

Fall 2012

# ACUTA Journal of Telecommunications in Higher Education

Follow this and additional works at: <http://digitalcommons.unl.edu/acutajournal>

---

"ACUTA Journal of Telecommunications in Higher Education" (2012). *ACUTA Journal*. 63.  
<http://digitalcommons.unl.edu/acutajournal/63>

This Article is brought to you for free and open access by the ACUTA: Association for College and University Technology Advancement at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in ACUTA Journal by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.



Fall, 2012  
Vol.16, No. 3

**acuta**

# Journal

of Information Communications Technology in Higher Education

Published by The Association for Information Communications Technology Professionals in Higher Education



In This Issue:

## **Virtual Computing: Life in the Cloud**

Making Dollars and Sense Out of  
Cloud Computing

VoIP Meets the Cloud

Surfing the Wave of Cloud Computing

Cloud E-Mail Momentum Swells



# Own Your Future

- Best-of-Breed UC Solutions
- Industry Leading Interoperability
- Deploy at Your Own Pace
- Three Decades of Innovation

AVST has been enhancing campus communications for three decades. We have extensive experience in making the most of your current infrastructure while providing you with your best options for the future.

Visit our educational campus resource center at:

[www.avst.com/education](http://www.avst.com/education)

Protect your past and define your future with AVST.

**AVST is  
Unifying Communications**

To learn more, visit:  
**[www.avst.com/education](http://www.avst.com/education)**



# Events Calendar

Event	Date	Location
Fall Seminar	October 14–17, 2012	Hilton Americas Houston, Texas
Winter Seminar	January 13–16, 2013	Hyatt Regency Tampa, Florida
Annual Conference	April 14–17, 2013	Manchester Grand Hyatt San Diego, California
Fall Seminar	October 6–9, 2013	Renaissance Grand Hotel St. Louis, Missouri

ACUTA's Core Purpose is to support higher education information communications technology professionals in contributing to the achievement of the strategic mission of their institutions.

ACUTA's Core Values are:

- Encouraging and facilitating networking and the sharing of resources
- Exhibiting respect for the expression of individual opinions and solutions
- Fulfilling a commitment to professional development and growth
- Advocating the strategic value of information communications technologies in higher education
- Encouraging volunteerism and individual contribution of members

**acuta**

The Association for Information Communications  
Technology Professionals in Higher Education



# Contents

Fall 2012 • Volume 16 Number 3  
Virtual Computing:  
Life in the Cloud

---

## FEATURES

---

### 10

#### Making Dollars and Sense Out of Cloud Computing

Phillip Beidelman

Beidelman explains the basic concepts of cloud technologies and reports some of his own observations of cloud applications in higher education. He also comments on the potential of the cloud and identifies some cautions.

### 14

#### Surfing the Wave of Cloud Computing

Curt Harler

Harler talks to four campuses to learn what impact the cloud is having on their department and how they provide services. Data ownership, cost savings, and security are three of the big issues everyone faces.

### 18

#### VoIP Meets the Cloud

Walt Magnussen

The marriage of VoIP and the cloud began in 2011. Magnussen describes the past, present, and potential for the future in this article.

### 26

#### A Quick Look at Cloud Computing in Higher Education, 2012

Jan-Martin Lowendahl

This article from Gartner provides an overview of cloud computing in higher ed today, including the current status as well as predicted opportunities and challenges.

### 30

#### Cloud Computing: Is the Forecast Bright or Overcast?

Thomas G. Dolan

Clouds are forming over Cal State Long Beach, Southern Connecticut State, University of Idaho at Moscow, and Illinois State at Normal. Hear what they have to say about the current conditions and the forecast.

### 33

#### Cloud E-Mail Momentum Swells

Paul Korzeniowski

Korzeniowski talked with Abilene Christian University, Washington State, and CUNY to learn more about the growing number of campuses implementing cloud e-mail.

### 36

#### Institutional Excellence Award:

Elon University

Virtual Computing Initiative

### 39

#### Individual Awards

- Bill D. Morris Award: Carmine Piscopo
- Ruth A. Michalecki Award: Jeanne Jansenius
- Jeri Semer Volunteer Recognition Award: Arthur Brant



©iStockphoto.com/Jesus Sanz

---

## COLUMNNS

---

### 6

#### President's Message

Jennifer Van Horn

Indiana University

### 8

#### From the Executive Director

Corinne Hoch, PMP

### 23

#### Q&A with the CIO

Marc Hoit, PhD

North Carolina State University

---

## ADVERTISERS' INDEX

---

### 40

Thanks to the companies that support ACUTA by advertising in our journal.





# OUR PRODUCTS HELP YOU BRAVE THE STORM.

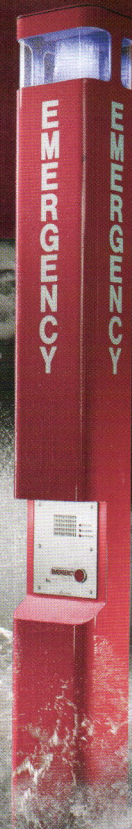
OUR SUPPORT HELPS YOU SAVE THE DAY.

ONLY TALK-A-PHONE PROVIDES THE  
DEDICATED SUPPORT YOU NEED FOR  
VIRTUALLY ANY SITUATION — STANDARD.

*"[After the hurricane] all Talk-A-Phone emergency  
phones were still functioning — even after being  
completely submerged in water and beaten hard  
by the debris and wind!"*

*- William Eggers, LPC, Inc.*

Discover the Talk-A-Phone difference.  
Get the full story at [www.talkaphone.com/oyster](http://www.talkaphone.com/oyster)  
or call 773-539-1100.



TALK-A-PHONE CO. | EMERGENCY COMMUNICATION | MASS NOTIFICATION | AREA OF RESCUE



TALK-A-PHONE'S VOIP-500 SERIES PHONE  
has tested compatible with Cisco UCM 7.1 and UCM 8.6.  
Go to [www.cisco.com/go/compatibledisclaimer](http://www.cisco.com/go/compatibledisclaimer) for  
complete disclaimer.

TALK-A-PHONE PROUDLY PARTNERS WITH:







The cloud is like a windup toy. Right now, it's all wound up, active, and in motion. . . but nobody knows what direction it is headed.

*Curt Harler, page 14*

## The ACUTA Journal of Information Communications Technology in Higher Education

---

### *Published Quarterly by*

ACUTA: The Association for Information Communications Technology Professionals in Higher Education  
152 W. Zandale Drive, Suite 200  
Lexington, KY 40503-2486

PHONE 859/278-3338  
FAX 859/278-3268  
E-MAIL [pscott@acuta.org](mailto:pscott@acuta.org)

*Publisher*  
ACUTA

*Editor-in-Chief*  
Pat Scott, Communications Director

*Contributing Editor*  
Curt Harler

*Advertising Sales*  
Amy Burton, Director, Strategic Relations  
859/278-3338 or e-mail: [aburton@acuta.org](mailto:aburton@acuta.org)

### *Submissions Policy*

The ACUTA Journal welcomes submissions of editorial material. We reserve the right to reject submissions or to edit for grammar, length, and clarity. Send all materials or letter of inquiry to Pat Scott, Editor-in-Chief. Author's guidelines are available upon request or online at [www.acuta.org](http://www.acuta.org).

The opinions expressed in this publication are those of the writers and are not necessarily the opinions of their institution or company. ACUTA, as an association, does not express an opinion or endorse products or services.

The ACUTA Journal is published four times per year by ACUTA, a nonprofit association for institutions of higher education, represented by communications technology managers and staff.

Contents of this issue of *The ACUTA Journal* are copyrighted: ©2012, ACUTA, Lexington, Kentucky.

ISSN 2151-3767

POSTMASTER, send all address changes to:

ACUTA  
152 W. Zandale Drive, Suite 200  
Lexington, KY 40503-2486  
Postage paid at Lexington, Kentucky.

Learn more about ACUTA at [www.acuta.org](http://www.acuta.org)

### *Membership and Subscriptions*

Subscriptions are provided as a benefit of membership. The publication is available to nonmembers for \$80 per year or \$20 per issue. For information, contact Michele West, Membership Services Director, 859/278-3338, ext. 222, or e-mail [mwest@acuta.org](mailto:mwest@acuta.org).

### ACUTA

#### 2012–2013 Board of Directors

##### *President*

Jennifer Van Horn, Indiana University, Bloomington

##### *President-Elect*

Ron Kovac, PhD, Ball State University

##### *Secretary/Treasurer*

Riny Ledgerwood, San Diego State University

##### *Immediate Past President*

Joseph E. Harrington, Boston College

##### *Directors-at-Large*

Randy Hayes, University of Northern Iowa

Walt Magnussen, PhD, Texas A&M Univ., College Station

Dan McCarriar, Carnegie Mellon University

Sharon Moore, Smith College

Mark Reynolds, University of New Mexico

##### *Executive Director*

Corinne Hoch, PMP

### *Publications/Media Committee*

Jeanne Jansenius, Sewanee: The Univ. of the South, Chair  
Buck Bayliff, PCR

Mona Brennan-Coles, Western University

Giselle Collins, British Columbia Institute of Technology

Keith Fowlkes, University of Virginia, Wise

Mark Herro, Texas A&M

Jeanne Kellogg, Colgate University

Jeanne Spinosa, Johnson & Wales University

Doug West, University of Richmond

##### *Ex Officio*

Jennifer Van Horn, Indiana University, Bloomington

Corinne Hoch, PMP, ACUTA Executive Director

Janice Bundy, UCLA, Chair, Social Networking, New Media,

and Web Resources Subcommittee

Amy Burton, ACUTA Director, Strategic Relationships

##### *Board Liaison*

Walt Magnussen, PhD, Texas A&M Univ., College Station

##### *Staff Liaison*

Pat Scott, ACUTA Communications Director

### *Editorial Review Board*

James S. Cross, PhD, Longwood University (Retired)

Mike Grunder, Vantage Technology Consulting Group

Ray Horak, The Context Corporation

Jeanne Jansenius, Sewanee: The University of the South

Walt Magnussen, PhD, Texas A&M University

Dave O'Neill, SUNY Empire State College

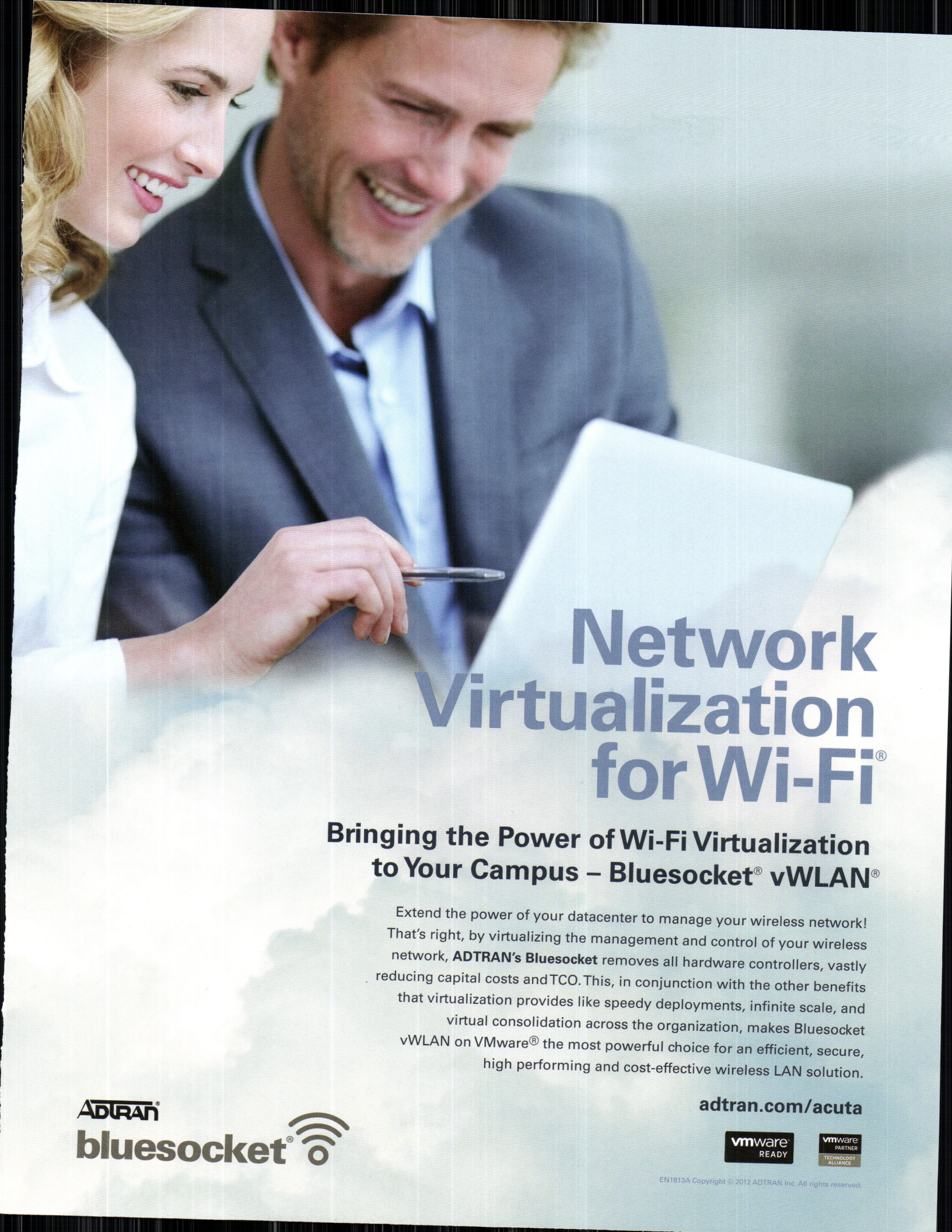
Cindy Phillips, Northern Illinois University

Carmine Piscopo, RCDD, Providence College

Patricia Todus, Northwestern University (Retired)

Pat Scott, ACUTA Communications Director





# Network Virtualization for Wi-Fi<sup>®</sup>

**Bringing the Power of Wi-Fi Virtualization  
to Your Campus – Bluesocket<sup>®</sup> vWLAN<sup>®</sup>**

Extend the power of your datacenter to manage your wireless network! That's right, by virtualizing the management and control of your wireless network, **ADTRAN's Bluesocket** removes all hardware controllers, vastly reducing capital costs and TCO. This, in conjunction with the other benefits that virtualization provides like speedy deployments, infinite scale, and virtual consolidation across the organization, makes Bluesocket vWLAN on VMware<sup>®</sup> the most powerful choice for an efficient, secure, high performing and cost-effective wireless LAN solution.

[adtran.com/acuta](http://adtran.com/acuta)

**ADTRAN<sup>®</sup>**  
**bluesocket<sup>®</sup>** 

**vmware**  
PARTNER  
READY

**vmware**  
PARTNER  
TECHNOLOGY  
ALLIANCE



## PRESIDENT'S MESSAGE

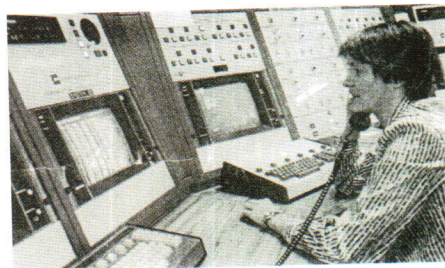


JENNIFER VAN HORN  
INDIANA UNIVERSITY  
ACUTA PRESIDENT  
2012–2013

## Desktop Management and Virtualization

Those of us who are baby boomers remember starting our careers using the old green-screen CRTs connected to main-frame computers. I started with United Airlines in the late 1970s, and we used CRTs to connect to the “Denver Central Site” for all reservations, flight check-in, and seat assignments. The Denver Central Site was a huge computer complex that housed all the rows and rows of cabinets that at the time made up one of the largest private computer systems in the world. The CRTs were dumb terminals that received all their intelligence remotely.

