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## 2012 FIRST ANNUAL STATE OF RESNET REPORT

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# 2012

FIRST ANNUAL

## **STATE OF RESNET** REPORT

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ResNet Trends & Practices  
Across Higher Education



The Association of Information Communications Technology  
Professionals in Higher Education

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# INTRODUCTION

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*An unprecedented perfect storm is forming on the horizon of network technology while IT budgets tighten across the country. With this study, ACUTA will begin to shed light on diverse practices, actively contribute to developing standards and provide a central knowledgebase that will better equip IT administrators to make decisions for the future.*

- Joseph Harrington  
**ACUTA President**  
Director of Networking,  
Boston College

Colleges and universities today are among the largest Internet Service Providers (ISPs) in the nation. As reliance on the Internet has expanded across every aspect of campus life, so too have the requirements associated with supporting network connectivity. Information Technology departments across the country are now tasked with providing reliable, ubiquitous and well-supported network access to a diverse community of students, faculty, and staff - all while continuing to stay ahead of advances in academic, administrative, and residential technology.

As IT administrators race to keep up with changes in network usage and technology, nowhere are these challenges more pronounced than in the campus residential student network (ResNet). Each fall, a new generation of technology-savvy residents arrives on campus with an expanding set of mobile devices, greater demand for pervasive wireless coverage, and complex needs for connectivity support. ResNet administrators, CIOs, and

IT professionals are tasked with finding a unified solution.

Meeting connectivity demands and overcoming bandwidth challenges are only the tip of the iceberg. The greater challenge is maintaining the network amidst a complex convergence of hardware, software, lifestyle, and policy issues. For instance, IT departments must scale their infrastructure to manage the explosive growth of wireless devices while simultaneously waging battles against illegal file sharing. Institutions feel compelled to meet student expectations for access to bandwidth while simultaneously working to ensure sufficient capacity and security for the larger campus network.

During a period of significant budget tightening and limited human resources, demand on the student ResNet continues to grow at an accelerated pace, exerting unprecedented pressures on colleges and universities to address critical cost and management challenges without sacrificing their mission-critical goals.

## Purpose of the Study

In February 2012, ACUTA retained the services of Forward Analytics, Inc., a nationally-recognized market research firm, to design and conduct the first of a multi-year study intended to measure the broad variation in practice and policy within higher education and lay the groundwork for long-term trend analysis and benchmarking. This innovative study targeted all higher education institutions in the United States with on-campus housing and focused exclusively on issues affecting the residential student network.

By compiling statistics on issues such as bandwidth and connectivity challenges, budget and staffing demands, and rising student expectations in the face of ever-changing network standards and technology, ACUTA aims to contribute a body of knowledge around an area where very little aggregate data currently exists.

# METHODOLOGY

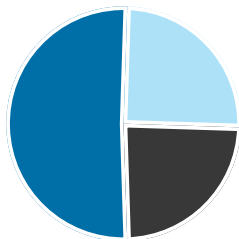
The market study utilizes survey research obtained from higher education IT leaders, or persons with titles such as CIO, Director of IT, Director of Network and Infrastructure, to name a few. Forward Analytics worked closely with ACUTA representatives to design a survey instrument that covers four categories:

- Residential Computer Network Structure
- Network Infrastructure - Present and Future
- Service, Support and Staffing
- Fees and Budgets

A total of 255 surveys were completed, representing 249 universities or colleges (six institutions had two respondents). With a sample population of 2,004 U.S. higher education institutions, the response rate represents a statistical significance of +/- 5.7% at the 95% confidence interval. This means that with 249 unique institutional respondents, it can be said that if the survey were repeated 100 times, 95 in 100 times the research findings would vary at most +/- 5.7%.

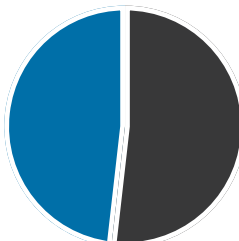
The survey sample had the following characteristics:

