2017 State of ResNet Report

ACUTA / ACUHO - I

ResNet Trends & Practices Across Higher Education

ACUTA

ASSOCIATION FOR COLLEGE AND UNIVERSITY TECHNOLOGY ADVANCEMENT

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ASSOCIATION OF COLLEGE AND UNIVERSITY HOUSING OFFICERS - INTERNATIONAL

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Introduction

The Association for College and University Technology Advancement (ACUTA) and Association of College and University Housing Officers-International (ACUHO-I), are pleased to present research findings from the 2017 ACUTA/ACUHO-I State of ResNet Study.

The sixth annual Residential Networking (ResNet) study examines the current state of Residential Networking (ResNet) – trends, practices, and the development of standards among U.S. and International higher-education institutions. Over the years, the study has expanded its opinion sources prompting communication among three significant ResNet stakeholders – higher-education IT Leaders, housing officers, and business officers.

This research, which includes data from 320 higher-education institutions, is designed to help administrators and business officers address issues such as: unprecedented growth in bandwidth and connectivity demands, budget restrictions, policy considerations, staffing, and support. Through these findings, we can provide a benchmark, solidify resources, and improve ResNet strategy among higher-education institutions, as well as enhance the living-learning environment for university and college students.

" The 'Internet of Things' blizzard has descended on US higher-education campuses, bringing with it new network challenges as student demand for bandwidth reaches new, higher levels every school year. Our sixth annual ResNet study shows a bit of a silver lining this year as we see more schools than ever finding ways to satisfy the skyrocketing demand. It's our hope this study provides administrators insight into how best to meet the challenges as IoT changes the landscape when students arrive on campus. "

~ Sharon Moore, Chair of the ACUTA Environmental Scanning Task Force and Deputy CIO at Smith College.

" Higher-education administrators understand that we serve one of the savviest group of technology early adopters – college students. Whether they are in the classroom or in the residence halls, they expect to be always connected. Their on-campus experiences can be made or broken by technology infrastructure, Wi-Fi and support. Now more than ever, it's imperative that housing, IT, and business officers collaborate to create an optimal environment for living and learning. By working together, schools can ride these new trends to greater satisfaction. "

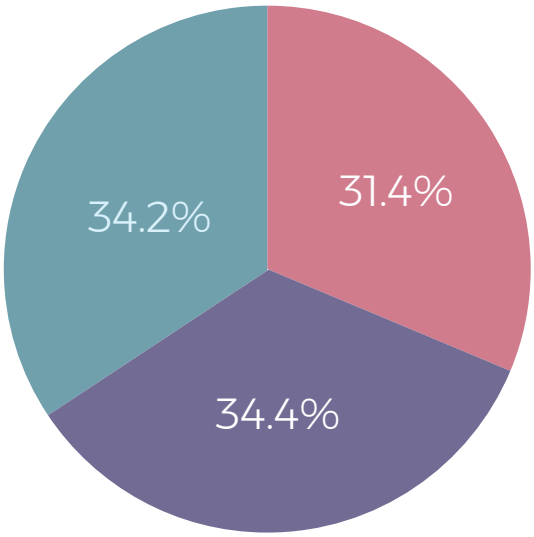
~ Mary DeNiro, ACUHO-I Executive Director and CEO.

Methodology

For the sixth year, market research firm Forward Analytics was contracted to perform ResNet industry research and provide significant visibility into the best practices and challenges of delivering a strong residential network infrastructure on college campuses. Forward Analytics worked closely with ACUTA and ACUHO-I representatives to design the 2017 survey and conducted online polling from October 2016 through December 2016. Three unique questionnaires were developed to take into account the three audiences. While the surveys have evolved over the years to reflect technological evolution, as well as developments in higher education, they have remained fairly consistent so that data comparisons can be made.

High Participation Rates

A total of 450 surveys were completed, a 76.5% increase in completion rates since the initial study in 2012. This represents 320 universities or colleges (some institutions had multiple respondents), with a sample (total) population of 1,700 U.S. higher-education institutions. The response rate represents a statistical significance of +/-4.0% at the 95% confidence interval. With 450 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 +/-4.0%. This level of sampling is deemed significant for supporting business decisions and strategic planning.



Size of Institution

31.4%	Small (fewer than 5,000 students)
34.2%	Medium (5,000 to 15,000 students)
34.4%	Large (15,000+ students)

Methodology

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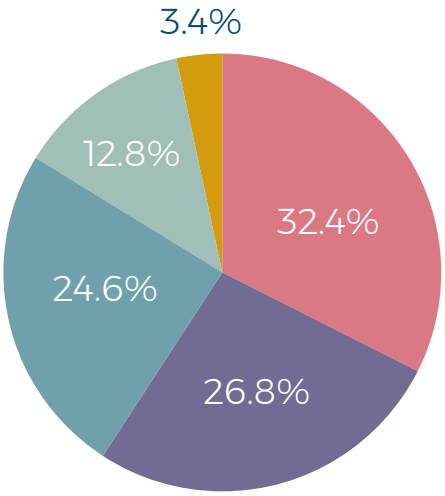


Number of On-Campus Students

32.4% Under 500

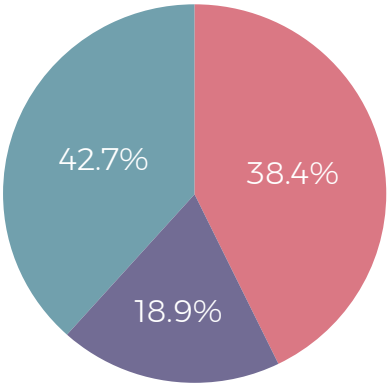
26.8% 501 to 1,000

24.6% 1,001 to 2,000

12.8% 2,001 to 5,000

3.4% More than 5,000

Slightly less than 40% of the respondents have between 1,001– 5,000 on-campus students. This type of learning environment is becoming increasingly popular on college campuses and provides a number of benefits, in terms of revenue, classroom performance, and student satisfaction and retention.



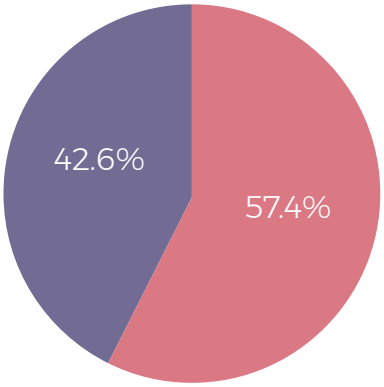
Job Responsibility

42.7% IT

18.9% Business

38.4% Housing

Of the 450 total responses, 85 respondents indicated their primary job was related to business and 173 to housing, while 192 respondents primarily handled IT.



Governance

57.4% Public

42.6% Private

Among the institutions represented in the survey, slightly more than half were public universities or colleges.

Executive Summary

Just as universities and colleges are rising to meet challenges posed by the Bring Your Own Device (BYOD) phenomena, the IoT (Internet of Things) trend is growing quickly and gaining a foothold on campuses across the nation. Higher-education institutions continue to evolve and improve upon ResNet and Wi-Fi practices as they now face the convergence of mobility, big data, advanced applications and even more devices.

The IoT movement will not only require more collaboration and strategy among housing, IT and business, but it will also require more communication with end-users or students. IoT can better the college experience in numerous ways, and opening the doors to further communication will enhance education and offer a better living environment for on-campus students. In order to provide the best experience possible, it's important to look at how schools have responded to past needs and demands of ResNet services and support.

The 2017 State of ResNet Report details the current state of the ResNet and its components – internet, cable, television/video services, phone services and support available to on-campus students. It documents the perspectives of IT, business and housing officers, and details how universities and colleges are responding to the diverse and ever-evolving challenges for ResNet services. The following section highlights the report's key points on the following topics: Bandwidth Management, Wireless Coverage and Capacity, Service and Support, Planning and Measuring, Funding and Technology Costs and Outsourcing.

