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Summer 2015

# ACUTA Journal of Telecommunications in Higher Education

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2015  
Summer  
Volume 19  
Number 2

**Association for  
College and  
University  
Technology  
Advancement**



# JOURNAL



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# The Bridge to Your Digital Future



## Mobility

- Unified messaging
- Intelligent personal assistant – Atom
- Speech
- Location-based availability
- Single number reach
- Mobile client



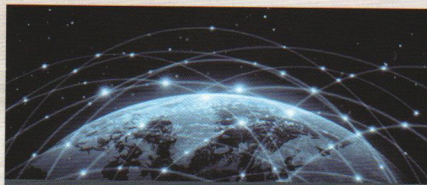
## Cloud

- Microsoft Office 365
- Google Gmail
- BroadSoft
- GENBAND
- RightFax Connect
- Mutare voicemail-to-text



## Lync

- SIP integration
- Enables migration to Lync
- Enhances Lync with mission-critical voice apps
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## Internet of Things (IoT)

- UConnect – extensibility to IoT and real-time event notification
- IoT is transforming the new digital business
- Connects data with communications to accelerate business decisions



## Security

- Private messages
- Web client keeps messages out of email
- Mobile client keeps data off of your mobile device
- Mobile number protection
- TLS to encrypt SIP signaling
- Secure RTP (SRTP) to encrypt audio



## Consolidation/ Optimization

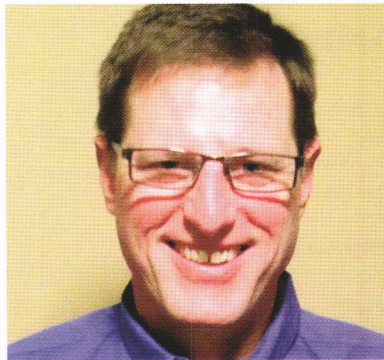
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**Quotes of Note**



*The greatest challenge is delivering value-added services within the constraints of financial resources, security requirements, ever-evolving technology service landscape, and shifting customer expectations, in a timely manner. Transforming IT requires new skills and a focus on "being of service."*

**Jerry Krawczyk**  
 Director,  
 Telecommunications  
 The Pennsylvania State  
 University  
 University Park, PA



*One of our challenges is maintaining and enhancing legacy systems while also delivering and supporting new systems. This is particularly true in terms of funding, staff time, and expertise.*

**Sharon Moore**  
 Deputy CIO  
 Smith College  
 Northampton, MA

**The Year Ahead**

<b>Fall Seminar</b>	October 25 – 28, 2015	Hyatt Regency Hotel Baltimore, Maryland
<b>Winter Seminar</b>	January 17 – 20, 2016	Hyatt Regency Hotel New Orleans, Louisiana
<b>45th Annual Conference</b>	April 24 – 27, 2016	Manchester Grand Hyatt Hotel San Diego, California

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ACUTA's mission is to advance the capabilities of higher education communications and collaboration technology leaders.

ACUTA's core values are to:

- encourage and facilitate networking and sharing of resources
- exhibit respect for the expression of individual opinions and solutions
- fulfill a commitment to professional development and growth
- advocate the strategic value of communications and collaboration technologies in higher education
- encourage volunteerism and contributions by individual members



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*The cloud changes the economic paradigm from long-term capital procurements of hardware and software into on-demand, time-based consumption and analysis for the purpose of optimizing collaboration across student work groups, educators, staff, and mentors.*

Larry Foster

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*Li-Fi technology uses light waves instead of radio technology to deliver data. It is a bidirectional, networked, mobile, high-speed data communication technology that complements Wi-Fi, and additionally has the key benefits of greater capacity, security, and energy efficiency. Li-Fi provides 10,000 times more bandwidth—the fundamental resource of all communication systems.*

Harald Haas

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## PRESIDENT'S MESSAGE

### Questions to Ask If You Are Thinking about the Cloud

by Michele Morrison  
British Columbia Institute of Technology  
ACUTA President, 2015-2016

**The theme for this issue of the *Journal* is Clouds in the Forecast, but this does not necessarily mean rough weather ahead.** Most institutions are delivering at least some

of their services via cloud-based solutions. Some of the more common ones that we are encountering in higher ed include offerings such as Microsoft Office 365, Google Docs, Adobe Creative Cloud, LMS tools, and Dropbox-type services, emergency alert services, E911, service desk tools, and so on.

This is great because we can essentially outsource a commodity service and focus our efforts on our core strengths. This supports a more contemporary approach to enterprise service delivery, capitalizing on ever-increasing bandwidth capabilities and evolving large-scale computing resources. However, this does not remove our responsibility to oversee the service.

When planning for a cloud-based service it is important to ask the following questions:

- What IT service management best practices, security and data protection standards, and guidelines are in use by the cloud service provider? The level of adoption of these best practices can be an indicator of the capability for the cloud service provider to deliver the service you expect.
- Where does the data reside? This poses questions about what legal jurisdiction applies to the data, who has access to the data from a legal perspective, and also what data protection laws come into effect. (Data stored in the United States has been particularly problematic for Canadian institutions, but on June 2nd Microsoft

announced that it will be building two data centres in Canada (Quebec City and Toronto) in 2016 to address the concerns related to data storage for cloud services for Canadian customers.)

- What availability levels are provided? Some cloud providers may impose their service levels, including service availability, on the customer and not provide flexibility to match your requirements. This can be a factor in dealing with all sizes of cloud service providers, not just large public-cloud offerings.
- What continuity plans are in place for recovering data, infrastructure, and applications? Questions that should be asked include: Can data be recovered? What data can be recovered? How long will it take to recover data and in what priority will my organization's data be recovered in the event of a large-scale data issue for the cloud service provider? In addition, you will want to know if the continuity plans are documented, clearly defined, and up-to-date.
- What level of service resilience and backup is provided within the service? Even if the service provider has a continuity plan in place, you will have to check what level of service resilience and backup is included as part of your service.
- Does the service provider have a service-desk function based on IT service management principles? Does the service desk provide sufficient support coverage and hours of operation, and is the service

desk local, onshore, or offshore? Is there a potential language issue?

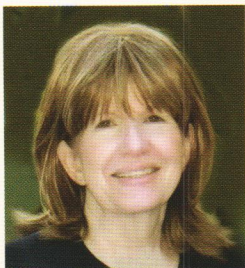
- What metrics will be provided, and are they relevant to your organization? Metrics are an important tool in understanding the levels of service provided.
  - Does the service provider's change management process match your needs? How will changes to the service be managed, and how will you be notified? Will you have a say in the changes being made, and when they will be made?
  - Does the cloud service provider require third-party providers in order to deliver services? The critical question here is whether your service provider has sufficient back-to-back contracts with its service providers to ensure provision of service.
  - How quickly can a cloud service provider scale services and capability, and is this quick enough for requirements of your IT organization or for your clients? Can the cloud-based systems platforms and applications scale in line with your requirements, and can the cloud services provide enough resources and extra capacity to meet increased demand from all of their customers?
  - Is your campus unionized? Moving existing services to the cloud may be considered "contracting out" within the collective agreement at your institution. You may be able to put a few new services in the cloud depending on where the data is stored.
  - Is there legislation that prohibits the use of cloud services where personal data is stored in another country? The provinces of British Columbia and Nova Scotia have the strongest legislation in Canada in this regard.
- Once you have answers to these questions, your organization will be in a good position to determine if the cloud service provider is capable of providing the service that your institution needs and expects.
- Reach Michele at [michele\\_morrison@bcit.ca](mailto:michele_morrison@bcit.ca).

# Snapshots What Is Your Campus Doing in the Cloud?

For this issue, we asked a number of campuses what they are doing in the cloud. Throughout the pages that follow, you will read these interesting responses.

## Sewanee, The University of the South

Jeanne Jansenius



Should your institution choose a cloud, premises, or a blended voice communications system? What factors should you consider? Over the next couple of years, many universities will be replacing their aging PBX voice systems. We are just beginning to research this question at the

University of the South. Here are some of the items we have identified:

- Is the phone system easy to implement, and does it meet the end users' requirements now as well as future needs? Mobility trending must be addressed.
- How does it interface with your other campus business systems?
- What are the hardware requirements (premises-based versus cloud-based)?
- Do you prefer a monthly subscription fee or a capital investment that can be depreciated over time?

- Do you want a system that continues to function even when the server is down or to depend on the cloud to be always available? What are the workarounds for outages?
- What is the best solution for controlling growth and expansion costs?
- Who bears the costs if the system becomes obsolete or the service provider goes out of business?
- How easy is it to port your DID numbers if the cloud relationship moves to a premises-based system? How valuable are those DID numbers to your institution?

- Is there an emergency backup plan? Can the system handle 911-type calls?
- Can your carrier support the integration?

- Do you need to upgrade any of your network infrastructure to carry your voice network? How will you handle QoS?

This is just the cusp of questions that you should identify as you research the best options for your PBX replacement.

[jjansen@sewanee.edu](mailto:jjansen@sewanee.edu)

## George Washington University

Chris Megill



Here at George Washington University we are committed to making a planned and deliberate move to cloud-based services and virtual-desktop environments where it makes sense to do so. This is no overnight project but a steady evaluation of our existing service offerings, a consolidation of duplicated or

redundant offerings, and, when appropriate and cost effective, a migration to cloud-based services.

If I had to describe our approach in a word, it would be the word "hybrid." Some solutions lend themselves to a cloud-based

service offering and support environment. Examples of this are that GW has migrated email services to Google for enterprise and our migration to a cloud-based service offering for Drupal, our Web-presence content management service. Some solutions lend themselves, due to cost or efficiency, to an on-premises solution. For example, we chose to provision our Cisco CUCM (unified communications) service on site.

Going forward GW will need to be vigilant and continue to evaluate the on-premises services as well as our hosted or cloud-based solutions and make sure we maintain a good working balance to meet the needs of the business and the constituents of the university community.

[cmegill@gwu.edu](mailto:cmegill@gwu.edu)

More Snapshots on pages 25 and 33...





FROM THE CEO

## What's Important on Campus?

by Corinne M. Hoch, PMP  
ACUTA CEO

**I am so proud of ACUTA. No other organization of which I have been a part equals the value and the level of camaraderie that exists within this association.**

I have said it before, but I'll say it again: It is an honor to be the CEO of an organization of people who genuinely care about each other and who willingly share the information and experiences that have brought each of us success.

Standing in front of you at the Annual Conference in Atlanta and addressing a crowd of several hundred intelligent, hardworking professionals once again made me feel proud and humble at the same time. As you invest your time and resources to come to our events, you rightfully expect to take home new ideas and strategies. I am confident that our Program/Content Committee consistently provides excellent speakers who address issues important to your campus.

But at all ACUTA events, a significant part of your ROI comes from the interaction among all participants, because the information sharing happens not just from the speaker's platform but during meals, in the exhibit hall, between sessions, and even during social events. That professional networking is what truly sets ACUTA apart.

At the conference in Atlanta, I promised to let you all know what's happening at other schools—a lot! The following, based largely on your input from the working business meeting at the conference, provides a snapshot of what

matters the most today at campuses large and small, public and private, with and without residence halls.

### Top Technology Issues

Wireless, Wi-Fi, and distributed antenna systems (DASs) continue to be the most important IT initiatives on your campuses followed closely by the increasing importance of network refreshes and upgrades,

information security, minimizing the risk of cybersecurity breaches, and much attention to data centers, which tells me that the ACUTA Program/Content Committee and the Environmental Scanning Committee have an excellent grasp on ACUTA membership needs.

For example, the fourth annual State of ResNet survey results were debuted at the Annual Conference in Atlanta. (See the infographic on page 18 or visit the ACUTA website, [www.acuta.org](http://www.acuta.org), for the full report.) The 2015 report represents continued partnerships with NACUBO and ACUHO-I and is designed to measure the broad variation in practice and policy within higher education and to lay the groundwork for long-term trend analysis and benchmarking.

ACUTA has devoted many recent seminar and conference topics and webinars to security. Many of the session recordings and all of the webinar recordings are provided as part of registration, and are always available from the ACUTA store.

The ACUTA DAS Architectural Specifications Task Force Report, also available on the ACUTA homepage, is yet another example of the forward-looking and collaborative approach of the association. It is a technology-independent document that outlines functional requirements for enhancing in-building wireless cellular coverage in LEED-engineered buildings. We encourage the provision of the recommendations to campus architects who are responsible for the functional specifications for new construction and remodeling projects and DASs, bi-directional antennas, and small-cell systems (femtocells).

### Other Initiatives

The next important campus initiatives reported at the business meeting in Atlanta were infrastructure upgrades and migrating to hosted cloud services. Whether reported as upgrading the IT data and

Figure 1. Thirty-seven states and provinces were represented at the 2015 Annual Conference.



voice infrastructure tier level, operational network upgrades, or as network Edge refreshes, it is clear that higher ed leadership recognizes the need for strong, fundamental support for its technology services. It is also clear that the norm is for IT professionals to question which services are best outsourced.

Other initiatives cited include the following:

- Migration to Microsoft Office 365/Lync, with emphasis on physical safety and security with card reader and first-responder tunnel installations
- Enhancing the student experience by installing active-learning classrooms, increasing overall classroom support, and implementing IPTV
- Defining IT service catalogs; rolling out large-scale ERPs; involved in strategic planning; grappling with the question of centralization vs. decentralization; reviewing workflows and business processes; improving help-desk service desks and reporting systems; adopting ITSM/ServiceNow; harnessing big data; working on system integrations, unified communications, and other collaborative technologies; and installing new phone systems.
- Training for IT professionals to update their skill sets to provide better support for faculty and students. (This one is one of my personal favorites.)

### Cloud Services

We asked participants to tell us to what extent cloud services have come to their schools. The responses continue to indicate much growth in areas other than just email, although this year student and/or faculty and staff email in the cloud was the number one cloud project cited. Microsoft Office 365 was a close second with other cloud-based projects on campuses everywhere shown below:

- Data storage, backup
- SharePoint
- Student information system
- Hosted third-party software

- Looking into Azure
- Identity management

Once, again, it is not surprising to note that some schools look first to the possibility of cloud-sourcing when faced with the need to implement new technologies. Many schools noted that the question “Can a service be hosted?” comes up in every project. They look at each application and decide whether they should host it or if the application is better in the cloud, depending on how the vendor supports the particular application. And yet, one school said that it is not even considering cloud at this time, so cloud services are still not quite pervasive.

