Case study

NATIONAL CHENGCHI UNIVERSITY LAUNCHES WI-FI 6E WIRELESS NETWORK CAMPUS PROJECT

RUCKUS Networks and MetaAge Corporation play key roles to meet high-density network demands

With the rise of social media platforms and the prevalence of live streaming, National Chengchi University (NCCU) has decided to launch a Wi-Fi® 6E wireless network campus project. Through MetaAge Corporation, the university has introduced the RUCKUS Networks R760 access points (APs), which feature high capacity, wide coverage, and excellent interference avoidance. This implementation aims to provide a stable and low-latency wireless internet experience for all faculty and students.

RUCKUS Networks R760 APs have proven their effectiveness in meeting the connectivity needs of high-density crowds at various NCCU events, including sports competitions and graduation ceremonies. Looking ahead, NCCU plans to expand the deployment of RUCKUS Networks R760 APs to further enhance network quality across the entire campus for all faculty and students.

RUCKUS Networks R760: Powerful functionality combining high capacity, wide coverage, and superior interference avoidance

As smartphones have become indispensable devices in most people's lives, they have fueled the rapid development of social media platforms, live streaming, online shopping, and mobile payments. However, this trend poses significant challenges to wireless network infrastructures at high-density locations such as sports events and concerts. Only next-generation wireless APs can effectively address these challenges.

Tsai Yi-huai, head of the Network Research and Development division at National Chengchi University Computer Center, says the university has been continuously exploring ways to optimize campus networks in response, to change internet usage behaviors and meet students' expectations for wireless network services. The RUCKUS Networks R760 AP is designed specifically for environments with high crowd density with simultaneous access to large amounts of network resources—ensuring excellent internet quality for every user.

Thus, when launching the Wi-Fi 6E wireless network campus project, National Chengchi University introduced the RUCKUS Networks R760 wireless APs through their IT intelligent optimization partner, MetaAge Technology. These APs feature high capacity, wide coverage, and superior interference avoidance capabilities, providing stable and low-latency wireless internet experiences for all faculty and students.

Tsai noted that, since the deployment of RUCKUS Networks R760 wireless APs in the university's gymnasium, they have demonstrated excellent high-capacity and wide-coverage characteristics during

numerous sports events and graduation ceremonies. The APs have successfully met the internet needs of thousands of people simultaneously, with overall performance that has been highly satisfactory.

Changes in internet user behavior require urgent updates to wireless network infrastructure

As a leading institution for humanities and social sciences in Taiwan, National Chengchi University (NCCU) is dedicated to nurturing talent with an international perspective in a globalized and diverse environment, advancing toward becoming a premier center for Chinese social sciences. Facing intense competition in higher education, the university is leveraging digital empowerment to fulfill its mission of "creative transformation," aiming to achieve five major visions: "Digital NCCU," "Diverse NCCU," "Resilient NCCU," "Public NCCU," and "Poetic NCCU." These efforts are geared toward actively enhancing educational quality and pursuing academic excellence.

National Chengchi University—committed to providing the best learning environment for students, and highly valuing student feedback—had launched a Wi-Fi 4 or Wi-Fi 5 wireless network campus project years ago, when smartphones first became widespread. This initiative involved deploying wireless APs at high-traffic student hotspots to meet substantial connectivity demands, and it received positive feedback overall.

However, in recent years, with the rise of various social media platforms and the popularity of live streaming, an increasing number of students have reported declining wireless network quality and expressed the need for wireless network services in outdoor areas. In response, National Chengchi University has decided to initiate a Wi-Fi 6E wireless network campus project.

NCCU gymnasium takes the lead in deploying RUCKUS Networks R760, achieving excellent results

Tsai Yi-huai explains that, with the rise of smart mobile devices, the deployment model for wireless network environments has shifted from merely providing signal coverage to meeting high-volume internet demands in short periods. With the recent popularity of Facebook, Instagram, and live streaming services, wireless APs now need the capability to process large volumes of data packets. As a result, NCCU has been evaluating suitable solutions over the past two years. After learning about the RUCKUS Networks R760 wireless access point, which adopts the Wi-Fi 6E standard and is designed for next-generation internet usage characteristics, the university decided to conduct a proof of concept (PoC) test in the

NCCU gymnasium—a venue with frequent activities and high population density. The verification was successfully completed with assistance from RUCKUS Networks distributor MetaAge and RUCKUS Networks.

