An Education in Modern Wi-Fi:

How Leading Higher Education Institutions Leverage Modern Networking and Cloud-based Management to Build Successful Environments
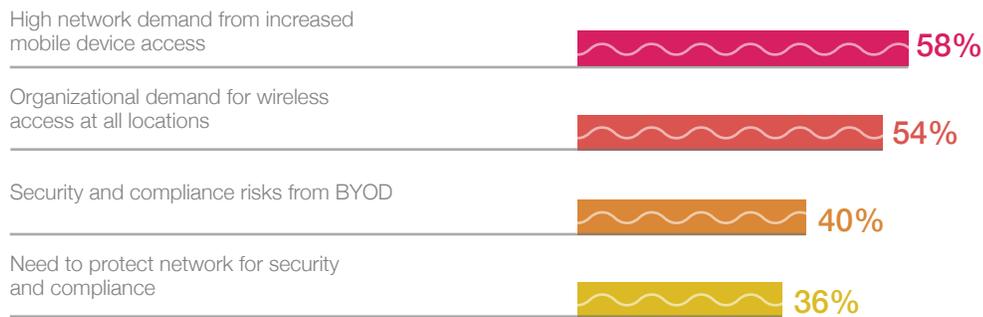
ABERDEEN GROUP | ADTRAN

Facing (and Overcoming)
the Challenges of Modern Wi-Fi

Few things in IT can be as frustrating as managing a modern network. Today, most networks are predominantly wireless, which brings in a whole host of new complexities in security, coverage, bandwidth management, and access control. And, in any distributed enterprise and large campus, there's the need to provide strong connectivity across a large area, while managing hundreds of access points **and even more mobile devices**.

These challenges are present in every organization, but they can be especially critical in higher education. To a large degree, these institutions, especially smaller ones, face some of the highest stresses and complexities when it comes to networking.

Top Pressures to Deploy Wi-Fi

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High network demand from increased mobile device access	58%
Organizational demand for wireless access at all locations	54%
Security and compliance risks from BYOD	40%
Need to protect network for security and compliance	36%

Aberdeen Group, May 2016

83% of all students use personal mobile devices (BYOD) in the classroom.

- Center for Digital Education

When we say that smaller colleges and universities can represent one of the toughest use cases for campus networks, we're not kidding. Let's break down some of the challenges these institutions face.
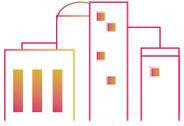
Large campuses with many separate buildings

Even small colleges often have campuses much bigger than some very large businesses. These buildings are often old and separated by wide-ranging lawns and fields. Providing strong wireless coverage here can be tough and resource intensive.

High technology innovation and demanding environments

The demands for cutting-edge technology can dwarf those of any but the most innovative technology firms. On their network at any point in time, colleges can have super-fast Internet 2 connections, very large big data analytics in place, video production and editing, and pretty much every cutting-edge technology in the market.

Technologically savvy and high service demanding end-users

Take the above challenges and add them to a work environment that is also the living space for end-users — heavy streaming and live video users, gamers, and social networkers. With use of bandwidth-intensive applications such as Netflix, YouTube, and Xbox, the network needs to accept connections from the widest amount of devices (phones, laptops, smartwatches, gaming consoles, you name it!), all while maintaining security and control.

Limited IT staff and resources

While major universities can throw massive amounts of IT resources at the above problem, smaller colleges face the same challenges, but with IT staff often in the single digits.

In a traditional, or old-school, Wi-Fi network infrastructure, these kinds of challenges can be very daunting. IT faces too much complexity and work in having to support a large number of wireless access points, as well as many wireless devices (including BYOD). Along with this, they must work to keep the network secure, updated, and running at its best.

However, by leveraging newer wireless networking technologies that embrace the latest standards and offer centralized and often cloud-based management capabilities, leading higher education institutions can gain a number of benefits, which we'll cover ahead.

Maine's Thomas College Innovates
with Leading Edge WiFi

Mention central Maine, and the first things that pop to mind will probably be scenic and beautiful valleys and rivers, and lots of great outdoor activities. With these rustic images in mind, you may not expect to find high-speed and technologically advanced networks.