Below is a picture of me working in the United Airlines Network Operations Center surrounded by CRTs.



Fast forward 30-plus years and we are at a new juncture of computing where we have the old model of getting intelligence remotely, but now it isn't just a CRT but *any* device. Enter the world of desktop management and virtualization.

There is a huge interest in desktop virtualization technology today because of the promises of improved management and flexibility. Virtualization makes it easier to manage PCs, provision new desktops, push out patches, and enforce security policies. Users get the flexibility of accessing hundreds of software resources from any location and any device.

Indiana University (IU) recently received one of the ten 2012 *Campus Technology Innovators* awards in the IT Infrastructure and Systems category for its project titled “IUanyWare.” The project lead for this is Duane Schau, director, leveraged support. I spoke with him recently about his project. IUanyWare is a client virtualization service that allows students, faculty, and staff at IU to run centrally located software over a network on almost any

popular device. IUanyWare includes more than 200 software titles such as Microsoft Office and Adobe and statistical and mathematical software including some formerly available only in certain computing labs.

IUanyWare came out of IU's second IT strategic plan, Empowering People, which called for IT efficiencies and effectiveness and stated that technologies such as desktop virtualization should be explored to help reduce the costs and extend the lifecycles of personal computing devices. This created a starting point of a new computing model that identifies common-good services to reduce compute cycle overhead including enterprise application delivery and enterprise machine management. Reducing desktop support needs allows IU to deploy those resources and dollars to more strategic and innovative initiatives.

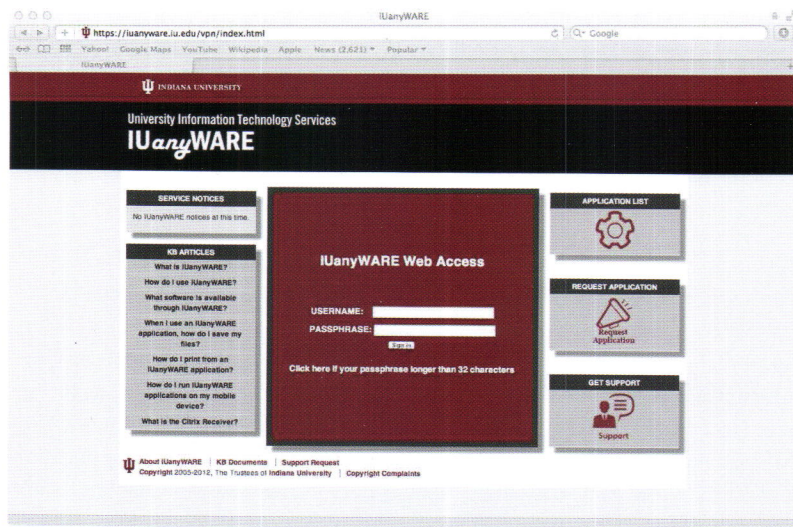
IUanyWare was launched in March 2011 and went into production on July 10, 2012, after a 10-month beta deployment. (See Figure 1.) It all started with a committee of 118 IT staff from all departments and schools across IU that was tasked to determine if a solution based on virtualization was feasible. Committee members tested and compared three vendor prototypes that were built on-site in actual-use cases to find the best fit for IU's needs.

The IU solution incorporates several vendor products but is based mainly on Citrix and Microsoft technologies. The fundamental Citrix product is XenApp, a centrally hosting and application server that presents the applications to any device including PC, Mac, iOS, Android, Linux, and Chrome. Most of the available applications are stored on a Microsoft App-V hub on Dell servers, and some applications require local installation on the XenApp server. The management and application delivery is done with Microsoft SCCM 2012. Figure 2 is a diagram of the IUanyWare architecture.

According to Schau, the storage environment is key to the success of virtualization. An important criteria was to have an easy

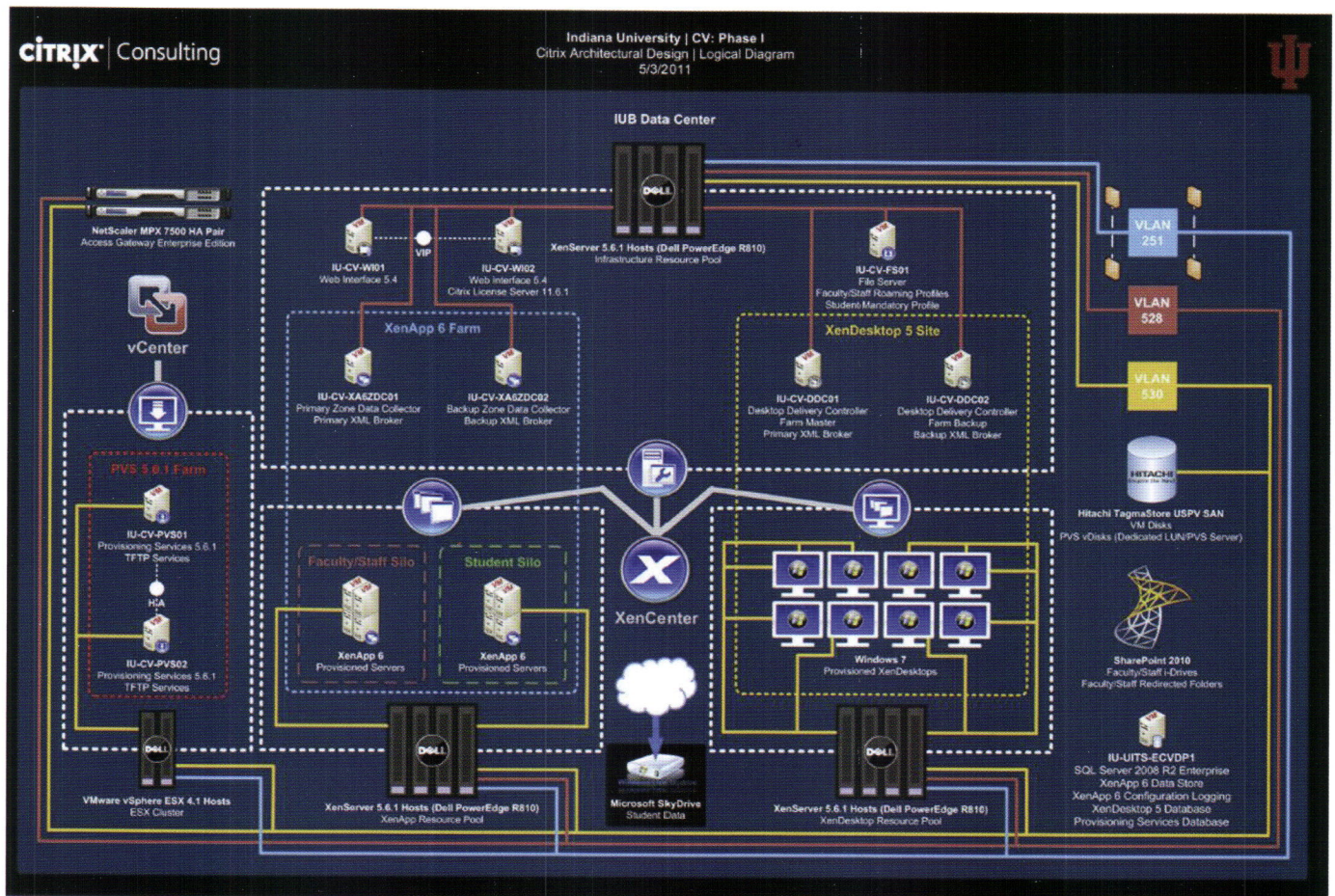


Figure 1. IUanyWare went into production on July 10, 2012.



way to access user files when using IUanyWare. IU developed the Cloud Storage Configurator to accommodate easy storage access with IUanyWare. The application provides a storage organization inside IUanyWare that allows the end users to define their favorite storage medium whether on or off premises. Application users can choose storage preferences of IU Box service, SharePoint My Site, IU File Share, or Dropbox. Box provides a 50 GB storage environment, IU File Share is dependent on the department, and DropBox's default storage is minimal and additional storage can be purchased by the user.

Figure 2. The IUanyWare architecture



IUanyWare is very popular with the IU Kelley School of Business graduate students because it solves the problem of crowded technology labs and of students having to go to certain labs to use specialized software. Now, instead of coming to campus to use the computing labs, they can access the applications on the go with their iPhone or iPad or from their home computer.

Schau comments, "In the next 18 months, we will see the effects of IT consumerization bringing forth an expanded proliferation of devices and operating systems. Faculty and students will bring two or three network devices with an expectation that they will have access to their scholarly information on those devices. Our virtualization environment provides certainty and trust that lesson plans associated with instruction will not require modification because their Windows applications can be used on any device whether Android, iOS, Linux, Chrome, and other systems providing a native user experience."

For IU, desktop management and virtualization are delivering on the promises of on-demand, ubiquitous access to applications, making the cycles of software upgrades, patches, and security updates transparent, and using less-powerful and less-costly desktop devices thus extending IU's lifecycle dollars. This is the new computing model, one that is old but new in so many wonderful ways.



FROM THE EXECUTIVE DIRECTOR



CORINNE HOCH, PMP  
ACUTA EXECUTIVE DIRECTOR

## Who's Moving to the Cloud? The Government, ACUTA, and Some of You!

Ken Salomon (principal, Dow Lohnes, PLLC) recently shared a report with the ACUTA Legislative/Regulatory Affairs Committee that reveals the parallel efforts of our governmental agencies' cloud computing efforts. In December 2010 the White House Office of Management and Budget (OMB) issued a "Cloud First" policy as part of a comprehensive effort to increase the operational efficiency of federal technology assets. The policy mandates that federal agencies implement cloud-based solutions whenever a secure, reliable, and cost-effective cloud option exists and that they migrate three technology services to a cloud solution by June 2012. In July 2012 the U.S. Government Accountability Office released its status report, Information Technology Reform, and found that progress has been made, but future cloud computing efforts should be better planned.

According to the report, cloud computing provides on-demand access to a shared pool of computing resources; can be provisioned on a scalable basis; and has the potential to deliver services faster, more efficiently, and at a lower cost than custom-developed systems.

The following common challenges to cloud computing are cited:

1. Meeting federal security requirements
2. Obtaining guidance
3. Acquiring knowledge and expertise
4. Certifying and accrediting vendors
5. Ensuring data portability and interoperability
6. Overcoming cultural barriers
7. Procuring services on a consumption (on-demand) basis

The report provides the following overview of cloud computing:

Cloud computing takes advantage of several broad evolutionary trends in IT, including the use of virtualization. It is a means "for enabling convenient, on-demand

network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction," according to the National Institute of Standards and Technology (NIST). NIST also states that an application should possess five essential characteristics to be considered cloud computing: on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. Essentially, cloud-computing applications are network based and scalable on demand.

According to the OMB, cloud computing brings a wide range of benefits:

- Economy
- Flexibility
- Speed

According to NIST, cloud computing offers three service models:

- Infrastructure as a service
- Platform as a service
- Software as a service

NIST has also defined four deployment models for providing cloud services: private, community, public, and hybrid.

Of special interest to higher-education IT leaders may be the types of services selected by the federal agencies to migrate to the cloud:

- Business process management
- Correspondence/audit resolution tracking
- Data center services: e-mail, production infrastructure, development test, workplace, SharePoint, project server, customer relationship management, business intelligence
- Electronic library
- Employment verification
- Grants solutions
- Human resources (performance management)
- LAN/WAN, off-site vaulting
- Medwatch



- Power management services
- Program management
- Website hosting

The entire report may be viewed at <http://www.gao.gov/products/GAO-12-756>.

In this issue of the *Journal*, you will learn how several campuses are approaching life in the cloud, which will help you with your own cloud decision making as you explore and evaluate innovative solutions.

One of our roundtable discussion questions at the 2012 ACUTA Business Meeting in Indianapolis was “To what extent have cloud services come to your schools?” The majority of the attendees responded that they provide student, faculty, staff, and some alumni e-mail via a cloud service.

Many schools are looking at a way to access e-mail and calendars, office Web applications, instant messaging, conferencing, and file sharing, such as via Microsoft 365. Others are exploring the possibility of cloud-sourcing such services as these:

- VoIP
- Videoconferencing
- Desktop virtualization
- File storage
- Web servers
- LMS
- Emergency management
- Accounting
- Other application-specific services

Some schools are looking into the development of providing internal cloud services, some are not interested in cloud computing at all, and everyone shares concern about privacy and security with cloud management.

Aaron Fuehrer, ACUTA director of IT, uses cloud management in the following creative ways for the ACUTA office:

- E-mail for remote-office employees: a simple solution for routing e-mail messages to and from an employee who is working outside the Lexington headquarters

- ACUTA Community: links our association database in the Lexington office to the ACUTA website in the cloud with a single sign-on (with one username and password granting access to all ACUTA Web services)

- ACUTA webinar service: an enhanced, cost-effective method of providing enriching, hot-topic webinars for the ACUTA community in a timely manner

- Lecture capture and streaming: a way of augmenting the membership experience by providing anytime/anywhere access to selected ACUTA programs that are now videoed on-site at ACUTA events and available at no additional charge to all registered attendees

- ACUTA mobile app: Our desire to meet attendees’ expectations for fast, easy, custom information and networking opportunities, and to increase the value of the conference to our exhibitors and sponsors, led to our launch of the ACUTA mobile app at the 2012 Annual Conference.

Fuehrer continues to explore other cloud-hosted opportunities for the ACUTA office, such as the provision of Internet access and VoIP services, to expand membership opportunities and capitalize on organizational cost savings and containment.

Please contact me ([choch@acuta.org](mailto:choch@acuta.org)) with any questions about the details of the ACUTA cloud experience.



*“The measure of a man  
is what he does with power”*  
Plato

## How will you power your network upgrade?



PowerDsine® midspans offer:

- Enhanced student information sharing
- Improved campus security
- Lowest total cost of ownership
- Reduced carbon footprint with innovative PowerDsine Green PoE technology



**PowerDsine PoE Systems**

Learn more at: [www2.microsemi.com/powerdsine](http://www2.microsemi.com/powerdsine)  
Or email: [powerdsineusa@microsemi.com](mailto:powerdsineusa@microsemi.com)

 **Microsemi**  
Power Matters.

© 2012 Microsemi and PowerDsine are trademarks of Microsemi Corporation.



# Making Dollars and Sense out of Cloud Computing

Phillip Beidelman  
WTC Consulting, Inc.

Making dollars and sense out of cloud computing: How does one do that? Although there are many examples of economic advantages associated with some cloud-based applications such as e-mail, document sharing, and some forms of data storage, I cannot report experientially that the cloud is always a sure bet for enterprise services based on cost performance.

The popular wisdom says that using the cloud is cheaper, but lower cost turns out not to be the compelling reason for cloud adoption at the enterprise level. While the expectation of lower cost may catch everyone's attention, accelerating delivery of services and allowing us to do things we otherwise cannot do are often the more compelling reasons for adoption.

To make some sense of the current state of cloud computing with an emphasis on the financial aspects, I will establish a context for my comments by first introducing basic concepts and vocabulary peculiar to cloud technologies. Next, I will report what WTC as a consulting firm has observed in higher education regarding the cloud, including what is driving interest in this area. I will close with comments about the potential role of the cloud within our institutions, along with some cautions.

## Basic Concepts and Vocabulary

Using a cloud to characterize access to an undefined set of computing resources finds its roots in many early technologies. I recall in the late 1970s and early 1980s using cloud symbols with telecommunication engineers to denote the idea of large networks using cloud images to show then-emerging virtual private network technology. The underlying cloud concept dates back to the 1950s with large-scale mainframes. It was common to share physical computer access from multiple

terminals to drive down the cost of cycle time. The thought was then—as it is today—to depict pooled technology resources as an abstraction of the underlying infrastructure. The use of a cloud showed where the dividing line was between the provider and the user. Cloud computing now extends this boundary to cover servers as well as the network infrastructure commonly found in the Internet.

