DZS

Founded as the people's university in 1890 in Pullman, Washington, Washington State University (WSU) fulfills that commitment by transforming lives through education, research and community outreach. During the 2015/2016 academic year, the University is celebrating 125 years of delivering life-changing knowledge and discoveries to citizens across the state, region, nation and around the world. As Washington's only land-grant institution and one of two public research universities, WSU provides a world-class education to nearly 30,000 students through its multi-campus statewide locations and its global online campus.

WSU Saves Half a Million Dollars Using FiberLAN GPON Versus Traditional Copper Installation in Residence Hall Deployment

Today's college students came of age in a connected world: entertainment via high-speed Internet, smart phones, wireless TV and multi-player gaming capabilities are just a sample of the technologies that today's collegians consider essential. As WSU embarked on a long-term initiative to build and update housing and dining facilities, WSU administration faced numerous historical challenges, including revamping cabling on residential halls built nearly 100 years ago, complying with green standards on new residence buildings, and meeting the bandwidth demands of the ever-increasing student body now and in the future.

The WSU Pullman campus needed a local area network (LAN) platform that could be implemented campus wide in the most economical way possible. Ideally, that solution would be energy efficient, provide optimal performance and security, and reduce capital costs, all while supplying reliable, high-speed Internet access.

The Challenge: Find a Cost-Effective Solution to Serve the WSU Student Population

In the fall of 2013, WSU opened the doors of Northside Residence Hall, a 302-bed facility built out with a switched Ethernet infrastructure. The overall cost of the implementation, including the technology infrastructure, equipment and space to house the equipment, was realized at the cost of nearly $4,700 per bed. As stewards of tax-payer dollars, the WSU IT group knew finding a more cost-effective solution would benefit both the students and the state, allowing the administration to finance other student and research improvements throughout the campus.

Craig Howard, Director of Residential Networking, WSU, credits Wallace Chase, a newcomer to WSU's Director of Networking post, with introducing the Gigabit Passive Optical Network (GPON) solution as an affordable alternative to switched Ethernet.

> "Wallace came to us from The George Washington University, where he had supported an earlier version of GPON with success," Howard said. "The more we looked at GPON and talked with Wallace about space and cabling redevelopment, not to mention future bandwidth requirements, the more GPON made sense for our projects."

The Challenge
The aging copper wiring in many campus facilities no longer meets the demands for high-speed Internet access

Solution
- Installed DZS FiberLAN GPON solution in WSU's new Global Scholars Hall, a five-story, 275-bed facility with additional requirements for common living and study spaces

- Build out new residence

- Halls and other facilities with DZS FiberLAN GPON solution to save money, time and space, and other Internet services

- Update existing, failing copper wiring with Zhone's fiber solution to lay the foundation for future growth

Benefits
- Savings of nearly $630,000 versus a traditional copper installation or upgrade

- A highly future-resistant infrastructure that allows WSU to continue to be good stewards of tax-payer dollars

- 504 square feet of space saved that can be used for student living, studying or entertainment

- Faster time-to-implement with fewer disruptions to students and staffz

GPON, or Gigabit Passive Optical Network, is a compact, high-performance fiber-based solution that requires less space while providing greater growth opportunities, decreased power consumption and less time to implement than traditional copper-based solutions. But just as important to this public university, GPON offers significant cost savings over a switched Ethernet solution.

> "Fiber is flexible," says Chase, who is a major proponent of fiber-based solutions. "It's fairly cost effective to deploy, allowing us to re-cable multiple buildings in a fiscally responsible manner. With the physical infrastructure in place in many of our buildings, fiber allows modifications without the expense of pulling cables."

The Solution: GPON Installs and Upgrades

Before the WSU IT staff could migrate and upgrade using fiber, the team undertook an extensive bid and review process, ultimately reporting their findings to the WSU Regents. On paper, there appeared to be significant cost savings when deploying fiber versus copper.

To validate these findings, and to demonstrate the ease of implementation, Chase initially implemented GPON in both WSU's IT building and a small university- owned apartment complex, allowing the administration to see firsthand how affordable and easy implementing a FiberLAN GPON deployment would be. With that success under his belt, Chase received approval to deploy GPON in a 275-bed residence hall that opened in the fall of 2015. The building, Global Scholars Hall, would be the first GPON deployment in a new residence hall.

WSU worked with PowerCom, a Washington-based telecommunications infrastructure design company, to design the GPON network for the Global Scholars Hall,

and layout the timeline of the technology deployment for the WSU Regents. PowerCom suggested using FiberLAN as the backbone for the Global Scholars Hall and recommended a design based on FiberLAN technology. With FiberLAN, WSU can upgrade multiple buildings using the same amount of funding it would have taken to cable one building using a traditional copper system due to the reliability, scalability and cost-effective nature of fiber.