Some schools are counting on putting more things in the cloud to reduce spending on IT services, viewing it as a cost-savings measure. Others point out that cloud cost issues are still not taking operating costs into account.

### BYOD (now BYOE)

When asked what impact BYOD is having on each campus, conference attendees gave us the following responses:

- Tremendous. Increased overnight from maybe 1 in 5 having a laptop to each person with an average of 3 to 5 devices
- Wi-Fi capacity, bandwidth management
- Expansion of wireless
- Wireless upgrades in buildings
- Security of the network
- Business continuity
- ERP
- Control of institutional licenses on personal devices
- Policy balance

This is the first year that someone noted the need for more insight into the customer perspective.

### Budgets

When asked how the economic recession of the past few years affected IT department spending, one school reported that it was back to normal while the majority

of the schools reported that their budgets remained the same, that while their budgets did not increase, they continued their prior level of spending.

This was followed closely by schools that cited frozen budgets. One school pointed out that it was depending on grants to support technology upgrades and that it recognized the risk of not being able to maintain the upgrades once the grants were no longer there. Community colleges announced budget cuts, and it was noted that state budgets could also be reduced.

No matter the size or status of the IT budget today, savings and creativity continue to be priorities. Many schools deal with staff reduction and hiring, consulting, and travel freezes. Declining enrollment, looking at budgets based on class size, and less research funding result in having to do more with less, which, as one school pointed out, definitely sparks innovation. There is more oversight at the CIO level as a direct result of budgetary priorities, and a good budget summary that is an overall reflection of budgetary demands. One member told us, “We adjust our efforts and focus depending on the vision of current leadership ... we follow where the CIO/CFO wants to take the campus.”

As you know and as you can see in the following pages of this issue, there is much work going on behind the scenes, preparing each campus to support the ever-changing needs of higher education.

Continue to use ACUTA as a resource for potential discounts, creative solutions, benchmarking, and pragmatic IT sharing to find out what will work in your environment. Remember the ACUTA listserv, or just let me know if there are questions for which you seek answers, and we will continue to connect you with the experts in your field.

*I am always happy to hear from you. Reach me at [choch@acuta.org](mailto:choch@acuta.org).*

•



## Security in the Cloud

### Cross-sharing, lower costs, and access round out the plus points of the cloud

by Curt Harler

**C**loud computing is a big deal. Security in cloud computing is an even bigger and more complex deal. And most of the issues in security revolve around access.

What makes the challenge doubly difficult on college campuses is the prevalence of malware that originates with or is propagated by college students. Add to that the individual departments that set up their own systems that may or may not be behind the approved firewall. To top it off, there always are staff and administrators who need remote log-in from myriad devices.

While the answer for secure access may be in the cloud, the first question any ACUTA member has to ask is: What's it going to cost?

There is little question that cloud security is economical. "Cloud IAM [identity access management] is 30 to 40 percent less expensive than an on-premises build-out over five years," says Andras Cser, vice president and principal analyst with Forrester Research who works with security and risk professionals. "This is a very conservative estimate," he adds, especially if the current system is complex and if the cloud imposes a simplified system on the issue.

Simple is good on both sides of access. IT appreciates it. Users want to be rid of the burden of handling a separate identity and password for every application (and, in reality, users rarely comply with such demands from IT).

Penn State University is working with Duo Security, a cloud security

company, to provide access to the Penn State Access Account. PSAA is the basis for logging in to email and the gamut of services that students, faculty, and staff use. Other options are available for Happy Valley users who do not have smartphones or require accessible alternatives (see sidebar).

Everywhere, school administrators must recognize that there are many applications that need to be integrated into the SaaS framework. Directories already are moving to the cloud, including Active Directory, so the concept is stabilizing and maturing.

"Cloud IAM really matters today," Cser says, noting the need for dynamic scalability, shared intelligence, best practices, support, and trust models as drivers. "A cloud-based service is going to be more secure than what people can do on-premises. It is going to be more rigorously tested and certified."

Active Directory is still a major factor, of course, for on-premises users. "But there is a shift toward the cloud," Cser says.

In the past, every college implemented products and solutions in its own silos. Even if a school hired the best resources to develop single sign-on (SSO), applications, provisioning, and mobile device management, that knowledge was not transferrable from one university to another.

The cloud allows cross-sharing of best practices. It gives everyone on a cloud system the ability to react to threats that undermine IAM systems. For example,

perhaps the oldest cloud-style security program is traditional virus protection software. If a virus is identified on one computer, the software immediately protects thousands of other computers from that virus even if they are on totally different networks.

Likewise, cloud management of access: The more access trends a cloud-based system can identify and quantify, the stronger IAM becomes for all users. "With mobile and all the different apps, more users than ever are using more devices than ever, accessing more stuff than ever—apps in the cloud, behind the firewall, in a hosted data center," says Chris Webber, security strategist from Centrify. His firm claims Harvard University, Morehouse College, and the University of Southern California as customers.

"End users want a single sign-on and fast self-service," Webber says. IT requires policy based on the user's identity, where users are located, and ability to control the devices they use for access. "It's not enough to say, 'You're allowed into this application,'" he continues. "What happens after that? Does application data get copied onto a device? You have to control that."

Webber says this requires unified management of devices, applications, and access. Among the key capabilities are SSO, hybrid identity (of two or more identities or directories), managing devices, and authentication.

In an era of "bring your own everything," access control security becomes a three-dimensional puzzle. The complexity of the environment is mind-boggling,

and traditional tools are falling behind, Cser continues. A cloud-based IAS (Internet as a service) ensures that all users are using the most current, most secure software available.

Cloud services basically are automated services as far as the school's IT department is concerned. Much of the burden on the school's call center is alleviated. The access request and approval process is streamlined. Periodic access review will be faster and more accurate. Software licenses are always up-to-date. Trust can be brokered among all members of a cloud community, Cser says.

The cost of cloud-based systems is low compared to those managed in-house. "The ROI [return on investment] in five years from cloud automation of identity management is between 150 and 200 percent," according to Cser. The biggest cost of IAM is internal labor. Staffing is expensive. It typically takes three full-time equivalents to manage an in-house IAM. There may be some integration involved with a cloud solution, but this usually is trivial.

"How much does it cost to manage the system and to manage identities? The monkey on your back is your auditor," Cser says. "How much money do you have to spend on compliance, and do you satisfy auditing requirements with a good set of controls around your resources?" The cloud solves those issues. "If you move things to the cloud, you will have templates and common best practices."

### Differences in Cloud

License fees are the biggest cost in the cloud. A company like Centrify charges a per-user, per-month fee. That fee covers external labor and constant updates.

"There is no infrastructure or CapEx cost," says Webber. "It is totally OpEx." Because it is all in the cloud, internal labor costs are miniscule.

Cser notes that the savings usually is in the area of three to four professionals saved on implementation. A university should expect to see 80 to 90 percent sav-

## Benefits of Cloud-Based 2FA

Penn State emphasizes to its staff and students that security of information about people for academic, research, and employment activities is important. Its cloud-based two-factor authentication (2FA) service provides application owners with higher assurance that only authorized users can gain access to critical information, systems, and services. It offers these benefits:

- It assures application owners that only authorized users can gain access to critical information.
- It complies with federal and industry regulations.
- There is no hardware for system administrators to deploy and manage.
- Users can use their existing smartphone; the convenience of integrating the "something you have" with something users already have benefits users while keeping service overhead low.
- Using a device that users are already familiar with reduces training time.
- Users have an easy time enrolling a phone device or installing the mobile app through bulk-user imports or using the self-enrollment feature.
- All smartphone platforms are supported for users to authenticate with or without cell service.
- There is real-time alert notification for fraudulent authentication attempts.
- Using a smartphone with the 2FA solution for access to Penn State-protected services means no additional wait time to receive a physical hardware token and no additional device to carry.

ings in hardware, Cser figures, and there is a 90 percent savings in upgrade costs. Plus, there should be little, if any, investment in hardware for cloud IAS.

Any cloud service provider should bring SSAE16 SOC2, TRUSTe, and EU Safe Harbor to the table and be prepared for emerging applications such as the federal government's connect.gov. They should work with Equifax, UIS, and providers like Verizon. A good system works with Active Directory, of course, but also should work with such systems as Google Apps and LDAP legacy situations.

With a cloud system, a college's workers are not saddled with the problems of updating systems to meet these goals. And there are other benefits—for instance, when it comes time to decertify an employee. With luck and foresight, a college's IT department will have a record of all of the permissions granted to that employee and all of the devices and loca-

tions where the employee had authority to access the system.

Consider also: If IT fails to give a new hire all the required access the first week on the job, it just requires a help-desk call from the new user to get things right. If the IT department fails to instantly terminate all privileges on all platforms in all areas for a terminated worker, it is the campus police (or worse) who may come calling.

"Network security issues are not going away anytime soon, and by most measures they are multiplying on a daily basis," says Dan Williams, enterprise account manager with XO Communications. He says it is imperative that enterprises of all sizes put in place a comprehensive, managed, network-based approach to ensure 24/7 protection from the ever-increasing number of network threats. ▶

“We see the reports in the news almost every week,” Williams says, noting when the AP’s Twitter account was hacked and put the financial markets into a tailspin for a short time. LivingSocial informed at least 50 million of its users that hackers had gained access to some of its customer data. And in March, the cloud-based data storage company Evernote informed the same number of users that it had a data security breach.

### **Tough Numbers**

Despite what trade papers might suggest, not everyone in IT is doing a good job of protecting access. In fact, the numbers are devastating. According to a survey of 3,529 IT and IT security practitioners by the Ponemon Institute, only 40 percent of business IT and security professionals say they have tools, personnel, and funding to determine the root causes of network security breaches.

The survey also revealed some other interesting insights into network security, including the following:

- For just nonmalicious attacks, 50 percent said lack of in-house expertise and 37 percent said lack of adequate security procedures were the main reasons for failing to prevent the breach.
- Most network security breaches are inside jobs. Sixty-one percent of data and security breaches are from employee negligence and malicious insiders.
- Thirty-two percent of malicious breaches cost between \$500,000 and \$1,000,000 each; most nonmalicious breaches cost between \$50,000 and \$100,000 each.
- In the United States, it takes 92 days for an organization to recover from a nonmalicious breach and 125 days to recover from a malicious breach.

Williams says many schools lack the resources—whether it be people, technology, or the budget—to adequately secure their most precious asset: internal and customer data. Williams recommends a three-pronged approach that includes:

1. Security threat monitoring with proactive monitoring and surveillance
2. Unified threat management with intrusion detection and prevention
3. Private WAN services based on MPLS IP-VPN technology providing a foundation to integrate your applications and cloud-based services

“Doing these things will enable you to focus on your core business and not be losing sleep at night worrying about the myriad of risks you face by not addressing this very real issue,” Williams says. The cloud, supporters say, does all of this...making it the equivalent of Lunesta for IT management.

### **How It Works**

Access is about process agility. Internal employees must be spared the hassle of spending hours signing on and being authenticated. It also is about meeting regulatory demands. Any school with an attached medical facility knows about the special requirements. Among the first campuses Penn State put on its cloud-based system was the Milton S. Hershey Medical Center in Hershey and its remote access service.

On a typical day, students and workers start out their quest from a legal access point inside the firewall. Yet everyone wants to be able to access their information from a bewildering array of devices ranging from desktops to laptops to iPads to smartphones to home computers to kiosks in hotel lobbies. Administrators might be in their office one day, at their mountain cottage on the weekend, and at a conference on the other side of the country the week after. Students might be on campus, at a friend’s apartment in town, or home with mom and dad.

This is where smart algorithms and easy accreditation make an IT manager’s job somewhat easier. “Before you are able to defend against a threat, you have to be able to identify that threat,” Cser says. In the past, expert systems tried to define threats. That brought about the challenge of managing rules and burgeoning poli-

cies that dealt with threats that no longer were relevant.

Today’s cloud-based system “learns” normal user patterns. It discovers that administrators in Old Main usually access the network from their office computer between 9 a.m. and 6 p.m. It also will “know” that administrators like to log on from home after 8 p.m. but rarely after midnight. And it will recognize that a request to the email server typically comes in sometime around 7 a.m. when the administrator eats breakfast.

Students will establish different, but congruent, patterns. These patterns will differ by student; that is, agriculture majors typically get up early in the morning and journalism majors write papers well into the wee hours. Most people fall into one of several categories that might be termed joiners, leavers, or movers. They work in predictable ways that allow the network to keep up with them.

The cloud records these patterns, then looks for anomalies—people who do not act as expected—and there will always be anomalies. The head of housekeeping might be on vacation in Florida when she needs to log into the campus network from her sister’s computer. How does the network know she is legitimate without requiring her to remember a string of passwords?

### **Password Problems**

Most people will put up with memorizing three or four passwords. But everyone has dozens of account passwords...each supposed to be unique and contain 10 characters, numbers, and punctuation marks. Sooner or later, users hit one of a couple of default settings: They use one password that they can remember for everything (bad); they get a different, strong password for every application and then stick all those passwords on a Post-it note on their wall (worse); or they simply call the help desk every time they need a reset to get into an application that has some arcane password they did not bother to write down (horrid).

Webber says one way to control that is to allow users to confirm their status by a single tap on a mobile device. Even the most callow user will know it is important to respond to an SMS message or email that asks, "Are you attempting to access XYZ App?" A simple tap on the smartphone will confirm the user's bona fides. A "no" will shut out the bad guys.

"Managing and protecting data on mobile devices is not your old 2,000-user Web SSO project," Cser says. "What happens if you have 12,000 or 120,000 users logging on?"

Many schools have huge numbers of remote clients. Among the first groups Penn State put into its two-factor cloud authentication were its online education clients and its undergraduate admissions office, which must be welcoming to total strangers making their first contact with Penn State.

"There are surprisingly large-scale requirements that we hear about all the time. The cloud can help you manage at a lower cost," Cser says.

He sees SSO as the first step in any process. "Access governance will expand," he predicts. Certification and recertification, adding and revoking privileges, will be a big part of the picture. Directories will move to the cloud along with compliance mandates and provisioning.

Webber says the cloud will tie in legacy apps and avoid having to fire up a laptop, get a VPN connection, find a client, and then go back in through the firewall. This required concentrator expansion, VPN configuration on each endpoint, and other hassles. This process of creating, modifying, classifying and labeling, discovering, retaining, deleting, and inventorying data all will be demanded of any IAS. Either in-house expertise will be required to handle all of

these aspects or the expertise will come from the cloud.