A good contemporary definition is the one developed by Gartner, Inc., and used by the EDUCAUSE Center for Applied Research, which describes cloud computing as “a style of computing where massively scalable, IT-enabled capabilities are delivered as a service via the Internet.”

The National Institute of Standards and Technology (NIST) goes a bit further and gives us more structure by defining the cloud as “a model for enabling ubiquitous, convenient, on demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” (see *NIST Special Publication 800-145*).

So much for definitions. What matters is that all cloud services are not created equal and that NIST establishes that all cloud models share five essential characteristics and have three service models and four deployment models. Let's start with the essential characteristics.

## Essential Characteristics

Cloud services have five characteristics:

1. On-demand self service. You can easily access the service from just about anywhere at any time.



2. Broad network access. Access can be both fixed and wired, slow and fast, and again, ubiquitous.
3. Resource pooling. There must be a common set of resources shared by many users.
4. Rapid elasticity. Growing and shrinking on demand so that you get what you need when you need it.
5. Measured service. Ideally you will pay for only what you use.

#### Service Models

These five characteristics are applied against three broad service models: software as a service (SaaS); platform as a service (PaaS); and infrastructure as a service (IaaS). Following is a little on each of these. I acknowledge my generous use of NIST sources in defining these ideas.

SaaS is the capability for consumers to use the provider's applications running on a cloud infrastructure. Facebook, Salesforce, Hotmail, Gmail, Pandora, and Garmin are examples of SaaS. The software is delivered over a browser and eliminates the need to install and run applications on the customer's own computers/servers. Customers do not manage or control the underlying cloud infrastructure, including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited, user-specific, application-configuration settings.

PaaS is the capability for consumers to deploy consumer-created or -acquired applications onto the cloud infrastructure and to use programming languages and tools supported by the provider. Google App Engine, Force.com, Windows Azure, WOLF, AppFog, and Parse are examples of PaaS. This approach is primarily for software development to facilitate development and deploy applications without buying, managing, and configuring hardware, middleware, and software layers. The consumer does not manage or control the underlying cloud infrastructure, including network, servers, operating systems, or storage, but does have control over the deployed applications and possibly application-hosting environment configurations.

IaaS is the capability for consumers to provision processing, storage, networks, and other fundamental computing resources, including operating systems and applications. Amazon, Rackspace, GoGrid,

## MANAGE YOUR CLOUD WITH PINNACLE SOLUTIONS

FOR NETWORK, DATA CENTER AND MOBILITY

### PINNACLE MANAGED AND LICENSED SERVICES

can help you get the most out of your campus  
cloud and communications investment:

- Validate invoice charges
- Track costs by service catalogue item
- Automate provisioning workflow
- Showback consumption for accountability
- Drive lower total cost of ownership

LEARN MORE ABOUT HOW YOUR INSTITUTION CAN  
BENEFIT FROM PINNACLE SOLUTIONS:

**800.776.2750 | [pinsoft.com](http://pinsoft.com)**

## PINNACLE

*A Windstream Company*





CloudSigma, and Nervanix are examples of service providers offering IaaS. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components such as host firewalls. The computing infrastructure is typically billed on a utility basis with the amount of resources consumed usually reflecting the level of activity.

### Deployment Models

Finally, there are four deployment models: (1) private—operated solely for an organization; (2) community—provisioned for exclusive use by a specific community of consumers with shared concerns; (3) public—available to the general public; and (4) hybrid—composed of two or more clouds bound together by standardized or proprietary technology that enables data and application portability.

The idea of private cloud deployment models turns out to be a big deal in higher education with the developments in Internet2 (I2) demonstrating the potential for services such as IP Centrex offered by CENIC in California.

### What WTC Sees Going On

Tactically: There is no question that cloud services are off and running, but our experience leads us to believe the actual rate of adoption is most likely slower than the market and some surveys might have us believe. Here are some facts to back up that idea.

Public cloud workloads have had a 50 percent compounded annual growth rate (CAGR) over the last three years, and server growth has shifted to the cloud with server shipments into public clouds expected to grow at a 60 percent CAGR through 2013. On-premises server growth is expected to decline. (See Morgan Stanley Research, *Cloud Computing Takes Off*, May 23, 2011.) Curiously, in that same study

only 8.6 percent of cloud users cited server hardware as the primary area of savings from the migration to cloud computing and only 1 percent cited decrease in storage spending. No compelling financial argument there.

Meanwhile in higher education, there is a different story. A tracking poll of 150 schools conducted by CDW-G in 2011 shows 29 percent of higher-education institutions have written strategic plans for cloud computing, and institutions expect to spend 15 percent of their IT budgets on the cloud within two years. Additional information from that poll shows cloud adoption in higher education to be in the following phases: 32 percent in discovery; 29 percent in planning; 28 percent in implementation; 6 percent in maintenance; and 5 percent not considering anything.

Our experience with client engagements that examine applications run in large higher-education IT organizations and the full cost of IT services does not match the CDW-G tracking poll. While we recognize it is possible our clients simply do not mirror the poll, we believe that what is actually happening is a pursuit of the easier targets because they are either completely or virtually free. This situation is borne out from other results showing that Gmail and Google Docs are both reported as adopted by 50 percent of respondents, MS Office Live Meeting by 22 percent, and Salesforce by only 2 percent. Also, 18 percent of respondents indicated no adoption. We believe this means that once free services are off the table, the rate of adoption in higher education will be slower.

Strategically: So, what is pushing the cloud? At a technical level, convergence

Figure 1. Big drivers for cloud adoption

What's Driving the Cloud		
Value Delivered	Traditional Time to Complete	Cloud Time to Complete
1 Change management.....	Months .....	Days or hours
2 Test provisioning .....	Weeks .....	10–15 minutes
3 New databases .....	2–6 weeks .....	10–15 minutes
4 New system.....	2–6 weeks .....	5–15 minutes
5 Provisioning environment.....	NA .....	.51% cost savings
6 Design and deploy .....	Months .....	Days/weeks business applications

improvements have made the cloud possible. Leading the pack of key innovations are (1) virtualization software to run multiple organizations on common physical infrastructure as if independent; (2) the eXtensible Markup Language (XML) to have a standard way to interchange data between providers and users; (3) Web 2.0 technologies to allow Web-based applications to have better user interfaces using standards-compliant browsers; and (4) cheap commodity Internet bandwidth reducing the cost of access. But the real story is just emerging.

What we see as the big drivers for cloud adoption at an enterprise level will be accelerated-time-to-market for new services, increased access to resources, improved functionality, and getting more done with less. (See Figure 1.) We think cost reduction will be a secondary motivation.

Compelling evidence for this point of view is found in a set of statistics published by IBM regarding one of their PaaS offerings summarizing experiences of 2,000 of their engagements in the first six months of 2011 with 4.5 million daily client transactions, and one million managed virtual machines. The results look to us as a portent for the real message of the cloud.

If the IBM results are anywhere near correct, then we can see the future now. These results are not about saving money



directly, rather they are about improving operations and potentially bringing teaching and learning and research to new levels not formerly available.

#### Where the Cloud Fits In and Some Cautions

Where to look? So we know the various flavors of cloud services available and can get enthusiastic about their potential role. Now the question is where do they fit. It is useful to acknowledge that not all applications are a good fit for the cloud. At this point in cloud development, the decision to consider the cloud is driven by a few things: (1) the importance of the application; (2) institutional risk; and (3) economics. We know that most IT organizations use about 400 different applications, not counting new applications being considered, those on a wish list, or anything involved with special research needs. Following is our suggestion about how to determine which applications might be cloud candidates.

First, consider the level of sensitivity associated with the data. The more sensitive, the less likely the cloud is suitable because it is difficult to ensure treatment of information when you do not know where it is and who might have access to it. Second, consider the degree of importance of the data. If data are critical to the institution, then again the cloud is a questionable place for it. Third, if the operating system you need is not available, then your options are limited. Fourth, because many pricing mechanisms are data- and usage-sensitive, applications requiring large uploads or downloads may not be a good choice. The fifth consideration is licensing. Some license schemes do not move well to the cloud. Finally, if data retention is important, then the cloud may not be a good choice. In summary, filters to determine cloud candidacy would be sensitivity, criticality, OS restrictions, frequency of access and file upload and download size, licensing, and data retention.

Some cautions: The advantages of the cloud also have some gotchas. We suggest you consider some of the trickier decision

points: (1) ownership—how do you secure ownership; (2) governing law—which state law governs (e.g., where you are, where the provider is, or where the data are); (3) service level agreements—can you really make one that is enforceable; (4) failure—what do you do if and when things go wrong; (5) disaster recovery and business continuity—what happens when your side or the provider side of the technology fails; (6) single point of failure—is the cloud provider really just that? When you are ready for a full list of things to think about, you will find “Above the Clouds: A Berkeley View of Cloud Computing,” Feb. 10, 2009, a useful document ([www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf](http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf)).

#### Summary

The cloud has a solid foothold in higher education in commodity services such as e-mail. The continued expanded use of the I2 infrastructure will provide a national and global private cloud capable of being used effectively in teaching and learning and research. Having said that, caution is still a good thing when it comes to enterprise IT. We believe the rate of adoption will be slower and less financially motivated than some would think. But the next five years will tell the tale.

Phillip Beidelman and WTC Consulting have been an active part of ACUTA for many years. This article is based on Phillip's presentation at the 2012 ACUTA Conference. Reach him at [pbeidelman@wtc-inc.net](mailto:pbeidelman@wtc-inc.net).

MiCTA – *We Make Buying Easy!*  
515 N. Washington Ave.  
Suite 405  
Saginaw, MI 48607  
Toll Free: 888-964-2227  
[www.mictatech.org](http://www.mictatech.org)



**MiCTA**  
Technology Solutions for Members Nationwide

- *Emergency Notification Services*
- *Telecommunications, Bandwidth and Applications.*
- *Video Integration Services*
- *Master Service Agreements for Cloud computing solutions*

MiCTA represents all nonprofit entities including educational, governmental, libraries, healthcare, religious, charitable, and public sector with members in all 50 states. MiCTA produces and publishes collaborative RFP's generating agreements that are made available to all MiCTA members in good standing.

Visit our website at [www.mictatech.org](http://www.mictatech.org) for further details regarding our Cloud Computing Services.



# Surfing the Wave of Cloud Computing

Software, platform, and infrastructure—all are available in the cloud

Curt Harler  
Contributing Editor

Here's an exercise for those who longingly await cloud computing services. Go outside, look at the clouds above, and then make them turn the way you want them to go. Order them to turn left, to circle around. You might consider this good practice for managing cloud computing services.

Have no doubt: Cloud computing is the wave of the future. Surfing that wave will be a major IT management challenge.

"The desktop computer will go the way of the wall phone in the next 10 years," predicts Gary Nelson, professor of computer science at Cuyahoga Community College, Cleveland, Ohio.

"The cloud is like a windup toy. Right now, it's all wound up, active, and in motion. . . but nobody knows what direction it is headed," Nelson adds. He advises colleges moving to the cloud to start with smaller applications and then take on more complex core applications.

"Be careful. Get to know the players and the vendors and figure your limitations and their limitations," he says.

Several universities that are active in the cloud offer advice to those who are hopping onto the bandwagon. Joel Reeves, associate vice chancellor for IT at the University of Tennessee, Knoxville, says UTK's move to the cloud entails a pair of separate initiatives.

"It is a two-fold strategy for me at this point: Build a private cloud and support my institution's needs (including the distributed IT component) and push the PCI-related transactions to the cloud," he says.

"We have other things in the cloud, but I am evaluating the costs and benefits of bringing those applications back to our private cloud," Reeves says.

At the moment, there is no documented blueprint for moving applications. Yet Reeves has a pretty solid idea of where he wants to go. "With a large VM cluster presence and enterprise database licensing, I'm still seeing the private cloud as more beneficial to us," he says.

"I would expect savings to come from personnel if I outsourced more," Reeves says. He advises an IT person at any college to crunch the numbers if they are planning a cloud migration. "They can evaluate the service/cost of their private cloud versus a third party."

"Moving to the cloud allows schools to restore data quickly, manage it more easily, and ensure it stays secure and compliant, providing significant cost savings," says Dave Hallmen, vice president of worldwide sales and marketing for EVault. Schools, like any business, have critical data that must be properly protected and accessible 24/7.

"The reality of the cloud is a huge benefit to schools with multiple campuses and IT demands," Hallmen says.

Hallmen sees the cost savings associated with moving to the cloud coming largely from the ability to streamline backup and recovery process. "The cloud enables organizations to reduce the time needed to back up, recover, and restore data and lessens the demand on the IT staff," he says.

With backup and recovery times reduced dramatically and because data from all sites



are consolidated in one location (the cloud), IT teams spend significantly less time travelling between data sites and exchanging backup tapes or discs.

Matt Lawson, director of enterprise services with the Virginia Community College System (VCCS), agrees that the cloud will fit best where there are multiple sites to serve. He is responsible for data centers, networks, and servers. "This is about economies of scale," Lawson says. VCCS figures it saves \$20 million in IT costs annually by adopting a community cloud approach, Lawson says.

"Our secret sauce is that it is a large, community cloud. It would be difficult to replicate this at one community college," Lawson continues. The \$20 million figure comes from their vice chancellor for IT, who figured it would cost the state that much more if each college were to fly solo. Although some infrastructure services are provided, Lawson says theirs is mainly a SaaS (software as a service) cloud. "We are not providing platform," he says.

Lots of divergent strings came together to make the VCCS program work. Chief among them was the strong executive support the project had from the beginning. The seed of the concept dates to 1999 or 2000, Lawson says. "We got lots of investment and lots of support from our governance."

#### Boost for Students, Schools

In addition to the cash savings, VCCS gets a huge boost in student services, Lawson says. The Virginia system serves schools from rural, mountainous western Virginia to suburban campuses in the shadow of Washington, D.C. While it is easy to find a Mandarin Chinese teacher near Washington, it is nearly impossible to do so in the area served by Mountain Empire Community College. The Chinese course is delivered to Mountain Empire students and branded as Mountain Empire—but the teacher will be lecturing from near D.C.

Another boost for students is single-source registration. . . at any school in the VCCS system. For instance, the city of Richmond is home to two community colleges. For scheduling reasons, or to pick up specific courses, students might choose a session at one college and another at the other college. But they can register at the same site for both.

The students win by getting access to courses that might not be available at a convenient time or location. "This enhances access to education," Lawson says.



**IMPROVE LEARNING AND  
ENHANCE SAFETY WITH  
MITEL'S SOLUTIONS FOR  
HIGHER EDUCATION**

**SIMPLY COMMUNICATING®**

**FOR MORE INFORMATION, VISIT:  
[mitel.com/industry-solutions/education](http://mitel.com/industry-solutions/education)**



## Ownership Issues

A college like UTK or consortium like VCCS is big enough to have a private cloud, which is a definite advantage. Small colleges might be better off outsourcing the cloud.

Who owns data in the cloud? While there is little doubt that a college that purchases a cloud service, say for personnel tracking, will own the actual names and addresses, who can use the data? Can that payroll data be aggregated by the provider for research purposes? Can those mailing addresses be sold, even as “anonymous” for promotional mailings?

Nelson says colleges should determine, right up front and by written contract, who owns the data in the cloud. “Who owns the data depends on who you ask,” he says. “If your data is on someone else’s disk drive on someone else’s machine at someone else’s location—who owns it? Possession is 90 percent of the law,” he muses.

Hallmen strongly agrees. “We do suggest having a written policy for cloud computing. In short, it should cover compliance and information security, classify all information assets, and define data location and regulations,” he states.