New Devices and Applications Keep Bandwidth Demands High

- The top bandwidth-consuming devices today are desktops and laptops as they support video, audio and rich media applications.
- This year, smartphones surpass tablets and rank #2 in bandwidth consuming devices.
- Over one-fourth of schools see the potential of newer devices – wearable technology, fitness trackers, medical devices and drones—to be big drains on bandwidth.
- TV and video consumption (Netflix), and other web-based rich content, are seen as the largest bandwidth-consuming applications.
- To support the increase in bandwidth demand, more than 71% of institutions now offer 1 GB or more of bandwidth per student – almost a threefold increase from 25.5% in 2012.
- Slightly more than one-fourth of campuses offer 7GB or more to accommodate student needs.

Executive Summary

(continued)

Better Wi-Fi Coverage Needed for Whole Campus

- The majority of college administrators realize a high-performing ResNet is critical to attracting and retaining on-campus students. Ninety-three percent of technology officers and 77% of business officers rate it as very important.
- Presently, only 56% of colleges report comprehensive Wi-Fi throughout 81-100% of the whole campus.
- Colleges have increased robust wireless connection only in academic areas, whereas there is a decline in coverage among social areas.
- 72% of campuses are now considering plans for cellular augmentation for Wi-Fi.

Most Schools see a Rise in ResNet Costs but also an Increase in Funding

- Over half of all institutions surveyed expect the cost of wireless network services to increase over the next two years – an unexpected 6% drop from last year. Forty-three percent of schools expect an increase in cost of 5% or more.
- ResNet funding increases were seen by 42% of institutions, whereas only 4% saw a decrease.
- Compared to five years ago, 68% of business officers express moderate or much more concern for Wi-Fi management and budgeting.

Still, Schools Look for Ways to Save ResNet Expenses

- 43% of business officers say their schools outsource or are considering outsourcing to trim costs. Thirty-five percent of housing officers outsource or are considering outsourcing some or all ResNet services to trim costs.
- More schools have increased or are considering increasing student/user fees to address the cost. Presently, 61% of schools levy a general technology fee.
- 40.4% of schools have merged network services with other IT services in order to save ResNet costs.
- 82% of schools with in-house ResNet services use bandwidth-management tools.

Executive Summary

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Despite Increasingly Sophisticated Devices and Technology, Support Services See no Revolution

- Only 14% of schools provide 24/7 support; 15% have no help-desk support.
- Low-tech support (on-site, walk-in and call center) prevails while social media and live chat have fallen in popularity.
- 78% of schools promote self-sufficiency support by providing web/wiki/online FAQ.
- Six percent of institutions outsource help-desk services, while the same amount are strongly considering it.

Strategic Planning Improves, Collaboration Needed

- In the past five years there's been a 28% increase in the number of institutions with a ResNet strategic plan, escalating from 34% to 62%. However, 27% of schools are without such a plan. And 26% only update their plan every 3-5 years.
- Communication has been consistently lacking between key ResNet decision makers.
- Thirty-nine percent of business officers and 47% of housing officers meet annually or not at all with their IT department. Whereas, 56% of technology officers say they meet with housing officers only annually or not at all.
- Sixty-four percent of stakeholders would like to be able to benchmark their ResNet services against other schools, but only 16% of institutions have access to sufficient benchmarking information.

Findings

Bandwidth Management

Key Takeaways:

- Historically, schools have bolstered their residential networks to meet the BYOD demands of millennial residents. Now, they are faced with the IoT movement – with even more devices, progressive usage, and increasingly sophisticated applications and data management.
- As computers and mobiles become increasingly high-tech, they've also become more bandwidth-greedy. Desktops and laptops have emerged as the top bandwidth-consuming device as they support the video, audio and rich media applications utilized in the living-learning environment of today's campus. This year, smartphones surpassed tablets and rank #2 as largest bandwidth-consuming devices.
- TV and video consumption (Netflix), as well as other web-based rich content, are the largest bandwidth-consuming applications. The digital learning environment (online learning tools, and interactive digital textbooks) has a less significant impact on bandwidth demand when compared to entertainment applications.
- More than 71% of institutions now offer 1 GB or more of bandwidth per student – almost a threefold increase from 25.5% in 2012. Slightly more than one-fourth of campuses offer as much as 7GB or more to accommodate student needs.
- 82% of campuses with in-house ResNet currently use bandwidth-management practices to control the increasing demand.

Snapshot of Bandwidth Management

Every year, students report to campus with an increasing array of mobile and Internet-connected devices. Today's students come to campus expecting high-performing, reliable Wi-Fi, not just in the classroom or residence halls, but throughout all college buildings and landscape. New methods of teaching add to the coverage and bandwidth-management problems on college campuses. For example, with the advent of the flipped classroom, educational content has shifted heavily to video, driving up bandwidth and Wi-Fi needs outside of the classroom.

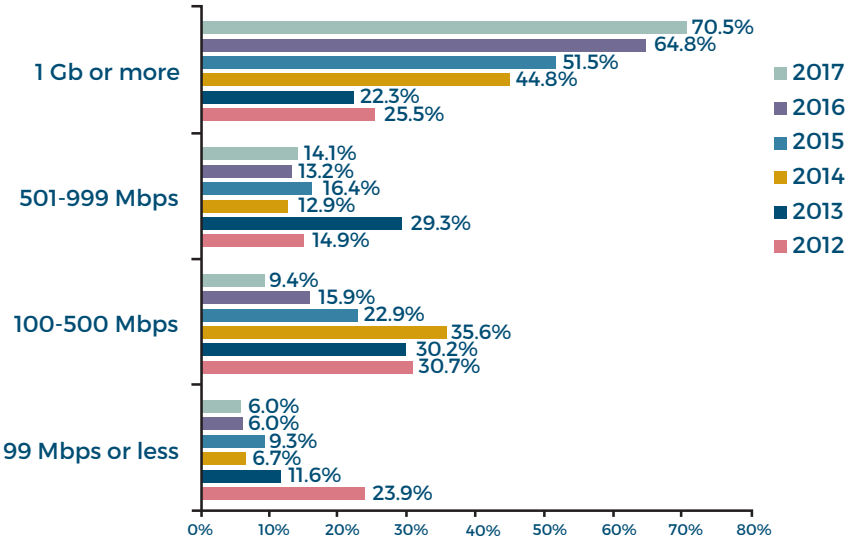
And we shouldn't overlook students' use of devices for communication and entertainment. The popularity of recreational peer-to-peer (P2P), social media, self-generated content, and gaming self-generated content applications further add to the networking demands.

Findings

(continued)

It's critical for schools to nurture the living-learning environment. Consequently, nearly three-fourths of campuses let residents connect an unlimited number of devices to the ResNet (a 6% increase from 2016). Schools not only accommodate the surge in mobile devices, but they also steadily increase the bandwidth available to on-campus students. 2017 shows that 70.5% of institutions now dedicate 1 GB or more to the ResNet – a drastic increase from 25.5% in 2012. Twenty-seven percent of campuses offer as much as 7GB or more.

Bandwidth Dedicated to ResNet



Future Bandwidth Consumers

As we move from the Bring Your Own Device (BYOD) trend into the Internet of Things (IoT), even more bandwidth will be required on college campuses. Not only will students have a primary computing device, but actual usage levels may be significantly higher when all IoT devices connected to the network are accounted for (e.g., smart watches, wearables, personal IoT devices).

Correspondingly, primary computing devices--desktop and laptop computers--are forecasted as the largest bandwidth consumers in the years to come. Desktops and laptops are seen as gateways to many disruptive applications that require excessive bandwidth. Through these devices, students have a larger canvas for complex games, virtual learning, 3D modeling software, computer animation or simply storing photos and videos.

Findings

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At the onset of the BYOD movement, tablets (iPad and Android) were viewed as the most significant threat to bandwidth consumption. Last year's data shows that concerns had tapered off for all network-enabled devices and their usage to affect bandwidth consumption. But this year, 2017, shows all devices back on the rise with the most significant increase among e-Book readers and wireless printers.