"Connecting this data-centric view of the world to the identity-centric view of the world is very important," Cser adds. "You cannot manage and protect data on shared drives or mobile devices in an unstructured format without having a very good understanding of which security groups protect and grant access to which datasets both on mobile devices and on laptops or desktops," he says.

"The whole idea of the trusted broker relationship and data protection gives the cloud a huge leg up," Cser concludes.

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*Editor's Note: There is plenty more to this story. Don't miss other perspectives and good ideas about what should—or shouldn't—move to the cloud. See articles on pages 4 and 26 as well as others in this issue.*

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# Why Is My Head in the Clouds?

## Urbana campus looks to the cloud for cost savings and convenience

by Andrew Nichols

The University of Illinois at Urbana-Champaign was established in 1867 as a land grant institution. The Urbana campus is the flagship campus of the University of Illinois system—rated as the number 11 public university by *U.S. News & World Report*. The university has over 44,500 students, more than 10,000 full-time faculty and staff, and over 425,000 (living) alumni.

### Overview

Only a few years ago cloud computing was referred to as a *technology trend*. Since then cloud services have continued to develop rapidly. Some of the first products that were “in the cloud” were

really just existing applications—such as Dropbox—that leveraged remote storage instead of the traditional, locally attached storage.

For this article, references to cloud service, software as a service (SaaS), and infrastructure as a service (IaaS) include enterprise solutions only.

The traditional licensing and costing model shifted greatly to meet the needs of service providers and consumers of cloud services. This new model became known as software as a service, or SaaS. Some of the key differences between the traditional model and SaaS are the following:

1. You can access your data from the cloud from any device without needing to purchase additional client licenses.
2. Most SaaS providers license their service to a user (or group of users), whereas the traditional model often licenses software per device, or even per processor in some server-based applications.
3. With SaaS you should have low or no capital costs to start, but you will pay a recurring cost. The lack of upfront costs coupled with regular recurring charges makes budgeting more predictable.
4. Additionally, without the initial costs, it is easier to change to a different provider without worrying about whether your ROI was met. This flexibility allows you to adapt as your needs change. As an SaaS consumer, you should be able to change your service offering at any time depending on your needs, or just cancel your account when you find another cloud service that meets your needs better.

Now, think how this would be accomplished in a traditional software licensing and costing model. Without diving too deeply, it's safe to say you would have to (1) buy or build applications that are designed to scale, based on changing needs that are difficult to predict; (2) deploy the infrastructure while constantly watching the blinking lights on the servers; and (3) manage, maintain, and support a new service within the specifications of an SLA.

### What Motivated Us?

Aside from the known benefits of SaaS, such as having ubiquitous access and new

The Boneyard Creek (foreground) and the Engineering quadrangle (background) at the University of Illinois at Urbana-Champaign



Photo courtesy of University of Illinois Public Affairs

features that are unavailable in on-premises software solutions, the University of Illinois had two additional motivating factors.

1. Security, privacy, and information assurance. First, the rapid proliferation of cloud services created an enormous new security concern. If the university hadn't provided cloud storage solutions, for example, staff would undoubtedly have set up personal accounts and used them to store university data. By providing a centrally managed cloud-storage service to all faculty, staff, and students, we were able to create a manageable risk by negotiating the contract terms with the provider in accordance with the university's security and privacy requirements. By providing this service at no additional cost to our customers, there was no motivation or unmet need to use personal accounts for university data.

2. Money, money, money, money. The state of Illinois has been in financial distress for years, which has resulted in shrinking state funds to public colleges and universities. Despite economic improvement nationally, Illinois is still deeply in debt. Continued decline in state funds for public colleges and universities is accepted as the norm in many states, including Illinois. In fact, this year our governor announced that he wants a 33 percent reduction in state funding to all public institutions of higher education. During these lean years, a mantra of "do more with less" was added to the parlance of the IT community.

IT organizations have found sticking our collective head in the clouds is attractive metaphorically and financially when the state announces significant, multiyear financial cuts and rescissions to previously allocated funding. This isn't to suggest that cloud solutions are always the best solution for everyone; they're not. However, when you find yourself in desperate financial straits, tough choices have to be made and creative solutions become a necessity. Would you retire

services from your portfolio in order to meet your unexpected budget shortfall or would you consider an SaaS that allows you to continue to meet your customers' needs while maintaining, or even enhancing, your existing portfolio of services?

For us, the answer was clear. Our goal was to remain relevant to campus, continue to provide the same level of service, and continue to add new services. Cost comparisons and feature analyses of cloud services compared to on-premises solutions immediately identified some low-hanging fruit.

### **What Did We Do First?**

In 2010 university administration initiated a campuswide evaluation of current expenditures including what were described as "commodity IT services" to determine whether they were essential to the mission of the university and whether there were opportunities to decrease costs or resource consumption. Coincidentally, the centrally managed email system was well past its prime. Many of our colleges and departments were running stand-alone mail servers and approaching end of life. Enter Google Apps for Education. By migrating undergraduate students' email accounts to Google Apps, we were able to retire a costly service with extremely limited features and reallocate several staff members to other services.

Google continues to enhance and add to the services included in the Apps for Education suite. Support costs have decreased considerably compared to the previous managed system. This migration to SaaS was a win from all perspectives. Students receive an @illinois.edu address, and have the full features and reliability of Gmail while the campus has no license or equipment costs. A custom application for provisioning Google Apps accounts was written that eliminated the need for manual account creation by campus IT support. As Google has upgraded its application program interfaces (APIs), there have been minimal costs associated with updating the provisioning application.

### **What Else Have We Done?**

Box.com was deployed for many of the same reasons as Google Apps for Education. The campus had a difficult-to-use, centrally managed, web-based file storage system. Box began offering its cloud-storage solution around the time that our centrally managed solution was approaching end of life.

This fortuitous timing coincided with a growing concern that faculty and staff were creating their own cloud storage accounts from multiple providers in order to store university data. Increased risk of a data breach became a growing concern. By providing a no-cost solution of one of the most feature-rich cloud storage services to all faculty, staff, and students, most people adopted the university-provided Box account. The university reduced risk by negotiating contract language related to security and privacy concerns and creating well-publicized, easily understood documentation on the types of data that can be stored in Box.

### **What Lessons Have We Learned?**

The changes we have implemented have had positive results for the Urbana campus. We have also learned some lessons that are worth sharing with anyone who may just be in the planning stages of a move to the cloud. Here are four aspects of the transition that warrant some thoughtful consideration.

- Customization. Offloading support and management to a cloud service may minimize your control over customization. Be sure to fully understand your use cases and involve your stakeholders early and often when defining your requirements.
- Privacy and security considerations. Cloud services are not necessarily any more or less secure than similar on-premises services. However, a shift in perspective on security is necessary to ensure a cloud service provider meets your needs. If your cloud service provider has a data breach, what are its incident-



handling protocols? How quickly will the company notify you and the affected customers? Is the company properly certified/accredited/compliant for the type of data it will handle?

- Control of support. When everything is working well, relinquishing control of support is in the “pros” column. However, when service interruptions that affect customers occur, will your customers receive the support to which they are accustomed? Make sure that the provider’s SLA is comprehensive and that service-interruption thresholds meet the expectations of your customers.
- Control of upgrade cycles. Cloud service providers tend to update their services with limited input from customers. Without proper communication and training, your customers may have a negative experience if an upgrade requires them to re-learn how they use the service. A mature change-management process should exist to mitigate this potential risk.

### Where Are We Going?

At this point, the university has only a handful of enterprisewide cloud services. However, this is changing rapidly. Mark Henderson joined us as CIO in fall 2014. The strategies that he has proposed and that we are beginning to implement are staggering in scope, require a monumental shift in how we provide IT services, and create the opportunity for campus IT practitioners to dramatically change their role in this new landscape.

Going forward, when cloud services are available that meet the needs of the campus, we will leverage cloud services.

By shifting the burden of software and infrastructure management to cloud offerings, IT practitioners will be able to interact more with their customers. The goal is that IT practitioners will no longer be constrained to providing just a service to their customer; they will be able to partner with their customer to truly understand their needs and then be able to



*Foellinger Auditorium is located at the south end of the campus quadrangle. (Photo courtesy of University of Illinois Public Affairs)*

provide or facilitate a solution with other campus IT practitioners.

Over the past few years our campus has established a data center shared service. The goal of this shared service was to consolidate departmental and college data centers into a single campus data center that decreased overall costs and resource consumption while providing an improved environment that could be used by all campus departments. This

model has been a great success, and we’ve demonstrated that providing a service at scale improves the overall service offering and decreases costs.

Building on the lessons learned from our data center consolidation, we’re looking for the next opportunity to pool resources, eliminate duplication of efforts, and reduce the overall cost of IT to the university. This is where IaaS has the potential to fundamentally change how we provide IT. Amazon Web Services (AWS) is an example. Although we have good data center resources as a result of the data center consolidation, we cannot compete with Amazon when it comes to cost, data center quality and availability, and the ability to provide massive computer power on demand. Microsoft, Dell, and other providers *are* able to compete in this market. The competition among providers should drive down prices and spur advancement of the IaaS offerings, all to our advantage.

As a campus, we can leverage IaaS to provide the best-of-breed computing infrastructure without the capital costs that come from owning, maintaining, and refreshing the infrastructure. IaaS puts incredible resources directly in the hands of consumers.

As IT practitioners we are responsible for supporting the researchers and educators who are our customers. Our responsibility has not changed, but our strategy must adapt to meet rapidly changing needs while mitigating increasingly difficult constraints created by decreased funding. This adaptation is absolutely critical for us to remain relevant to our customers.

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# Unified Communications: Challenge and Opportunity for Education

## More than ever, higher ed must support the integration of technology and students' lives

by Larry Foster

Educational institutions are always looking for ways to capitalize on technologies that can create breakthroughs in delivering better and more economical services to their student populations. Technologies of keen interest to educational institutions today include cloud technologies supporting unified communications and collaboration (UCC).

UCC complements the traditional classroom experience and alleviates the education constraints of physical presence, time, and even common language. It will usher in new ways for students to interact and establish personal relationships with peers, mentors, and business leaders around the globe. Students at institutions that harness the benefits of UCC will gain a significant advantage in a highly competitive global digital workforce.

To make sure their institutions remain competitive and continue to deliver state-of-the-art services, educators need to collaborate with their IT leaders to embrace this new global cloud-enabled communication paradigm and formulate a progressive and measurable strategy that encompasses people, process, and technology.

The following insights will help educational institutions maximize the value of their communications technology investments and better prepare students to become productive leaders as they enter the workforce.

### A Brief History of Technology Innovations and Education

Higher education has helped pioneer a remarkable spectrum of innovations that have ushered in many new ways to learn and communicate seamlessly across the globe. Early examples include the National Science Foundation's 1986 project (NSFNET), which connected supercomputer centers at 56,000 bits per second—the top speed of a dial-up modem at that time. The NSFNET was essentially a network of networks that connected academic institutions along with ARPANET, which can be summarized as the precursor to the Internet. Just a few years later, higher education forged the concept of distance learning over dedicated ISDN networks in order to extend the educational experience beyond the constraints of the traditional brick-and-mortar classroom.

In the early 1990s, the National Center for Supercomputing Applications at the University of Illinois supported the MOSAIC project, which introduced a precise yet pivotal innovation of embedding images into HTML documents. The results of this project were offered as free HTML browser downloads for the most popular desktop operating systems. This became the spark that ignited the fire of interconnecting remote files via graphical HTML markup tags known as hyperlinks. Today we commonly refer to this worldwide electronic bookshelf framework of interconnected documents

as “The Web.” The emerging UCC cloud technologies will combine the value of all these innovations to create a digital world that operates independent of geography and time.

### Preparing Students for the Global Digital Workforce

Students of today will be the leaders of the emerging global digital workforce. UCC offers new opportunities for educators to leverage cloud-based platforms and analyze communication patterns to improve the educational experience

***Definition of Unified Communications: An evolving communications technology architecture that automates and unifies all forms of human and device communications in context, and with a common experience. Its purpose is to optimize business processes and enhance human communications by reducing latency, managing flows, and eliminating device and media dependencies.***

*Rick McCharles: <http://ric.ca/definition-of-unified-communications-repost/>*

and better prepare students for effective global collaboration. An abundance of published human-resource studies have proven the economic value of effective workforce collaboration. A report published in 2005 by Gay, Mahoney & Graves resolved that communication is the most fundamental driver of busi-

ness performance. The 2009/10 Towers Watson report on communication ROI indicated that companies with highly effective communications experienced 47 percent higher returns to shareholders over companies with least effective communications. And a report published by Watson Wyatt in 2004 indicated that improvements in communication effectiveness in organizations were linked to a 29.5 percent rise in market value. Effective collaboration and communication skills will complement any academic degree.

### The Cloud: The Emerging Paradigm Shift

Higher education has already been a proving ground for many of the current cloud-enabled business applications such as telepresence, WebRTC (Web real time collaboration), instant messaging, presence, and communication-enabled business processes (CEBP). These technologies have matured to the point

and obviated reasons to travel to obtain quality education or interact with instructors or peers. UCC applications are eliminating the distinctions between the remote and the in-person experience.

Collecting usage data in the UCC world requires a much broader approach than previous voice-only call-detail-record collection methods. On the next page, Table 2 illustrates the multiple dimensions of unified communications, which have become increasingly complex and diverse as the technology has evolved over the past decade.

### Challenge and Opportunity

The ever-growing virtual classroom and workgroups enabled by UCC can include members in different geographic regions and time zones. It's not uncommon for collaborative teams to span continents, communicating in real time from their desktop or mobile device. This can be a huge boon for expanding the impact of

to understand and act on. George Bernard Shaw's observation that "the single biggest problem in communication is the illusion that it has taken place" offers poetic insight into the types of challenges facing learning institutions and digital workers in the era of UCC. Differentiating real from illusory communication will be a growing challenge for everyone who ventures to harness the benefits of virtual, cloud-based collaboration.

Educators and technology leaders must work together to address this challenge. In parallel with the growth of cloud-based communications, solutions must be developed to help analyze, combine, simplify, and share these new streams of information in meaningful ways. Application of the appropriate technologies will deliver insights supporting continuous improvement in the educational experience while preparing graduates with a competitive advantage.