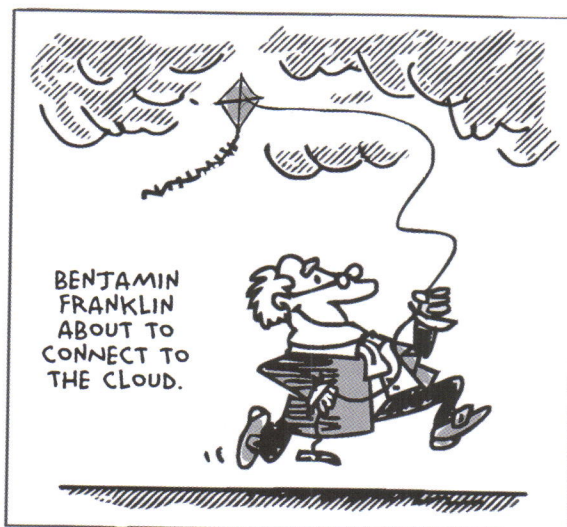
More of a concern, perhaps, is how difficult it might be to transfer cloud data from one service provider to another. It literally became a federal case before traditional telephone users were allowed to port their phone numbers from one provider to another. There still exist fees for doing so. Just how much will your provider be allowed to charge to transfer all the gigabytes of data it holds for your engineering or architecture department to another CAD/CAM service provider?

This, of course, can be solved by contract. Be sure any such fees are spelled out before you give up control of the data to the cloud. This becomes a key concern when

the college’s contract with the vendor ends . . . whichever side terminates the relationship. You may become disenchanted with the vendor. Or, the vendor may go out of business.

“Be certain you can get your data back in some form that you can use,” Nelson says. “Get your data sent back as a flat file.”

Who knows what format will be required to make those data useful a decade from now? The simple fact is you must be able to use those data or be able to reformat



the data easily to run on another application somewhere else.

“Later is not the time to hash this out,” Nelson says. “Understand the considerations up front.”

## Security and Other Questions

How secure is the cloud? How secure is your cloud provider? Cloud computing companies will work mightily to answer those basic questions. Not only will information such as student data have to be protected but personnel records, payroll information, and similar data will need to be secure against intrusions.

Know who shares your cloud services. Big companies that use the cloud will be especially leery in this area. Will a cloud company be able to provide services to both Coke and Pepsi, for example? While companies of that size are likely to have private clouds, quite separate from competitors, the concept holds.

Cloud computing offerings are shared infrastructure, storage and network resources, and applications provided by a third party via a Web browser and the Internet. SaaS, PaaS (platform as a service), and IaaS (infrastructure or network as a service) are probably the most common, says Shayne P. Bates, CCSK, CPP, CHS-V, DABCHS, who is a security strategist, adviser, and advocate who blogs at <http://www.cyber-crime.biz>.

Bates typically divides cloud organization into one of four cloud types: private, community, public, and hybrid. If yours is a large university, a private cloud for services to share only within your own community of users would be an effective strategy. While it requires a good IT staff, most big schools already have one in place. A community cloud allows several colleges or academic units that share the same concerns to access information. This might be a coalition of astronomy departments at several schools or religious philosophy departments at Catholic colleges.

For some smaller schools, public cloud services might prove just the ticket. These are applications that are available to anyone but fit a computing need at the college. Most users are familiar with services like Microsoft’s Office 365 or TurboTax. The user pays for them and can access them when required. Someone else handles the headaches of software updates, compatibility issues, and debugging programs, Bates says.



In Virginia, SaaS is a combination of homegrown software and commercial offerings. They use Oracle's PeopleSoft Campus Solutions both for student-centric features and to run financials. They use the Blackboard Learn software for teaching and classroom applications.

"The technology is behind the scenes," Lawson says. "Our cloud infrastructure provides a large, scalable environment—single implementations that are shared."

Other colleges might look at hybrid cloud offerings, too, combining the strategies of any couple of the basic services.

That said, there are security benefits to the cloud, especially in network backup. Hallmen notes that, traditionally, enterprises have a second data center for disaster recovery purposes. "However with a cloud migration, you don't need to invest in that type of second data center but can instead use the cloud to virtualize servers in the cloud and failover to it in the event of a disaster."

#### Moving Ahead

Probably the first thing a school should do when moving to the cloud is to inventory all unneeded (or soon-to-be-unneeded) technology. That is, define what will be saved by going to the cloud.

Bates says the first step is to prepare to divest yourself of unneeded technology and find a reliable partner. Second, plan to virtualize using Windows 2008 Server, Hyper V, VM Ware, or some similar system.

Next, Bates says the school must decide where core business functions should live—including resolving the question of where they should be hosted and where they should be backed up.

Last, in the course of time, prepare to move from hosted apps to native cloud

apps. (To be clear, a hosted application is one you own or license that you have loaded into a computing environment in the cloud; i.e., infrastructure as a cloud service. A native cloud application is one for which you have contracted in the cloud, such as software as a service.)

All cloud offerings might not be cheaper than doing it in house. Sarbanes-Oxley requires that many university departments maintain their e-mail for seven years and have all of that e-mail available for audit. Depending on the cloud storage medium used, this simple application may not be suitable for early removal to the cloud. On the other hand, as storage becomes cheaper it might just be one of the first functions to send to the clouds.

At the same time, start looking for cloud partners. The main decision is figuring out where core business functions will be in the cloud—where they should be hosted. Many vendors will expect you to have a plan to virtualize using Windows 2008 Server, Hyper V, VM Ware, or some similar software. Keep in mind that the endgame likely will be a move from hosted apps to native cloud apps.

Remember that the cloud, eventually, will serve all sorts of appliances. "There is no reason why students should not be able to access academic content on their PlayStation," Nelson notes. "It's just another appliance."

In fact, providing good access to Web-based content will give a college a competitive advantage down the road. "Tomorrow's college will see more coursework completed as Web-enabled content with virtual instructors and less in the physical plant," Nelson predicts. This will have an impact on textbook publishers and college bookstores, as well as IT departments.

Especially for the nontraditional student—the woman who works long hours or the salesman on the road—the ability to pull course content from the cloud or to register for classes 24/7 from anywhere on the planet will be major factors in college attendance.

Reeves says their cloud program is still evolving. "The biggest thing I see is consideration of our enterprise-level expenditures; automatically thinking a third-party cloud solution is best does not leverage those enterprise-level commitments," he states.

Hallmen advises college IT staffs to be aware of costs associated with moving to the cloud. Many people think the cloud is more expensive than on-premises backup and recovery, but in reality it's the opposite," he says, noting that over the past couple of years the market has grown and the technology has improved, providing organizations a variety of affordable solutions.

"IT managers should be aware of what they need from a cloud solution," Hallmen reiterates. Ask whether your school needs all facets of its backup and recovery in the cloud, or just some.

"Cloud solutions are much more customizable than on-premises ones and can be tailored to fit almost any need," Hallmen says.

It is also important for IT teams to do some research when planning a cloud migration. There are a lot of reputable cloud vendors out there, but there are also some pretty bad ones. Do your research, ask around, read reviews. Your business and your job depend on it.

Curt Harler is a freelance writer and a contributing editor to the *ACUTA Journal*. He can be reached at [curt@curtharler.com](mailto:curt@curtharler.com).





# VoIP Meets the Cloud

Walt Magnussen  
Texas A&M University

In a 2007 survey of ACUTA members, 65 percent of the campuses that responded had some sort of VoIP initiative underway. It is safe to say that today that number would either be 100 percent or would be rapidly approaching 100 percent. In fact, I have spoken to some colleges and universities that have even already changed courses; they began down one VoIP path only to decide to consider a different one.

There are many reasons for this increased activity, including end-of-life of existing TDM systems, a desire to add enhanced features, a hope that VoIP would be less expensive, or a requirement to reduce dependency on failing infrastructure such as copper cable. Regardless of the motivation, the fact is that colleges and universities have either set a VoIP strategy already or are doing so now.

At the same time that the interest in VoIP was growing, the “cloud” was invented (or reinvented depending on who is talking). Higher education began to move services off campus that had traditionally been supported by our IT departments. These services now include e-mail, Web collaboration tools, storage, and many others. With these two technologies—VoIP and the cloud—getting this much attention, it only made sense to try to marry them.

## The Project Begins

In the fall of 2011, when Dr. Charles McMahonen, CIO of Tulane University, approached the Texas A&M University Internet2 Technology Evaluation Center (ITEC), it was decided that the two institutions would work together on a feasibility assessment. That fall several meetings were held

with Verizon, Level3, AASTRA, Qwest (now Century Link), Microsoft, and others. Ultimately, Tulane and TAMU requested and received support from Internet2. An RFP was written over the Christmas holiday and released on January 8, 2012.

This was not Internet2’s first foray into evaluating voice services over the Internet2 network. In 2006 Internet2 commissioned the Voice Services Advisory Committee (VSAC) that was made up of approximately 20 members from various colleges and universities. The report from this committee recommended the creation of services at that time, but the then-recent FCC ruling that would have required CALEA compliance and the uncertainty as to what this meant resulted in the decision not to move forward for the time being.

We received RFPs from several major service providers in February, and a committee with representatives from Tulane, Rutgers, LSU, TAMU, Internet2, and others began the task of evaluation. The committee recommendation resulted in negotiations beginning with two service providers. AASTRA would provide cloud-based hosted VoIP station services, and Level 3 would provide SIP-based trunk services. Between the two service providers, there are about 20 different services to choose from.

From the beginning, the following requirements were established:

1. The services had to be cost effective and accessible from the Internet2 network.
2. They had to be IETF RFC 3261 and other SIP RFC compliant.
3. Each service had to be able to stand alone. They could either work as a part of a bundled service or could be integrated into



an existing campus SIP-based platform. All services had to be available on an a-la-carte basis.

4. MAC activity had to be supported via a service-provider portal.
5. There had to be local survivability that would allow calls to be completed in the event of a loss of Internet2 connectivity.
6. The system had to be 100 percent redundant.
7. The system had to be able to support 1,000,000 lines.
8. It had to include an E-911 solution.
9. There had to be a method that allowed proactive monitoring of voice call quality.
10. Both services would be hosted by ser-

vice providers under an Internet2 contract.

11. The services would be hosted at Internet2 co-location sites.

A unique feature of this combination of services is the integration of the TAMU ITEC into the mix. A small part of the cost of the service will support an engineer and possibly students who would work on adding future capabilities. This leverages the strengths of both Internet2 and ACUTA, which are communities that are willing to share. These activities will be driven by an advisory committee to be created which will include representation from both Internet2 and ACUTA institutions. A development platform has been installed at the TAMU ITEC with support from AASTRA,

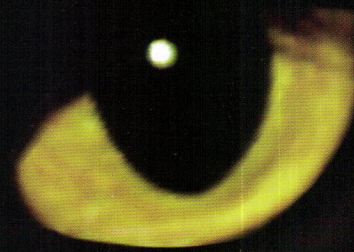
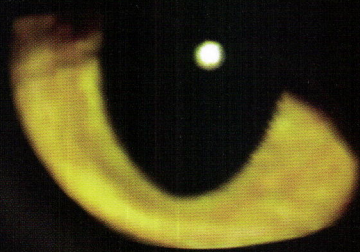
Broadsoft (their proxies that are a part of the core of the AASTRA Clearspan system). Potential projects include the following:

- NG 9-1-1 implementation.
- IMS-based fixed-mobile convergence with major wireless service providers
- LYNC client integration
- ENUM-based campus-to-campus dialing
- Support for Internet2 AVCI video collaboration group. This would support integration of SIP voice and video with H.323 and telepresence video.

Going Live Fall 2012

As of the last week of July 2012, we were completing the contract negotiations with

# PCR°360™



## It's all about visibility.

COMMUNICATIONS AND TECHNOLOGY MANAGEMENT SOFTWARE

PCR°360 provides a comprehensive set of integrated functions - Service/Help Desk, Asset Tracking, Cable, Product Catalogs, Billing, Knowledgebase and Dashboards - which combine to provide unparalleled insight and visibility into customers, expenses, and operational performance.

*Have you seen it?*

For more information contact us at 616.554.0000 or [www.pcr.com](http://www.pcr.com)





# Introducing "Your Voice in the Cloud" Hosted PBX Services from Internet2 and Aastra

Join industry-leading institutions like Texas A&M and Tulane University who are moving their voice communications to the cloud. Internet2 has selected Aastra to provide Hosted PBX and Unified Communications services to the Internet2 community at a great value. To learn more email [SIP@internet2.edu](mailto:SIP@internet2.edu) or visit [www.internet2.edu/sip](http://www.internet2.edu/sip).

**AASTRA**<sup>®</sup>

**INTERNET**<sup>®</sup>  
*2*



[www.aastrausa.com/internet2](http://www.aastrausa.com/internet2)



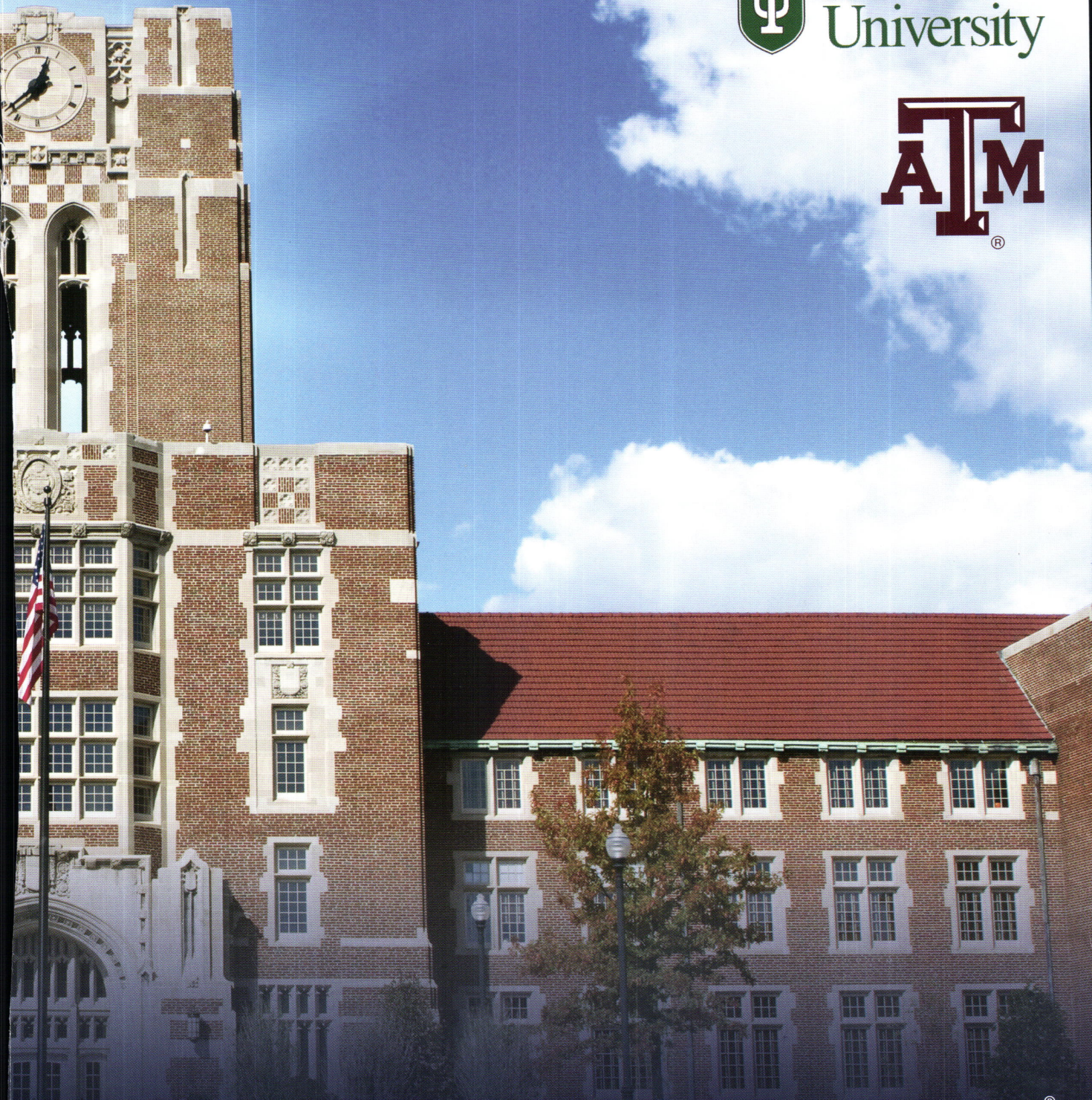
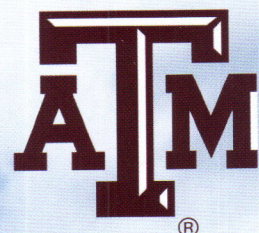
[www.youtube.com/aastratv](http://www.youtube.com/aastratv)





ud”