The 2017 survey measures concern for bandwidth consumption among newer technologies, too. Drones (30.4%), wearable technology such as Google Glass, Gear VR, and smart watches (29.1%), wearable medical devices (27.5%), and wearable fitness trackers (27.1%) each prove to be of substantial concern.

Largest Bandwidth-Consuming Devices	2013	2014	2015	2016	2017
Tablets (ipad, Android)	83.5%	73.4%	67.9%	57.7%	54.2%
Desktop and laptop computers	75.0%	69.3%	76.5%	58.6%	62.3%
Video systems (DVD/Blu-Ray Players, Apple TV, Roku, Slingbox)	63.6%	49.3%	53.7%	48.9%	50.0%
Smartphones (iPhone, Android)	63.2%	64.2%	66.8%	55.2%	61.8%
Game boxes (PS3, Wii, XBOX, XBOX 360, etc.)	60.7%	46.7%	52.2%	41.9%	48.8%
Smart TV's	51.7%	37.2%	38.8%	36.6%	47.6%
e-Book Readers (Kindle, Nook)	27.8%	13.0%	9.4%	7.4%	27.3%
Wireless Printers	14.1%	5.8%	8.7%	7.8%	28.8%
Wearable technology (Google Glass, Gear VR, smart watches)	-	-	-	-	29.1%
Wearable fitness tracker (FitBit, Nike)	-	-	-	-	27.1%
Wearable medical devices	-	-	-	-	27.5%
Drones	-	-	-	-	30.4%

Findings

(continued)

Last year's study acquainted us with the idea that evolving higher-education learning environments, as well as the entertainment needs of students, require colleges to invest in and build a wireless network that will support the increased bandwidth usage and demand for wireless connection. So this year's survey looked at device usage and how the consumption of technology by student housing residents contributes to increased bandwidth usage.

As supposed, TV and video consumption (Netflix) ranks at the top for bandwidth consumption. Interestingly, data shows that digital learning environments, such as online learning tools, are presently less of a threat to the bandwidth dilemma.

Largest Bandwidth Consumers By Application	2017
TV and Video Consumption (Netflix)	87.7%
Web-based rich content (such as video)	78.2%
Music and audio (internet radio, Pandora)	61.3%
Video Gaming	51.7%
Cloud content (Spotify, Apple iCloud, etc.)	51.1%
Other social media	35.6%
Online learning tools	30.4%
Personal video and photos (Flickr)	28.7%
Interactive digital textbooks	13.3%
e-books	8.8%

While there is a great deal of uncertainty around the impact of IoT on bandwidth and campus networking, only 17% of technology officers are concerned about the ability of ResNet to meet future demands. Housing officers show slightly more unease with 25% concerned about the ability of their provider to meet future demands of residential networking.

Findings

(continued)

Capping Bandwidth

Currently, 18.6% of colleges cap bandwidth, an increase from last year's 12%. This year's data shows that 82% of colleges that manage ResNet in-house currently control bandwidth through a variety of practices, the most common of which are shaping and limiting bandwidth by protocol or blocking activities such as P2P sharing, music downloading, etc. Data shows that schools that outsource ResNet and Internet are less likely to require bandwidth management practices.

Bandwidth Management Practices	2013	2014	2015	2016	2017
Shaping and limiting bandwidth by protocol	72.4%	66.7%	77.3%	46.2%	30.7%
Blocking activities such as P2P sharing, music downloading, etc.	N/A	52.0%	68.1%	40.1%	33.9%
Capping network-wide throughput available to streaming video	22.9%	18.6%	25.9%	20.3%	11.5%
Implementation of cache servers	22.9%	21.1%	25.9%	25.4%	24.5%
Providing minimum guaranteed service levels by user	12.9%	15.2%	20.8%	10.2%	9.9%

Other bandwidth-management practices in place on campuses include:

- Bandwidth sharing services
- Fairness Algorithms
- Limiting when 80% of total available bandwidth is used
- Caps high users but only after total throughput has been exceeded

Findings

(continued)

Wireless Coverage and Capacity

Key Takeaways:

- While the explosion of mobile devices and applications require better Wi-Fi performance and access, only 56% of colleges report comprehensive Wi-Fi throughout 81-100% of the whole campus.
- 2017 shows a slight drop (6.1%) in robust wireless coverage of 81-100% throughout student areas on college campuses. There is a 3.6% increase in campuses that have scaled back to 60-80% robust coverage now.
- The majority of college administrators realize a high performing (coverage and capacity) ResNet is very important in attracting and retaining on-campus students. Ninety-three percent of technology officers and 77% of business officers rate it as very important. Colleges have increased robust wireless connection but only in academic areas, whereas there is a decline in coverage in social areas.
- 72% of campuses are considering plans for cellular augmentation. And those schools that do not plan for cellular augmentation believe their cellular reception is satisfactory, too expensive, or that augmenting is the carriers' responsibility.

Snapshot of Current Wireless Coverage

Colleges and universities are amongst the most demanding wireless environments today. Over the past five years of this study, bandwidth demand by students has been increasing, and bandwidth availability and the delivery to satisfy those demands have also increased. At the same time, the on-campus housing communities have moved rapidly to accommodate the latest trends of student living and learning. The quality of Wi-Fi, Internet access and the ability to access it, no doubt, has an impact on occupancy and satisfaction of student housing, and the university as a whole.

In fact, the research shows that the overwhelming majority of college administrators realize a high-performing (coverage and capacity) ResNet is very important in attracting and retaining on-campus students. Ninety-three percent of technology officers and 77% of business officers rate ResNet as very important.

Yet, only 56% of colleges and universities offer comprehensive wireless coverage throughout 81-100% of the whole campus.

Findings

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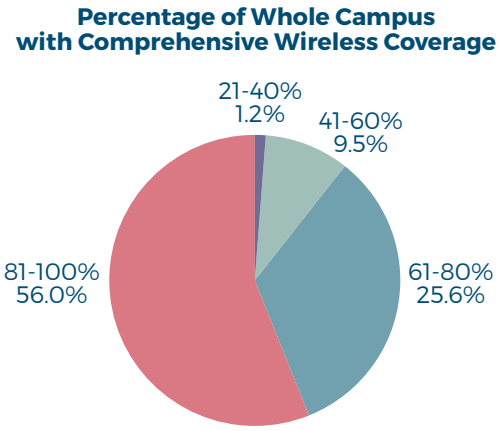
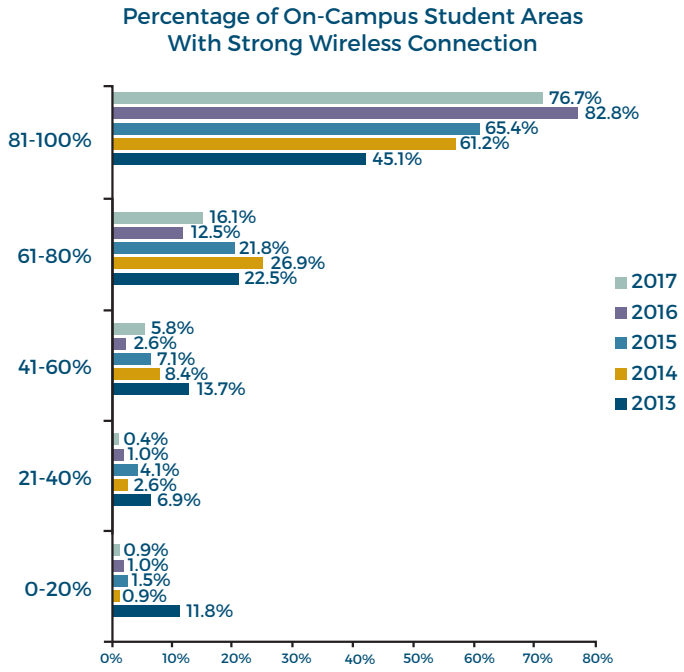


This year's data presents a drop in robust wireless coverage available in student areas on college campuses. Historically, there has been a sweeping increase in campuses offering strong coverage throughout 81-100% of their on-campus student areas (nearly doubling in the past five years). However, 2017 shows a slight decrease (of 6.1%) in robust coverage at 81-100% and an increase in campuses offering it throughout only 60-80% of the campus.



