Leading Colorado University Deploys Expansive Wireless Network

University of Colorado employs borderless Cisco network to improve faculty and student productivity while reducing costs.

EXECUTIVE SUMMARY

Customer Name: University of Colorado
Industry: Education
Location: Boulder, Colorado
Number of Employees: Approximately 6,700

BUSINESS CHALLENGE

- Provide reliable wireless access across campus, including in stadiums and university buses
- Support online access from personal mobile devices
- Provide easily managed, centralized network management architecture for streamlined software updates

NETWORK SOLUTION

- Cisco wireless networking solutions to deliver cohesive, reliable, and secure access for wide array of digital devices used throughout campus

BUSINESS RESULTS

- Facilitated centralized network management for better responsiveness, efficiency, and cost-effectiveness
- Extended wireless access to all indoor, some outdoor, and campus transit locations around campus for more than 30,000 students and nearly 7,000 employees
- Helped enable students and faculty to connect to vital online resources from any Wi-Fi device, indoor and from designated outdoor areas

Business Challenge

With its idyllic setting in the foothills of the Rocky Mountains, the University of Colorado (CU) is widely acclaimed for its campus's natural beauty as well as its highly regarded and nationally ranked undergraduate and graduate programs in business, science, technology, and environmental studies.

Nearly 7,000 university employees and more than 30,000 students interact, engage, and collaborate in the academic and research environment daily. Whether in a lecture hall, a dorm room, or at the basketball arena, students and faculty need easy, secure, and reliable access to online resources.

In recent years, the university has deployed a stable and scalable wireless network. In the past, the network included nearly 1000 autonomous wireless access points, which were managed individually on-location. As network traffic grew due to more frequent and complex applications by faculty and students, so did the network's footprint, expanding from 1000 access points to more than 2400.

The rapid growth made managing the network increasingly difficult, as staff spent more time on maintenance, fine-tuning, and managing connections that experienced frequent interference and degraded service from heavy use. Adding to the challenge was that university administrators, as part of a progressive modernization initiative, wanted to expand wireless coverage to athletic facilities, the events center, and even university-owned buses to give students and faculty universal network access from indoor and designated outdoor areas from any Wi-Fi device. These initiatives have been completed, and the university is now moving on to next-generation wireless controllers and Cisco CleanAir™ technology.

"A 9.5-million-square-foot campus poses several logistical challenges to providing reliable wireless access. Adding mobile spots on buses and heavy-traffic areas made it even more difficult," says Max Lopez, senior wireless engineer at CU's Boulder campus. "It's an evolving environment in which building configurations and uses change, so we needed to develop a flexible network architecture to support wireless in hard-to-reach spaces and be able to manage it centrally for greater efficiency and responsiveness."

Network Solution

The university deployed a robust, centrally managed, controller-based wireless Cisco network to extend wireless connectivity across campus and provide users reliable and secure access from virtually any device. The network is built around Cisco Catalyst® 6500 Series Wireless Services Modules (WiSM), which will be upgraded to the Cisco® 6500 Series Wireless Module 2 (WiSM2) in the coming months to support more access points and additional backlink throughput.

> "Along with the Cisco Mobility Services Engine (MSE), the Cisco Wireless Control System (WCS) and Wireless Service Modules (WiSMs) let us see performance history and trends for all our access points, so we can make adjustments or fixes instantly, instead of waiting a full day."
>
> **— Max Lopez, Senior Wireless Engineer, University of Colorado-Boulder**

As part of the Cisco Wireless LAN Controller family, the Cisco WiSM works in conjunction with Cisco Aironet® access points, and the Cisco Wireless Control System (WCS) to support wireless data, voice, and video applications and gives network managers a centralized console for easy, efficient management of the entire network. The Cisco WiSM2 can support up to 1000 access points, enabling the university to support additional capability and scalability to foster mission-critical wireless business communications.

Cisco WiSM1, Cisco WiSM2, and the Cisco WCS enable network managers to plan, deploy, monitor, troubleshoot, and report on indoor and outdoor wireless networks from a centralized location. With built-in troubleshooting tools, guides, and templates, the scalable management platform provides real-time insight into endpoint connectivity and streamlines network management for greater efficiency and cost effectiveness.