### Analysis vs. Reporting

In the digital world enabled by UCC, analytics and reporting will serve different target audiences, produce different deliverables, involve preparing data differently, and support different institutional goals. Analytics and reporting will be complementary, which means different levels of the institution will continue to need both and neither will replace the other.

IT managers create traditional network usage reports mostly about entities and facts they already know well, represented by highly polished transactional data records. Data elements take the form of carefully modeled and cleansed data with rich metadata describing the data sets. Traditional reporting in this environment is typically built on interpreting and storing prestructured data. Universities use this data to ensure sufficient network capacity and accurately allocate charges to cost centers. These basic principles take on new dimensions in the cloud-enabled world.

Whereas traditional reporting supports "high-volume answers," advanced analytics will generate "high-value

Table 1. Top Three UCC Applications in the Cloud

Communication Method	Statistic
Email *	~ 188 billion global per day
Instant Messaging **	~ 4.1 billion global per day
Voice ***	~ 3 billion per day in USA ~ 10 billion global per day

\* readwrite.com \*\* Answers Corporation \*\*\* Dept. of Labor Statistics

where educators can begin to leverage them effectively to improve the overall educational experience in ways that were unimaginable a few years ago. UCC offers new cost-effective and convenient ways to dynamically connect students with "digital mentors" from across the globe. Of course, technology alone will not better prepare students to compete, but it is an essential enabler for the prerequisite educational experience.

Table 1 summarizes the top three UCC applications deployed in the cloud according to Infonetics Research. Lower cost and ease of use have virtually eliminated barriers of remote collabora-

tion and obviated reasons to travel to obtain quality education or interact with instructors or peers. UCC applications are eliminating the distinctions between the remote and the in-person experience.

Like most breakthrough technologies, however, cloud-based collaboration presents challenges as well as opportunities. Ubiquitous, "always on" communication will fuel an explosion in messaging frequency and volume on a global scale and test our abilities to sift meaningful information from the "noise" that invariably finds its way into our in-boxes. Students and educators will be challenged to identify what is most important for them

insight.” Advanced UCC analytics will enable the discovery of information the institution didn’t know, based on the exploration and analysis of combining traditional, foundational, standard, and emerging usage data feeds illustrated in Table 2, combined in ways that have no precedence.

Unlike the structured data that traditional network usage reports operate on, advanced communication analytics for UCC will be predicated on detailed source data in its original and sometimes unstructured form, using discovery-oriented technologies, such as mining, statistics, predictive algorithms, and natural language processing. In short, many of the same methodologies Google, Yahoo, Facebook, and Twitter use today will be leveraged by educational institutions to improve the educational experience and create better outcomes for students.

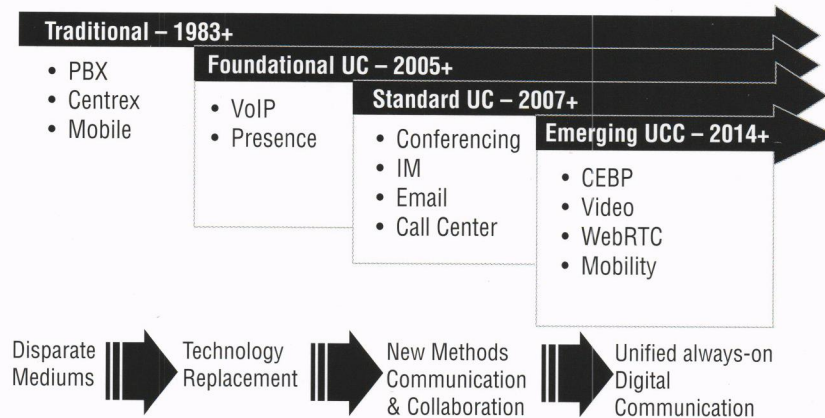
While reporting will still have a critical place in the UCC world, advanced analytics will enable insight into the flood of communications captured from all sources and convert it to actionable information that can transform the educational experience. Educators need to work with IT leaders to understand why, what, when, and how to measure data that will help them statistically model their communication patterns and identify and develop best-practice models. The role of IT leaders at educational institutions will expand beyond a traditional focus on supporting operations to that of providing critical information to help educators prepare students for the demands of the digital workforce.

The cloud changes the economic paradigm from long-term capital procurements of hardware and software into on-demand, time-based consumption and analysis for the purpose of optimizing collaboration across student work groups, educators, staff, and mentors.

### Applying UCC Usage Analytics

In the world of software development, agile methodology refers to the collaborative evolution of requirements and

Table 2. Emerging usage data feeds



solutions. Agility promotes adaptive planning, continuous improvement, and rapid and flexible response to change. In the UCC world, big data usage analytics will enable agility in higher education. Agile methodology coupled with big data UCC analytics provides opportunities for educators to collaborate and assess the direction of how their students are learning throughout a continuous life-cycle that tailors the educational process to meet the variables specific to each student, topic, and program. This is an alternative to national top-down mandated standards, in as much as the results are not myopically focused on discrete topic-specific test results, but rather on assessing the continued development toward preparing the student for a successful holistic life and career. UCC usage management will enable an agile approach to education that will focus on developing and tailoring comprehensive educational strategies derived from an understanding of how each student actually approaches his or her assignments and learning.

UCC usage management provides a means to seamlessly capture important data about when, what, and how long students invest in various digitally enabled learning activities over a prolonged period of time without disrupting the student’s learning process. This type of

valuable insight will help educators develop more effective learning models for students based on their natural learning habits and tailor programs to maximize individual strengths and abilities. Educators will be able to collaborate on individual and collective schoolwork patterns to assess and enable students well beyond the constraints of geography, time, and teaching paradigms of the traditional classroom engagement.

### Summary

Emerging UCC technologies enhance the abilities of educational institutions to prepare students for their roles in the emerging digital workforce. UCC enables new, exciting ways for students, teachers, and business leaders to collaborate on a global scale. The risks of “information overload” in the world of UCC can be managed by new technologies that analyze the interrelationships of data transactions in combination with other information to allow educators and students to derive maximum value from UCC-enabled communication and collaboration.

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# STATE OF THE RESIDENTIAL NETWORK — 2015

Residential networking (ResNet) has transformed from an IT issue to a campus-wide priority. This is why three leading professional organizations (ACUTA, NACUBO and ACUHO-I) representing college and university business, IT and housing officers joined forces to conduct the fourth annual study of ResNet practices. ResNets provide wired/Wi-Fi internet, cable TV services and more to students living in residence halls. A combined total of 550 respondents representing 465 unique colleges and universities, the largest number since the study's inception, completed the surveys. The following infographic summarizes the "State of the ResNet" for 2015.

## A SNAPSHOT OF 2015

### BANDWIDTH & WI-FI NOW A COMPETITIVE ADVANTAGE

To attract and retain students, more than half (51.5%) now dedicate at least 1 Gb vs 25.5% in 2012 specifically to the ResNet. More than 3 out of 5 schools now provide wireless to 81-100% of the campus



**25.5%** dedicated 1Gb in 2012



**50.5%** now dedicate 1Gb in 2015

**3 out of 5 schools** provide wireless to 81-100% of the campus



### TENSION BETWEEN SUPPORTING STUDENTS AND LIMITED RESOURCES

Bandwidth is costly, so bandwidth-management practices are on the rise. However, schools with outsourced ResNet are less likely to need bandwidth management because the provider is typically responsible for meeting all bandwidth needs.



**72%**

Almost 3 out of 4 schools are shaping by protocol



**55%**

More than half the schools with in-house internet limit or shape bandwidth



**21%**

Only 1 in 5 schools who outsource their ResNet implement bandwidth management

### RESNET FUNDING BALLOONS

Although an increasing number of schools expect costs to grow, the number of schools that saw ResNet funding increase jumped from 38% in 2014 to 54% in 2015.



**54%**



**38%**

Saw funding grow in 2014

Saw funding grow in 2015

# Jumps in Funding, Bandwidth and Outsourcing in the Race to Meet Students' Wi-Fi and ResNet Needs

With competition increasing to attract and retain students, colleges and universities face a deepening tension between their desire to serve students' increasing Wi-Fi and residential networks (ResNet) needs and balancing the pace and costs of bandwidth growth. As schools invest in technological upgrades, reporting significant jumps in funding, bandwidth, and outsourcing, they are also increasingly on the lookout for ways to improve the value and performance of their ResNet to meet student demand.

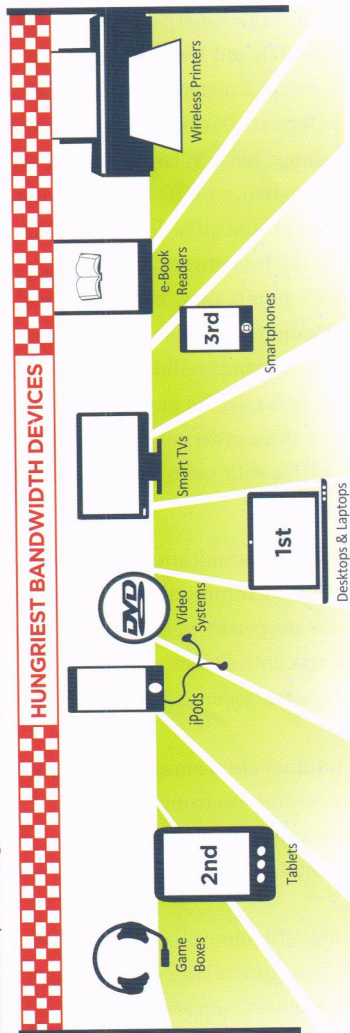
A total of 550 respondents completed the 2015 survey—the largest number since the study's inception. Published by ACUTA, the National Association of College and University Business Officers (NACUBO), and the Association of College and University Housing Officers-International (ACUHO-I), the report is the fourth installment of a five-year study to measure the pulse of ResNet practices and policies in higher education.

Key insights from the 2015 report include the following:

- Bandwidth and Wi-Fi—Reaching New Heights: For the first time, more than half of the schools surveyed (51.5 percent) dedicate at least 1 Gb to ResNet. This is double the number from 2012, when only 25.5 percent of schools did so.
- More bandwidth-management practices than ever: Despite robust funding increases, the use of more bandwidth-dependent devices continues to challenge universities. The result: All bandwidth-management practices are on the rise. The most popular methods are limited

# DESKTOPS & LAPTOPS BEAT TABLETS TO WIN STUDENTS' HEARTS

Students now prefer a larger canvas for complex applications, will this trend require even more bandwidth?



## OUTSOURCING TRIMS COSTS, PROVIDES BETTER VALUE, SUPPORT

Outsourcing or consideration to outsource nearly doubled, growing from 22% in 2013 to 38% in 2015, showing an increasing number of schools looking to meet student Wi-Fi and ResNet needs through outsourcing.

**2X** the growth from 2013



## PRIORITIES VS. REALITY

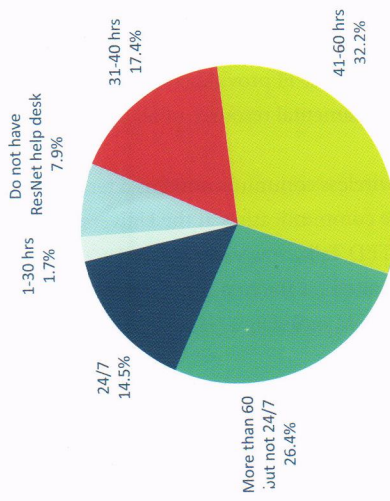
While security is a top IT priority for business officers, more than three in four schools have no or small Information Security and Internal Audits (ISO) teams



## ON DEMAND DIGITAL LIFE, NOT ON DEMAND SUPPORT

Less than 15% of schools provide 24/7 support.

### ResNet Helpdesk Hours Per Week



by protocol and blocking activities such as p2p sharing and music downloading. Fifty-five percent of institutions that provide their own bandwidth also limit and/or shape bandwidth, compared with 21 percent who have outsourced their ResNet.

- Desktops and laptops now #1 Bandwidth consumers: Desktops and laptops have taken over the top spot from tablets as the largest consumers of bandwidth as students look to a bigger canvas for more complex applications such as 3D modeling and inverted classrooms.
- Round-the-clock support is rare: Fewer than 15 percent of schools provide 24/7

support. However, 68 percent of schools that have outsourced their ResNet have 24/7 support compared with 9 percent of schools with in-house networks.

- Outsourcing nearly doubles: With the increased volume of traffic and devices, as well as the need for support, schools are looking outside their walls to provide the high level of service students expect. The number of schools outsourcing or considering outsourcing continues to grow, nearly doubling from 22 percent in 2013 to 38 percent in 2015.
- Funding grows year to year: More institutions saw an increase in ResNet

funding, jumping from 38 percent in 2014 to 54 percent in 2015.

- Security lacks strong presence: While security remains a top priority for business officers, there is no information security or internal audits (ISO) team in place at three out of four schools responding to the survey.

The full report, available free at [www.acuta.org](http://www.acuta.org), provides further trends and insights into higher-education's ResNet structures, present and future network infrastructure issues, and staffing service and support.

## ABOUT THIS YEAR'S SURVEY: MOST EXTENSIVE TO DATE

The survey was conducted from December 2014 through January 2015, and represents some 450 institutions, compared to 412 in 2014 and 251 in 2013. Of the 550 total responses, 204 respondents indicated their primary job was related to business and 99 to housing, while 247 respondents were from IT.

Read the full report at: [www.acuta.org](http://www.acuta.org)

All Data from 2015 ACUTA/MACUBO/ACUHO - State of ResNet Report  
 ACUTA: Association for College and University Technology Advancement  
 MACUBO: The National Association of College and Under-Only Associate Officers  
 ACUHO-I: Association of College and University Housing Officers International  
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# How Light Can Change the World

## If a lightbulb becomes a wireless access point, light as a service will be the norm

by Harald Haas

It is estimated that by 2017, more than 11 exabytes of data traffic will have to be transferred through mobile networks every month.<sup>1</sup> Do we have the bandwidth to accommodate this volume, or could something unexpected, such as a lightbulb, offer a better alternative?

### What Is Li-Fi Technology?

Li-Fi technology uses light waves instead of radio technology to deliver data. It is a bidirectional, networked, mobile, high-speed data communication technology that complements Wi-Fi, and additionally has the key benefits of greater capacity, security, and energy efficiency. Li-Fi provides 10,000 times more bandwidth—the fundamental resource of all communication systems.