2017 data shows that the increase in robust wireless coverage is mostly in academic areas on college campuses. Schools have lowered their standards for robust wireless coverage in social spaces, even residential rooms, suites, or apartments. Fifty-nine percent of business officers support expansive Wi-Fi access or coverage for the entire campus rather than limit coverage to the extent of available funds only for the most densely-populated areas.

Findings

(continued)

Percentage of Campuses offering Robust Wireless Coverage in 81-100% of Residential Areas	2014	2015	2016	2017
Academic spaces in residences, including classrooms and study areas	73.0%	71.4%	86.1%	87.3%
Residential Computer Labs	73.0%	72.1%	81.0%	87.9%
Administrative areas (front desks, area offices, residential staff offices, etc.)	71.2%	66.9%	82.9%	85.5%
Common areas and community spaces	69.9%	66.1%	80.2%	80.2%
Dining facilities	69.3%	66.9%	81.4%	80.8%
Residential rooms, suites, or apartments	59.0%	58.7%	87.8%	82.2%
Outside areas adjacent to residential spaces (courtyards, parks, breezeways, etc.)	19.6%	12.1%	19.3%	11.9%

Cellular Reception

To accommodate the highly mobile student needing seamless wireless coverage, 72% of institutions are considering an array of services to augment residential cellular reception on campus, representing an increase of 14% from last year. To handle coverage and capacity problems, 21% of institutions plan to deploy in-building DAS, 15.3% outdoor DAS, and 13.5% outdoor cellular sites/towers.

Thirty-five percent of institutions that have no plans for cellular augmentation believe the cellular reception on campus is performing satisfactorily. Another thirty-five percent believe cellular augmentation is too expensive and 20% of institutions have the perception that the carrier should provide satisfactory cellular coverage.

Findings

(continued)

Switches and Hubs

To allow for seamless performance, 41% of schools let campus residents install personal network devices, like switches or mini-hubs, but only 7% let them install wireless routers. Nine percent of schools permit the installation of servers (a drop from 14% in 2016). In contrast, 59% of universities prohibit the installation of network devices in campus residences. When compared to the past five years, 2017 shows less tolerance for personal network devices among colleges and universities.

Wired Ethernet Ports

Despite the increase in wireless coverage on college campuses, only 21.1% of institutions will remove existing wired Ethernet access ports in residential buildings and 23.4% are unsure if they will remove the ports. These figures are slightly higher than the previous two years and represent an overall growth since 2012 when a mere 5% of institutions had plans for removal.

The majority of institutions include wired Ethernet access ports in new residential construction. Most offer one port per student (44%), whereas 17.8% provide one port per residential unit and/or 9.4% provide ports upon request. Eight percent of institutions chose not to include Ethernet ports in residential construction completed over the past three years.

Findings

(continued)

ResNet Service and Support

Key Takeaways:

- The past year shows that college and university housing departments have increased their role in ResNet services, both in manpower and time allocation.
- Today, 74% of colleges offer unlimited device connectivity; most have increased bandwidth and provide technical support for a wide array of devices. However, less than one in five schools (14%) provides 24/7 support.
- Fewer schools are providing support via live chat and social media, but the majority of schools continue to provide on-site, walk-in and call center support.
- Six percent of institutions are outsourcing help-desk services, while another 6% are strongly considering it.

Snapshot of Support Services

On most campuses, Central IT (Networking, Security, etc.) takes responsibility for both maintaining the physical infrastructure and providing end-user support for residential networking. Yet, 18% of campuses rely on Student Affairs to provide end-user support for ResNet. Housing & Residence Life plays a significant role in monitoring ResNet by measuring student satisfaction with ResNet services. Presently, 68% of housing departments reportedly measure student satisfaction with ResNet services. Sixty-eight percent of housing departments receive their IT support from the central university IT department. In fact, almost half indicated that there is no full-time staff within their housing/residence life IT department.

Options for Support

With the potential upsurge of IoT devices, their increased sophistication, and their continual usage, schools should anticipate an amplified need for technical and network support for students. Institutions will likely turn to technology to elevate their ResNet customer service and support to offer it in “real time, anytime.”

Findings

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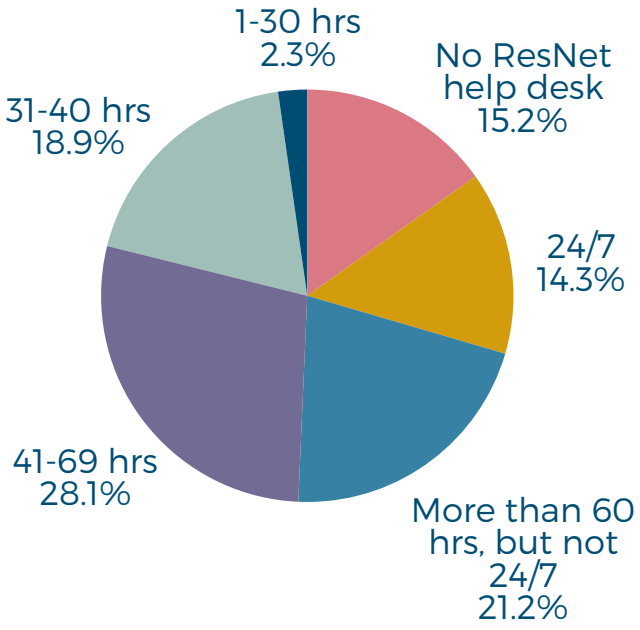
Presently, only 14.3% of campuses offer 24/7 help desk support. There has been a year-to-year increase from 2012 when only 9% of schools had 24/7 support. Sixty-eight percent of schools offer more than just 9-to-5 help-desk support, but not 24/7 assistance. To better meet the needs of students' 24-hour lifestyle and the increased use of technology in education, 6% of institutions are outsourcing help-desk services, while the same number of schools are strongly considering it. This is an 8% drop from last year when 20.4% of schools either outsourced help-desk or were strongly considering it.