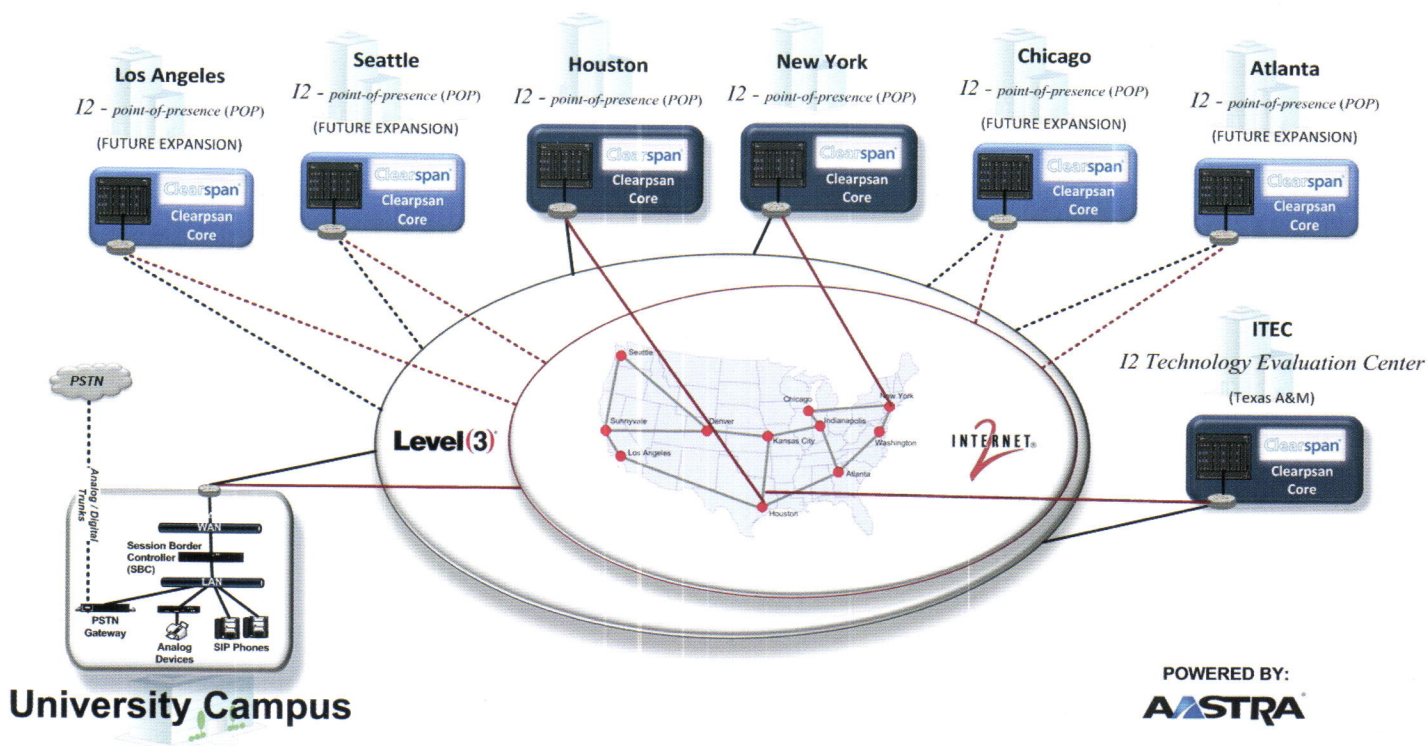
Join these early adopters





# INTERNET2 NET+ SIP SERVICE

## Clearspan Topology



the intent of going live in November 2012. At least two early adopters have agreed to implement the solution. The development service at the ITEC is currently online, and we are porting 30 local lines over to Level3. Houston and New York City co-location sites are also being prepared for installation. Figure 1 is a detailed site implementation document.

Early adopters have already decided to implement these services. Tulane is going to begin a campus PBX replacement and Texas A&M University is going to

utilize Call Center services. Several other universities are either ready to begin testing or have expressed interest in some sort of implementation. Behind all of these services will be an advisory committee. It will be sponsored by the ITEC and will consist of 20 members, 10 from the Internet2 community and 10 from the ACUTA community. This will make this the only cloud service that is more directed by the community than by the service provider.

While the SIP solution will remain the main service offering, the team has been

asked to assess the feasibility of adding both hosted Cisco and Microsoft solutions at some future date. There have already been two Internet2 webinars on this topic, and we hope to present an ACUTA webinar this fall. If you have any questions regarding this opportunity, send them to [sip@internet2.edu](mailto:sip@internet2.edu).

Walt Magnussen, PhD., is a past president of ACUTA, a frequent speaker at ACUTA events, and author of many articles for ACUTA publications. Reach Walt at [wmagnussen@mail.telecom.tamu.edu](mailto:wmagnussen@mail.telecom.tamu.edu).







MARC HOYT, PH.D.  
VICE CHANCELLOR FOR IT & CIO  
NORTH CAROLINA STATE UNIVERSITY

## Q&A with the CIO

**ACUTA:** Information technology's evolution at colleges and universities continues to blend people, processes, and technology to generate increased productivity, creativity, and innovation. How would you characterize NCSU's success and approach to this evolution, its impact on campus life and the organization's structure, and the role of the CIO and IT in decision making?

**Hoyt:** Success has had pockets of excellence and pockets of slower change. Four years ago NCSU merged academic and administrative computing, and hired the first CIO (me). I have spent the last four years on a three-stage plan:

1. Organize the new OIT into an efficient organization. I did this through the development of a strategic operating plan. (<http://oit.ncsu.edu/sp/sop>)
2. Develop a campuswide governance model to define the input and decision process for IT on campus. (<http://oit.ncsu.edu/it-governance-at-nc-state>) This has just rolled out and is making great strides. The entire campus is involved, using the structure to improve, communicate, and help balance the efforts between central IT and colleges and departments.
3. Develop a universitywide IT strategic plan. (We are about to launch this effort.)

All of these efforts are working very well. The two areas with slower-than-hoped-for change are in culture change (getting IT folks to embrace team efforts and focus on strategies and priorities for the campus and not just their area) as well as culture around changing of technologies (trade offs are more than just which is "the best technology," but involve migration

effort, change acceptance of campus, people versus cost trade-off, risk, and more.

The second slower part has been resources. Cuts and a lean IT organization have made faster change difficult.

**ACUTA:** Financial pressures, budget cuts, and technology continue to be game changers on many campuses. Cloud computing is always promoted as a source of increased productivity as well as cost savings. Has this been the reality for NCSU? Although cloud computing allows for business flexibility, it still mandates institutional staff support; where do you see the cost savings? How have the actual costs varied from projections? What kind of financial models are being used to calculate those savings?

**Hoyt:** We have had an internal cloud since 2004 (<http://vcl.ncsu.edu>), an open source Apache project. This was a reaction to both cost pressures and effort to develop an image (installed software) for computer labs across campus. We have continued to migrate to the cloud where appropriate. We are a Google Apps school for students, faculty, and staff. We have many shared services (additional internal clouds such as VM farms, HPC services, and others).

Yes, there have been cost savings of which cloud is one. The choice and decision is part of the development of options before selecting a solution.

Moving to the cloud does not necessarily create savings—in many cases, higher ed has already developed cost-effective solutions. However, the cloud has the opportunity to allow resource shifting. In many cases, it can allow IT staff to focus on



the institution and its key strategies (for us, student success, faculty excellence, global reach, interdisciplinary approach).

Moving to Google Apps allowed us to shift four FTE to other needed areas (especially due to cuts, this was critical).

I require a TCO approach for all solutions—as well as the pros and cons (not just financial)—and multiple options so that a strategic-decisionmaking body can make a decision. This has been very accurate and successful.

**ACUTA:** The grid and cloud are envisioned by many as the new norm in the IT environment. In what academic discipline areas does NCSU have the lead role in developing grid/cloud test beds as they relate to administrative, academic, and social applications as well as security and FERPA/HIP-PA issues? Has reliability been an issue with the cloud for NCSU? What about the risks associated with causing existing systems to fail when moving to the cloud?

**Hoit:** As mentioned above, we developed an open-source cloud used throughout the world (<http://vcl.ncsu.edu>). We are working to extend these efforts to our ERP for disaster recovery and more. We have a new NSA “tablet” on the science of security (in computer science). We have a shared infrastructure for HPC (another internal internal cloud).

In many cases, the cloud is more redundant than some of our systems. Google has multiple data centers and systems to serve our campus. While we can and do create this level of redundancy for key systems, we have many systems that cannot justify that cost. The cloud can offer more reliability in those cases.

Contracting and stability of the company can help with the privacy and security of the cloud. In many cases, these are as strong or stronger than the average campus.

**ACUTA:** What criteria do you use to determine whether to embrace a public or

private cloud model (with the difference being who is managing the cloud)? In a private cloud the IT user still has control over cloud management, whereas in a public cloud, it is managed by the provider. Is one of these consistently better for higher education, or is there value to another option: a managed private cloud—a dedicated, single-tenant cloud infrastructure in a public-cloud environment; or a mixture of private and public cloud? What would be the criteria for including applications and services in the private or public cloud? As campus infrastructures continue to move to grid frameworks and the “grid of grids” concept, how will they be interconnected into larger grids that will crisscross the state and multiple organizational boundaries at the state and local level?

**Hoit:** We use a data security/sensitivity model—and risk. We have a framework for data types and what the sensitivity / security requirements are. From there, we evaluate the risk of data loss and the effect on the campus. This combination of risk, data, cost, pros and cons allows us to bring options for choosing a solution.

For example, some data should not be included in an e-mail (SSN, ITAR restricted, and others); for those systems, we need an alternative that meets the data security and protection requirements.

**ACUTA:** As one of the top state public universities in the country and one of the lead institutions in the VCL Consortium, what do you see in terms of emerging trends and collaborative efforts in education? How do institutions benefit from participation in the Consortium? Please comment on how utilizing VCL affects the software licensing structure for participating institutions.

**Hoit:** Universities working together to create cooperatives (buying groups), shared services, shared development groups (such as Kuali and VCL) and more are the trends of the future. Resources are too precious to not optimize their effectiveness.

VCL, for example, allows institutions to share efforts and develop a critical mass of effort and shared costs to create solutions. This is happening more and more. Universities have always been open and sharing—leaders in the open-source movement. This is just a continuation of those academic principles.

VCL is a loose consortium. We have been doing research with IBM since 2005, and IBM has been promoting a connection to other universities, but more as a way to help them, and not as much joining to develop more aspects of VCL. Our VCL team has helped many schools implement VCL, and computer science folks, as well as humanities and education, are doing research using VCL. NC State supports the North Carolina community colleges by hosting VCL for them.

VCL just moved to a full development project at Apache (they call it graduated), so things are starting to pick up.

We are working with the other UNC system schools on other shared services. We already do consortium purchases. Many systems do this. We are investigating NC State extending out VoIP telephony to other UNC schools. We are also looking at offering the high performance computing environment to other schools.

Finally, Kuali is run out of Indiana University (IU) and is an outstanding example of a more organized approach. Groups that want to do a shared development project each contribute resources and create the open-source solution. We are active in the Library Management Project. (See [www.kuali.org/](http://www.kuali.org/))

**ACUTA:** With the exponential rise in demand for smartphones, momentum continues to build for deployment of the LTE standard. The LTE standard is an evolution of the GSM/EDGE and UMTS/HSPA wireless standards and provides increased capacity and speed. Does NCSU’s strategic



plan include migration to the LTE standard to support the new generation of wireless smartphones, the myriad of apps being developed, and elasticity in the cloud?

**Hoit:** We do not choose a specific technology for mobile, but focus on the mobile solution/access space. So we are concerned with providing services and access through mobile devices, and yes, moving toward assuming a higher bandwidth. Provided the user can access the Internet, we do not dictate the connection method.

We do expect the bandwidth demand (and requirements for access) to increase.

This is why we are a very active participant in the GigU effort (<http://gig-u.org>).

**ACUTA:** Technology consumption has increased dramatically on many campuses as IT's evolution moved from the mainframe to grids to the cloud. What grid and cloud applications at NCSU would you highlight as noteworthy and of which NCSU is most proud as North Carolina's Land Grant University?

**Hoit:** Some of the highlights are:

- VCL: <http://vcl.ncsu.edu>

- Mobile and Twitter frameworks: <http://twitter.ncsu.edu> , <http://oit.ncsu.edu/news-releases/mobile-web>

- Our Governance model: <http://oit.ncsu.edu/it-governance-at-nc-state>

- Mobile access to student info: <http://www.eos.ncsu.edu/soc/>

- Google Apps migration and implementation process ([google.ncsu.edu](http://google.ncsu.edu) )

ACUTA thanks Marc Hoit, Ph.D., vice chancellor for information technology and CIO at North Carolina State University. Dr. Hoit is also a professor of civil, construction and environmental engineering.



Introducing

# CloudReseller

The Voice of **Enterprise Cloud**

A monthly report on cloud communications  
for the enterprise.

Visit us at [www.cloudreseller.com](http://www.cloudreseller.com) and [www.telecomreseller.com](http://www.telecomreseller.com)

# TelecomReseller™

THE VOICE OF UNIFIED COMMUNICATIONS

NETWORKS • IP/IP-PBX • VOIP • SIP • CLOUD



# A Quick Look at Cloud Computing in Higher Education, 2012

Jan-Martin Lowendahl  
Gartner

Gartner defines cloud computing as “a style of computing where scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies.”

In this research, we also refer to three simple cloud layers—software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS)—as defined by the National Institute of Standards and Technology (NIST).

## NIST Definitions

- SaaS. The consumer is provided with the capability to use a provider’s applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin-client interface, such as a Web browser (for example, Web-based email). The consumer does not manage or control the underlying cloud infrastructure that includes network, servers, operating systems, storage, or even individual application capabilities. The possible exception is limited, user-specific, application configuration settings.
- PaaS. The consumer is provided with the capability to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure that includes network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.
- IaaS. The consumer is provided with the capability to provision processing, storage,

networks and other fundamental computing resources so that the consumer is able to deploy and run arbitrary software. These can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure, but has control over operating systems, storage, deployed applications and possibly limited control of select networking components (for example, host firewalls).

## Status of Cloud in Higher Education

“Cloud” is for many institutions only the latest buzzword for a concept that has been around in many shapes and forms for several years. The appeal of cloud precursor services such as Blackboard ASP (application service provider) has been high, as demonstrated by the thousands of remotely run instances of the e-learning platform. However, this particular form of sourcing now is reaching truly “scalable and elastic” dimensions, making institutions in greater numbers clamor for more types of functionality.