However, at **Thomas College** in Waterville, Maine, that is exactly what you will find. Despite its modest campus and small college vibe, Thomas is heavily invested in providing the best technology capabilities for its students and faculty.

According to Chris Rhoda, Vice President for Information Services and CIO at Thomas, "Our goal for the past two or three decades has always been to provide the latest technologies and tools to our students and faculty. And the reason for this is that when someone graduates, we want to make sure that they are that much more valuable to future employers."

Rhoda says that, because of this focus, they spend a lot of time and money on infrastructure and are proactive in their IT planning. And this dedication definitely plays out in their implementation of a high-speed and reliable wireless and wired network infrastructure that can serve as the backbone for all of their technology services.

According to Rhoda, having a strong Wi-Fi network is key to delivering technology to modern students. He said, "When it comes to a student's perspective of college IT, really, it's Wi-Fi."
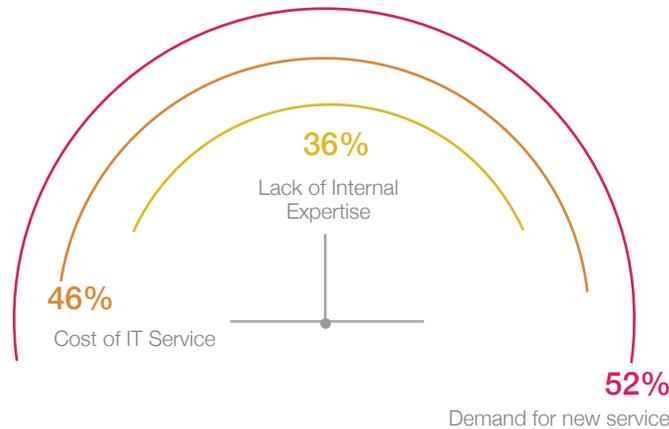
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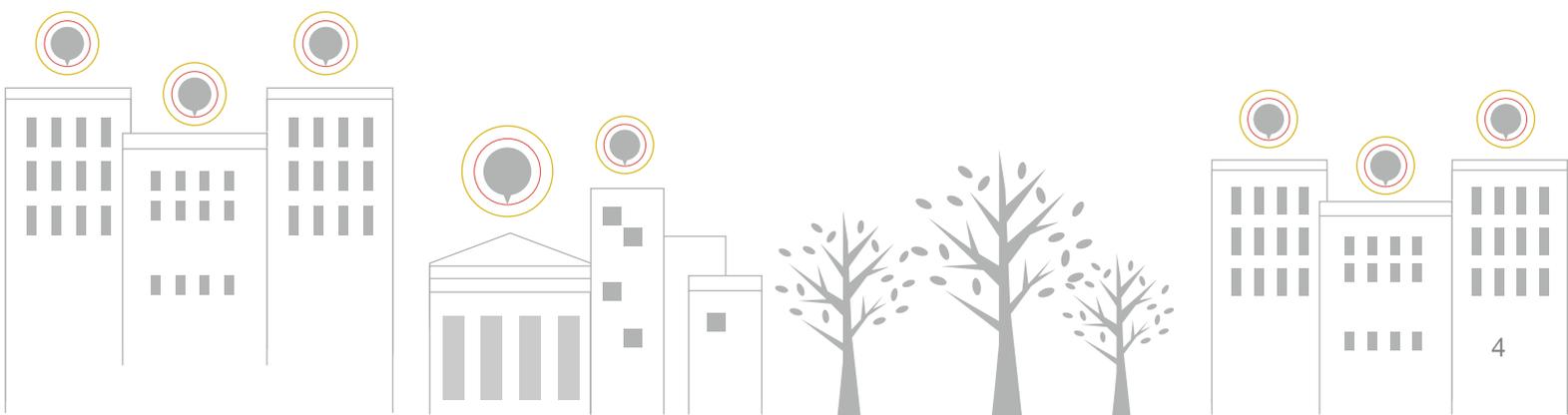
Overcoming the Network Challenges at Thomas College

Top Pressures to Deploy Wi-Fi

36%
Lack of Internal
Expertise

46%
Cost of IT Service

52%
Demand for new service

Aberdeen Group, May 2016

To support this environment, Thomas has made a big investment in having state-of-the-art wireless capabilities, said Rhoda: "We are not only prepared to provide Wi-Fi, but to do it at a density level that supports today's students, who have everything from a smartwatch to a smartphone to a gaming console to a tablet to a laptop, and any other device you can imagine.