Availability of ResNet Help Desk



Findings

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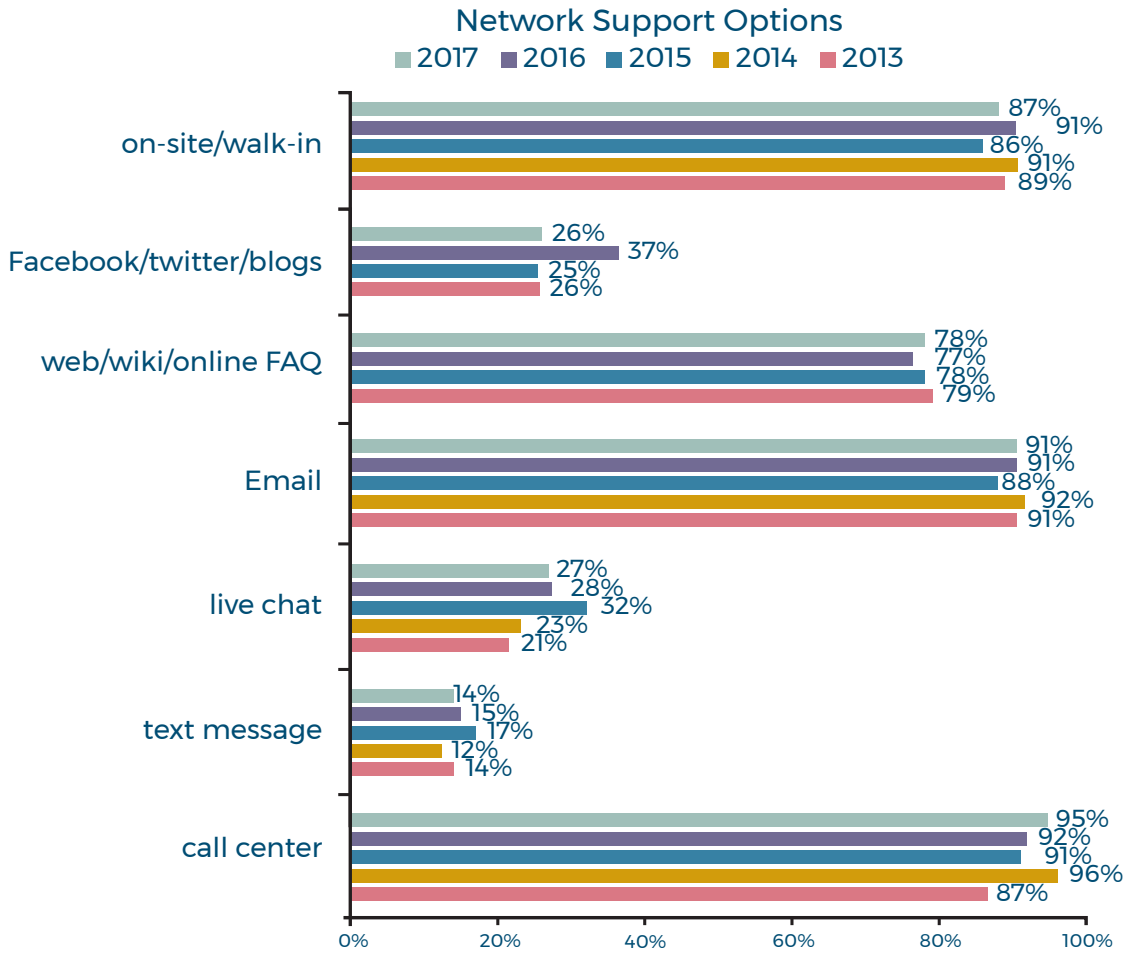
Technology also allows for more efficient help-desk solutions, particularly self-support options which can free up resources and time for IT departments. This year, 78% of schools utilize web/wiki/online FAQ for self-serve support options. But while mobile devices are proliferating on college campuses allowing for virtual communications, on-site/walk-in network support is still offered by 87% of universities. Further, old-school communication (phone and email) prevails. Surprisingly, device and network support through social media, live chat and text message has remained consistently low the past six years.



Findings

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Planning and Measurement

Key Takeaways:

- More higher-education institutions today are recognizing the importance of strategic planning for the ResNet. The past five years present a 28% increase in the number of institutions with a ResNet strategic plan, escalating from 34% to 62%. But only one-fourth update their plan annually.
- While benchmarking can likely improve performance, only 16% of housing officers and business officers have access to such information. Sixty-four percent of stakeholders would like to be able to benchmark their ResNet services. Business officers value quality over cost in regards to an IT and networking solution.
- While IT Security is a top priority and has increased in importance, one in four schools has no Information Security and Internal Audits (ISO) team.

The potential of IoT can touch nearly every aspect of campus life. If embraced, IoT can result in a more valuable college experience, more specifically a richer education and outcome. Nonetheless, the IoT movement presents a lot of uncertainties, pertaining to the deluge of devices, security and data management, to name a few. Despite the unknown, schools must prepare for the movement by fortifying their network.

The BYOD movement brought about increased awareness and need for strategic planning to provide effective ResNet services. Presently, 62% of surveyed colleges have strategic plans in place for the ResNet – compared to 34% in 2012. Such a plan may include an approach for management and maintenance, staffing and support, as well as cost and performance information for wireless Internet (Wi-Fi), Internet bandwidth, cable TV, IPTV, VoIP and related services.

Because of the rapid evolution of technology, 23.5% of schools update their ResNet strategic plan annually; while 38.5% update it every 2-5 years. However, 27.2% of institutions still do not have a strategic plan for ResNet, and 10.8% of institutions are unsure whether they have a plan and/or how often it's updated.

Findings

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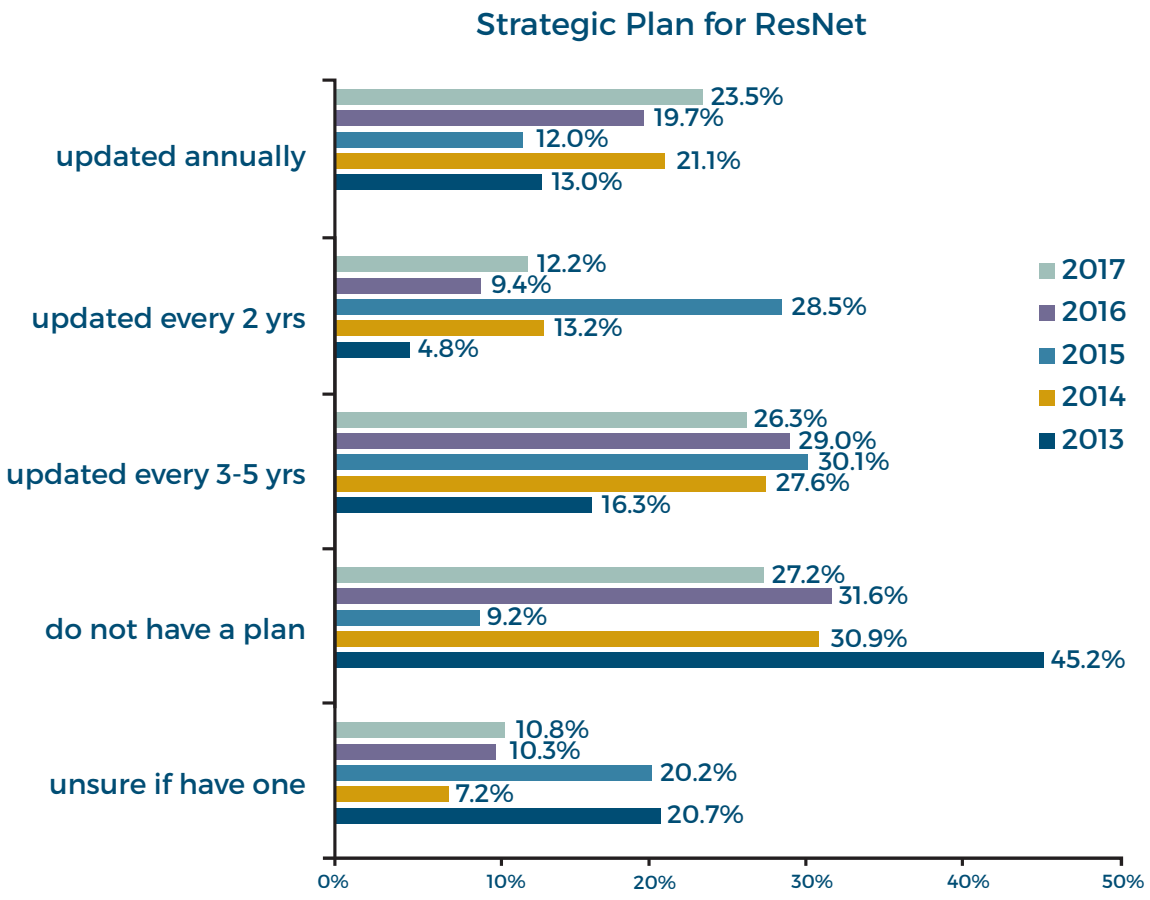