Li-Fi, light-enabled wireless communication, is a term I coined as chair of mobile communication at the University of Edinburgh. In my 2011 TED Talk, now viewed over 1.6 million times, Li-Fi was demonstrated for the first time in public. (For information about the TED Talk, including a URL, see the caption under the photo on page 22.)

The infrared and visible light spectrum is huge (about 300 terahertz is available), unregulated (free), and secure (and safe), and devices such as LEDs and photo detectors are

inexpensive and are already in common use and with existing infrastructures.

### How Li-Fi Works

Li-Fi modulates the changes in the intensity of light to communicate data. LEDs are electronic devices, and algorithms are used to enable encoding of 0's and 1's into subtle changes of the intensity of light of an LED. This is done at very high speeds, more than 100 million times per second. Algorithms convert the received signal into the same binary data stream. In the Optima Lab at the Li-Fi Research and Development Centre, transmission speeds of 3.5 Gbps at 2 meters distance and real-time video streaming at 1.1 Gbps at 10 meters distance have been demonstrated. This is almost twice as fast as current Wi-Fi.

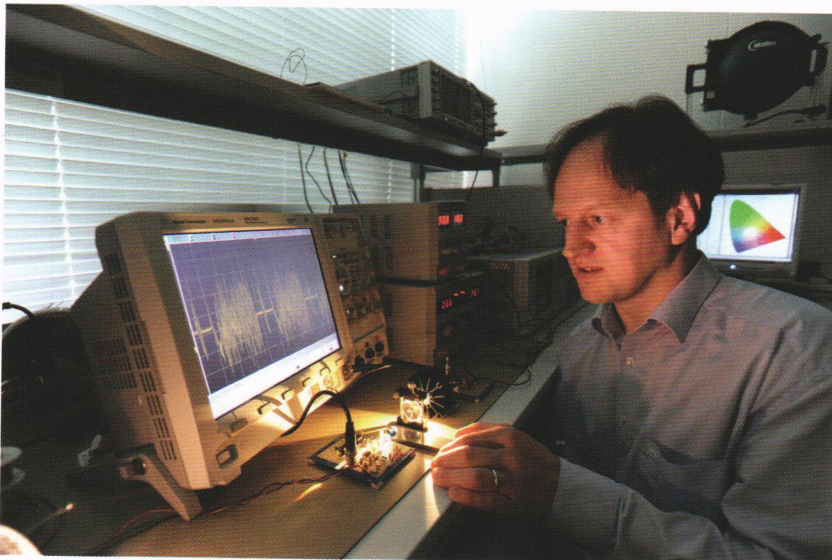
With a Li-Fi chip integrated, an LED light in a room ceiling becomes a Li-Fi access point, and all Li-Fi access points together form the optical attocell (Li-Fi) network, giving a high data density. The optical access points allow networking with multiuser access and signal handover. A Li-Fi attocell layer as part of heterogeneous 5G (and beyond) cellular networks would be able to enhance the area data rate, the number of bits per second per square meter, by three orders of magnitude compared to what is currently available with radio frequency systems only.

### Advantages of Li-Fi

The use of visible light for communication provides many advantages to radio frequency communication. These result mainly from the inherent properties of light, which is very directional and, therefore, controllable:

- **Security:** Provides entirely secure access. Where there is no light there is no data.
- **Safety:** Does not produce electromagnetic radiation and does not interfere with existing electronic systems.
- **Localization:** Allows localization due to the small coverage area of a Li-Fi access point. Localization can be used for very precise asset tracking.
- **Data density:** Provides ubiquitous high-speed wireless access that offers substantially greater data density (data rate per unit area) than RF through high bandwidth reuse.

Professor Haas at his desk



## Applications

Li-Fi is particularly suitable for environments where Wi-Fi is unsuitable or where Wi-Fi does not provide enough capacity to meet increasing demands—for example, places where secure data exchange is paramount, such as hospitals, company headquarters, homeland security agencies. Another example is in modern factories where hundreds of tools and machines require constant and reliable connection to central servers. This is under the umbrella of the Internet of things. Another example is in intrinsically unsafe environments such as refineries, oil platforms, or petrol stations, where electromagnetic radiation of the antennas of radio frequency communication systems could spark explosions.

The possible applications are huge, for example:

- Internet of Things. We have lights in cars, street lights, indicator lights in our ovens, fridges, microwaves, our lights at home, in racks in data centers. Turning all of them into wireless transceivers will immediately enable the Internet of Things to monitor and control energy consumption and other systems, as well as fat data pipes that we need for a “big data future.” Using solar cells as data receivers as well as energy harvesting will bring many new opportunities for the Internet of Things or smart environments.
- Real-time health monitoring. By implanting very small lights under the skin, vital data such as blood pressure or blood sugar levels can be transmitted, bringing efficiencies and effectiveness to hospital management as people can leave the hospital as they recover, but their doctor can be alerted automatically with any health monitoring information.
- Street lights can be used as base stations transmitting and receiving real-time information to aid traffic congestion.

## Latest Research Areas

Our latest research is in developing a novel SPAD (single-photon avalanche diode) photodiode receiver chip. This is an extremely sensitive receiver for applications where ambient light is very low, such as in downhole well monitoring in the gas industry.

Li-Fi is an emerging industry that could have a huge impact on our everyday lives, and independent market research has forecast that Li-Fi will be a \$6.1 billion industry by 2018.

The lighting industry is redefining itself due to the advent of the light-emitting diode, which has a 20 times longer lifespan compared to incandescent lightbulbs. Old business models cease to exist, and this creates a huge opportunity for Li-Fi. This opportunity can be compared to the change from analog photography to digital. Li-Fi will turn simple lightbulbs into multifunctional devices, which most likely will be replaced because there are new

services and applications possible with newer versions, and not because the bulb is broken.

Like a mobile phone has evolved from a single-service device (mobile telephony) to a multifunctional smart device (the smartphone), the current lightbulb will transition to a multifunctional device providing many more services using embedded sensors and Li-Fi capabilities. Therefore, in the coming three to five years, the lightbulb will become a wireless access point, and with this, light as a service will become the norm.

## pureLiFi

In 2012, I founded and became chief scientific officer of a University of Edinburgh spin-off company, pureLiFi. In 2015, pureLiFi took these Li-Fi networking and multiuser technologies to market through its Li-Flame product. This adds to its original product, Li-1st, a point-to-point communication system launched in 2013.

The Li-Flame is the world's first fully networked Li-Fi system. This means that an off-the-shelf LED lamp is enabled to

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transmit to multiple users at the same time. The system includes a mobile unit that is attached to the screen of a laptop. This means users can roam inside a room or a building, and once they leave the coverage area of one lamp, their session will be transferred seamlessly to the next Li-Fi-enabled lamp that is closest to the users. Within the next couple of years we will see this system miniaturized, and the company is currently raising money for this development. pureLiFi's partners range from lighting companies and companies providing technology for the defense and security industry to mobile operators.

### Li-Fi Research and Development Centre

The Li-Fi Research and Development Centre is part of the University of Edinburgh, and is a dedicated core facility undertaking research and product prototype and applications development. It operates as a "flexible open collaboration" model with industry and commercial partners to assist in the development of marketable Li-Fi products and new spin-off companies, and to promote knowledge exchange with the global Li-Fi community, including providing expertise for new industry standards and promoting the adoption of Li-Fi technology and accelerating its development as a global industry. The Li-Fi Research and Development Centre also offers consultancy to assist in the global adoption of what is deemed a game-changing technology.

The Li-Fi Research and Development Centre has developed the world's first analog transmitter chip capable of achieving 1 Gbps as well as a first receiver chip composed of 49 avalanche photodiodes (APDs), each achieving a gain of 10 dB. The size of the APD array of receivers is only 3 x 3 mm. Compare this to a 6 cm

long antenna for cellular communication in current mobile phones. The chips are available for licensing. There have also been demonstrations that provide a pathway to 100 Gbps wireless Li-Fi transmission over several meters of distance and covering an area of 1 square meter. This is achieved by using different-colored laser diodes and combining them to produce white light. Large coverage is achieved by diffusing the white-light beam. The lighting technology is similar to the one



*What if every lightbulb in the world could also transmit data? At TEDGlobal, Harald Haas demonstrates a device that could do exactly that. By flickering the light from a single LED, a change too quick for the human eye to detect, he can transmit far more data than a cellular tower — and do it in a way that's more efficient, secure, and widespread. See the video at [http://www.ted.com/talks/harald\\_haas\\_wireless\\_data\\_from\\_every\\_light\\_bulb](http://www.ted.com/talks/harald_haas_wireless_data_from_every_light_bulb)*

used in the latest high-performance car headlights.

There has also been breakthrough research in using solar cells as data detectors. It has been shown that off-the-shelf 30 cm x 30 cm solar cells can be used to receive data at speeds of up to 15 Mbps, and when using smaller organic solar cells of 2 mm x 4 mm, speeds of up to 50 Mbps were demonstrated. This technology is at the heart of self-powered autonomous wireless transceivers that can be embedded everywhere. Ambient light is used as a source to power the device while Li-Fi-enabled LEDs provide data to the device.

### From the Editor: Final Thoughts

Li-Fi is not a newcomer to the technology scene in 2015. It was listed as one of the 50 best inventions in *TIME Magazine* back in 2011. And as consultant Geoff Tritsch pointed out, "Alexander Graham Bell would be gratified. On June 3, 1880, Bell used his Photophone to transmit wireless voice over light from the roof of the Franklin School to the window of Bell's laboratory, some 213 meters (about 700 ft.) away. It's only taken 135 years for data to catch up."

Although Li-Fi appears to hold tremendous potential for removing some serious roadblocks to global communications, some questions still remain. Perhaps chief among them: What are the practical challenges to widespread implementation? And what are the specific benefits to higher education?

We will continue to watch for new developments that could have an impact on higher-education IT and will share what we learn that could be of interest in future ACUTA publications.

*Harald Haas is a professor in the School of Engineering at the University of Edinburgh. In 2012, he was awarded the Established Career Fellowship from the EPSRC (Engineering and Physical Sciences Research Council). In 2014, he was selected by EPSRC as one of 10 RISE Leaders. The RISE award, "Recognising Inspirational Scientists and Engineers," honors those carrying out world-leading research, and who, with their knowledge and dedication, lead and inspire innovation.*

<sup>1</sup> Cisco, Cisco Visual Networking Index, "Global Mobile Data Traffic Forecast Update, 2012-2017," white paper, February 2013.

# A Case for Hybrid Cloud

## Why higher education is moving toward a hybrid model for unified communications

by Tom Minifie

For many universities, the hybrid cloud model is a final destination. There are few campuses willing to go only public cloud or only private cloud when it comes to deployment of unified communications (UC) components, such as call control, email, messaging, conferencing, fax, and contact center. “Hybrid cloud, and by extension hybrid IT, is here to stay,”<sup>1</sup> according to Gartner, Inc., a worldwide information technology research and advisory company. In the end, the hybrid cloud will serve the needs of more universities than any one model alone.

### Opening Argument

By definition, the UC hybrid cloud is the combination of private cloud/on-premises and public cloud UC elements. The hybrid model is appealing and has become the final destination for so many because of the wide array of options it presents to organizations. For instance, many UC components can live behind the institutional firewall for security and control purposes, while others are ideal to take advantage of the elasticity and quick provisioning benefits of the public cloud.

Also, the hybrid model protects important education governance—many organizations are reluctant to host sensitive information outside of their own data center, especially student records, employee records, research data, and private communications. In addition, hybrid cloud deployments leverage legacy infrastructure investments. Since many universities have made significant investments in their on-premises UC equip-

ment, there is no reason to discard these assets just to gain some of the benefits of the public cloud.

“Hybrid cloud is a very practical alternative for the higher-education sector’s topology and business model. For example, campuses with high concentrations of users can more easily justify expenditures for on-premises communications infrastructure compared with smaller locations such as satellite campuses, remote back-office sites, and small home offices,” says researcher Jay Lassman. Before becoming an independent consultant in 2014, Lassman was a research director with Gartner, Inc., where he spent 14 years developing deep awareness and insights on UC and contact center technologies and the product portfolios of major global vendors. According to Lassman, hybrid deployments enable universities to fully depreciate IT assets; implement selected functions for where they are best suited; provide an interim strategy to full cloud; choose between deployment options; and keep options open for changes in technology, suppliers, and adoption trends.

### Cross Examination

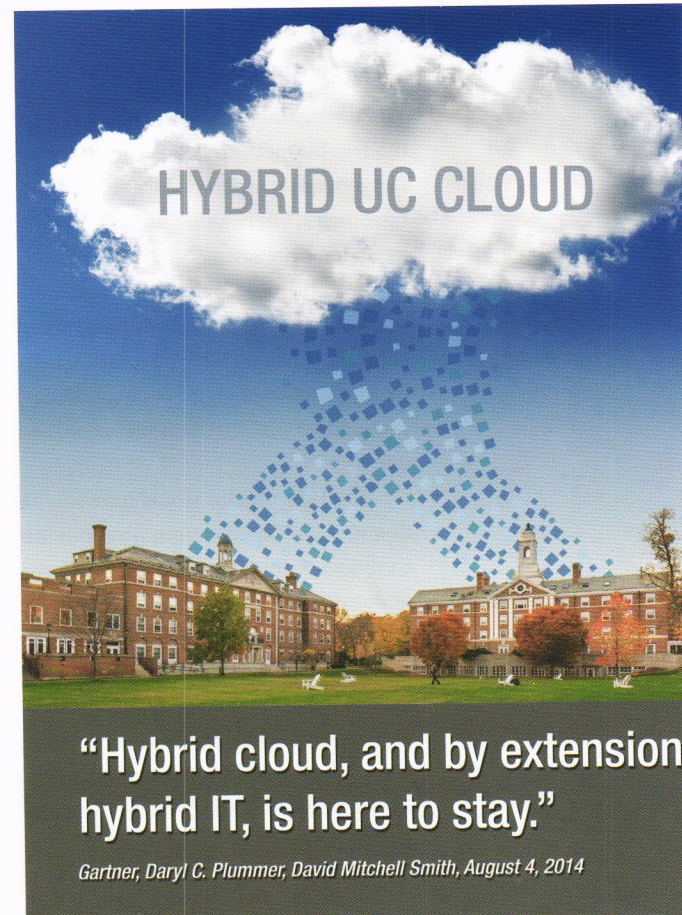
When considering which components of the UC solution stack should remain on-premises and which should be provisioned from the cloud, campus IT staff should consider each UC element and answer the following questions:

- Are there education governance or confidentiality concerns regarding sensitive data?
- Is there a dedicated IT staff with the

necessary skill set required to support specific UC applications?