## Size of Institution



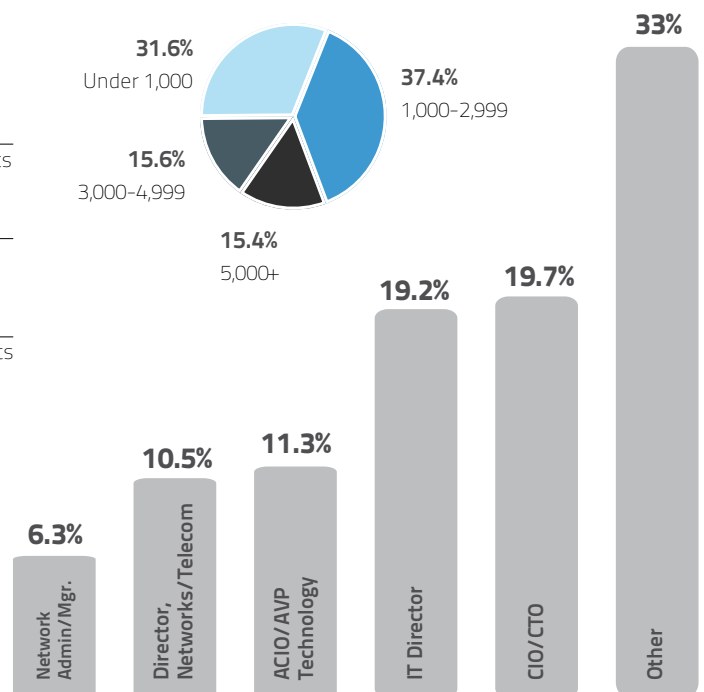
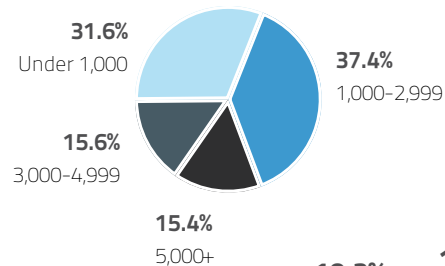
|            |                           |
|------------|---------------------------|
| <b>51%</b> | <b>Small</b>              |
|            | Fewer than 5,000 students |
| <b>25%</b> | <b>Medium</b>             |
|            | 5,000 to 15,000 students  |
| <b>24%</b> | <b>Large</b>              |
|            | More than 15,000 students |

## Governance



|              |                |
|--------------|----------------|
| <b>48.2%</b> | <b>Private</b> |
| <b>51.8%</b> | <b>Public</b>  |

## Number of Beds



## Title of Respondents

# EXECUTIVE SUMMARY

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Higher education institutions have always been on the cutting edge of technology seeking to provide faculty and students with the most powerful and efficient access to information. In today's environment, the increase in the number of Internet connected devices and their associated high-bandwidth applications have put CIOs and IT departments in the crosshairs of managing infrastructure, technology, lifestyle, and costs. Despite rising bandwidth demands, increasing connectivity requirements, and the expectation to provide premium services, institutions are still charged with providing a high-performance, uninterruptible network with long-term budget stability.

Research finds that about 9 % of higher education institutions report that they are currently outsourcing all or significant portions of their residential network. Another 4% of survey respondents indicate they are currently considering outsourcing, while 15% of institutions have considered outsourcing their residential network but have yet to pursue such an option.

At this time, higher education IT departments have scarce resources dedicated to managing complex residential networking systems. The majority of universities and colleges (75.9%) distribute 20% or less of the total annual IT budget to residential computer networking. More striking, 78.4% of institutions have three or less FTE staff providing direct support to their residential computer network.

Yet, in order to maintain student satisfaction in a competitive higher education environment, universities and colleges are reluctant to set or enforce residential network policies and controls that could eliminate headaches and minimize costs for the IT department. To explain, we provide some research findings:

## 68%

of institutions allow students unlimited connectivity to the residential network.

## 50%

of IT Departments pay for bandwidth supplied to the residential networks but do not recover the cost.

## 19%

of colleges and universities limit bandwidth to mobile and network devices. For most institutions, these connected devices share the same bandwidth as desktop and laptop computers.