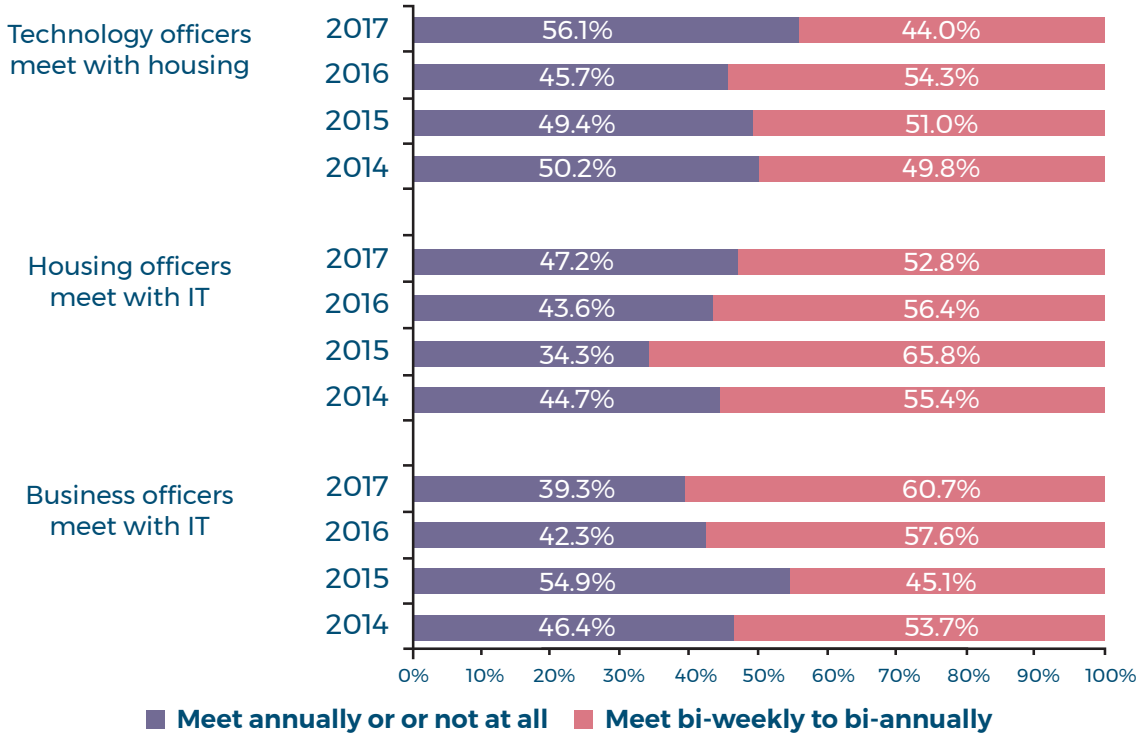
Communication between Departments

The promise of IoT is that more things can get done better and faster. Undisputedly, greater access to technology can result in a more valuable college experience. But in order for universities to stay on the forefront of technology, high-level decision making needs to be done collaboratively. However, data shows that communication has been consistently lacking between responsible departments. Thirty-nine percent of business officers meet annually or not at all with their IT department. And forty-seven percent of housing officers meet annually or not at all with IT. Whereas, 56% of technology officers say they meet with housing officers only annually or not at all.

Findings

(continued)

Frequency of Communications Among Key ResNet Decision Makers



Level of Satisfaction with ResNet Services

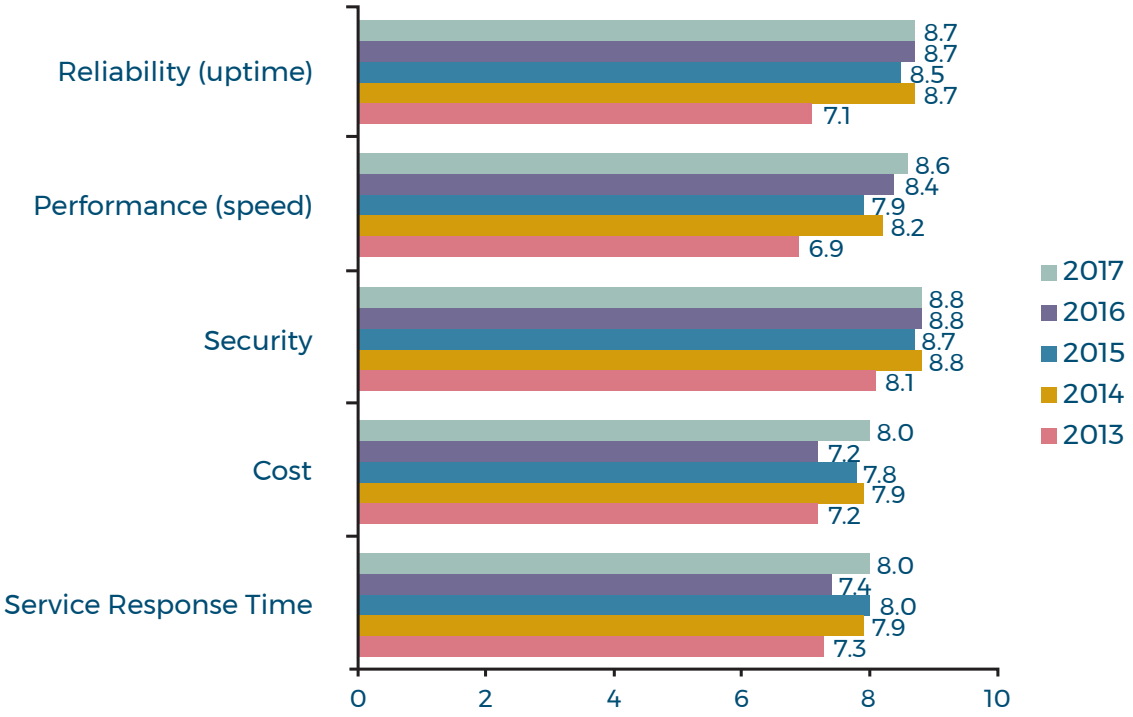
With the increasing popularity of the living-learning environment on college campuses today, students' expectations for a high-performing ResNet have intensified. The role of the housing officer is to ensure student satisfaction with all aspects of on-campus housing, including ResNet services. They advocate for student residents. Presently 68% of housing departments measure student satisfaction with ResNet (another 25% of schools measure student satisfaction through another department).

Housing officers are reportedly satisfied with the overall performance of the ResNet services available to their on-campus residents. In fact, satisfaction has peaked in 2017 showing either increased or consistent satisfaction across the board when compared to previous years. In the survey, housing officers were asked to measure the performance of ResNet services on a scale of 1 to 10, where 1=poor and 10=excellent. The following chart provides the average rating.

Findings

(continued)

Housing Officer Satisfaction with ResNet Services (Average Rating)



Diagnostics

Measurements and reports are critical to quickly diagnosing and resolving ResNet problems, as well as improving the ResNet to ensure user satisfaction. Furthermore, measuring and analyzing costs with quality of service can be a critical component of evolving strategies for new and more sophisticated technologies. IoT will bring significantly more data to manage but may also allow for automatic integration and easier access to relevant data.

Although 64% of housing and business officers would like to benchmark ResNet services, only 15.6% have access to such information (52.1% do not have access). When business officers were asked to rank various factors in terms of relative importance with respect to IT telecommunications and networking services, the survey found that reliability (uptime), security, and performance (speed) were all valued over cost. The following table illustrates the ranking factors and weighted scores (which is the sum of all weighted rank counts). Rankings are the same as the past two years' survey results.

Findings

(continued)

Drivers of IT Telecommunications and Networking Services Ranked by Importance – Business Officers	Rank	Weighted Score
Reliability (uptime)	1	246
Security	2	235
Performance (speed)	3	199
Operating Cost Predictability	4	190
Capital Cost Predictability	5	157

Presently, only 26% percent of business officers have the diagnostic information they need regarding the above factors. Even more concerning, data reveals that business officers have the least information on the factors of most importance. Although the chart above shows that business officers value information regarding security breaches, 63.6% say they require better data – a 12% increase from last year. And this year's data shows an increased need for information in all factors when compared to the 2016 findings.