Many institutions cannot seem to wait to get rid of their back-end IT operations. In fact, in last year’s CIO agenda (2011), 64 percent of higher education CIOs (128 respondents) expected to move more than 50 percent of their infrastructures into the cloud before year-end 2015. The corresponding number for SaaS was 49 percent. In this year’s higher education sourcing survey (92 respondents), we find that 49 percent of institutions are already involved in some type of cloud sourcing, and 67 percent expect to be by year-end 2012 (see Figure 1).

This data is not to be interpreted as



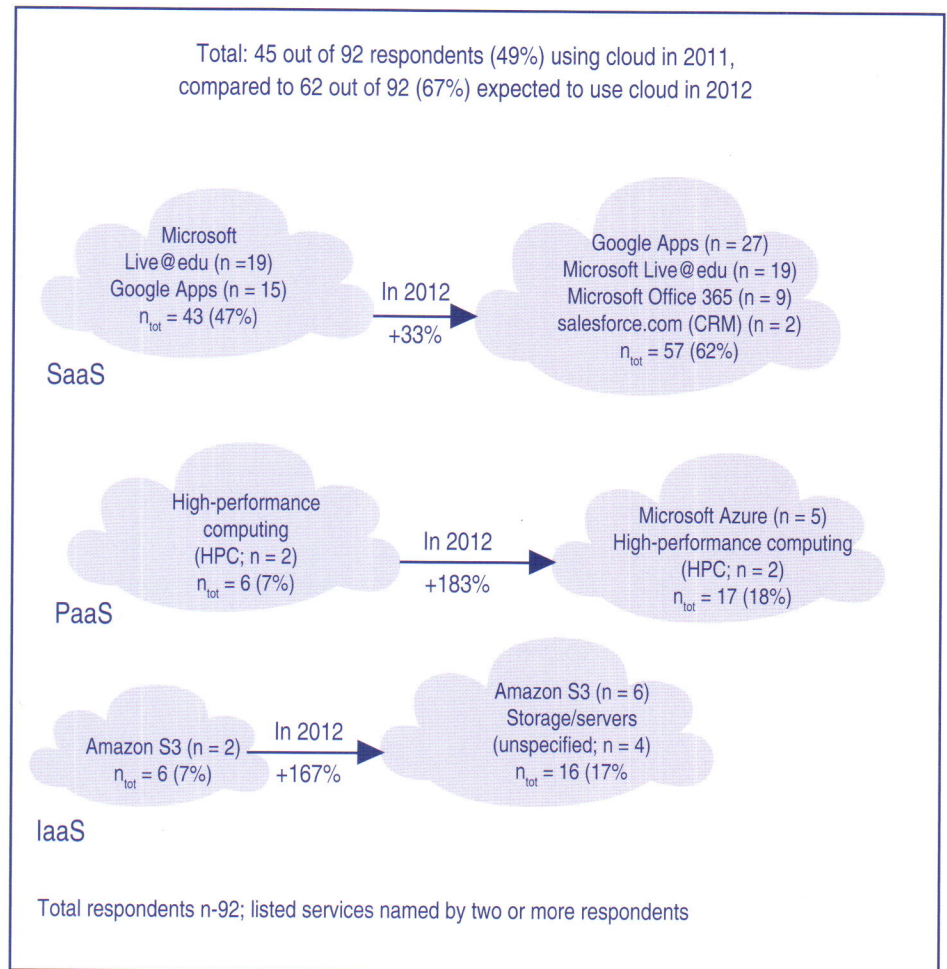
statistically significant. The number of respondents represent less than 1 percent of the world's 20,000 institutions. However, it can be used to identify approximate levels and trends. In combination with the information we collect in our interaction with clients and the higher education community, the survey gives a fair picture of the situation in regions in which we have respondents. These regions are North America, EMEA and Asia/Pacific. Furthermore, the mentions of services are purely based on this limited sample and does not necessarily represent the real market share.

The majority of the cloud sourcing share is still SaaS in the form of "no fee" cloud email for students, which higher education institutions have adopted whole-heartedly since it was first available in late 2005. There is a clear trend, however, toward looking for more services to put in the cloud. We can see this in the expected increase in PaaS (+183 percent) and IaaS (+167) during 2012 alone, according to Figure 1.

This corresponds well with the 2012 CIO agenda survey, where the 143 higher education respondents ranked cloud second after mobile among their technology priorities in 2012. New functional domains are opening up as we see early adopters working with relatively established SaaS vendors, such as Workday, to implement HR services in the cloud. At the same time, smaller startups—such as OER Glue—are taking mashups to a whole new level, enabling professors to design courses entirely from elements in the cloud. There is no lack of ingenuity in what can be done in the cloud for the higher education community.

We are also seeing real concern about privacy and IPR that hampers, for example, cloud collaboration services uptake for faculty. National laws and institutional understanding of this regulation, and how to forge contracts for cloud services, still have some catching up to do before cloud services become fully trusted. However,

Figure 1. Use of and Plans for Using Cloud Services by Type of Service and in Total



Source: Gartner (March 2012)

these centrally procured services are often overmanaged by faculty, staff, and students that microsource the service they need directly from the cloud without the aid (involvement) of the institution.

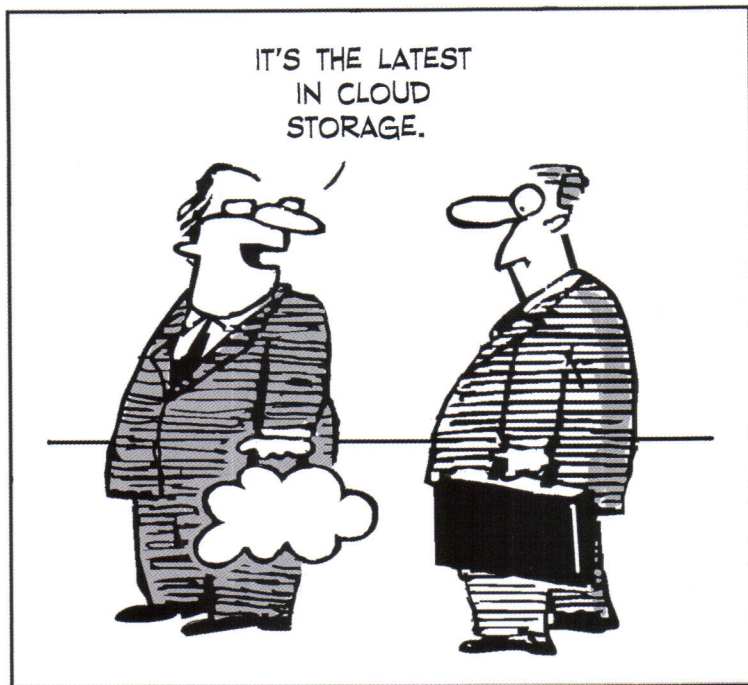
#### Major Opportunities Through 2014-15

- Leveraging consumerization for commodity collaboration functionality. This is already underway, whether the institutions want it or not. The question is if institutions are innovative enough to keep integration

under control and provide institutional context, such as Purdue has done with the "mixable service." Purdue simply uses the institution's student/faculty data and invites students to a study room on Facebook that is integrated with Dropbox.

- IaaS is the next immediate cloud service opportunity, where simple commodity services such as storage are finding use as a dynamic regulator for storage needs, and are already taking over as a cost-effective





©David Fletcher, www.CloudTweaks.com

storage medium for noncritical data.

- Similarly, PaaS is already explored as a development platform in early project phases and increasingly used for noncritical smaller applications, mainly to increase speed of implementation and save space in the data center.
- Leveraging the collaborative culture of the higher education community and developing trusted cloud brokers. This is a major opportunity for speeding up the implementation of cloud services and gain the benefits of economies of scale, as well as integration of information flows. The most natural vehicle for that in most countries are the NRENs, such as SURF or Internet2. The SURFconext and Internet2 NET+ box storage service are good examples of sharing cost and knowledge for integration and legal issues.

- The next generation of back-office SaaS is expected to be a big money and time saver. Although the interest in SaaS Finance, HR, CRM and SIS is high among our clients, only a few institutions have yet taken any exploratory steps. A mixture of lack of true SaaS offerings and existing investments in campus ERP puts implementation of this type of SaaS services several years into the future for most institutions

#### Major Challenges Through 2014-15

- Trust is a key challenge for cloud services in higher education. Trust that the service meets enduser expectation about availability, privacy, and IPR. The resolution of these issues will be a long journey of developing such things as simple end-user familiarity with cloud services and government's increasing experience in associated legislation. It will develop differently for

different areas, as we have already seen for student versus staff cloud email. Mastering the legal aspects of contract negotiation and compliance to national and international law is something institutions can start implementing immediately.

- Balancing institutionally led cloud sourcing relative to individually led microsourcing is an urgent challenge. This challenge ultimately depends on the speed of implementation or expectation of quality that the institution can achieve in its procurement, integration and innovation processes.
- Flexibility of the institution's IT infrastructure is a major challenge for cloud service exploitation in general, and lack of speed in implementation is the key result. Implementation of service-oriented architecture (SOA) and adherence to standards are key strategies available today, although changing an infrastructure can be a long-term project.
- One size fits all. That's what cloud services inherently are about, and it is the hardest challenge. To exploit the higher order SaaS in a cost-effective way, institutions need to standardize their processes. This is something that the higher education community has historically had a hard time doing. Ironically, it seems easier for institutions to adapt to a one-size-fits-all cloud service than engage in a shared service with five fellow institutions. However, this process will likely take several years and result in differentiation in higher education business models.

Differentiated business models—from a cost-effectiveness standpoint—can achieve the ultimate goal of business process outsourcing (BPO) and “university-in-a-box” back-office functions that allow institutions to focus on education innovation or cost.

#### Recommendations

- Realize that adopting cloud services is just one particular form of sourcing. The



institution needs a formal sourcing strategy to find the optimal balance between “do it yourself” and “hired hand” to truly leverage the cloud.

- Engage in active vendor management. Ensure the institution hires staff that have or can acquire legal and contracting skills to control your risk.
- Work on your integration skills. Establish a portfolio of standards based on the IFaPs (identifiers, formats and protocols) principle. Develop a center of excellence for integration to ensure a flexible infrastructure.
- Take the economies of scale to the next level. Work with your national research and education network (NREN) organization as your trusted broker to share integration and contract negotiation costs for the institution and the cloud service vendor.
- Understand that the CIO needs to engage the rest of the institutional management to exploit the disruptive innovation potential of cloud services for the institutional business model or at least prepare for increased competition from those institu-

## Key Findings

- In the 2011 CIO agenda, 64 percent of higher education CIOs expected to move more than 50 percent of their infrastructures into the cloud before year-end 2015. The corresponding number for SaaS was 49 percent. In this year's higher education sourcing survey, we find that 49 percent of institutions are already involved in some type of cloud sourcing, and 67 percent expect to be by year-end 2012.
- Gartner is seeing real concern about privacy and intellectual property rights (IPR) that hampers, for example, cloud collaboration services uptake for faculty.
- The big money and time saver is expected to be the next generation of back-office SaaS. Although the interest in SaaS finance, HR, CRM and student information system (SIS) is high among our clients, few institutions have yet taken any exploratory steps. A mixture of lack of true SaaS offerings and existing investments in campus ERP puts implementation of this type of SaaS services several years into the future for most institutions.
- An urgent challenge is how to balance institutionally led cloud sourcing relative to individually led microsourcing from the cloud. This challenge ultimately depends on the speed of implementation or expectation of quality that the institution can achieve in its procurement, integration and innovation process.

tions that go to the cloud.

Jan-Martin Lowendahl, Ph.D. (chemistry), is a research VP in Gartner Research, where his research area is mainly higher education governance, strategy and emerging trends.



## Graduate to Advanced VoIP & Videoconferencing Performance Management

**SQmediator® provides a real-time view of VoIP & video call quality in campus IP networks.**

- Passive Monitoring & Active Testing
- Voice and Video MOS Scores
- Measures End-to-End QoE
- Interactive Web UI, Dashboards
- Detect & Diagnose Problems before Users Complain
- Collects QoE Data Directly from IP Phones & Other Devices
- Supports Large Campus Networks, Multiple Locations, Thousands of Users
- Highly Secure, Multi-tenant

SQmediator is an advanced software application that provides real-time passive monitoring and active testing for VoIP & Videoconferencing and proactive testing for IP services, Web, Email, DNS and DHCP.

For more information or to request an evaluation copy of SQmediator, please contact Telchemy:

Email: [info@telchemy.com](mailto:info@telchemy.com)  
Toll free: 1 (866) TELCHEMY

[www.telchemy.com](http://www.telchemy.com)



# Cloud Computing: Is the Forecast Bright or Overcast?

Thomas G. Dolan

Should you outsource your campus computer functions to the cloud—that distant, amorphous, all-encompassing entity somewhere off in virtual reality that changes when the winds blow or you have a different perspective? On many campuses the jury is still out as knowledgeable sources sort out the benefits and drawbacks, and we watch to see just how this latest “great *byte* hope” is or is not being implemented.

Here four campuses tell their stories about cloud computing and the possibilities.

Southern Connecticut State University



California State University, Long Beach

Steve La, director of network, telecommunications, and security at California State University, Long Beach, reports that his school is just in the planning stage. He says they may begin by expanding student

e-mail, which is now handled by Microsoft, to all of the personnel on campus, but he is concerned about security issues.

The main issue La is currently facing has to do with the storage of data. “We now have 1,000 megabytes, and are utilizing 700, so we have only 300 left,” La says. “We can’t expand very fast without upgrading our infrastructure. In order to go to cloud computing to increase our capacity, we have to move our 20,000 users to a wide area network. Right now, however, our bandwidth is too narrow for all these users. So the WAN will be our bottleneck.”

Southern Connecticut State University

Kenneth A. Spelke, PhD, interim CIO at Southern Connecticut State University in New Haven, says, “I think everybody is in the same boat with cloud computing. It’s such a general term. And people define it in different ways. It seems to come down to remote storage of capacity and services, so we don’t have to host the data here. Cloud is new enough so it’s interesting, but it comes with a lot of hype, so it needs more investigation to see where it’s going.”

For the mission-critical services that are his responsibility, Spelke says he has a number of misgivings that fall into four areas of concern. “First is security. There are different security measures we have to both employ and enforce. This is difficult to do when you don’t have your own servers, and the servers are located who knows where.”

Second, Spelke says, and related to security, are legal issues. “As a part of the Connecticut State University system, we have a



number of requirements a private institution may not have, which are mandated by law and overseen by the state attorney general. We would be concerned with giving up control about payroll, administrative and other information related to campus faculty and staff. And what about any kind of litigation in which we were obliged to provide discovery? How could we be assured we could get that back if it resided in a cloud? What about retention? Suppose after a number of years we were required to retrieve that information, but the cloud provider had already deleted it?"

Spelke's third concern is disaster recovery. "What if we had to rebuild content? If we ceded control, we couldn't even guarantee that."

Finally, he says, "We have not only the interest in, but also the responsibility for the services we provide. People contact our help desk and user support services concerning their problems or issues.

Of course, they could also contact Microsoft, but that's a pretty big organization. Sometimes somebody from IT has to go out and sit down with a staff member. That's hard to do remotely."

On the other hand, Spelke says, Microsoft's e-mail system works very well for the schools' 12,000 students. "There it's a win-win situation," Spelke says. "Cloud computing is still new, and I'm excited about it, but you have to move cautiously and make sure there's a good fit."

University of Idaho, Moscow

Gregory Donohoe, PhD, professor, chair of the computer science department at the

University of Idaho, Moscow, offers the perspective from the classroom. "Cloud computing to me is a service or commodity, analogous to electric power. We don't all have our own generators. The service is off somewhere we don't know where. Wires come to our building and the power is there. With cloud computing, the storage, disc drives, and services are located somewhere else. Cloud is actually a metaphor for the Internet, where the data's at—out in a cloud somewhere."