## 90%

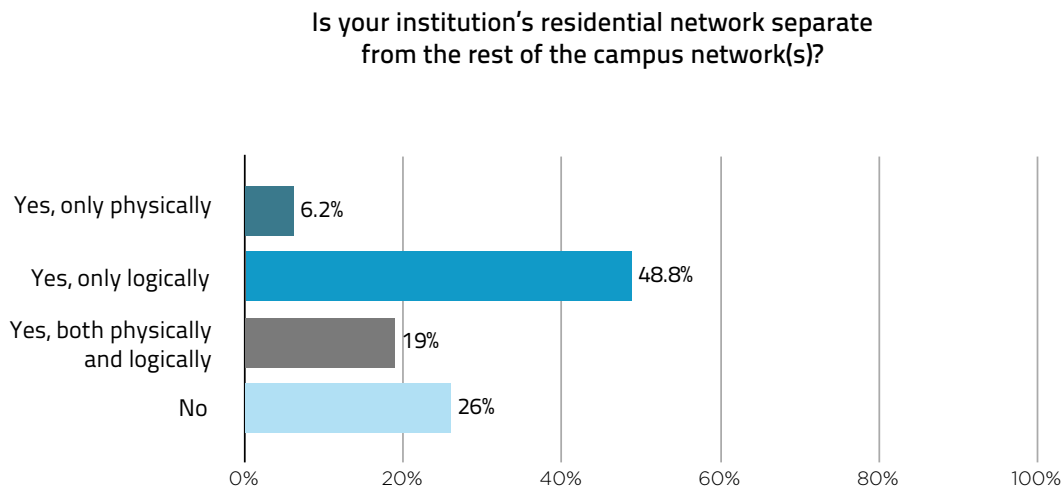
of institutions provide campus residents with cable/satellite TV (and also provide the bandwidth for video-on-demand services, like Hulu, Netflix, etc.)

The survey indicates that a rise in both high-bandwidth services and the number of connected devices on campus is a core concern for IT administrators. If momentum continues behind current trends, how long before the majority of higher education institutions will be forced to invest in substantial upgrades? Currently, 59.6% of institutional networks cite a total capacity below the 500 Mbps threshold. Universities and colleges will also have to increase their dense-capacity wireless coverage, whereas 25% of institutions cover less than 40% of their residential footprint.

# SUMMARY OF SURVEY FINDINGS

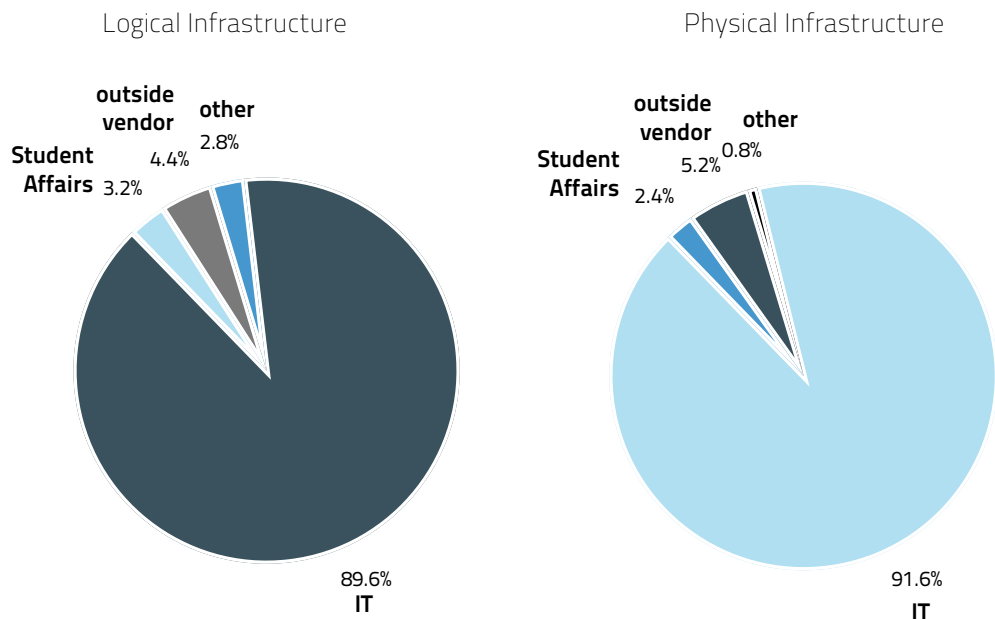
## Residential Network Structure

Presently, 19% of higher education institutions have a residential computer network that is both physically and logically separate from the rest of the campus network(s). Nearly half (48.8%) of institutions have a residential computer network that is only logically separate, while 6.2% have a system that is only physically separate. Twenty-six percent of survey respondents report that their institution's residential network is not separate from the rest of the campus network(s). Size of the institution does not have a significant impact on the network structure.



Multiple organizations and persons may play a role in supporting residential networks, from the operation of the network to planning, recruitment, and data collection. But, the market study reveals that IT (Central IT Networking, Security, etc.) is primarily responsible for maintaining both the logical and physical infrastructure of the computer network for on-campus housing facilities at most universities and colleges. The IT department is also responsible for maintaining the end users (residents, staff, faculty, guests, etc), though 8.9% of higher education institutions rely on Student Affairs and 5.7% rely on an outside vendor.