- How critical is the reliability of the communication solutions?
- How variable or elastic is the usage?
- Are there significant existing investments in on-premises UC equipment?
- Is CaPex (capital expenditure) or OpEx (operating expenditure) the best choice for the specific UC solution?

Lassman offers insight on the cloud decision. “Legacy infrastructure investments, total cost of ownership (TCO),



scalability, and maturity of the cloud delivery model (otherwise known as UCaaS, or unified communications as a service) dictate how fast and where applications will be assigned in the future.”

Web, video, and audio conferencing are prime candidates for cloud deployments today, Lassman continues. “Email, directory, instant messaging, contact center, and IVR are next in line.”

### Case in Point

With a total student enrollment of 4,217, Seattle Pacific University is a 40-acre city campus located 10 minutes from the heart of downtown Seattle. The private university moved to a hybrid cloud UC model when it migrated from an on-premises Exchange Server email environment to Office 365 in the cloud, but kept its call control/PBX and voicemail on-premises.

“Faculty and staff can manage and access availability, contacts, and calendaring from their mobile devices, regardless of whether they are using a premises- or cloud-based email system,” according to David W. Tindall, the university’s assistant vice president for technology services.

There are other benefits as well, Tindall says. “The hybrid model is optimized to meet our business requirements now and the future. We are leveraging our existing asset investments while maximizing business continuity, security, and scalability.”

### Financial Implications

When weighing cost benefits of cloud and on-premises models, business process is a primary consideration: The cloud offers agility and scalability, and it eliminates hardware investment, but running static workloads doesn’t necessarily mean financial savings.

“Commercial pricing for UCaaS ranges from \$25 to \$35 per user per month, based on volume and feature bundle,” Lassman explains. “However, the higher-education sector is well positioned to get discounts from communications vendors and service providers that could amount to 25 percent or more.

“Industry pundits would have you believe that migration to cloud-based communications is inevitable,” Lassman continues. “However, planners and decision makers have a lot of due diligence to accomplish if they want to keep their jobs. This is primarily because the cloud pricing model is recurring and perpetual, which makes it difficult to substantiate cost savings. Additionally, achieving enterprise-class security, performance, reliability, and an acceptable user experience can be challenging—not to mention the task of finding a certified service provider with resources that can support service-level agreements for onsite and cloud components.”

Over time, the recurring license model will cost more than the traditional CapEx license model where you pay for the license up front. However, the cost of the license is not the only consideration. When evaluating TCO, one must evaluate the cost-benefit associated with personnel costs, infrastructure costs, hardware refresh, and so on.

### Closing Statement

“Before making hybrid cloud investments, higher-education IT planners need to develop strategies for UC adoption,” Lassman adds. “Start by creating an inventory of the main communications platforms already in place, such as for telephony, voicemail, and conferencing. Next, identify desired requirements and cloud service providers that have the potential to best support the organization’s vision and strategic direction for a hybrid cloud implementation.”

## Weighing Cloud Advantages

Private Cloud Advantages	Public Cloud Advantages
+ Leverages existing on-premises investments	+ Reduces infrastructure costs
+ Disaster-recovery and business-continuity benefits	+ Fast provisioning of applications
+ Business compliance	+ Elastic licensing models
+ Consolidates benefits of the public cloud with increased privacy and security	+ Reduces in-house IT staff costs

Once these steps are completed, send a high-level request for information (RFI) to potential suppliers. In addition to functional requirements, ask about:

- How proposed solutions interoperate in a multivendor onsite environment
- Road maps for cloud and hybrid UC implementations
- Budgetary pricing and projected five-year TCO, including costs for support and upgrades
- References from the higher-education sector
- Demos and available pilot programs

Lastly, keep in mind that, in a world where technology is constantly evolving and innovation drives change, flexibility is key.

*Tom Minifie is chief technology officer at Applied Voice & Speech Technologies, Inc. (AVST). Visit their website at [www.avst.com](http://www.avst.com).*

*1 Daryl C. Plummer & David Mitchell Smith, Hybrid Cloud Is Driving the Shift from Control to Coordination, Gartner, Inc., September 19, 2013, refreshed August 4, 2014.*

## Snapshots



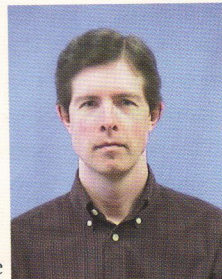
### Rutgers University

*Adrienne Esposito*

Rutgers is planning to move its financial management to the cloud in the 2015 to mid-2016 time frame. This includes general ledger, project accounting and grants management, accounts receivable, and cash management and treasury.

### Principia College

*Robin Burns*



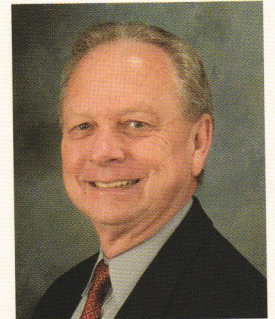
Principia College has considered cloud services, but we continue to host major applications on site. Outsourcing email probably had the most interest from IT and administration, to reduce costs and workload for in-house staff related to maintaining and replacing servers and software. Nothing is planned at this time, but discussions about new services or projects often include considering whether using the cloud could be the best option.

On a smaller scale, there are any number of ways that departments or groups are already using cloud resources to augment our in-house offerings. Our director has asked all of us in IT to stay informed about cloud computing in general and how it might benefit our environment.

A small number of specific departmental apps used here are public-cloud based. Centrally, we are developing plans to move storage to Box. We are moving student email to Gmail this fall. We are building a shared (between state institutions) cloud-like virtualization environment that we will all share for nonprivate data. We are concerned about security and privacy issues and will therefore not likely move any private data/systems to any cloud platform. We are not currently using public cloud IaaS, but think we may get there in the next few years. We don't use any PaaS or other aaS platforms and have no known plans for this.

### University of New Mexico

*Mark Reynolds and Brian Pietrewicz*



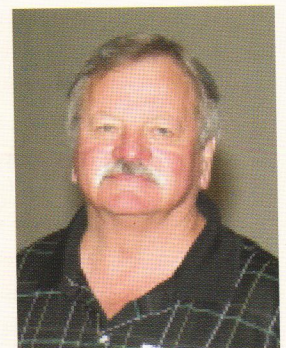
UNM currently has a private cloud, branded LoboCloud. LoboCloud is built on the VMware stack utilizing vRealize Automation Center. LoboCloud allows UNM affiliates and researchers to deploy Windows and Linux virtual machines (VMs) in 20 minutes or less via a self-service portal using a Web browser. Customers can size VMs based on their needs by selecting the appropriate amount of CPU memory and storage. DNS entries and firewall rules can be set via the self-service portal. Robust management tools are also available through the portal. Customers have administrator/root access to their VMs, allowing full control over their VMs. IT manages the underlying infrastructure, thus allowing customers to stay focused on their core mission.

UNM is researching hybrid-cloud solutions. Many public-cloud providers offer integration with the VMware stack, making hybrid-cloud solutions quick and easy to deploy. Vendors such as Amazon's AWS and VMware's vCloud Air integrate directly with the VMware stack. In other cases, public-cloud providers make APIs available to set up hybrid-cloud service. Hybrid-cloud services allow for the migration of data or VMs back and forth between private-cloud and public-cloud providers. UNM plans to stand up its hybrid-cloud services by early 2016.

UNM IT is actively working to make public-cloud services easily accessible for UNM affiliates and researchers. UNM intends to sign BAAs and enterprise agreements with key public-cloud providers. We intend to escort UNM affiliates to the cloud by highlighting the key details of the BAA, including security posture, and making the details available through a service catalog. This will help customers understand which cloud provider will best meet their needs. UNM will set up consolidated accounts with the cloud providers. Delegated accounts will then be made available to researchers to purchase cloud services. The purpose of the consolidated accounts is to drive down costs through volume purchases. UNM is also setting up peering relationships with cloud providers through WRN and Internet2. Once in place, traffic can flow to and from cloud providers without incurring commodity Internet charges, thus driving down cost.

### Utah Valley University

*Tom Branam*



by Paul Korzeniowski

# Cloud Hurdles Shift from Security to Contracts

## Convinced that the cloud offers top-notch security, universities dot their I's and cross their T's

The collegiate cloud marketplace is hitting a significant transition point. Traditionally, schools have been most concerned about the security features available in these systems. Not so much anymore. A growing number of universities think cloud security is as good as or even better than traditional checks. "My budget is limited, so I am unable to hire specialists who focus solely on security," says Eric Hawley, chief information officer and associate vice president for information technology at Utah State University. "Our vendors do not have that limitation."

Consequently, many schools are migrating to the cloud at full bore. "We are moving all of our IT infrastructure to the cloud," stated Doyle Friskney, chief technology officer at the University of Kentucky, which now has about 25 percent of its IT systems running there. Schools clearly see the value the cloud offers: reduce computing costs, provide more system flexibility, and provision resources more quickly than premises-based systems. Universities want to take advantage of these features.

But even with security concerns ebbing, the cloud is not an IT panacea. This computing technique has limitations, but they revolve more around administrative issues than technical challenges. For instance, colleges need to make sure that they craft strong acceptable-use policies, so confidential data are not misused. They also have to dig deeply into their contract and make sure that safeguards are consistent. As a result, the communications manager's role increasingly is becoming

one of a contract manager rather than a technical guru.

### Resistance to Change Is Common

Security has always been a major bugaboo as schools evaluate cloud computing. In fact, an International Data Group (IDG) survey found security (76 percent) at the top of the list of concerns when evaluating cloud computing. The worrying centers as much around where the information is housed as the checks that cloud providers put in place. With public cloud, information moves out of the academic data center to the provider's site. That change makes communications managers uncomfortable for a couple of reasons. They no longer are the gatekeepers controlling how the information is used. Also, this computing paradigm is different, and individuals tend to resist change.

Such thinking seems to evolve gradually. Utah State began dabbling with cloud technology in 2007. "We were one of the first schools to adopt Google Mail," Hawley said. The reason? Economics. Google offered the system for free, so the school offloaded its traditional maintenance functions. Users were happy because the new system offered more functionality than the old one. It was a win-win for the IT department and the users.

Since then, cloud systems' footprint at Utah State has grown incrementally. One reason is the school views information in the cloud as safe. "One cloud system was HIPAA compliant, and those regulations are as stringent as any we have implemented," Hawley said. The

university now has about 40 percent of its systems running in the cloud, including a procurement system, a job application solution, a configuration management product, a file system, and IT service management software. Like Kentucky's Friskney, Hawley envisions a day when all of the school's applications reside in the cloud.

### Anteing Up for Cloud Solutions

Utah State and the University of Kentucky are not alone. Schools across the country are rapidly adopting cloud services to support their educational missions. IDG sees spending on cloud services increasing at a compound annual growth rate of 22.8 percent during the next five years, much higher than the 3.8 percent rise in spending projected for IT services overall in 2015.

As the spending rises, a shift is taking place with the types of applications moving to the cloud. Initially, schools focused on simple, convenient systems such as email and data storage. Increasingly, colleges are using these online services for mission-critical applications, such as student information systems and enterprise resource planning applications. Because of this transition, schools transfer large quantities of personal data, including transcript information, coursework, student IDs, credit card numbers, and Social Security numbers to third-party providers.

Not everyone is convinced that universities are ready to make that change. While cloud providers may be able to keep outsiders from breaking into their systems, other issues arise that colleges

quite frankly may not have thought through. “Cloud services are poorly understood, non-transparent, and weakly governed,” noted a report from the Fordham Center on Law and Information Policy. Rather than the shortcoming seen with traditional security tools, such as holes in application code, the shortfalls revolve more around the language in cloud contracts. The key issues are typically not found with premises systems, so schools often do not take them into account when making the switch. Communication managers need to understand the potential shortfalls and take steps to protect their schools—and themselves.

### **Losing Control**

As noted, once information, say student IDs, goes into the cloud, colleges lose control over that data. With premises systems, the school had the information, monitored its use, and disposed of it however the academic institution desired. With cloud, data is now shared by the supplier and the university, and this difference creates new concerns. The first one is making the user aware of how his or her information will be used. Before entering anything, the individual’s consent is needed. Typically, how the data will be used is outlined in a *terms of agreement* document that individuals acknowledge (but, honestly, rarely read) when they first access any system. That agreement outlines how the personal data will be stored, who accesses it, and how it will be used. The document should also acknowledge the existence and identity of any cloud service providers.

While this step seems like it should be commonplace, fewer than 25 percent of the current agreements specify how student information will be disclosed, according to the Fordham Center. The Family Education Rights and Privacy Act requires that colleges maintain control of student information whenever it is disclosed to third-party service providers. In some cases, schools may be falling short of compliance with that statute.

## Chief Privacy Officers Becoming More Common

As security concerns increased in the recent past, the role of safeguarding systems rose from an IT staff member position to a top-line manager with the title of chief security officer (CSO). A similar scenario is taking place today with privacy, spawning the emergence of the position of chief privacy officer (CPO).

A CPO is a senior-level executive who is responsible for managing the risks and implications of constantly evolving privacy laws and policies. The position was created in response to both growing concerns about the use of personal information as well as more laws and regulations focused on protecting such information. The area touches on patient medical records, with the Health Insurance Portability and Accountability Act of 1996, and consumer financial transactions, with the Payment Card Industry Data Security Standard. In the academic world, the Family Education Rights and Privacy Act extends those responsibilities to student information.

CPOs are experts in relevant government and regulatory laws. They educate other C-level officers, employees, and students about privacy issues and help to create policies and documentation, such as informational brochures, training materials, and tests, to help ensure that users understand the potential dangers and follow the procedures to protect sensitive information. CPOs also identify what data can be collected, as well as when, where, and how long it is kept. Data retention and deletion policies are critical for applications such as email and data storage. CPOs are also on the lookout for and try to remediate any privacy violations.

In sum, this person has the expertise needed to navigate the very murky waters of dealing with third parties, such as cloud providers. With growing volumes of data being created, universities need help to make sure that they are good stewards of that information. The CPO helps them meet that goal.