Illinois State University, Normal



Donohoe also cites as a disadvantage the need to be able to properly access the Internet. "If you are editing photos which require a high bandwidth between you and the Internet, the rates of transmission can be too slow to be useful," Donohoe says. He also mentions the security issue. "If you have private staff or student data on a cloud, and somebody steals it, you have no control." But Donohoe also adds that his department is conducting research into security and information insurance to address this challenge.

One of the advantages Donohoe sees is you pay by the amount you use. "You don't

have to pay for and maintain your system whether you use it or not. So if your use fluctuates a lot, it can be cost effective. You also save in the personnel necessary to keep the system going.

"Another advantage is mobility. Typically, say, if I edit a Word document, go home, and want to change it, I have to have my computer with me. I can access it through browsers from anywhere. And, though it's probably in the future, I believe I'll be able to create a document at a Google site, not at my desktop. I'll no longer need spread-

sheets, photo editing, drawing, or document software. I won't need the software, for it will all be on Google.

"We've actually started with Amazon Web services to write software to automatically grade student homework. If students write a program, we get from the cloud input and output as to what works and doesn't work in the program. And we think the applications might be much broader for use in other disciplines, through the automatic grading of multiple-choice or yes or no test answers.

"Finally," Donohoe says, "we see the cloud potential in computer labs. Different classes may require different Windows or Unix operating systems. The usual way is to have a technician go in to change the software and reboot the systems in their new configurations. With a cloud doing this it would be much easier and cut down on IT costs."

Illinois State University, Normal

Eric Hodges, director, enterprise systems support, Illinois State University, Normal, says, "Cloud computing is the buzzword currently taking over our conversation. It's a nebulous marketing term for what takes



our data from what we do and stores it in someone else's data center."

What makes the cloud attractive, says Hodges, "is that in this economy of scarcity, we can replicate the same data again and again, without needing to build those individual user drives. Also, when you want to go to peak usage events, such as registration, housing, or grading, or cut back during vacations or other lower usage times, you can do so automatically, just using what you need."

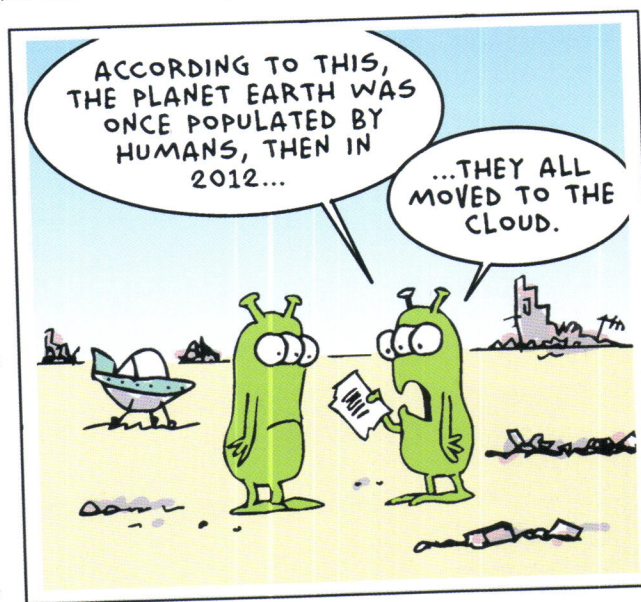
Hodges acknowledges that security is a widespread concern, but says cloud technology "is maturing quite nicely in this area. Many are holding back waiting for a big security breach. But maybe it hasn't happened because the providers have done a good job, so maybe that big security breach just won't happen."

Yet another risk, according to Hodges, "might come to the IT community itself. Some might suggest that as more and more of the IT services are outsourced to cloud providers, there will be less and less need for IT personnel!"

But Hodges says his school is addressing this challenge through its new Computing Competency Center, designed to prevent the IT expert from following the path of

the horse-and-buggy driver. This center is designed to retrain IT personnel in new skills to replace the ones no longer needed as the various functions are taken over by the cloud providers, who, at this time, are primarily Microsoft, Amazon, Google, and Dell.

Hodges sees IT personnel "over a period of time migrating from simply technical



©David Fletcher, www.CloudTweaks.com

to technical and business skills and being much more integrated than they are today. We see IT as playing a brokering role looking at all of the services available to see what can best serve the university. For instance, a representative may go to a trade

show to incorporate the latest technology, but determine whether it should be best handled in house or through a cloud, or maybe a hybrid of both. So the cloud shouldn't be looked at as a threat to IT or IT as a hindrance to outsourcing."

Hodges adds, "Also, in addition to being brokering and cost managers, we can be contract managers for the school's dealings with cloud providers. For instance, we can make sure some key portions of the contract are not missed. If the university has a department which wants to void the relationship, can it get its data back in the format wanted in a timely fashion? If the vendor is acquired or goes under, will we get the data back? And if there is a breach in data security, will the cloud let us know in timely fashion? All of this amounts to value-added services that we will be able to provide.

"By the same token, we are working to partner with cloud vendors and looking for opportunities to offer our brokering services to other entities interested in cloud computing. We are just now getting our feet wet with the big players. But we're

making a very deliberate effort to get out in front of cloud computing."

Thomas G. Dolan is a freelance writer who specializes in technology topics.

## Winter Seminar January 13-16, 2013 Tampa, Florida Hyatt Regency

Track 1. Next-Generation Data Networks

Track 2. ICT Disaster Preparedness: Plan, Prepare, Practice, and Protect

[www.acuta.org](http://www.acuta.org)





# Cloud E-mail Momentum Swells

Lower cost, reduced maintenance, and more flexibility convince universities to adopt this computing approach

Paul Korzeniowski

Usually, academic institutions follow rather than lead the new technology curve, but that is not the case with cloud e-mail solutions. "About half of all U.S. higher-education institutions now rely on cloud e-mail services to communicate with their students," noted Matthew W. Cain, research vice president at Gartner, Inc.

The reasons for the movement are myriad. For openers, cloud systems carry lower upfront costs than the traditional premises-based systems. These systems are easy to maintain, offer universities needed flexibility, and can be quickly deployed.

However, cloud solutions present academic institutions with a few challenges. Migrating from the old to the new infrastructure can be tedious and time consuming. Installing the new services can lead to ancillary costs for items such as storage. While the move seems likely for many schools, there are hurdles they must clear in order to make a successful transition.

## The Price (Free) Is Right

Vendors have been trying to make their e-mail cloud services attractive to educational institutions by offering them at a low cost—and even for free in some instances. The low pricing attracted Washington State University (WSU), which serves approximately 25,000 students, 1,300 faculty members, and 4,300 staff from a main campus in Pullman as well as satellite locations in Spokane, Tri-Cities, and Vancouver.

In the summer of 2008, the school recognized that it needed to provide a consistent communications channel for

its students, faculty, and staff. Users had worked with a variety of self-selected e-mail systems, which created various inconsistencies. For instance, students would often change their systems but fail to notify school officials of the switch.

WSU began looking at its options for a central mail system. They thought about putting in a traditional premises-based e-mail system, but that would have required a significant up-front investment in new servers as well as software. "Because we were tightening our belt and did not have money for new servers, a cloud solution best met our needs," stated Casey Hanson, vice president of IS and CIO at WSU.

## Reducing Support Costs

WSU also envisioned reduced e-mail maintenance expenses. "By moving to the cloud, we would no longer have to invest in hardware or software upgrades," explained Hanson. The only administrative costs would involve provisioning accounts for new users.

After examining various cloud systems, the selection came down to Google and Microsoft. "A lot of our administrative systems rely on Microsoft software, so it was the best selection for us," explains Hanson.

By the fall of 2009, the university had deployed Microsoft Live@edu, a free service. It features a suite of collaboration and productivity solutions, including Microsoft Office Live Workspace, for document sharing and collaboration; Windows Live SkyDrive, a cloud-based file-storage service; and Windows Live Messenger, for re-



al-time messaging. In addition to improved productivity, WSU estimates that it is now saving more than \$100,000 annually after making the shift.

#### The Sun Sets on University E-mail Systems

Abilene Christian University (ACU) in Abilene, Texas, began to look for a new e-mail system in the fall of 2006. The university, which has about 4,700 students on a 250-acre campus, was using mainly a Sun Microsystems e-mail system, although students, faculty, and staff supplemented it with other e-mail solutions. For instance, Cisco Systems' Iron-Port appliances secured and managed e-mail transactions.

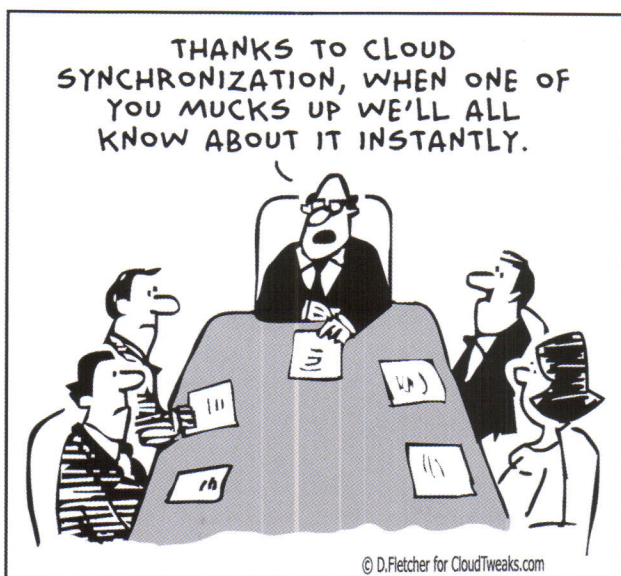
While providing basic service, the configuration lacked functionality, and users complained that they could not effectively manage their mail. For instance, the solution's calendar function was so weak that faculty and staff found it difficult to set up meetings. Also, the Sun system featured a command-line interface that had become time consuming and difficult for the IT staff to operate. Because it was an older system, it was not intuitive and required that technicians spend a lot of time and energy learning how to operate it. Finally, the full-time e-mail administrator had left, and the academic institution was not sure if it could find a replacement with the appropriate skills.

So in the fall of 2006, ACU considered both open-source and commercial software packages that were packaged as appliances, as well as cloud services. ACU could continue to pay licensing fees, upgrade hardware and disks, and dedicate a person, along with training and consulting as needed, to the in-house system, or it could

let its provider host the mail server. "We determined that a cloud solution would be simpler to maintain," stated James Langford, PhD, director of Web integration and programming and adjunct assistant professor of information technology.

#### The Power of the Google Brand

Again, the school eventually narrowed its list to a Google or a Microsoft solution. Users were already familiar with the Google interface and had expressed strong faith in



©David Fletcher, www.CloudTweaks.com

the Google brand. This solution included e-mail and calendar functions, and the tight integration would encourage more calendar use.

In the fall of 2007, the university made the switch to Google. Because of the collaboration features, productivity rose. Faculty and staff often held meetings and shared the proceedings afterwards. With Google Documents, they were able to collaborate with that information more easily. The Google solution also meshed with ACU's mobile-learning initiative. Faculty members use the Google applications to create calendars for every course. As instructors

add assignments and other events to course calendars, students view e-mail updates on a dashboard on their mobile devices.

#### Downsides to Diversity

The City University of New York (CUNY) also has moved to a cloud solution. It has 35,000 employees, overseeing 23 institutions including 11 colleges and six community colleges. It serves more than 243,000 degree-credit students and 273,000 continuing and professional education students.

Previously, the different colleges had selected their own e-mail systems, so there were more than 50 operating on the various campuses. "Some of our colleges offered feature-rich e-mail service, others provided only basic freeware, and others none at all," says Brian Cohen, associate vice chancellor and CIO at CUNY.

The hodgepodge approach to delivering e-mail services had some limitations. There were e-mail outages at some campuses, and that caused students to abandon the campus solution and revert to using personal Web-based e-mail. As a result, it was increasingly difficult for the university to meet the demands of its students.

In early 2007, the CUNY IT staff began searching for a campuswide e-mail system and evaluated cloud—as well as various premises-based e-mail solutions. The school relies on many other Microsoft products and determined its e-mail cloud system offered the best fit. "Users work with more than e-mail," explained Cohen. "They have other applications that need to be integrated with the mail system. Since we rely so heavily on Microsoft software, it was the best fit for us."

CUNY worked with Microsoft to develop a Live@edu deployment plan that covered the requirements of 23 campuses and has provisioned more than 450,000



e-mail accounts to students. After making the switch, it became easier to integrate e-mail functionality into other applications, such as the school's Student Information System. In addition, the university operates a help desk, which had difficulty staying abreast of changes to the various e-mail systems.

"Microsoft has now basically taken on all of our e-mail help desk requirements," said Cohen. The college estimates that the change has cut its annual operating costs by hundreds of thousands of dollars.

#### Dark Side of the Cloud

While cloud systems have benefits, they also present universities with challenges, starting with how well they fit into existing infrastructures. E-mail applications are not used in a vacuum, but sometimes they cannot be easily integrated with other applications. In addition, e-mail often comes bundled with other functions, and universities can end up with overlapping functionality, such as multiple conferencing systems.

In addition, personnel issues can arise. CUNY found that it had to change its IT culture. "When we started, there was distrust of the cloud-based service because we did not control the system as much as we had in the past," notes Cohen. In addition to various meetings, the university held training sessions so employees understood how the changes would affect them.

ACU offered various types of guided learning, so employees would understand how to use the new system. Orientation sessions, demonstrations, and Q&A sessions helped introduce employees to Google apps, as did some hands-on, lab training sessions. Finally, they sponsored open labs to answer any questions employees had as well as to assist them in migrating e-mail, setting up clients and other tasks for those who want or need more help.

#### Increasing User Awareness

Then, the IT department must get its users on board. Typically, a deployment plan includes a marketing campaign. CUNY made students and faculty aware of the change through the use of targeted brochures, notices on campus websites, and posters in various locations.

As its migration approached, ACU developed a campuswide "GDay is Coming" marketing campaign, which included t-shirts, lawn posters, and video tutorials about how to migrate e-mail accounts. The rollout began in April. Within 24 hours of adoption, more than 3,000 users on campus had switched over to Gmail.

E-mail services are available at low up-front cost, but universities can incur ancillary fees as their implementation progresses. Vendors provide the basic services as well as a certain amount of storage for free but will charge—sometimes large amounts—if users exceed the totals. For instance, teachers who work with a lot of video files may exceed their quota. Features, such as encryption, archiving, and collaboration, typically come with a price tag, according to Gartner's Cain.

#### Raising New Security Issues

Security is a major concern. Control over student information, grading data, and financial information moves off premises to the cloud, so universities need to ensure that their systems comply with regulations, such as the Family Educational Rights and Privacy Act (FERPA).

Tools are emerging to help universities ascertain the completeness of a vendor's security procedures. The American Institute of Certified Public Accountants Statement on Standards for Attestation Engagements No. 16 is a set of standards that generate three reports so universities can determine how well a cloud provider's internal controls function.

Service Organization Control (SOC) 1, the first report, focuses on internal controls to ensure proper financial reporting. The report is designed mainly for internal use, so cloud service providers can produce accurate financial reports.

#### Taking a Techie's View

An SOC2 report takes a look at the service provider's IT controls. This summary examines approximately seven to ten objects in a handful of categories: security, confidentiality, processing integrity, availability, and privacy. This report is targeted at a university's IT staff, mainly techies who understand the minutia about how IT systems operate.

Similar to an SOC2 summary, an SOC3 report concentrates on a cloud service provider's IT processes. However, this iteration presents a high-level summary rather than a detailed explanation about how a cloud service provider's IT systems function. This report may appeal to managers who do not understand computer system intricacies.