**What organization on your campus is primarily responsible for maintaining the infrastructure of your residential computer network?**



The responsibilities of higher education CIOs and IT departments are continuing to expand as they grapple with complex issues such as technical support, security, bandwidth management and illegal file sharing.

About 9 % of higher education institutions report that they are currently outsourcing all or significant portions of their residential network. Another 4% of survey respondents indicate they are currently considering outsourcing, while 15% of institutions have considered outsourcing their residential network but have yet to pursue such an option. As future studies provide insight into changing ResNet management practices over time, it may be possible to determine whether a trend is developing towards outsourcing the student network in coming years.

By contrast, nearly half (47.8%) of survey respondents currently outsource residential cable television sources to an outside entity not affiliated with the institution. Another 4.5% are presently considering outsourcing these services. And 7.3% are considering it but have not yet pursued it. Twenty nine percent of universities and colleges are not seriously considering outsourcing residential cable television services to a non-university organization.

Ninety percent of institutions provide campus residents with cable/satellite TV. There are a suite of cable/satellite TV services that institutions may provide.



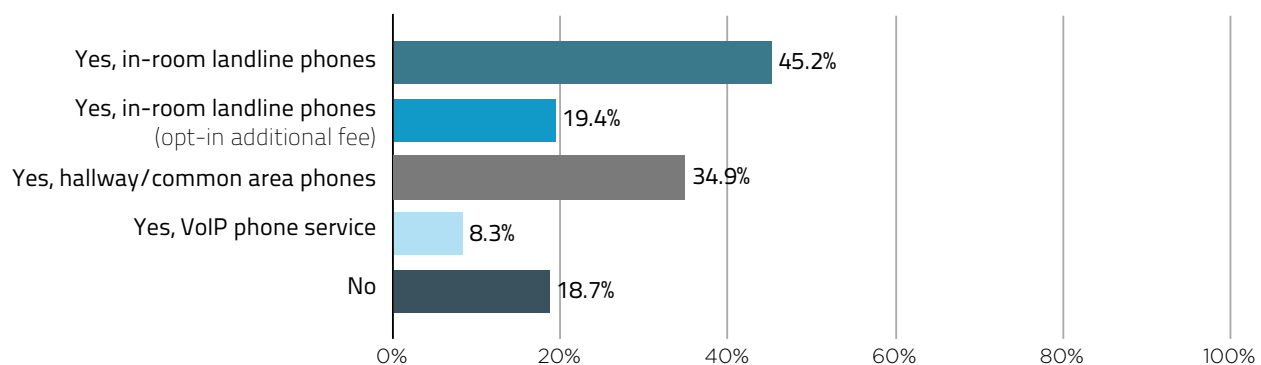
The following table illustrates the options provided by universities and colleges:

| Cable/Satellite TV Services                                   |       |
|---|-------|
| Set-top boxes providing cable service                         | 17.3% |
| Upgrade cable or DVR options                                  | 19.7% |
| IPTV (video over the IP network) service                      | 8.3%  |
| Emergency notification broadcasts through the cable tv system | 24.6% |

Despite a recent study performed by Ball State University, which found that 99.8% of college students own a cell phone, landline phone connections still maintain a significant presence in student rooms and residence halls. In fact, while a clear majority of schools continue to offer phone service to residents, the graph below illustrates that network-based phone systems (e.g., VoIP) trail legacy landline systems among surveyed universities and colleges by almost 10 to 1.

