Northwest Missouri State University Brings Pervasive Wi-Fi to Campus, Transforming Classroom Learning

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TIMOTHY CARLYLE,
DIRECTOR OF NETWORK COMPUTING
AND SENIOR UNIX ADMINISTRATOR,
NORTHWEST MISSOURI UNIVERSITY

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Overview

ESTABLISHED IN 1905, Northwest Missouri State University offers 135 undergraduate and 36 master's degree programs to more than 7,000 students. The business, education, geography and agriculture departments graduate the largest number of students at the university each year.

The university is a true advocate of hands-on experience. For example, in its Horace Mann Lab School, students majoring in education get an inside view of what teaching is all about. Other opportunities for hands-on experiences include internships, the University Farm for agriculture majors, volunteer work, on-campus radio and television stations. With a student-to-teacher ratio of 21-to-1, students consistently receive personalized attention from faculty. University sports are also an important part of the culture at Northwest Missouri State University; the university has won the NCAA Division II National Football Championship four times in the last 16 years: in 1998, 1999, 2009 and 2013.

As part of its continuing focus on creating and maintaining learning environments that attract top students and faculty, Northwest Missouri State University prides itself in providing state-of-the-art information systems to meet current and future requirements. Among the university's most important initiatives is improvement of classroom communication, testing and students' access to information. These initiatives are directly supported by the rollout of a pervasive and high-performance wireless network throughout the campus using Xirrus Wi-Fi access points (APs).

## Wireless Network Covers Over 90 Percent of Campus

BEFORE INSTALLING THE NETWORK, the university had a very limited wireless network that had been built over time, covering the library, residence halls, administrative and academic offices and some facility and maintenance buildings. The network did not cover classrooms and large venues such as the Bearcat Arena, which houses the basketball and volleyball games and seats 2,500 spectators. The network included a single controller in the basement of the library, and this controller was the gateway to the internet for the entire wireless network.

It also represented a single potential point of failure that could bring down the entire network. A single controller through which all wireless traffic passed also proved to be a performance bottleneck — unable to handle the scale and demands of a growing university wireless network. As the network continued to support the increasing number of devices such as laptops, smartphones and tablets, the university searched for a more flexible and powerful solution.

Additionally, each Xirrus Wi-Fi AP utilizes directional antennas that cover a wider area over various environments compared to traditional APs. The multi-radio platform enabled the university to support twice as many devices than the former solution for optimal efficiency, value and simplicity.

One of the most notable successes of the university's IT department and the Xirrus wireless network occurred with the deployment of pervasive Wi-Fi to 160 classrooms. This deployment supported university-wide online testing, which all departments implemented simultaneously. The deployment proved the scalability and administrative ease of Xirrus Wi-Fi technology, which makes it easy to create a single classroom profile and deploy it to all classrooms at once. Following the deployment, the university was able to support a 100-percent increase in device connections.