Another concern is what will the vendor do with this information? Colleges typically have not used student data for marketing purposes, such as selling their names to a third party pushing tablets or tutoring help. In today’s highly competitive marketplace, the temptation for the cloud vendor to take that step is great. Also, the advent of big data applications enables third parties to collect and manipulate information in new ways. Schools need to guard against their users becoming marketing piñatas. The Fordham Center found that fewer than 7 percent of cloud contracts restrict the sale

or marketing of student information by vendors. Again, schools may be opening themselves up to problems.

Schools need to look carefully at the contract wording. Many agreements allow vendors to change the terms without notice, which could put the school in a bind. When negotiating, schools must be proactive and make sure that the terms will not change.

### **Contract Complexity Increases**

Consistency is essential. The cloud vendor may subcontract running part of its system to someone else. Schools then

become passive parties to cloud service contracts that they did not negotiate. The terms of agreement that the user signs may contradict the cloud vendor's other contracts. To avoid such problems, schools need to include wording in the original contract that provides them with input if such issues arise or allows them to opt out if the changes are too significant.

But opting out is challenging. To whom does the data belong? That question needs to be answered in the basic agreement, but again sometimes it is not. Even worse, some agreements allow vendors to retain student information in perpetuity.

Finally, having the data on paper is not the same as having it in your data center—and going back is difficult. Moving information out of the cloud and back into your data center can be challenging. The vendor may use a data format that is not compatible with the university computer systems. For instance, moving information from one database management system to a second

is a complex process that involves translating a variety of data formats.

### Losing the Extras

While theoretically, customers could push a few buttons and be working with a new supplier in a short time, the reality is the process is much more complicated. A school does a lot of customization work, building an interface to another system and providing a familiar feel to users, before it deploys an application. If the academic institution swaps vendors, the process of writing that code starts all over again. Sometimes, the potential for the work is so great that it deters the college from making a switch.

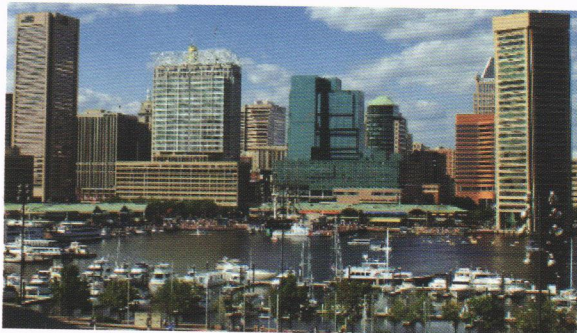
Other ripple effects arise. Eventually, a contract comes up for renewal. The cloud vendor may offer low rates to get the school's business, but later, the supplier looks after its own needs, that is, more revenue. If there is a significant increase in pricing, the school may pay it rather than go through the often tedious process of migrating to another solution. With so much change taking place and the stakes so large, new roles have been

emerging. The position of chief privacy officer is taking hold (see sidebar); the person is responsible for dealing with the growing complexities found in cloud contracts.

### Final Thoughts

In spite of the potential stumbling blocks, schools are moving to the cloud in rising numbers. Initial security fears are abating as schools gain more experience with these systems; however, the change does not mean that the cloud lacks potential downsides. Many of the possible pitfalls center on contracting language. To successfully deploy cloud applications, communications managers need to understand these new issues and then take steps to protect their users and the school.

*Paul Korzeniowski is a freelance writer who specializes in communications issues. He can be reached at paulkorzen@aol.com.*



visitbaltimore.com

## Coming ACUTA Events

Fall Seminar

October 25-28, 2015

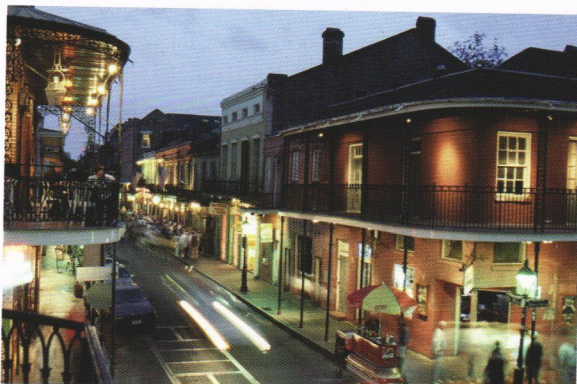
Baltimore Inner Harbor, Maryland

Hyatt Regency

Track 1. Preparing & Innovating for Tomorrow

Track 2. Enterprise Telephony and UC: Today and Tomorrow

Mark Your  
Calendar!



New Orleans CVB: Richard Nowitz

Winter Seminar

January 17-20, 2016

New Orleans, Louisiana

Hyatt Regency

Track 1. Opportunities with Infrastructure as a Service

Track 2. Communication Services Delivery Strategies

Visit the website for details:  
[www.acuta.org](http://www.acuta.org)

# Attending ACUTA Events Promises an Excellent ROI

In this era of tight budgets, higher-education professionals must often prove the value of educational conferences before attending. We've pulled together some information that will help you demonstrate how attendance at ACUTA events supports your institution's goals.

## ACUTA's educational programming is first rate. It allows you to:

- Learn first-hand from industry and higher-education experts who have successfully implemented technology solutions, avoiding costly and time-consuming mistakes.
- Create a professional network of knowledgeable peers and colleagues from other institutions
- Create talking points to communicate more effectively with vendors
- Get immediate answers and solutions to issues within your institution



## The Exhibition allows you to:

- See the latest in technology and services, discovering new products that can decrease expenses and increase revenue
- Visit with current and prospective vendors in one location
- Get answers directly from vendors on the exhibition floor
- Comparison shop for the best value

## Develop Your Agenda

Clarify the purpose of your attendance. List the things you would like to accomplish:

- Identify current issues at your institution for which you are seeking solutions.
- Research projects you anticipate in the future to get a head start.
- Inquire about developing technologies that might benefit your institution.
- Talk to your vendors about specific issues you are facing.
- Find one idea that will increase revenue and/or decrease costs.
- As your campus looks at implementing a new technology, you will attend sessions that will help you succeed with this implementation.

## Make a Presentation to Your Management

You may wish to prepare a formal memo directed to the appropriate manager requesting attendance and why. The memo will be most successful if it focuses on what you will specifically bring back to the institution in return for the investment.

On the ACUTA website, you will find a sample memo and the following talking points that may assist you in making the case to attend. It could read like this:

- ACUTA has been hosting national seminars for many years and serves its membership by providing two specific topics of interest at each seminar and covers an impressive list of hot topics at the annual conference.
- I am going to look for a solution for [this particular problem or issue].
- I believe [this new technology] could benefit the institution, and I would like to learn more about it.
- Our institution will benefit from contacts I make with other schools facing similar challenges.
- The educational sessions at ACUTA events are right on target with our institution's/department's current and future needs.
- Having so many vendors in one place at one time can reduce the time spent while at the office in researching and meeting with vendors, and I will share product information with you and my colleagues in the department when I return.
- I will share the slides from and links to educational sessions with co-workers when I return. (Slides will be available online.)
- I will write a report on highlights from the event and share the key takeaways at a subsequent staff meeting.

*Join us for our next event, and you'll head home with a refined perspective on both current and future developments in IT and telecom that will benefit your institution for years to come. That's what we call ROI.*

## Fall Seminar

October 25-28 • Hyatt Regency Baltimore Inner Harbor

Track 1. Preparing & Innovating for Tomorrow

Track 2. Enterprise Telephony & UC: Today & Tomorrow



The Institutional  
Excellence Award  
is sponsored by  
Windstream

## Institutional Excellence Award 2015 Online Project Management Initiative



Dr. Prashanti Bollu accepted the award for Roseman University of Health Sciences at the Annual Conference in April. Shown with her are Mark Reynolds, ACUTA president; Ron Kovac, immediate past president; and Dawn Bozeman, representing Windstream, our sponsor.

**T**he College of Dental Medicine (CODM) Advanced Education in Orthodontics and Dentofacial Orthopedics/Master of Business Administration (AEODO/MBA) Postdoctoral Residency Program requires all residents to complete a graduate-level research project culminating in a thesis-like final research document and a publishable manuscript eligible for a peer-reviewed journal. With 10 residents in each class in a three-year program, 30 resident research projects are in progress simultaneously and at varying phases of project completion.

Besides the resident projects, the faculty research mentors from the AEODO/MBA program may also be involved in a few independent research projects.

The total volume of rigorous research projects by residents and faculty may range from 30 to 50 research projects at any given time. As the final supervisor for all research activity conducted at the program, the director of dental research at one time is consistently managing 30 to 50 research projects. In addition to this volume, each year as residents graduate, the projects are archived and are eventually followed by the director of dental research, related research mentor, and the research staff to facilitate the publication process.

The residency program was launched in 2008 and by 2013, the total ongoing and archived research projects, that needed follow-up reached 50. Residency programs and colleges that run a high volume of research projects run the risk of several projects and valuable information that lie dormant for years until due follow-up is undertaken.

Being part of a technologically advanced institution, the AEODO/MBA residency program at CODM, Roseman University of Health Sciences perceived the need for an effective online resources that can improve efficiency in the overall research activity and thereby facilitate dissemination of research outcomes to the community at large. To address this challenge of project load and streamline the research process within a postdoctoral orthodontic residency program, an online project management application was developed on a Microsoft SharePoint platform. This application houses necessary resources, as well as resident graduate project requirements.

The aim of this application is to address issues of project management, time management, and student/faculty interaction. In addition to the guidelines and resources needed to conduct a research study, the application also consists of personal student pages that store the project requirements, an asynchronous chat feature to facilitate student/faculty interaction, a calendar, and the ability for students and faculty to assign specific tasks complete with due dates. This interface promotes ongoing collaborative activities between faculty mentors and the residents whether they are on- or off-campus.

This application is unique, especially for the population it serves. The AEODO/MBA residency program is one of the largest orthodontic residency programs in the country. Not all orthodontic residency programs have a mandatory graduate research requirement. The high volume of research within one single unit does make the research load at the AEODO/MBA residency program a special challenge. Moreover, the research committee for each research project can involve faculty from other colleges of the university and include research advisors from other universities. The ability to house the majority of the research processes of each individual project under one hub and access to this information off-site has expanded the ability to collaborate with faculty from other institutions, thereby improving the overall diversity in the type of research projects. This project management application has received significant positive reviews by

visiting faculty from other institutions and several requests have been received to share the resource with other institutions. Various aspects of the project management site and its ultimate improvement in research outcomes have been accepted to be presented at recognized education and technology related conferences, such as EQRC and SITE, in the near future.

### **Planning, Leadership, and Management Support**

The information technology operations director worked closely with the director of dental research to review the challenges and concerns with tracking research project activities and document versioning. Requirements and work flows were outlined through a statement of work during several meetings in order for the consulting architect to design the environment. The project site was built on a Microsoft SharePoint platform using a Microsoft SQL server to house the data. Historical information was managed through network drives and email, but later uploaded to the project site for data retention.

After the initial testing from the director of dental research, a pilot program was launched with 10 residents to utilize the project site. Throughout that phase of the project, issues were identified and brought to the architect's attention to address. Additionally, the dean of the College of Dental Medicine—Henderson Campus and the vice president for technology services were informed regularly of the progress made on the project.

While the pilot phase helped to identify programmatic issues, it also broadened the vision for the project site to include additional features and functions, such as site archiving when a project was closed; empowered the residents to provide feedback and suggestions for future versions of the site; and helped streamline training on these curricular activities. Part of Roseman University of Health Sciences' mission is that it "provides a collaborative and supportive environment that enables its students, faculty,

and staff to be successful." This project provided that environment for collaborative activities to help the faculty mentors, research staff, and residents involved. Moreover, it provides a template for future activities for students and/or faculty at Roseman University of Health Sciences.

### **Promotion of Technology and Maturity of Effort**

The project was launched during the 2012-2013 academic year with the Director of dental research and the information technology operations director. The project began with refining the concept of the project management life cycle where task assignment and documentation had a more interactive approach. While there are existing management products available to help with some of the tracking, there wasn't one that had all of the needed tools and flexibility in one application that would meet the needs of the AEODO/MBA residency program.

Roseman University of Health Sciences had established its intranet and student portal on the SharePoint platform so the infrastructure already existed to create a custom project portal for the AEODO/MBA residency program. Additionally, the direct link to Active Directory provides the needed security, but still gave the convenience for users with using one set of login credentials. This connection provides the environment for consistent support on a technology level where end users already know what to do when they need help with logging into Roseman University of Health Sciences' resources. The project portal also utilizes audience targeting to simplify how the end users see their data. The result is an end user logging in and only seeing the site(s) they need to see to avoid any confusion.

This project morphed into providing separate project sites for select faculty and staff to manage their own projects, which was launched in the 2014-2015 academic year.

### **Quality, Performance, and Productivity Measurements**

The research requirement involves a fairly complex and lengthy process which posed a significant data management challenge to the research administrators. Each research project entails seven milestones and the overall project can take two to three years for completion. In order to complete and prove competency in each of these milestones, the documents involved go through 10 to 40 revisions depending on the topic, the writing skills, and the milestone. With 30 resident ongoing projects each with seven milestones, control and access to up to 1,000 documents with important research data was necessary.

With multiple committee members providing feedback on each milestone, access to version history was necessary for research administrators. Prior to the launch of this project management application, there was a heavy reliance on email correspondence and face-to-face discussions, which delayed the overall research processes. When a document was emailed to multiple committee members, revisions by each of them and independent email correspondence sometimes made the process confusing. In order to eliminate this duplication of efforts, a "check-in, check-out process" was introduced that allowed only one committee member to edit the document at any given time. A log of comments also allowed for better correspondence between committee members and allowed better utilization of researcher time.

The portal provides a date-and-time stamp of every document uploaded and every task that is assigned. This was used to determine productivity. Each resident portal page is monitored to determine if the resident is progressing within their research project requirements.

Research productivity and outcomes were measured based on criteria such as number of publications, timely completion of research projects, quality of the projects, and collaborative potential

among other features. A retrospective review of research outcomes was conducted comparing the earlier Traditional Approach (2008-2012) with the recently launched Project Management Application Approach (2013-2014). Based on these pilot observations, the significant improvement in research productivity was overwhelmingly in favor of the project management application. The biggest challenge with the traditional approach was the time management. A close inspection showed that the initial brainstorming phase involved in identifying a research project was the biggest challenge for most residents. The feedback collected from residents each year also reinforced this challenge. The asynchronous chat feature was implemented to address this issue. The ability to return to the research discussion as many times as needed enabled the resident's ability to comprehend the information. Moreover, the online discussion aspect improved the approachability of mentors in a timely manner.