Looking back at 2023, during the new student orientation phase, NCCU conducted a PoC of the RUCKUS Networks R760 wireless APs in the university gymnasium. Test data showed that a single AP could simultaneously connect up to 350 users, with data upload and download speeds peaking at nearly 300 Mbps. The overall network usage reached 5 Tbps that afternoon, with the RUCKUS Networks R760 demonstrating excellent overall performance. Consequently, with the joint assistance of MetaAge and the RUCKUS Networks sales engineering team, multiple RUCKUS Networks R760 wireless APs have been successfully deployed in the NCCU gymnasium.

Tsai mentions that, due to the poor signal penetration of 4G and 5G mobile networks, it's difficult to receive signals from mobile carriers inside the NCCU gymnasium. In the past, whenever the NCCU Griffins basketball team had a game, or during large events such as graduation ceremonies or new student orientations, they heavily relied on the venue's wireless network services for live streaming and social media activities on Facebook and Instagram. Before the deployment of the RUCKUS Networks R760, the Network Research and Development division of NCCU's Computer Center would have to deploy additional mobile wireless access points on site at the request of the event organizers. However, since the deployment of the RUCKUS Networks R760 wireless APs, they no longer need to expend significant manpower and resources on these cumbersome and complex setups.

Adopting Wi-Fi 6E standard with multiple proprietary designs and unique engineered designed for high-density environments

To meet market demands, RUCKUS Networks has developed the RUCKUS Networks R760 access point, a high-end solution uniquely designed for high-density environments. Supporting concurrent tri-band operation in 6 GHz, 5 GHz and 2.4 GHz bands, the R760 adopts the latest Wi-Fi 6E standard—integrating Wi-Fi, the internet of things (IoT), and APP capabilities into a single unit. The RUCKUS ultra-high-density technology suite easily enhances capacity, improves coverage, and boosts performance to provide users with faster and better Wi-Fi services.

The RUCKUS Networks R760 wireless AP incorporates several proprietary designs. First, it integrates RUCKUS Networks BeamFlex+® technology with Wi-Fi 6E, and features a 10 Gbps RJ-45 interface—ensuring overall wireless network connection quality. Additionally, it has built-in BLE and Zigbee IoT communication capabilities and supports up to 1,536 client connections and 36 SSID configurations, meeting the connectivity needs of high-density crowds.

"Most wireless access points on the market use omnidirectional antennas, which automatically reduce radio wave power when wireless signals encounter obstacles, resulting in reduced signal coverage. This requires deploying more devices to solve signal coverage issues," Tsai Yi-huai explains. "In contrast, the RUCKUS Networks R760 access point uses directional antennas. Even if one antenna is very close to an obstacle, the other antennas can still stably transmit wireless network signals, allowing for better signal coverage with fewer access points and providing stable connection quality for users on-site."

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Tsai Yi-huai
Head of the Network Research and Development division at National Chengchi University Computer Center

Expanding deployment of RUCKUS Networks R760 to provide enhanced network quality for all faculty and students

Tsai Yi-huai points out that, since the deployment of the RUCKUS Networks R760 APs, the NCCU gymnasium has hosted numerous large-scale events, including basketball games and graduation ceremonies. During these events, organizers have conducted various live streaming activities and interactive games on-site. To date, neither students nor event organizers have reported any issues with the on-site connection quality, demonstrating that the project has fully met expectations.

Looking ahead, National Chengchi University plans to draw on the successful implementation experience from the gymnasium to gradually deploy RUCKUS Networks R760 wireless APs at other suitable locations across the campus. This initiative aims to provide all faculty and students with an improved wireless network service experience.

About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

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