FiberLAN, DZS POL solution, is a high-density, high-performance GPON- based POL alternative to copper wiring. FiberLAN allows WSU to meet the high bandwidth demands of Global Scholars Hall's busy students with unparalleled access speeds. DZS FiberLAN also decreases power consumption and improves infrastructure lifespan by at least 20 years compared to copper.

A POL is considered to be environmentally friendly, thanks to a reduction in power consumption and a significant reduction in air-condition cooling costs. Traditional solutions require multiple telecommunications closets which house tiers of heat-generating equipment and air conditioning units to keep them cool. In contrast, DZS Optical Line Terminal (OLT) and Optical Network Terminal (ONT) equipment are more compact and create minimal heat output, making additional tech closets unnecessary.

Working with PowerCom, the WSU IT team designed a data solution based on DZS MXK-819 OLT unit, which meets student and staff demands for high- bandwidth streaming and on-demand services. The OLT works in conjunction with DZS 2400A, 2600- series, and 2804P GPON ONTs, which connect each student's room and public study space to the OLT. Each wall-mounted ONT supplies ports for voice, video and data, and is compact enough to not be a physical burden or eyesore throughout the residence hall. In addition, software for the system is controlled remotely, removing the need for IT staff to

travel when error corrections or upgrades to the system are required.

"Initially we were concerned that students may inadvertently damage the ONT units," said Kevin Imel, Information Systems Manager, WSU. "But instead, we've seen that the students value their Internet so much that they're going to respect the device that brings it to them." DZS platform scales well to support the high-speed demands of the five-story, multi-room Global Scholars Hall, allowing students 24/7 Internet access no matter how many students are accessing the network at any given time. The first floor of Global Scholars Hall is home to retail food operations that include seating and open space served by wireless routers so students can stay connected.

> After separate deployments across two different residence halls, one with a traditional copper-based solution and the other with a Passive Optical LAN (POL) fiber-based network, WSU saw 44% cost savings in the POL deployment versus the copper-based installation.

"What's attractive about the DZS solution is the fact that it requires so much less space for network infrastructure than previous solutions," said Howard. "This allows us to provide additional living areas for the students, which in turn supports an innovative environment that fosters a community of academic and cultural diversity."

GPON: Significant Cost Savings vs. Traditional Infrastructure

One of the most compelling reasons to stay with DZS FiberLAN GPON solution for WSU's long-term strategic plan was the significant cost savings. While Northside Residence Hall's switched Ethernet solution costed out at nearly $4,700 per bed in the 302-bed facility, using DZS FiberLAN GPON implementation in

the Global Scholars Hall reduced the cost to approximately $2,900 per bed, resulting in a 38 percent cost reduction.

> "The cost savings is dramatic, especially when you start to get into larger buildings," noted Chase.

"When we compared final costs of the two newest residence halls, we saw a savings of nearly $630,000 with a GPON solution compared to copper. That equates to a 44 percent savings, which are real dollars that we can put back into supporting students with better labs, scholarships and other improvements."

"Our students require a technology platform that provides high-speed Internet that supports multiple uses, from streaming to gaming to entertainment," Chase said. "To provide our students with the best possible Internet solution today and moving forward, we continue to utilize GPON solutions to help us maximize our strategic plan to roll out a fiber-based network throughout the campus."

FiberLAN – Flexible and Future-Forward

The entire WSU IT team supports FiberLAN GPON as a future-resistant solution for WSU's technology redevelopment efforts.

"We've got old copper wires that are starting to fail; moving forward, we're going to remove 99 percent of our copper and replace it with fiber," Imel says. "Part of the selling point of fiber is we put it into the walls once and we don't ever have to go back in and replace it. Replacing copper is simply too cost prohibitive."

WSU is using DZS FiberLAN to retrofit historical buildings across the campus, not just for the cost and space savings, but because the implementation timeline is drastically reduced with FiberLAN.

"Today, we consider fiber the best option for any installation that serves more than 100 people," said Chase. "Not only is GPON cheaper than copper with better connectivity, the deployment is faster. Our wiring contractor estimates they can completely redo a six-floor, 300-bed residence in 10 days versus the three to four weeks a copper upgrade would require."

Fiber is key to the success of WSU's technology structure as the University continues to implement innovative ways of providing leading-edge services to students and staff. DZS FiberLAN GPON suite provides WSU with an affordable, future-resistant solution that saves space, decreases power consumption, and improves infrastructure lifespan so that WSU can continue to be a visionary leader in public education.

Contact DZS to request a customized assessment identifying how a Passive Optical LAN (POL) can reduce operational investments, increase energy efficiency and reduce storage space for your next project

The new Global Scholars Hall is the first residence hall on WSU's campus with GPON. FiberLAN allows WSU to meet the high bandwidth demands of Global Scholar Hall's busy students with unparalleled access speeds.

Students can use their connected devices anywhere in the common areas, as well as individual rooms. DZS 2400A, 2600-series, and 2804P GPON ONTs connect each student's room and public study space to the OLT in the technology closet.

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