### Cost, Benefit, and Risk Analysis

As a part of the university's licensing agreement with Microsoft, Roseman already had SharePoint. There weren't any additional server hardware requirements either due to us already having an established SharePoint environment. The direct costs associated with this project were the consulting, project management, and architect build-time of the project portal as well as each individual site, which were approximately 200 hours. Throughout the various phases of the project, the time spent on Roseman's side with project management and application testing was approximately 30 hours.

While the initial build took a tremendous amount of work up front, the

end result provided a flexible and robust system for all of the residents' information with minimal work for the end user. The current state of maintenance is that it takes Technology Services approximately 30 minutes to an hour to build and configure to the specific resident. For historical purposes, resident sites are archived rather than reusing them for a new resident.

### Customer Satisfaction/Results To Date

The Director of dental research provides group and one-on-one training with the residents. The residents provide regular feedback about the process with her. Feedback is also provided in written format via email.

of the user-reported challenges.

As expected, when the service was first launched there was a huge resistance to change from the traditional method to the primarily online interface of research workflow. Within 3 months, the users started to recognize the significant benefits of having a central hub for research activity. The asynchronous chat feature, in particular, was identified by residents and mentors as most useful in streamlining the research workflow. Significant training was necessary for the older faculty mentors in particular. Their feedback was more positive after the first year when a follow-up project for an archived project was planned. The ability to search through existing research threads

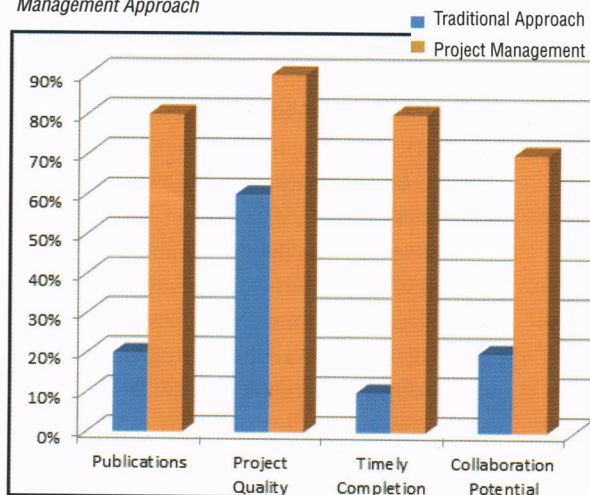
and to pull up a discussion from one year ago with various researchers on a particular subject was reported to be extremely valuable. The overall productivity has significantly improved, especially for the research administrators.

The majority of the challenges encountered in the beginning were browser related, as this is how the product is accessed. Some of the features and functionality are lost or do not appear as intended when not utilizing Microsoft's browser, Internet Explorer (IE), because SharePoint is a

Microsoft product. Resetting browser cache and instructing users of the risk associated with not using IE were the resolutions. Additional issues of permissions and audience targeting came up as well in the beginning which were resolved with training.

*For more information about this project, contact Laura Jarrett, Information Technology Operations Director, Roseman University of Health Sciences. ljarrett@roseman.edu*

Figure 1. Traditional Approach versus Project Management Approach



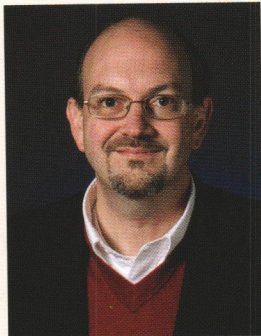
Based on the feedback, the learning curve appeared to be steep, especially for older faculty who are used to the more traditional approach of face-to-face discussions and hand-written reviews. Extensive training was provided to all users to resolve this issue. Users who had continued challenges were tracked based on their usage of the project interface. Additional focused training was offered to such individuals. Routine audits, focused training, and sharing of the positive research outcomes have all helped tremendously in addressing the majority

## Snapshots

### Abilene Christian University

*Arthur Brant*

With respect to the cloud, Abilene Christian University has been engaged in this conversation for many years. Our first significant adoption of cloud services came in 2007 when we made the decision to move email services to Google for faculty, staff, and students. This decision was complex and involved multiple points of consideration such as security and reliability.



Probably the most difficult aspect of this decision, specifically associated with our IT group, was addressing the perception that outsourcing services meant we were giving up control. In essence, we were altering how we controlled or managed services. This change required us to be more attentive to service-level agreements, contracts, and procedures that facilitated interactions with service providers. Resetting the expectations of control and highlighting the benefits and feature sets available with moving services to the cloud has been the biggest benefit of that decision.

Today, most applications decisions include a conversation regarding whether the application should be hosted locally or in the cloud. Faculty and staff desktop backups, the university's learning management system, and conference-calling services are among the many applications that ACU has moved to the cloud. Thus far, most of the decisions are application specific as opposed to computer or server specific. The hurdle we've encountered with moving computer resources (essentially moving to cloud servers), is that we don't have good metrics that would help us to make informed decisions about the cost of moving servers or computers to the cloud. ACU's system administrators are currently working to better understand east/west traffic, so that we can forecast the financial implications and opportunities associated with this facet of cloud computing.

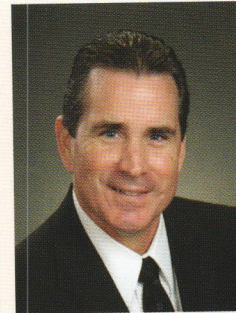
### Boston College

*Joe Harrington*

At Boston College we are taking a slow approach to moving applications and services to the cloud. One of the areas we have spent the most time and effort on has been in disaster recovery. Each April, members of the IT systems, network, and security teams conduct a disaster recovery exercise and simulate recovering our highest-priority applications and services. Each year we add a couple of new applications to the list and continue to push the envelope.

For this exercise we subscribe with a third-party "cold" site in New York. Once we give them the call that we are starting our simulation, they get busy building the virtual server environment. Tapes are overnighted from our backup provider and delivered to the site. Several IT staff members travel to the site to oversee and conduct the recovery of 30 to 40 key business applications. In the past couple of years, we have used Amazon Web Services to build some of those services in the cloud. Since that environment is virtual, both from a server and a network device standpoint, there has been a learning curve to fully understand using this remote environment and getting it configured to work between our third-party New York cold site location and the main campus data center.

We expect that more and more applications can be recovered quickly and securely from a hosted cloud environment. Before going further we are concentrating our efforts on making sure the data and connections between locations are all locked down and secure.



### Smith College

*Sharon Moore*

We moved our email to the cloud with Google Apps for Education (GAFE) in 2012 and have been very satisfied with it. With the recent upgrades to Drive in GAFE, we have decided to standardize on Drive as our supported cloud storage and collaboration option. We are also implementing Nasuni as cloud back-up for our on-site network-attached storage. On the voice side, we are planning on moving our speech-recognition directory service from a premises-based system to a hosted/cloud service over the summer.

# 2015 Award Winners

At the Annual Conference each year, ACUTA is proud to recognize some members who have contributed their time and talents in very special ways. Here are the three people who were honored in 2015 for giving their best efforts to strengthen ACUTA and make the association more valuable for everyone.

## Awards Committee

Chair: Ron Kovac, PhD, Ball State Univ.

Eric Alborn, Univ. of Wisconsin-Madison

Christian Boniforti, Lynn University

Frank Cafasso, Wagner College

Scott Claverie, California State Univ., Chico

Kurt Faszholz, Taqua, LLC

Scott Genung, The University of Chicago

Becky Goudy, e2Campus by Omnilert, LLC

Christopher Megill, The George Washington Univ.

Christine Mulvey, Marist College

### Ex-Officio

Mark Reynolds, ACUTA President, Univ. of New Mexico

Corinne Hoch, ACUTA CEO

Lisa Thornton, Staff Liaison

The ACUTA awards program is just one of many benefits of the association. If you know a campus that is not a member of ACUTA, invite them to become a part of the network. Although your invitation to your peers is much more significant, the office staff will be happy to follow up on your suggestions for new members. Just call Lori Dodson at 859/721-1658 or email [ldodson@acuta.org](mailto:ldodson@acuta.org).



## Bill D. Morris Award Sharon Moore Smith College

As ACUTA members know, the Bill D. Morris Award represents our highest level of recognition. The recipient, in the estimation of the president, exemplifies the dedication, vision, professionalism, and leadership that Bill brought to this organization as ACUTA president.

Sharon Moore, this year's recipient, has proven her dedication to ACUTA and to higher education and continues to prove it. A UMass graduate, she worked with AT&T for 13 years, specializing in higher-education equipment and accounts before joining Smith College in 2002.

Throughout my 30+ years with ACUTA, I have met many brilliant people, including Sharon. Among those who deserve this award, she stands out, in my opinion.

She has been attending ACUTA for over 20 years at conferences, seminars, webinars, and Just-in-Time Roundtables. During that time she worked behind the scenes as a committee member, as chair of the Corporate Liaison Committee from 2007 to 2010, and in an executive leadership role as director-at-large for two consecutive terms. She has participated in various task forces and special projects, including Board Liaison to the Environmental Scanning Committee that lasted two years because she was so much help to them, even while she was board liaison to other committees.

In her words: "I've been struck by the openness and collaborative nature of ACUTA members and have always found the ACUTA community to be an excellent resource for information. The strength of any organization lies in its members, and that is especially true for ACUTA. As an active, longtime ACUTA member, I have benefited firsthand from the special mix of technical resources, professional network, and social circles that is the ACUTA community."

Sharon is not only a friend, peer, and mentor but much more. When she is quiet, you wonder, "What is she thinking?" And when she speaks, you understand how articulate, smart, and charismatic she is. I am pleased to present this year's Bill D. Morris Award to ACUTA director-at-large and deputy CIO at Smith College, Sharon Moore.

## Ruth A. Michalecki Leadership Award

### Jennifer Van Horn

Indiana University Kelley School of Business

This award was created in 2001 to recognize outstanding leadership among the ACUTA membership and to honor the memory of ACUTA past president Ruth A. Michalecki, formerly of the University of Nebraska Lincoln, for her leadership of ACUTA and the communications technology profession. Nominees must be ACUTA institutional members, associate members, or corporate affiliates.

This year the Awards Committee selected Jennifer Van Horn of Indiana University's Kelley School of Business as the recipient for 2015.

Jennifer has a long history of volunteering for ACUTA. She has served the association as a presenter on numerous occasions, as program chair, director-at-large, and as president. As president, Jen assisted in the planning, coordination, and execution of the strategic planning retreat. The plan that resulted had many recommendations that have since been approved by the board and implemented. She also formed several task forces as president, one of which was asked to take a hard look at the current seminar/conference live-event format. Through Jen's leadership the recommendations of that task force have re-directed ACUTA on a new course.

Jennifer has been a leader in ACUTA for a long time, contributing in every way possible. She is a trusted adviser to many members of the association. She has worked tirelessly and does everything she can to contribute to the success of ACUTA. She is a great example for all those who follow in her footsteps, personifying the values and characteristics of a leader in every way.



## Jeri Semer Volunteer Recognition Award

### Jerry Krawczyk

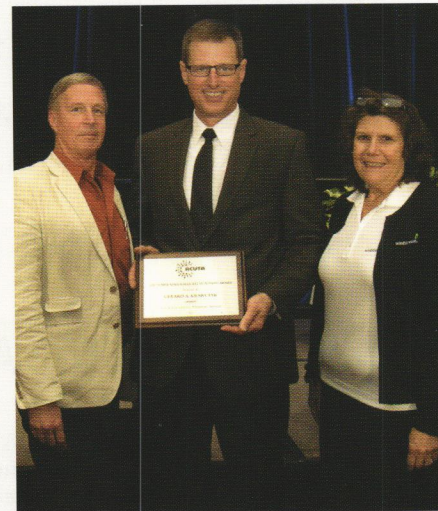
Pennsylvania State University

This award is granted to a member who has provided extraordinary service during the year but is not a board member or a committee chair. The award was established in 2012 to honor the late Jeri Semer, ACUTA executive director from 1994 to 2011, who saw the future of the organization reflected in its active members, and who did much to foster the growth of our extensive volunteer program.

In the opinion of the Awards Committee, Jerry Krawczyk has surpassed expectations in volunteering his time and efforts for ACUTA. If you have attended an ACUTA event in the last year, odds are you have met him. Not only has he consistently been there, he has always been willing to moderate, contribute to discussions, and present. He always makes sure that his institution is well represented, bringing others from his campus to events as well.

Jerry is also active on ACUTA's listserv. In August, the Program/Content Committee was challenged to identify a new "just-in-time" format where topics that generate a certain amount of traction or responses from the listserv could be elevated into an interactive discussion. One hundred sixty-one ACUTA members posted a total of 492 comments/responses to the ACUTA listserv between July 2013 and August 2014, and Jerry was the second-most-active member during this time period, accounting for 5.5 percent of the comments. He was second only to ACUTA president Mark Reynolds.

On the Program/Content Committee, Jerry is also a consistent contributor when it comes to identifying potential speakers and session ideas, and we all know that we can rely upon him. He has truly gone above and beyond to serve ACUTA, bringing new ideas and opportunities to the entire ACUTA membership.



## Advertiser's Index

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By advertising in the *ACUTA Journal*, these companies are not only promoting products and services relevant to information communications technology in higher education, they are also supporting our association. As you have opportunity, we encourage you to mention to these companies that you saw their ad in our journal and that you appreciate their support of ACUTA.

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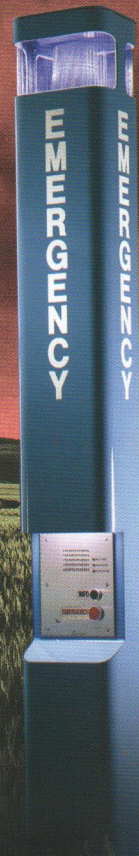
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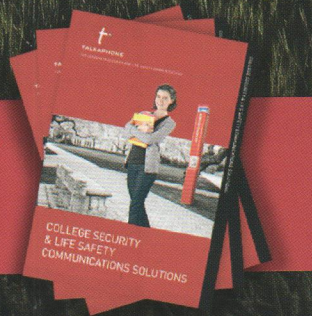


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