Independent School Enriches Collaborative Learning with Technology

Hong Kong Academy installed Cisco wireless network to support laptop initiatives and educational applications.

Challenge

Founded in 2000, Hong Kong Academy (HKA) is an International Baccalaureate school for preschool to Grade 12 students. Located in the seaside town of Sai Kung, HKA works to offer a personal, individualized learning approach within a close-knit community for its 600 students. As part of this approach, HKA highly encourages the use of technology in the classroom, including a one-to-one laptop program for grades 5 to 12 and a strong bring-your-own-device (BYOD) initiative.

"When used properly, networks have the potential to bring together teachers and students by creating a virtual community and facilitating communication," says Andy Birch, director of technology at Hong Kong Academy. "Many of our teachers and students carry at least a laptop and smartphone, and we can see the number of devices per person growing as technology continues to evolve."

HKA recently constructed a new building that will serve as the school's home for many years to come. As part of the building process, HKA had the opportunity to construct a new network built specifically to the school's standards. HKA needed a network that could deliver the capacity and reliability needed to support the school's laptop and BYOD initiatives. The school also wanted ways to effectively manage the network to help prioritize bandwidth for lessons and classroom assignments. Most importantly, as the network would become an integral part of construction, HKA needed a network that could evolve over time and would be compatible with future versions.

Working with installation partner BT Group, HKA wired its new facilities with Cisco® wired and wireless network solutions, including Cisco Connected Mobile Experiences (CMX) to enhance traffic optimization with location intelligence.

> "Cisco enables us to create a network where teachers, parents, and students are truly connected in a virtual space that supports learning."
>
> – Andy Birch
>   Director of Technology
>   Hong Kong Academy

Solution

While the new school building is wired with fibre channel and Ethernet to support high-speed connections, mobility is the future at HKA, with both teachers and students heavily using laptops in the classroom. "Teachers, in particular, need strong wireless connections to access projectors and online information quickly and easily when they move between classrooms," says Birch. "We want to give them a strong network connection so that they can access resources in the classroom with as little delay as possible."

Most teachers and students access the network through the Cisco wireless network, built using a total of 118 Cisco Aironet® 3602 Series Access Points and Cisco Aironet 1552 Series Outdoor Access Points. Two Cisco 5508 Wireless Controllers manage and balance loads across the access points. To gain the most performance from the 3602 Series Access Points, HKA decided to take advantage of the modular design and add the 802.11ac Radio Module. By supporting 802.11ac, the 3602 Series Access Points provide higher wireless performance that approaches the speed and reliability of wired connections, which helps it accurately deliver streaming video.

As a part of the Cisco CMX solution, Cisco Mobility Services Engine (MSE) triangulates location information and signal strength from multiple access points to determine exactly where devices are within the school. The Cisco CMX analytics platform helps IT staff leverage this data, showing the density of devices and signal performance, which enables HKA to adjust its wireless design and to meet needs.

HKA also uses Cisco Identity Services Engine (ISE) to automate and simplify policy control for the BYOD environment and Cisco Prime Infrastructure 1.2 to unify management of both wired and wireless networks in a single location. By integrating information from both Cisco MSE and Cisco ISE, Cisco Prime™ delivers a holistic view of overall network and network health throughout the building.

At the core of the network, HKA uses two Cisco Catalyst® 3750-X Series Switches that prioritize business-critical traffic, which helps to ensure that teachers receive reliable, high-speed connections in the classroom. Twelve Cisco Catalyst 2960-S Series Switches form the access layer, with two Cisco ASA 5515-X Series Next-Generation Firewalls for security and intrusion prevention. Two closets on each floor connect to the server room, which houses two Cisco UCS C220 M3 Rack Servers, through dual fibre channel connections for redundancy.

In addition to using Cisco networks, HKA deploys voice over IP communications with Cisco solutions. The Cisco 2951 Integrated Services Router delivers secure voice applications with support for Cisco Unified CallManager Express. Around 100 Cisco Unified IP Phones connect teachers and staff to parents and the community. By integrating the voice and security systems into the single Cisco network, HKA reduces costs and management while improving the potential scalability of the connected systems.