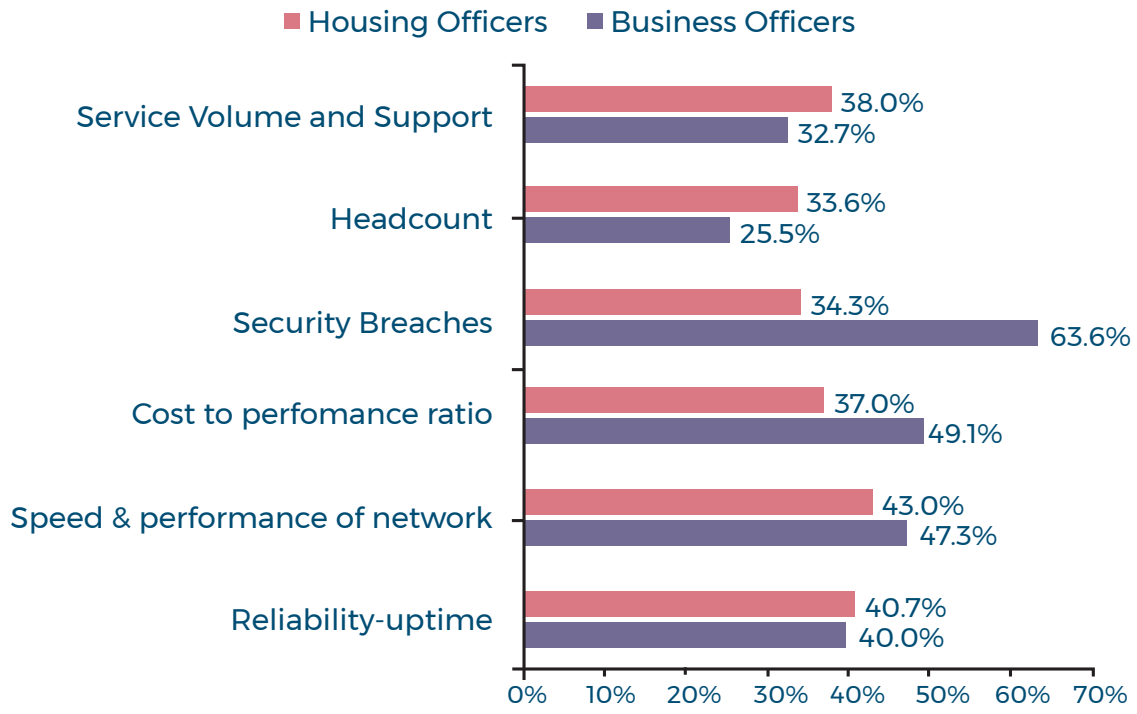
This lack of information may be due, in part, to limited manpower dedicated to security – 27% of universities and colleges do not have an Information Security Office and Internal Audit's team. Fifty-seven percent have a team of between 1 and 4 staff members. And 11% of institutions have a team of between 5 and 9 staff members, while 5% have 10 or more.

Findings

(continued)

The below chart demonstrates the differing diagnostic needs of business officers and housing officers. Housing officers place more value on user satisfaction; with needs for reports and diagnostics pertaining to service volume and support, headcount, speed and performance, and reliability.

Diagnostic Needs of Housing and Business Officers



Findings

(continued)

Funding and Technology Costs

Key takeaways:

- 68% of business officers experience growing concerns for Wi-Fi management budgeting.
- Over half of all institutions expect the cost of wireless network services to increase in the next two years with 43% expecting a cost increase of 5% or more. On the positive side, an equal number of institutions saw an increase in ResNet funding.
- More schools are implementing a general technology fee to both on- and off-campus students.
- Almost half of higher-education institutions have addressed the cost of ResNet by combining network services with other campus IT services and over one-third through shaping bandwidth.

As IoT goes mainstream, it will place new strains on IT resources the same way BYOD has done. The proliferation of newly-connected devices will increase capacity demands and pressure institutions to guarantee unfettered, pervasive wired and wireless access. And at the same time, the educational model has become more tech-centric with the expectations of student residents growing bigger. Certainly, all these requirements, changes and upgrades come at a cost.

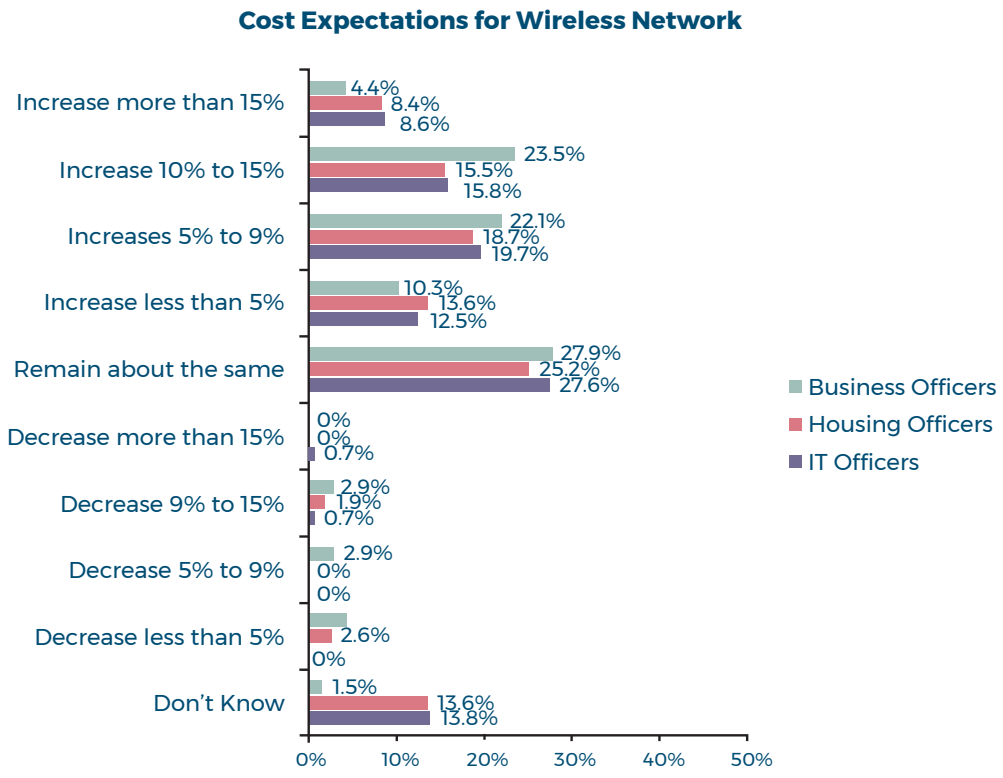
Compared to five years ago, 68% of business officers have more concerns for Wi-Fi management/budgeting. Over half of all institutions expect the cost of wireless network services to increase over the next two years with 43% expecting an increase in cost of 5% or more. Nine percent of institutions anticipate an increased cost of wireless networks services at 15% or more.

A deeper analysis of these findings shows that business officers have a more dispiriting expectation of the future costs of wireless (see chart below), with 60% expecting wireless costs to increase. While the three stakeholders have similar outlooks on the future costs of ResNet, 14% of administrators in housing and technology do not know how ResNet costs will change in the years to come.

On the positive side, 42% of institutions saw an increase in ResNet funding. However, this number dropped from 54% in 2015. This year only 4% of institutions expect a decline in funding.

Findings

(continued)



Who Pays for ResNet Costs & How Are Costs Recovered

Annual budgets for ResNet closely reflect the size of the institution. Over half of institutions (55.3%) have an annual budget of less than $750,000; one-fourth has a budget between $750,000 and $2.5 million and 20% over $2.5 million.

The past five years track ongoing shifts in the funding model(s) used for university ResNet. Funding models generally follow the size and type of university. Small, predominantly private institutions fund centrally, and medium to large, predominantly public institutions implement a fee/recharge system. Presently, 54% of institutions use mixed-resources as opposed to relying solely on central university funds.

