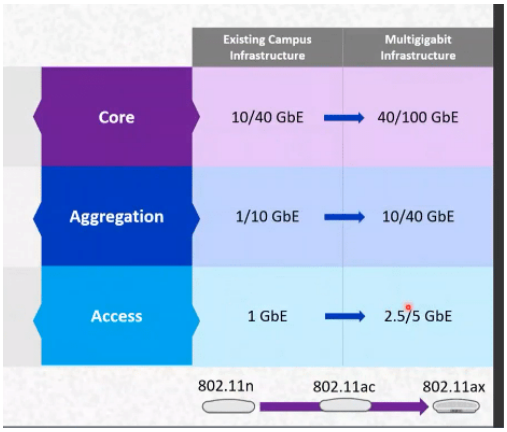
Physical infrastructure is built on top of network infrastructure in a Smart City. It connects to the environment, such as buildings and automobiles, via IoT devices. It improves situational awareness in preparation for new services, lowers costs, and promotes public safety.

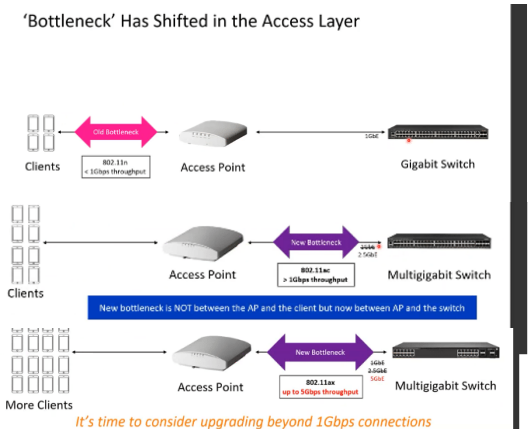
A smart home is a comfortable residential setting in which appliances and gadgets can be handled remotely from anywhere with an internet connection using a smartphone or other networked device.

A smart campus is a hybrid of a smart city and a smart residence. Smart living, smart learning, and smart security are all available on the smart campus. This combination may provide a better learning environment for students.

Multigigabit Technology

Enterprise network traffic is increasing by the day. This is because WIFI speeds, IoT devices, cloud applications, and video streaming are all rapidly increasing.





With a transfer speed of less than 1Gbps, an old bottleneck placed between clients (users) and access points. With the introduction of new access point technology (802.11ac), the bottleneck is now located between the access point and the multigigabit switch, allowing speeds to exceed 1Gbps. There are now (802.11ax) devices that can boost the speed to 5Gbps. This allows multiple customers to connect to a single access point.

Cloud Analytics

According to data, 42% of network administrators spend too much time troubleshooting, and 38% of network professionals are unable to recognize network performance issues. To tackle these issues, more resources are required. Organizations will soon be unable to rely solely on human labor; instead, a more automated, self-optimizing, and healing network environment will be required.

IT Professionals are no longer required to spot issues that have occurred thanks to cloud analytics technologies. The system can recognize and provide solutions to its own problems. Problems can be solved in less time.

IT administration is aided by RUCKUS analytics. It provides incident analytics, which may be used to locate and prioritize IT issues. Without the use of overlay sensors, service validation helps to automatically validate service levels. The impact of network configuration changes on key performance indicators can be monitored and assessed using configuration change analysis (KPIs). Create and monitor SLA categories and thresholds for network health monitoring. Event correlation and granular client connection diagnostics are aided by client troubleshooting. Data Explorer, Reporting, and Dashboard deliver 12 months of historical data with configurable presentation and personalized reports.

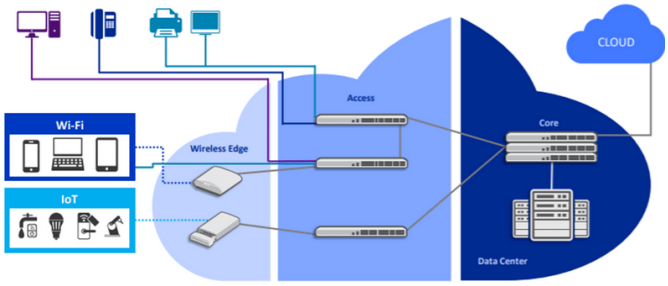
Campus Network

Students and staff use WIFI-enabled devices such as cellphones and laptops to connect to the network. The university also has its IoT gadgets strewn over the grounds. These IoT devices use their own wireless protocol to connect with one another. An access point connects all of these devices. A cable from the access point will link the switches. The switches will be used to connect all of the devices. The switches will be connected to the central switch via uplink. The core switch will be housed in the data center. There will also be data storage and a firewall in the data center.