### Do you provide phone service in your residence halls?

*Respondents were asked to check all that apply*

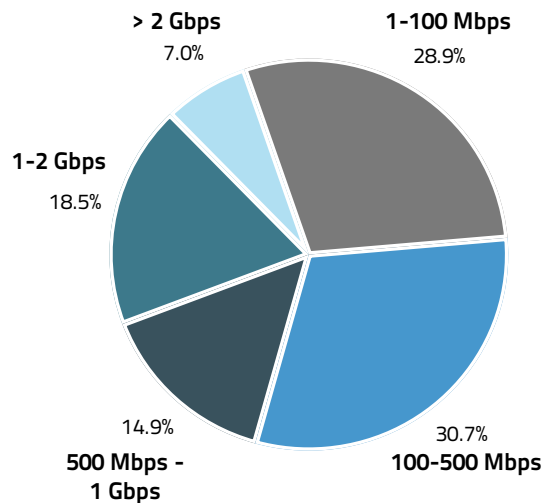


### Network Infrastructure - Present and Future

Higher education institutions are experiencing a competitive back-and-forth between rising broadband supply and demand (similar to the market phenomenon experienced by Windows and Intel over growing processing power and consumption in the 1990s). As students consume bandwidth faster than any other cohort on campus, this experience is most pronounced in the residential network. Survey data reveals that 42.5% of universities and colleges have a residential computer network that shares an Internet connection with the rest of the campus - but only a portion of that bandwidth is allotted to the residential computer network. For 41.3% of institutions, however, the residential computer network shares an uncapped Internet connection with the rest of campus. And 8.7% of higher education institutions have residential computer networks which are outsourced and therefore the institution receives bandwidth from a vendor. Several institutions have a residential computer network with its own dedicated Internet connection.

The amount of bandwidth offered through their residential computer network connection to the Internet vary among surveyed universities and colleges. More than one-third of higher education institutions provide more than 500 Mbps. In contrast, nearly 60% of respondents indicated that less than 500 Mbps is provided in the residential computer network's connection to the Internet.

How much total bandwidth is available in your residential computer network's connection to the Internet?



Undoubtedly, universities and colleges are working to keep up with the unprecedented growth in bandwidth demands, due largely to student demand and their increasing number of connected mobile devices. Looking into the future, survey respondents were asked, “Which categories of network-enabled devices do you view as the largest bandwidth consumers in coming years?” Respondents were asked to check up to three responses.

The findings are illustrated in the graph below with the percent of respondents indicating that the device is a concern. Several respondents reported that it is not so much the device that is of concern, but the activities that are performed on the equipment. Specifically, video on demand services like Netflix, YouTube, Hulu, and others are consuming the bandwidth on college campuses.

| Largest Bandwidth Consumers                                   |       |
|---|-------|
| Tablets (iPad, Android)                                       | 89.5% |
| Smartphones (iPhone, Blackberry, Android)                     | 85.6% |
| iPod/iPod Touches   | 76.4% |
| Gameboxes (PS3, Wii, Xbox, Xbox 360, etc.)                    | 75.5% |
| e-Readers (Kindle, Nook)                                      | 68.1% |
| Video systems (DVD/Blu-Ray Players, Apple TV, Roku, Slingbox) | 44.5% |
| Handheld game consoles (3DS, etc.)                            | 43.2% |
| Smart TVs   | 38.9% |
| Wireless printers   | 29.3% |
| DVRs (Tivo, etc.)   | 29.3% |

Again, looking into the future, the survey instrument asks respondents to rate their level of concern for the impact that various factors may have on the way their institution manages its network. Respondents are asked to rate factors on a scale of 1 to 5, where 1= no concern and 5= significant concern. The following table lists each factor and tallies the percentage of responses rated 4 or 5 (significant concern).

| Factors Impacting the Network              | % with significant concern |
|--|----------------------------|
| Increasing number of mobile devices        | <b>77.0%</b>               |
| Increasing bandwidth usage                 | <b>76.4%</b>               |
| Demand for wireless coverage               | <b>73.1%</b>               |
| Rising student expectations                | <b>71.5%</b>               |
| Available staff time and resources         | <b>61.3%</b>               |
| Capital funding for network infrastructure | <b>60.2%</b>               |
| Increasing demands on network support      | <b>52.6%</b>               |
| Funding network support/help desk          | <b>39.9%</b>               |
| IP address space management                | <b>26.1%</b>               |

At the present, higher education institutions vary among their approaches to the above residential networking issues.

Let's look at the biggest concern- the "increasing number of mobile devices" and their impact on network management. Though it's of significant concern, the majority of universities and colleges (68.1%) allow students to connect unlimited devices to the residential network. Twenty-seven percent of schools cap the number of devices, in addition to computers and laptops, at five devices or under.

Survey respondents were asked to indicate the network-enabled devices for which they provide connectivity support/assistance (in addition to computers and laptops). Several institutions indicated that connectivity for ancillary devices is provided but support is not. The following table reveals the percentage of colleges and universities that provide connectivity support/assistance for each device.