Results

"HKA teachers are highly innovative and committed to cutting-edge use of technology in the classroom," says Birch. "We want them to access any technologies that they need to enhance their lessons. With our new network from Cisco, we gain the reliability and capacity that enables HKA teachers to provide students with the best learning opportunities possible."

Teachers use the new Cisco wireless network to connect their laptops to projectors from anywhere in any room without being tied to a single, wired location. "Since implementing

the Cisco wireless network, we've seen excellent uptime and reliability," says Birch. "With more confidence that the network will be there for them when they need it, teachers feel encouraged to bring more online tools and resources into their lessons to provide a more innovative learning environment."

Support for Bonjour Gateway features, combined with the 802.11ac Radio Modules, sets the stage for streaming and HD video. "A reliable wireless streaming solution was one of our biggest goals for the new network," says Birch. HKA has been testing Apple TV to fulfil this need. "In addition to streaming video of lectures or educational programs, teachers can connect to Apple TV through an iPad to demonstrate apps and present information from anywhere in the classroom, which opens the doors for more flexible instruction."

HKA has also developed an active media team that films and publishes videos about school events online. Unlike previous networks, the new Cisco wireless network delivers speeds that make publishing videos fast, even at high definition.

Cisco ISE enables IT staff to segment users, such as teachers versus students, and automatically manage user profiles based on policies. This capability helps IT staff prioritize use for teachers in the classrooms and prevent unauthorized high-bandwidth activities, such as smartphones being used as hotspots. "We want to encourage students to connect to our network, but we want to avoid situations where bandwidth is being drained by a small number of individuals for personal use," says Birch.

The location-based services from Cisco CMX enable HKA to customize access for specific locations. For example, if a large group of students connect in one area for a meeting, the real-time analytics tools can help IT staff identify the traffic changes and balance loads for improved performance.

With only four team members supporting technology throughout the school, the IT team highly appreciates the ability to view all devices through the unified Cisco Prime Infrastructure. HKA receives weekly reports from the system and uses alarms to help alert staff to any changes in performance or traffic. "With Cisco Prime Infrastructure, we can drill down to the switch level," says Birch. "If one classroom experiences low performance, we can use Cisco Prime Infrastructure to pull together all of the available information and track down the issue visually without needing to physically go to the location."

The IT team spends less time troubleshooting technology, which enables them to spend more time optimizing network performance and quickly responding to IT requests from teachers. "In poor networks, everyone is online but not connected," says Birch. "Cisco enables us to create a network where teachers, parents, and students are truly connected in a virtual space that supports learning."

Next Steps

The modular design of the Cisco wireless network enables HKA to make the network compatible with future versions and easily upgrade access points to boost capacity or support new technologies. As students and teachers begin working with more devices, HKA expects to expand network capacity and throughput to meet demands. HKA is also looking to add more systems, such as electronic keypads, to the telephony and CCTV systems running on the Cisco network.

Product List

Wireless
· Cisco Aironet 3602 Series Access Points with 802.11ac Radio Module
· Cisco Aironet 1552 Series Outdoor Access Points
· Cisco 5508 Wireless Controller

Routing and Switching
· Cisco Catalyst 3750-X Series Switches
· Cisco Catalyst 2960-S Series Switches
· Cisco 2951 Integrated Series Router

Network Management
· Cisco Prime Infrastructure 1.2

Location Services
· Cisco Mobility Services Engine

Security and VPN
· Cisco ASA 5515-X Series Next-Generation Firewall
· Cisco Identity Services Engine

Voice and IP Communications
· Cisco CallManager Express
· Cisco Unified IP Phone 6901
· Cisco Unified IP Phone 6945
· Cisco Unified IP Phone 7965

Data Center Solutions
· Cisco Unified Computing System™ (UCS®) C220 M3 Rack Servers

For More Information

For more information about Cisco Enterprise Network solutions, please visit:
www.cisco.com/c/en/us/solutions/enterprise-networks/index.html.
For more information about Cisco Wireless solutions, please visit:
www.cisco.com/go/wireless.
For more information about Cisco 802.11ac solutions, please visit:
www.cisco.com/go/80211ac.

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.