WIFI is expected to explode in popularity in the near future. The most recent wifi protocol supported is Wifi6. Wifi6e is still unavailable in Malaysia. To attain the desired WIFI speed, you must first upgrade your WIFI plan and access point. New access point technologies will be required to allow the high WIFI speed. A WIFI 5 access point's WIFI speed is insufficient to handle a WIFI 6 access point's WIFI speed. To get speeds of up to 1 GB/s, you'll need WIFI 6. In order to achieve high-speed WIFI, your gadgets must also cooperate. Faster WIFI connections are not supported by older devices, necessitating a router upgrade.

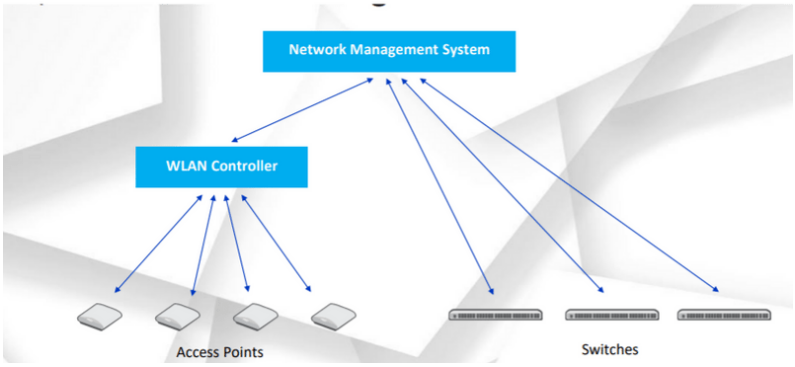
Network Infrastructure

The hardware and software resources of an entire network that enable network connectivity, communication, operations, and management of a corporate network are referred to as network infrastructure. It connects users, processes, applications, services, and external networks/the internet by providing a communication path and services.



Unified Network Management

The traditional approach to on-premises LAN/WLAN network management



Two network elements: WLAN controller + Network Management System

Reflection

We can see from this discussion that there are some options for making our lives better and more technological. The first and most crucial step is to increase our usage of modern technology. We can improve internet usage by incorporating more sophisticated devices. As a result, our lives become more credible. When the number of people using the internet grows, the government will upgrade the internet or improve the internet equipment. Then, as time goes on, the percentage of people who use the internet will grow. Following that, when the internet improves, there will be an update to campus life. In the future, once all of the infrastructures have been improved, a smart campus will be established. When the smart campus is fully operational, students will feel more at ease and secure when on campus. The smart campus has given smart living, smart learning, and smart security as a result of this. Students have had a better learning experience because of the smart campus. As a result, the introduction of a smart campus will entice more students to stay on campus.

INDUSTRIAL TALK 6:

5G, Wi-Fi6 and Emerging Network Technologies (HUAWEI)

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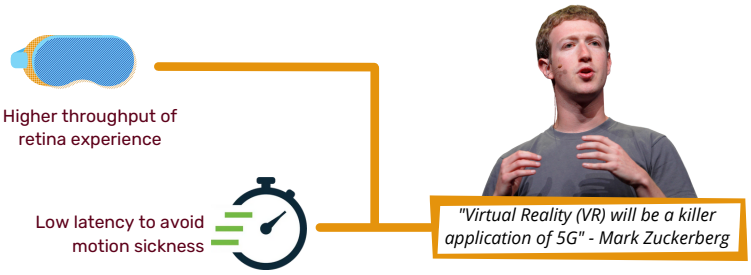
Description

5G is the next (and fifth) generation of wireless technology systems that provide faster speed and are comparable to fiber optic cables. Early testing of this technology shows that the real world speed can reach from 0.7 to 3.025 Gigabit per second, which means movies that took minutes to download with 4G, will now only take seconds with 5G. The two main highlights of this technology are its high bandwidth and low latency.