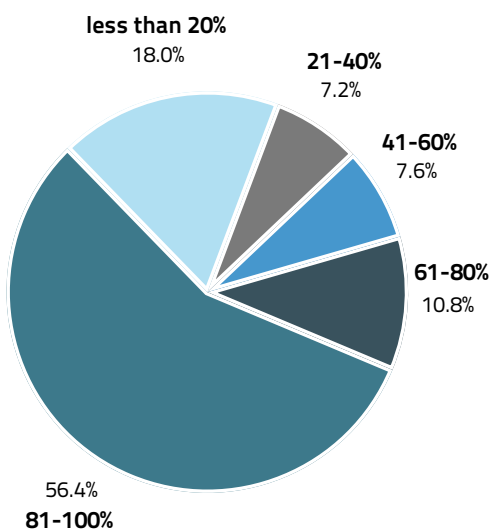
| Network Supported Devices                                     |              |
|---|--------------|
| Tablets (iPad, Android)                                       | <b>89.9%</b> |
| Smartphones (iPhone, Blackberry, Android)                     | <b>86.0%</b> |
| iPod/iPod Touches   | <b>76.8%</b> |
| Gameboxes (PS3, Wii, Xbox, Xbox360, etc.)                     | <b>75.9%</b> |
| e-Readers (Kindle, Nook)                                      | <b>68.4%</b> |
| Video systems (DVD/Blu-Ray Players, Apple TV, Roku, Slingbox) | <b>44.7%</b> |
| Handheld game consoles (3DS, etc.)                            | <b>43.4%</b> |
| Smart TVs   | <b>39.0%</b> |
| Wireless printers   | <b>29.4%</b> |
| DVRs (Tivo, etc.)   | <b>29.4%</b> |
| Other   | <b>9.6%</b>  |

In support of the numerous devices and gadgets, campus residents are permitted to install personal network devices, like switches or mini-hubs, at 42.6% of universities and colleges. But only 16.3% permit residents to install routers (wired and wireless) in their rooms.

While 92.9% of universities and colleges currently provide wired access ports in existing residences, 5% of these institutions plan to remove them within the coming year; 9.2% of respondents are unsure if wired access ports will be removed from residence halls within the coming year. Sixty-five percent of universities and colleges still plan to provide access ports in new residential construction.

Wireless technology - the number three concern - is quickly gaining traction on many campuses as a means to achieve “anytime, anywhere” access. Wireless Internet is affecting the classroom environment, but also the actual activities of studying and out-of-the-classroom learning. More than half of universities and colleges (56.6%) have wireless coverage (dense capacity) in more than 80% of their residential footprint. By comparison, 18% of institutions offer dense capacity wireless in less than 20% of their residential footprint.

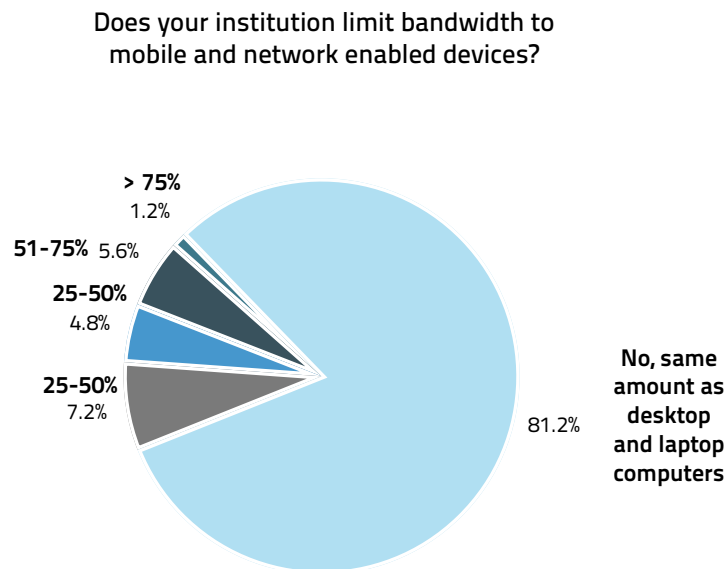
**What percentage of your current residential footprint has dense-capacity wireless coverage?**



While higher education institutions strive to be an enabling resource in the use of technology for academic study, office productivity, and other areas of college life, there occasionally comes a point when expectations and limits must be set. Twenty-seven percent of survey respondents have a published (10.0%) or non-published (16.9%) individual bandwidth quota for campus residents. Some campuses (6.0%) monitor bandwidth consumption but do not have individual quotas for campus residents. Yet, 62.7% of colleges and universities do not monitor individual bandwidth consumption. Several institutions have overall ResNet, not individual, bandwidth quotas or limits.