"The services that we offer are really good. Right now, we have 802.11ac on a quarter of our campus, and the next quarter of our campus will get it this summer. We're updating over 50 wireless access points this summer. We have hundreds of access points around campus."

Given the size of this network, and the small size of Rhoda's IT staff (listed as 4 1/2 people), complexity of management for all of these devices could clearly be a problem, which it was for their previous wireless network implementation.

"Years ago, we had a wireless network that was fair – it wasn't great – and when we went to look for a new wireless vendor, we knew that we didn't want a controller-based network," said Rhoda. "We wanted something a little more decentralized, but that still had central management.

"We were also in the process of updating our wired network, and wanted to make sure that we continued to have a good backbone to support this infrastructure." Rhoda said that they chose **ADTRAN** for both the wired and wireless sides of the house. "It gave us some peace of mind that if there was a wireless problem and it ended up being a wired problem, that we could talk to the same company."

One of the biggest benefits that Thomas saw from the new wireless infrastructure from **ADTRAN** was how it greatly eased managing and updating the hundreds of access points on their campus. Rhoda said: "Our prior products, the WAPs, were all standalone devices – they were thick access points, and there was no central management of that. We couldn't push out an update or define settings and have that replicated throughout our hundreds of access points."

With essentially one person serving as systems and network administrator, the cloud-based central management of the new wireless network made it very simple to keep the network well-managed and up-to-date.

The cloud-managed **ADTRAN** network has also made it possible for Thomas to meet the high-demand requirements of its students and faculty, not only in educational uses, but for the students who live on campus. According to Rhoda: "We know that the majority of our bandwidth is used from our residential halls – why wouldn't it be? Our students live on campus, and for them, it's not just where they go to school — it's home. We really focus to make sure we have more capacity than they're using and that we always stay a year or two ahead of them."

Through this high-speed wireless network with cloud-based management capabilities, Thomas is able to continue to meet their mission of giving students all of the technology capabilities that they need to succeed in the modern world. By building a strong network backbone, Thomas College makes sure that the network is a road to the student's future, and not a roadblock that they need to overcome.

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Leveraging Cloud-Management to Become a Wi-Fi Valedictorian

One of the best things about education is learning something new, whether a technology, methodology, or figuring out a better way to do a common task. Of course, education doesn't end when you leave school — we all constantly learn and improve (or you should be!) in our daily work and personal lives.

This is certainly true for CIOs, network administrators, and other IT staff tasked with building, managing, and optimizing the networks that organizations rely on to run their businesses. In this eBook, we've discussed the challenges that higher education and all organizations face today when deploying Wi-Fi networks that can meet the high demands of modern users and technologies.
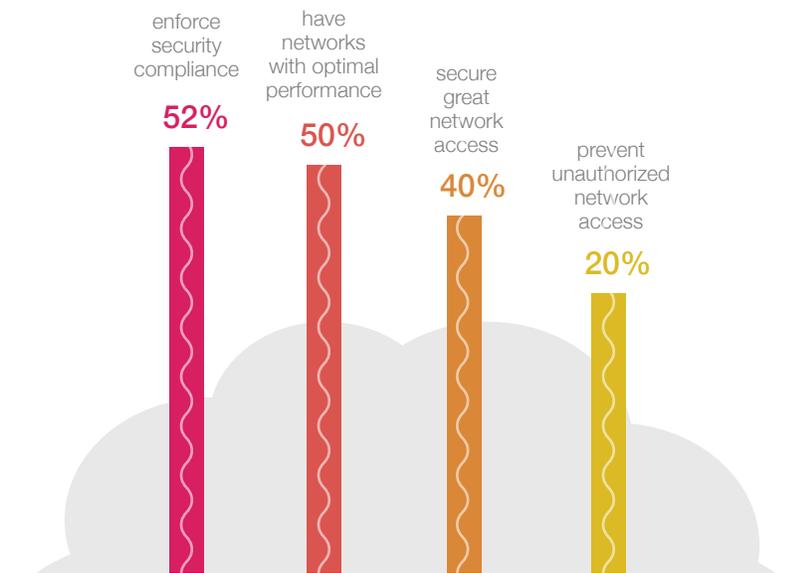
We've also seen how one institution, Thomas College in Maine, has leveraged modern networking technologies and cloud-based network management to ease the demands on their IT staff and ensure that their Wi-Fi network serves students, faculty, and administration who rely on it to deliver high-speed and reliable connectivity.