Pervasive Wi-Fi has also improved classroom communication because teachers are no longer limited to standing in front of the classroom with their computers connected via fixed Ethernet cables. Teachers can now move freely throughout the classroom with their devices and work with students while remaining online. Additionally, students can move freely between lecture buildings and other venues while remaining connected. After bringing Wi-Fi to classrooms, the university's IT department forged ahead with its vision to bring Wi-Fi to Bearcat Arena, administrative buildings and maintenance buildings. The wireless network now covers more than 50 buildings and more than 90 percent of the campus with 400 APs, and has thus far served 3,000 simultaneous users during peak loads.
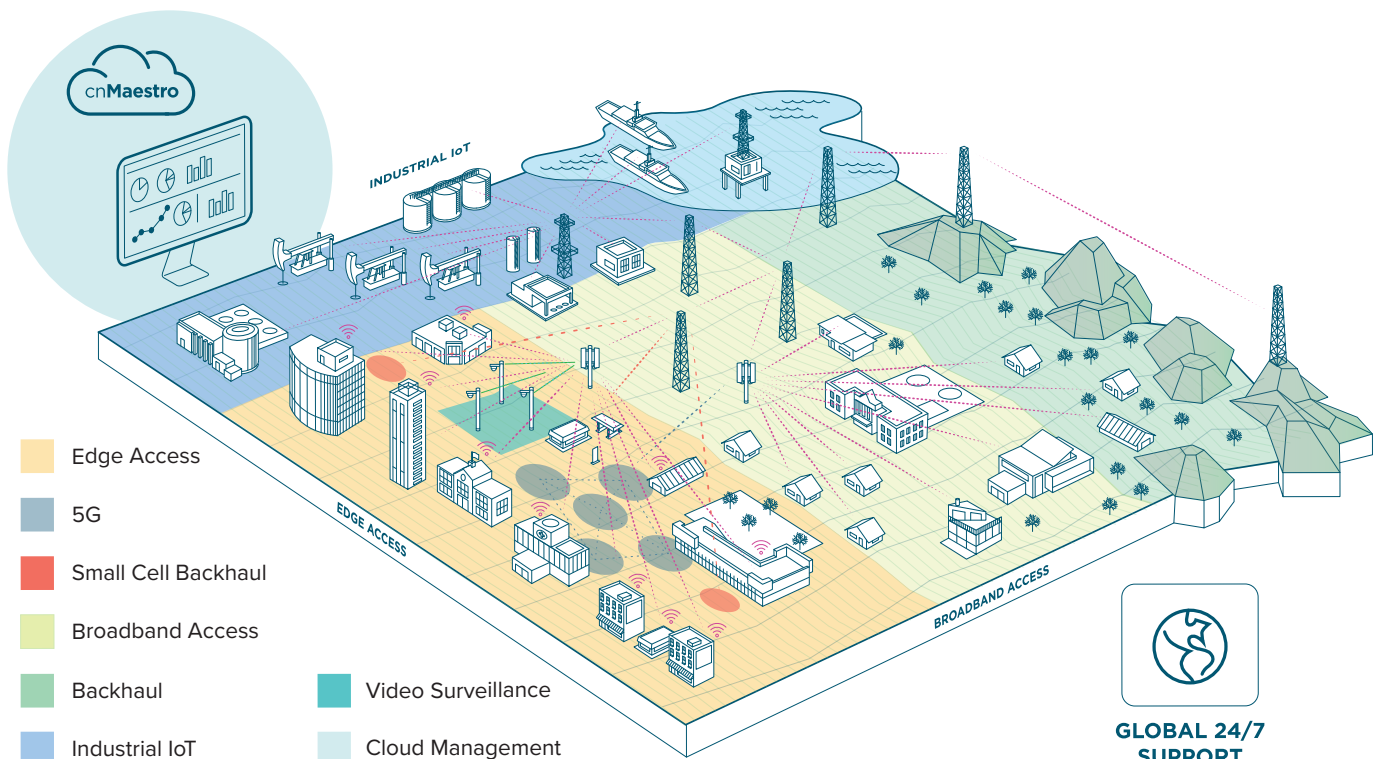
Cambium Networks' Gigabit wireless solutions enable municipal, enterprise and service provider operators to tailor connectivity to meet exact requirements and grow as needs evolve.

"Xirrus [Wi-Fi APs] provide the scalability, the distributed architecture, the ability to upgrade and most importantly the performance that delights our students and faculty," said Timothy Carlyle, director of network computing and senior UNIX administrator at Northwest Missouri State University. "All of this greatly contributes to our ultimate goal of providing the best learning environment and experience possible. With Xirrus [Wi-Fi], we have a wireless network that performs consistently, deploys and expands rapidly, provides insight into user density and devices across our campus, and has won our complete confidence in its ability to deliver optimal service and support our changing needs in the future."

Advantages of Xirrus Wi-Fi

WITH THE EXPLOSION OF SMARTPHONES AND TABLETS, mobility has become pervasive. People expect to connect wirelessly. Organizations depend on high-bandwidth to send and receive voice, video and data, from any device to any one. Xirrus Wi-Fi APs draw from cellular tower design principles to provide wired-like reliability, increased user density and capacity plus superior security. They perform under the most demanding conditions and have lower infrastructure requirements. When integrated with business and IT objectives, they help you do more than ever before.

Cambium Networks applies the "best practices" of wired networking to wireless infrastructures by distributing the intelligence to the edge and outfitting Wi-Fi APs with dense multi-state radios in the same manner as a wired switch. Xirrus Wi-Fi APs work as part of a strategic IT infrastructure advantage that fuels organizations.