Presently, only 4.4% of universities and colleges offer additional bandwidth to students for a one-time or per-use fee. Another 9.6% of institutions plan to offer additional bandwidth for a fee in the future. But 81.7% of institutions have no plans for up-charging students a fee for additional bandwidth usage.

Nineteen percent of colleges and universities limit bandwidth to mobile and network devices. On 81.2% of campuses, mobile and network devices receive the same amount of bandwidth as desktop and laptop computers.



The majority of universities and colleges (68.5%) employ packet-shaping devices to effectively manage bandwidth and control network traffic in order to deliver quality services to their students and faculty. Most of these universities (62.9%) shape Internet traffic during both the day and night, while 6% utilize shaping devices only during the day.

### Staffing, Service and Support

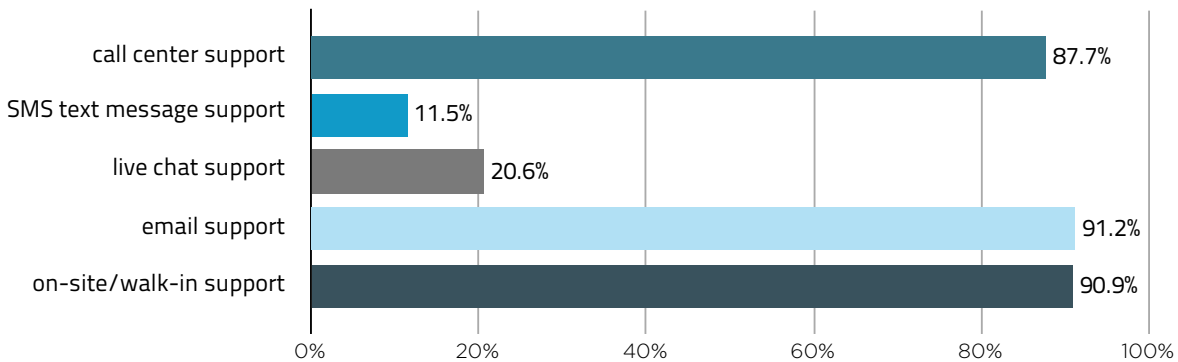
Today's technology-savvy college students insist their variety of gadgets and devices are essential to their educational and learning experience. But perhaps more important to the student is a campus network that has good connection, is easy to use, and is well-supported by IT staff and services.

When needing network support, students want a fast and convenient way to request assistance. Survey research shows that there is no standard way for residents to request assistance for their network connection and related services. In the majority of higher education institutions (65.2%), residents must call for assistance via their telephone. A web-based process (submitting a support ticket, log a problem, etc.) is another popular approach used on 56.1% of campuses. And 54.9% of institutions require campus residents to physically go to a central location (the Residential Computer Network Office, Helpdesk, etc.) for support. At some institutions (12.6%), residents are required to go to distributed locations where assistance is offered via a web-based approach (instant messaging, interactive chat, remote desktop, software, etc.)

When network support personnel must be dispatched to residents' rooms, typically (among 58.5% of institutions) appointments with support personnel are scheduled in advance, while some universities (34.8%) dispatch support personnel as requested. 14.6% of surveyed institutions do not offer in-room assistance.

Most universities and colleges offer on-site/walk-in support, call center support, and email support. Live chat is available on 20.6% of campuses and text message support on 11.5%. (Several respondents commented that they offer network support through popular social media sites Facebook and Twitter as well.)

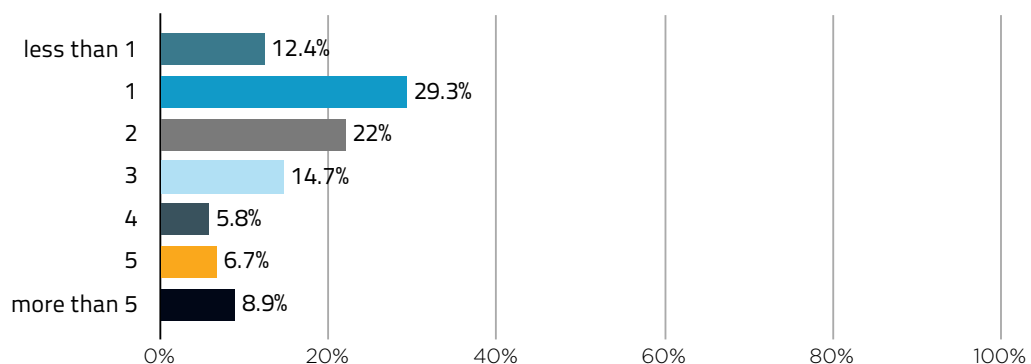
#### What method of support does your institution provide?