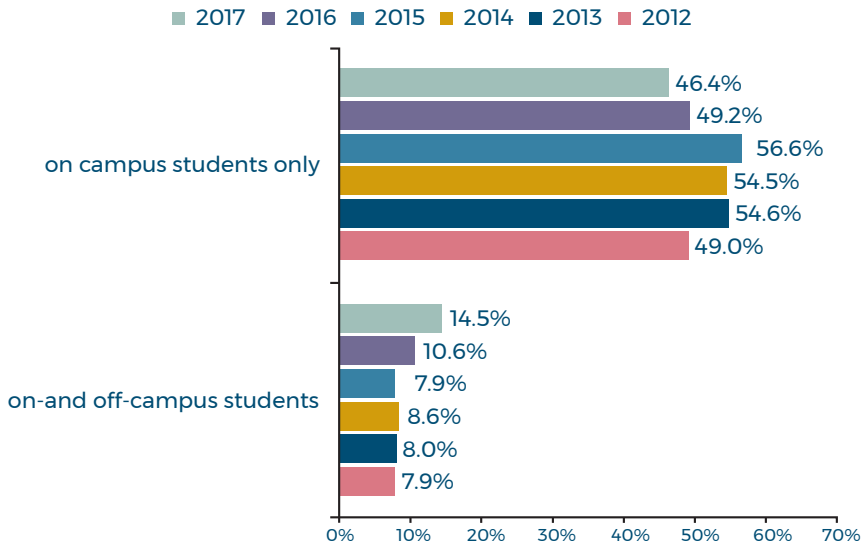
Findings

(continued)

Funding Models for Campus Telecommunications and Network Services	2013	2014	2015	2016	2017
Completely fund the network as a core university service from central university funds.	30.8%	49.3%	47.4%	41.5%	42.4%
Partially fund with student fees and partially through central university funds.	35.9%	23.7%	28.6%	33.3%	30.6%
Jointly fund the network through central university, student fees and departments.	15.0%	13.8%	15.1%	17.1%	18.8%
Partially fund by departmental assistance (colleges and schools) and partially funded by central university funds.	12.8%	9.9%	4.2%	4.9%	4.7%

Some technology costs are recovered through a general technology fee with 61% of schools implementing such a fee. This year we see a small shift in the way universities levy the technology fee. There is an increase in the number of universities that levy a general technology fee to both on- and off-campus residents (14.5%), while now 46.4% charge on-campus fees only.

How Institutions Levy General Technology Fee



More schools have addressed the cost of ResNet by combining network services with other campus IT services (40.4%) and/or through shaping bandwidth (31.6%).

Findings

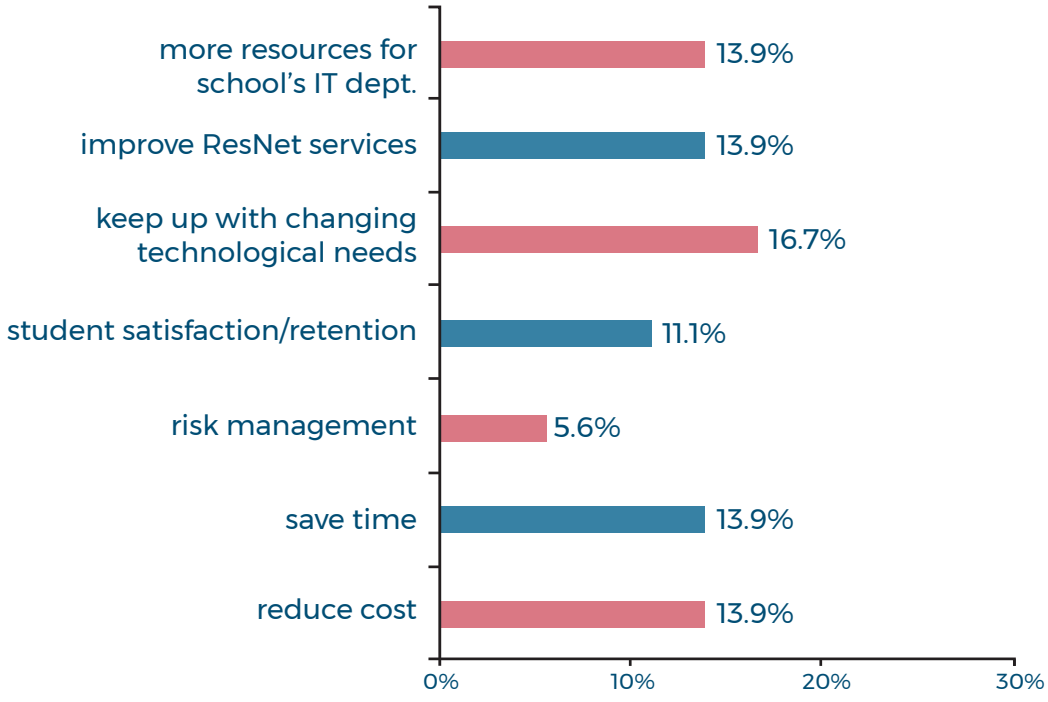
(continued)

Outsourcing

Key takeaways:

- While cost savings has traditionally been the reason cited for outsourcing, this year's survey reveals that schools have other priorities, such as keeping up with changing technology, saving time, more resources for IT, improving ResNet services – which now rank above or equal to cost savings.
- Perceptions on outsourcing differ across departments. This study found that business officers have a higher affinity to solve ResNet challenges by outsourcing, with 43% saying their schools outsource or are considering outsourcing to trim costs, whereas 35% of housing officers and 32% of technology officers stated the same.
- Outsourcing IPTV may be the way of the future as the number of universities outsourcing has doubled over the past year to 17.1%. An equal number of institutions is currently outsourcing or considering an outside entity to provide these services.

Why do institutions outsource ResNet?



Findings

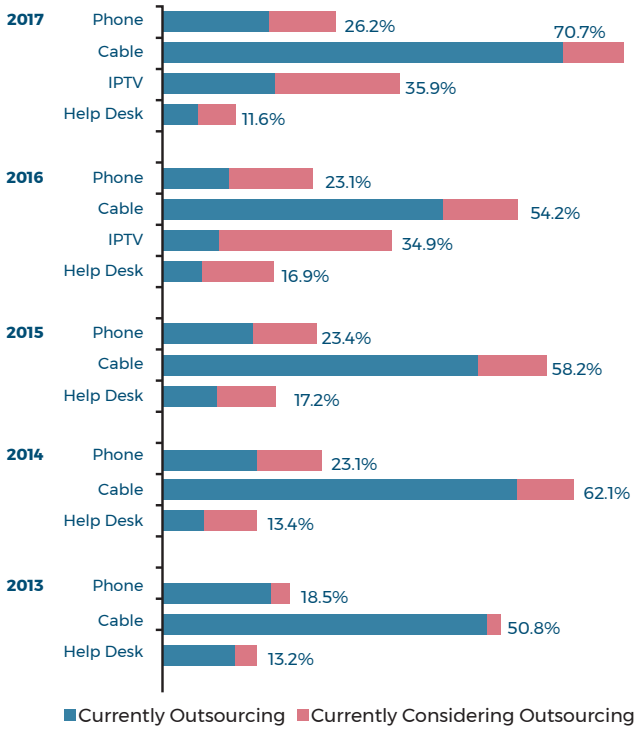
(continued)

Business officers, IT and housing officers have differing perceptions when it comes to outsourcing. Business officers have a stronger preference to solve ResNet challenges by outsourcing, with 43% saying their schools outsource or are considering outsourcing to trim costs. However, a lower number – 32% of technology officers and 35% of housing officers – reported on the same. This finding underscores the study's earlier reported finding (p17) regarding the lack of communication and exchange of ideas between departments.

In 2017, 42.7% of universities have considered or are considering making up for rising ResNet costs by increasing student/user fees. This is an increase from 2016 where 36.8% of schools considered or implemented the change. More schools have addressed the cost of ResNet by combining network services with other campus IT services (48.4%) and/or through shaping bandwidth (35.9%).

The below chart illustrates that more institutions outsource cable TV compared to other ResNet services. In fact, 70.7% of universities and colleges are now outsourcing cable TV, a significant 20% increase since 2013. Outsourcing IPTV may be the way of the future as the number of universities outsourcing has doubled over the past year to 17.1%. Data indicates that many schools who were considering outsourcing IPTV in 2016 followed through with their plans.

Percentage of Instututions Outsourcing ResNet Services



Please note: The 2017 State of ResNet Study does not inclue data pertaining to internet outsourcing due to differences in terminology used that resulted in uncomparable findings

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