> "With the introduction of CleanAir Technology from Cisco and the ability to support multiple frequencies, we were able to deploy a network to accommodate everyone's unique needs (access to library resources, homework assignments, or vendor point-of-sale transactions at football games) from any Wi-Fi device within buildings and from designated outdoor areas on campus without degrading service or compromising security."
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> **— Max Lopez, Senior Wireless Engineer, University of Colorado-Boulder**

"Along with the Cisco Mobility Services Engine (MSE), the Cisco Wireless Control System (WCS) and Wireless Service Modules (WiSMs) let us see performance history and trends for all our access points, so we can make adjustments or fixes instantly, instead of waiting a full day," Lopez says. "Now we can be proactive with settings, so we spend fewer hours troubleshooting."

The wireless connectivity is provided by an array of Cisco wireless access points, including Cisco Aironet 1242, Cisco Aironet 1140, and Cisco Aironet 3500 with CleanAir technology access points spread across campus. The Cisco Aironet 1242 and 1140 Series access points provide expanded, broad wireless coverage across CU's campus, while the Cisco Aironet 3500 Series access points leverage CleanAir technology to identify and mitigate interference to supply reliable wireless connectivity to high-density areas such as residence halls, auditoriums, and lecture halls.

PRODUCT LIST

Network Management

- Cisco Catalyst 6500 Series Wireless Services Module 1
- Cisco Catalyst 6500 Series Wireless Services Module 2
- Cisco Wireless Control System
- Cisco Mobility Services Engine

Wireless Access

- Cisco Aironet 1140 Series Access Points
- Cisco Aironet 1242 Series Access Points
- Cisco Aironet 3500 Series Access Points with CleanAir Technology

Business Results

With a unified, wireless Cisco network, CU can more efficiently leverage its existing technology and staff resources to extend network access to all users. "Cisco technologies give us the best of both worlds, extending wireless services to hard-to-reach spaces while increasing employee productivity," Lopez says.

Cisco network solutions provide IT managers with real-time visibility into network operations, enabling more responsive, cost-effective, and efficient network management. Centralized network management helps IT staff look at trending data on access points and schedule staff for troubleshooting. Being able to look at historical and trending information minimizes hours spent troubleshooting, allowing staff to focus their attention on higher-value operations and begin working on future upgrades.

With Cisco solutions, IT staff have successfully extended reliable wireless access beyond lecture and residence halls. Now, students, faculty, vendors, and visitors can instantly connect to the network from the football stadium, the university's events center, outdoor areas, and university-owned buses. While students have Wi-Fi access at the event center at the basketball arena, vendors have Wi-Fi access at both the basketball arena as well as the football stadium. "Students, faculty, and visitors all have different uses and needs for the network at different times and from different places," Lopez says. "With the introduction of CleanAir Technology from Cisco and the ability to support multiple frequencies, we were able to deploy a network to accommodate everyone's unique needs (access to library resources, homework assignments, or vendor point-of-sale transactions at football games) from any device indoor and from designated outdoor areas on campus without degrading service or compromising security."

The Cisco network is fully scalable, enabling the university to quickly add, remove, or reconfigure access points as needed for optimal access. In addition, the high-performance network supports the growing bring-your-own-device trend, allowing students and staff to be more productive, because they are always connected, even when roaming between buildings on campus. Professors can conduct office hours outside their office, while students have team meetings on the lawn, wirelessly accessing online resources such as videos from professors and library resources from personal mobile devices.

"The Cisco network has had a profound impact on the technology culture at CU," Lopez says. "The ability to use any personal device (smartphone, tablet, or laptop) from within buildings and designated outdoor areas on campus is invaluable to students, because it gives them the freedom to work wherever and whenever they want. It's also a great recruiting tool for attracting prospective students, because it reinforces the university's cutting-edge image."

Since deploying the Cisco wireless network, the university has increased network access and adoption with its expanded wireless access and support for personal devices. “Our Cisco network deployment has helped fill in the gaps our network used to have,” Lopez says. “With coverage from corner to corner, we can further connect students, staff, and visitors to the university and create a truly wireless community.”

For More Information

To find out more about the Cisco Wireless, go to: http://www.cisco.com/go/wireless.

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Printed in USA C36-702100-00 03/12