While only nine percent of universities and colleges offer 24/7 network support, an overwhelming 64.3% offer more than 40 hours of support through their network help desk. Eight percent of institutions outsource a portion of the network help desk. Of the institutions that outsource, 56.5% offer 24/7 network help desk support. Another 17.4% offer more than 60 hours but not 24/7 network support.

The survey data indicates that 63.9% of universities and colleges have 2 or less staff members (full-time equivalent) providing direct support to their campus residential computer network.

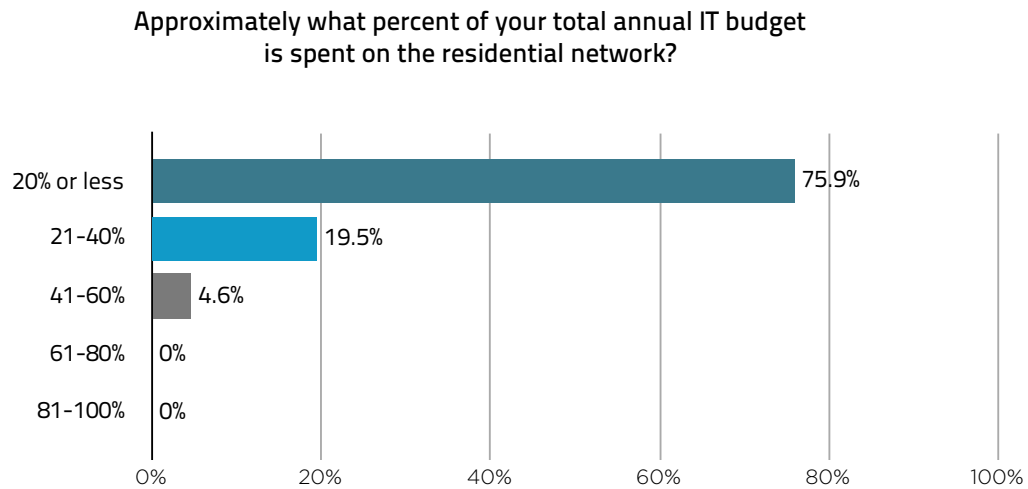
#### How many staff members (FTE) provide direct support to your campus residential computer network and its users?





## Fees and Budgets

Survey respondents were asked, "Approximately, what percentage of your total annual IT budget is spent on the residential computer network?" An overwhelming 75.9% indicated 20% or less. Another 19.5% said the residential computer network is 21-40% of the total annual IT budget.

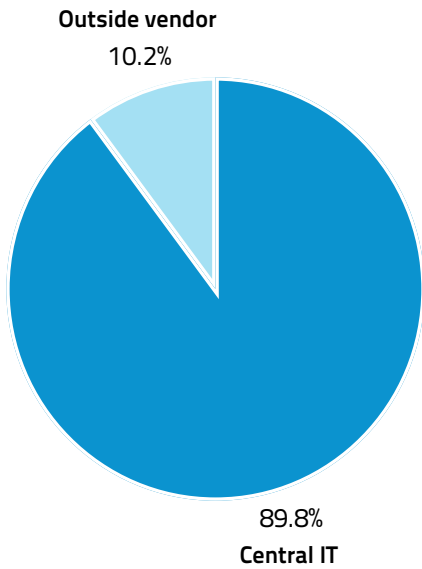


Slightly more than half of universities (56.9%) levy a "general technology" fee on students. And of these institutions, 46.9% indicate a portion of the general technology fee is allocated to build, maintain, and/or support the residential computer network (though 11.2% were unsure of such an allocation).

In addition to a general technology fee, some institutions (6.4%) give students the option to pay for a faster connection speed.

As seen in the chart below, the cost of bandwidth going to the residential network is still handled largely by the institution's IT department, while a smaller percentage outsources the cost of bandwidth to an outside provider.

Who pays for the cost of bandwidth going to the residential network on your campus?



Typically, Central IT pays for bandwidth available to the residential computer network (according to 89.8% of survey institutions). Fifty-eight percent of these respondents reveal that Central IT does not recover the cost of bandwidth for the residential computer network. For 7% of institutions, an outside vendor supplies the bandwidth and recovers the cost through a charge to the university. While 3.2% of institutions pays a non-university ISP and recovers the cost through "housing" rent or fees.

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