This technology will surely become transformative to the industries due to its lower latency which allows faster data transmission of larger data streams. Furthermore, 5G is more reliable as it has the capability to transmit data better in extreme conditions. On top of that, 5G is known to be more flexible than Wi-Fi and can support a wider range of devices available in the market.



Devices Used


HUAWEI 5G Mobile WiFi Pro


HUAWEI Mate X2


HUAWEI Outdoor 5G CPE WIN Router


Philips Hue Smart Bulb


HUAWEI VR Glass


Tesla Model 3

Uses in Healthcare Domain

As 5G has high bandwidth, it can support 4K and 8K remote group consultation with high-speed sharing and transmission of medical images and data. On top of that ultrasound can be done remotely using HD remote ultrasound systems that offer no latency.

Next, 5G may offer remote emergency issues to be dealt with while in the ambulance itself, where patients will receive the same treatment just as they could in a hospital. Even medical training and education can be done virtually with a more immersive experience. Last but not least, autonomous robots also may ease the work of nurses and doctors, with the presence of 5G technology.

Description

Wi-Fi6 is one of the technologies that has been verified for more than 3 years, Only in 2019, the Wi-Fi Alliance initiated Wi-Fi6 Certification, indicating that Wi-Fi6 has officially entered the Mature Commercial use phase. Currently, in the market, we could see many devices that support Wi-Fi6. For example, iPhone 11 series, network adapter released by intel, and Wi-Fi6 routers from different companies in the market.

There are several advantages gained from Wi-Fi6 in which are, large bandwidth, low latency, high concurrency, and low power consumption. Firstly, the bandwidths improved from 1.73Gbps (Wi-Fi5) to 9.6Gbps (Wi-Fi6). This has improved the bandwidths by 2.8 times compared to Wi-Fi5. Secondly, the coverage range is improved by 40%. This allows a house with 120 square meters house to have 5GHz coverage. Thirdly, there is a big improvement in network capacity and efficiency, thus power consumption is reduced by 30%. These advantages allowed us to do multiple things that we aren't able to do with the previous Wi-Fi5. Such as Wi-Fi6 able to support Gigabit Broadband Promotion (1Gbit/s to mobile devices and PCs), increased the speed of uplink and downlink experience better multi-user experience.

AirEngine Wi-Fi6

AirEngine Wi-Fi6 are devices that were released by Huawei, that support Wi-Fi6. These devices have characteristics as below :

1. High performance
2. Most stable user experience
3. Most comprehensive IoT Apps
4. Most Secure
5. Powered by Huawei 5G

Wi-Fi6 in Gaming Domain

With the evolution of Wi-Fi6, the gaming world is being changed to entirely a new level. Gamers are now able to enjoy a better experience playing their video games as this new technology is aiding them. First and foremost, gamers are now able to have a better multi-user experience. They will be able to play with more people online without any laggings and interference. They will also have a much better gaming experience with a better data transfer rate with low latency that makes the refresh rate faster. Gamers also will be able to play longer as Wi-Fi6 reduces power usage by 30%. As we could see, the gaming world is evolving with Wi-Fi6. Gamers should adapt to Wi-Fi6 as soon as possible so they could have a better experience while playing their video games.

Reflection

Wi-Fi 6 and 5G technology is a big influence and has many benefits that assist humans from a Technological perspective. The evolution of Wi-Fi6 and 5G not only improves our productivity rate but also helps us to get the best experience being on our devices. For example, with the help of 5G, we can download large files within minutes, which would have taken hours with the previous technologies. 5G and Wi-Fi6 enable better coverage indoors and outdoors that would help us to be online and reachable wherever we are. With these two technologies evolving, we as people should also be ready to adapt to them, so that these technologies can be used at their most credibility. With that, it will help the technologies to be evolved to even better phases. To conclude, everyone should try to adapt to these two awesome technologies as it will result in a better world for us from a technological perspective.