Leveraging these technologies isn't simply a matter of just having support for new standards or easier administration — Aberdeen Group research has shown that any organization taking advantage of technologies such as cloud-based management for their networks gain a number of benefits.

Hitting the Books and Benefitting from Cloud-Based Wi-Fi

Companies Using Cloud-based Wi-Fi Network Management are more likely to:

enforce security compliance
52%

have networks with optimal performance
50%

secure great network access
**40%**

prevent unauthorized network access
20%

Companies using cloud-based network management are 20% more likely to prevent unauthorized network access, and they secure guest network access 40% more than non-cloud management businesses. They also enforce mobile endpoint security compliance at a 55% higher rate. With this focus on ensuring secure and policy-compliant access to their wired and wireless networks, these leading organizations show that use of cloud-based management does not equal a low emphasis on security.

More importantly, when asked if their network performance was optimal, adequate, or poor, institutions with cloud-based network management were 50% more likely to have networks with optimal performance. These benefits are especially important in today's technology landscape. Providing network connectivity is no longer about just putting in place some wireless access points and supporting basic web browsing and laptops.

Modern users connect a wide variety of devices, from smartphones and tablets, to smartwatches and other devices. And, much like higher education institutions, businesses are putting increasing amounts of performance-sensitive traffic on these networks, whether real-time video and voice communications, or massive amounts of big data analytics and virtual systems.

To meet these demands, IT departments everywhere need to keep up their education in network technologies and practices. They need to leverage emerging technologies such as 802.11ac, secure against unauthorized access, and be ready for the influx of Internet of Things devices that will soon swamp networks everywhere – all in environments with often limited IT resources and staff.

This kind of education never really stops. Organizations today need to continue to hit the books to ensure they are ready and able to handle every new innovation and demand that modern users and business requirements send their way.

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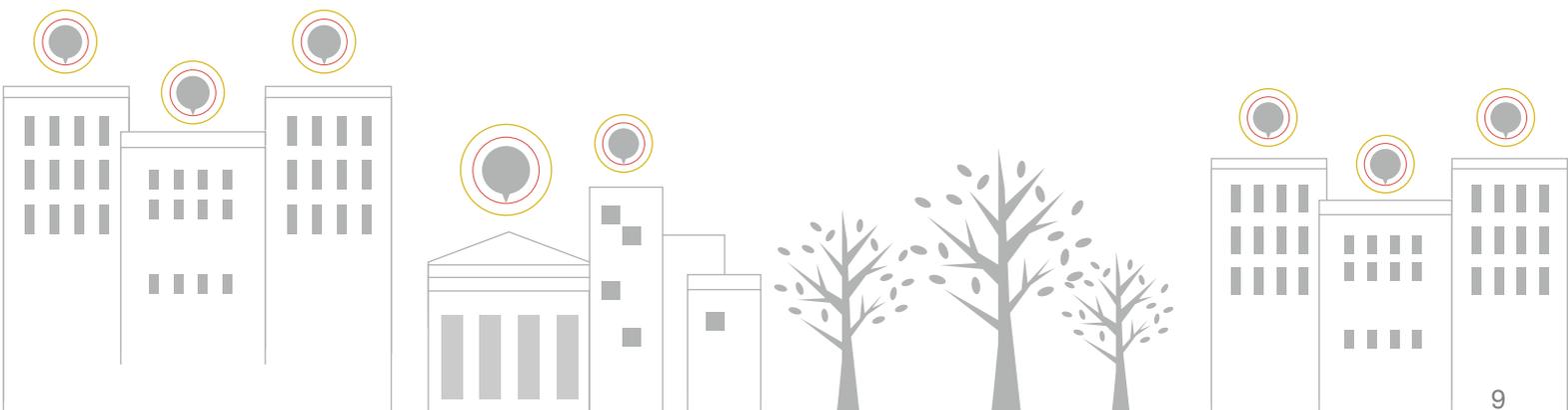
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