In addition to the reports, universities can take steps to ensure that their data are safe. CUNY put checks in place so personal information, such as Social Security numbers, does not make its way into the cloud.

Cloud e-mail is becoming more popular, but not all universities are on board. "Institutions cannot be afraid to ask the question: Will a cloud solution work for us?" concluded WSU's Hanson. "In some cases, the question may raise some alarms, but it is now a viable option that universities need to consider."

Paul Korzeniowski is a freelance writer who specializes in communications issues and is based in Sudbury, Massachusetts. He has been writing about these issues for more than two decades and can be reached at paulkorzen@aol.com.





## 2011–2012 Institutional Excellence Award

### Elon University, Virtual Computing Initiative



Elon University accepted the award at the Annual Conference in May. Pictured (from left) are ACUTA president Joe Harrington; Arif Khan, Christopher Waters, and Michael Thompson from Elon; Larry Foster from Windstream (sponsor of the award); and Matt Arthur, ACUTA Immediate Past President and chair of the Awards Committee.

Elon University started the planning and implementation of the Virtual Computing Initiative in early 2006 by first introducing VMWare into the enterprise server datacenter and then migrating the entire VMWare infrastructure to Cisco's UCS server platform. Once the core virtual server environment was fully deployed and in production, the user support group started their deployment of Citrix's application virtualization technology, followed by the deployment of Citrix's Virtual Desktop Infrastructure (VDI). The combination of these four projects was the

basis of inception of Elon's private cloud. The Virtual Computing Initiative was a partnership with all of the IT departments, allowing much cross-collaboration with our system administration, networking, user support and teaching and learning groups within our technology division.

This endeavor greatly improved our capability to use hardware and application resources more efficiently while using fewer energy resources; improved user experiences by having better up-time, availability and reliability of servers, virtual desktops and virtual applications; and enhanced the process of provisioning new products and resources and to consolidate their management. This helped to extend considerably the life of client-level equipment in the labs and classrooms and reduced the number of software licenses required as well as the amount of labor needed to support and maintain academic computing labs.

The advanced technology classrooms and computing labs gave faculty greater flexibility, even allowing the university to add virtual computers to many more instructor stations. In addition, virtualizing our core teaching applications gave our students and faculty access to these resources anywhere and anytime.

One of the biggest benefits of this initiative was a unique partnership that developed between the individual IT departments. This partnership established a better understanding of what each unit does within the technology division, as well as strengthened the trust relationship between them. They worked together to provide a seamless user experience.

#### Planning, Leadership, and Management Support

By adopting the VMWare platform in 2006 and migrating most mission-critical servers to the virtual infrastructure, the university was technically positioned well for Cisco's UCS server platform. The platform is a server/networking design partnership between VMWare and Cisco. Elon's experience with VMWare and long-term strong relationship with Cisco made the university a perfect institution for the product to enter the education market. In addition, the Citrix's Virtual Desktop Infrastructure and virtual application initiative brought the Virtual Computing environment to its inception.

This synergistic endeavor was initiated and planned, and budgetary funding was sought by IT. After approval, project management of implementation was handled by the implementation team, which included systems administration, networking, teaching and learning technologies, Citrix and Cisco Systems, and user support. Addition-

Thanks to Windstream, sponsor  
of this award.



ally, our CIO and assistant CIO discussed the project at length with our senior vice president, Deans Council, senior staff administrators, the Academic Council, and our Board of Trustees, who embraced the plan and followed its progress closely.

Beyond working to pitch the vision of our virtual computing environment to our campus community, senior management allowed the redirection of nearly three quarters of a million dollars in funding. They recognized that we would spend the funds regardless of the project. Our choice simply was in how we would use those resources. Did we continue financing an outdated model of application and desktop delivery and server deployment and management, or did we embrace new, more capable methods?

The vision and goal of moving to a virtual computing environment in 2006 was a desire to maximize the ROI of hardware investments and energy costs with the added benefits of reduced deployment time, elasticity of the environment, and personnel efficiencies. The virtual environment gave us greater access to key software applications, streamlined server and desktop management, reduced expenses associated with allocation licensing, and extended the life of server and client equipment.

The strategies, risks, and exposures associated with an early adoption of virtualization were mitigated through the reluctance of various vendors to adapt and support the platform for their applications. Technical competencies of how virtualization works allowed for university staff to judge when a product could be implemented on a virtual platform and when it

was too risky. Virtual computing presented a unique challenge, as it required us to form new partnerships even within the technology divisions. By combining these technologies into one platform, the entire department was outside of their comfort zone and was required to learn new skills for the proper design, implementation, and support.

Virtualization has changed the culture of IT by simplifying support procedures. Having the ability to move virtual servers to different physical servers allows for daytime downtime when better support is available from vendors. Users have appreciated the fast provisioning of new servers that is now



Elon University Library

possible since hardware, cabling, and other physical elements of server and software deployment are no longer required. This endeavor has extended the useful life of existing institutional IT investments. By reducing the time and costs associated with maintaining our IT infrastructure, virtual computing lets us put more resources into our primary business, which is delivering an exceptional learning environment to our community.

#### Promotion of Technology and Maturity of Effort

In early 2006, IT went through an extensive

exercise of capacity and need planning and collected an extensive amount of data, e.g. amount of BTUs and amperage used in our datacenter, catalog of servers and applications, total cost of contracts and licenses, hardware replacement costs, cost of sustaining existing services, and expected new services to be deployed. It became apparent to us while analyzing the data that we were quickly reaching the capacity of our enterprise datacenter with respect to power and cooling, while Elon University was continuing to create and support energy sustainability goals. By creating the virtual private cloud utilizing the Cisco UCS platform, the university was able to establish a

server infrastructure within its existing datacenter. This was done without costly upgrades to facilities while also becoming more sustainable with its server resources.

#### Quality, Performance, and Productivity Measurements

Once our infrastructure was moved to virtual computing, we looked at six specific criteria to measure our success, as these were also our pain

points that led us in the direction of virtualization and then eventually to the cloud environment.

As mentioned, the virtual computing project team worked closely with our pedagogy support group to provide a sampling of the virtual experience to faculty within a controlled environment. Our senior vice president, CIO, and assistant CIO discussed the project at length with our Deans Council, senior staff group, the Academic Council, and our Board of Trustees. Our CIO offered several university-wide e-mails



detailing the project and its predicted impact. At this point in the project, our team had not formally evaluated the initial phases. We continued to collect feedback from all constituents for a final report on quality and performance.

Based on our 2006 capacity analysis, IT determined that we must reduce our energy consumption to keep in line with the university's goal of environmental conservation, to be fiscally conservative, and at the same time add new and improve existing services. When our virtual computing infrastructure was fully implemented, we measured its success by evaluating the criteria to see if we had achieved what we sought to accomplish.

#### Cost, Benefit, and Risk Analysis

During the planning phase of our Virtual Computing Initiative, one of our biggest challenges was determining how to fund this massive project during this period of

financial change. It was very difficult for IT to ask for additional resources. To mitigate this risk, our earliest strategies for this project focused on leveraging existing desktop and server replacement budgets that included dividing the entire project into multiple phases and using Cisco System's leasing option. Essentially, we funded the entire project by redirecting the funds from desktop deployment and server replacement budgets and strategically using the Cisco leasing option.

The benefits of the virtual computing project were two-fold. We enhanced our capabilities to efficiently use our hardware and software resources and improved user experiences by increasing our services uptime, availability, reliability, and accessibility. In addition, we drastically increased the deployment of new services, managing our resources, extending the life of our equipment and reducing our licensing cost and support. We were able to form a unique

partnership and cross-collaboration environment between the technology groups.

#### Customer Satisfaction and Results to Date

A few key faculty members tested virtual lab deployments and offered feedback that prompted changes to design elements, as well as menu clarity and application deployment.

Users are pleased that key software is available to them from anywhere there is a Web browser and an active Internet connection. They are also pleased that we can change application loads in the virtual labs approximately six times faster than in the traditional labs (once per month instead of twice per year.)

For more information about Elon University's Virtual Computing Initiative, contact Christopher Waters at [cwaters@elon.edu](mailto:cwaters@elon.edu).



## Mark Your Calendar!



San Diego CVB

### 42nd Annual Conference & Exhibition

April 14-17, 2013

San Diego, California

Manchester Grand Hyatt

Watch for Details:

[www.acuta.org](http://www.acuta.org)

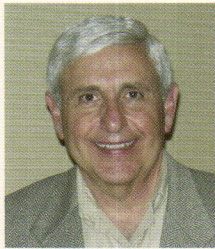


# ACUTA Awards 2012

## Bill D. Morris Award

### Carmine Piscopo

Providence College



This annual award was established to recognize Bill D. Morris, the 17th President of ACUTA, and the attributes he possessed that made him so extraordinary: dedication, vision, professionalism, and leadership. The award is presented to a member who, in the opinion of the president, best exemplifies these ideals.

This year's recipient, Carmine Piscopo, is currently telecom manager at Providence College. Over the past 27 years, he has served the association in many different capacities, including the following:

- writer of *Journal* and *eNews* articles
- committee member and chair of the the Program Committee, Nominating Committee, and Awards Committee
- session presenter and panelist
- session moderator
- ACUTA task force member and leader

Carmine served on the ACUTA Board as secretary/treasurer, president-elect, president, and immediate past president. In 2009 he received the Ruth A. Michaleki Leadership Award.

ACUTA president Joe Harrington, who announced Carmine as the winner of this award, remarked, "He has been a mentor and friend to me during the past 12 years, and it is an honor to recognize him with ACUTA's original individual award."

## Ruth A. Michalecki Leadership Award

Sponsored by Windstream

### Jeanne Jansenius

Sewanee: The University of the South



This award recognizes outstanding leadership among ACUTA members and honors the memory of past president Ruth A. Michalecki of the University of Nebraska Lincoln.

The person selected for this award motivates and fosters collaboration to accomplish the goals, objectives, and mission of his or her institution or company; actively participates in the education, professional development, and mentoring of other professionals; demonstrates initiative in creating programs, projects, or activities that impact the community; and engages in activities that directly benefit ACUTA or the broader higher education community.

This year's winner is Jeanne Jansenius from Sewanee: the University of the South. Since Jeanne joined ACUTA in 1995, she has served as chair of the Program Committee, as Director-at-Large, and as president in 2002–03. After years of board service, she has remained involved by serving on the Journal Editorial Review Board and the Legislative/Regulatory Affairs Committee and writing the "DC at a Glance" column in the *ACUTA eNews* for two years. She is currently the chair of the Publications/Media Committee and serves on the Ambassadors Task Force.

Jeanne has mentored several ACUTA members into leadership positions within the association and gives of her time and advice freely. Her activities within ACUTA earned her the association's most prestigious award, the Bill D. Morris Award, in 2005.

## Jeri Semer Volunteer Recognition Award

### Arthur Brant

Abilene Christian University



The Jeri Semer Volunteer Recognition Award, a new award this year, is presented annually to a committee or subcommittee member; institutional, corporate affiliate, associate, or emeritus member who has provided extraordinary service.

From nominees submitted by volunteer leaders and ACUTA staff, the winner each year is selected by the president-elect, immediate past president, and executive director.

This award was created by the Board of Directors in the fall of 2011 to honor Jeri Semer, ACUTA executive director from 1994–2011.

Arthur Brant, director, enterprise infrastructure at Abilene Christian University, has been a member of ACUTA since 2007. His service to the association includes serving as chair of the Social Networking, New Media, and Web Resources Subcommittee; writing articles for the *ACUTA Journal* and *eNews*; doing presentations at ACUTA events; being a webinar presenter; and much more.

Arthur's expertise and his enthusiasm will serve him well in his next challenge: He is the new chair-in-training for the Program/Content Committee.

We appreciate Arthur, value his contribution to ACUTA, and look forward to great things in the future.



## Advertisers' Index

★ Indicates ACUTA Corporate Affiliate

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.

★ Aastra .....20-21 Keith Gyssler (800/468-3266) 2811 Internet Blvd., Frisco, TX 75034 sales@aastrausa.com www.aastrausa.com	★ Mitel .....15 Sanjay Mehta (770/970-9131) 7300 W. Boston St., Chandler, AZ 85226 sanjay_mehta@mitel.com www.mitel.com
★ Adtran .....5 Rene Lozano (866/273-6658) 901 Explorer Blvd., Huntsville, AL 35806 edu@adtran.com www.adtran.com/hed	★ Professional Computing Resources, Inc. ....19 Bob Glover (616/554-0000) 4635 N. Breton Ct. SE, Kentwood, MI 49508 bgllover@pcr.com www.pcr.com
★ Apogee .....Inside Back Cover Wendi Lisso (512/478-8858) 715 W. 23rd St., Austin, TX 78705 wlisso@apogee.us www.apogee.us	★ Talk-A-Phone Co. ....3 Alex Kireyenka (773/539-1100) 7530 N. Natchez, Niles, IL 60714 info@talkaphone.com www.talkaphone.com
★ Avcomm Solutions .....Outside Back Cover Brent Kraus (866/998-9991) 324 8th St., Aurora, NE 68818 bkraus@avcommsolutions.com www.avcommsolutions.com	★ Telchemy, Inc. ....29 Anthony Caiozzo (678/387-3000 x811) 2905 Premiere Pkwy., Ste. 280, Duluth, GA 30097 anthony.caiozzo@telchemy.com www.telchemy.com
★ AVST ..... Inside Front Cover Doug Juntwait (949/699-2300) 27042 Towne Centre Dr., Ste. 200, Foothill Ranch, CA 92610 djuntwait@avst.com www.avst.com	★ Telecom Reseller Magazine .....25 Doug Green (360/260-9708) 17413 SE 28th St., Vancouver, WA 98683 publisher@usernews.com www.telecomreseller.com
★ Microsemi/ PowerDsine .....9 949/380-6100 One Enterprise, Aliso Viego, CA 92656 www.microsemi.com	★ Windstream .....11 Terrence O'Brien (585/340-2884) 770 Canning Parkway, Victor, NY 14564 terry.obrien@windstream.com www.windstream.com
★ MiCTA .....13 Tim Von Hoff (888/964-2227) 515 N. Washington Ave., Ste. 405, Saginaw, MI 48607 micta@mictatech.org www.mictatech.org	

## Maximize Your Advertising Investment with ACUTA

- *The ACUTA Journal* is regularly read by CIOs, directors, and managers of information communications technology and others responsible for campus voice, data, and video technology.
- Ads appear in their original format when we post the issue to our website.
- Each advertiser is listed by company name with complete contact information in the advertisers' index.
- Corporate affiliates who advertise accumulate points in ACUTA's point system.
- Advertisers are listed by frequency of their commitment in a thank-you page in the eNews annually.
- ACUTA members notice which vendors support the association.

For complete details contact  
Amy Burton, Director, Strategic Relationships  
Phone: 859/278-3338 x240 • e-mail: [aburton@acuta.org](mailto:aburton@acuta.org)  
[www.acuta.org](http://www.acuta.org)





# THE DEVICES ARE COMING... IS YOUR CAMPUS READY?



Hand-held devices like smartphones and tablets are rapidly becoming the primary way that students access the Internet. According to a recent EDUCAUSE study, more than half of all college students used mobile devices to get on the network in January 2011, compared with only 10 percent in 2008. Across the nation, IT administrators agree that the student network of 2012 is facing bandwidth and mobility challenges like never before.

By partnering with Apogee, schools can meet and exceed student



Jabra®

The quality of the device defines the security of the business.



## Jabra PRO 9450™

- 64-bit encryption ensures a secure conversation.
- Kensington lock provides added theft protection of headset base.
- Up to 450ft. of wireless range gives users the freedom to multi-task with minimum efficiency and from anywhere in the office.
- Free firmware upgrades through Jabra PC Suite makes this headset a future proof investment.