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Fall Issue, 2009
Vol.13, No.4

ACUTA

Journal

of Information Communications Technology in Higher Education

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Legislative and Regulatory Issues

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Event	Date	Location
Fall Seminar	October 25–28, 2009	Marriott Downtown Waterfront Portland, Oregon
Winter Seminar	January 24–27, 2010	Sheraton New Orleans New Orleans, Louisiana
Annual Conference	April 18–21, 2010	JW Marriott Hill Country Resort & Spa San Antonio, Texas
Summer Seminar	July 18–21, 2010	The Palace Hotel San Francisco, California

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

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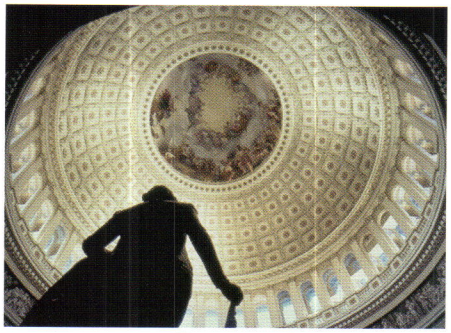

Photo courtesy of Destination DC

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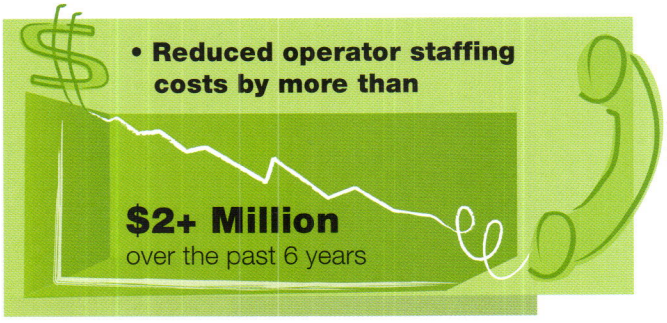

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Unfortunately, relatively few owner/operators of MLTSs today understand the complexities involved, the tools that are available to help, or the responsibilities that they shoulder.

Guy Clinch, NENA
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PRESIDENT'S MESSAGE

HARVEY "BUCK" BUCHANAN
FLORIDA STATE UNIVERSITY
ACUTA PRESIDENT
2009–2010

The Florida State University Technology Fee

Enhancing Instructional Technology: A Roadmap @ FSU.edu

For my column this quarter, I have invited two of my colleagues at Florida State to explain the university's technology fee. Michael G. Barrett and Joseph Lazor offer their perspectives and expertise to shed a different light on this subject. I know this is a topic many campuses are considering as we all struggle to meet demands *and* balance budgets. I hope you find their comments enlightening and beneficial.

The Journey Begins—Point of Departure

For many years, the university awaited a decision by the Florida legislature on establishing a technology fee. Other states, such as Louisiana, enacted related legislation in 1997. And so, during the 2007 legislative session, the Florida legislature amended Florida Statutes, Section 1009.24, to establish "a technology fee of up to five percent of the tuition per credit hour, beginning with the fall term of the 2009–2010 academic year. The revenue from this fee shall be used to enhance instructional technology resources for students and faculty. The technology fee shall not be included in any award under the Florida Bright Futures Program."

The Framework—Roadmap@FSU.edu

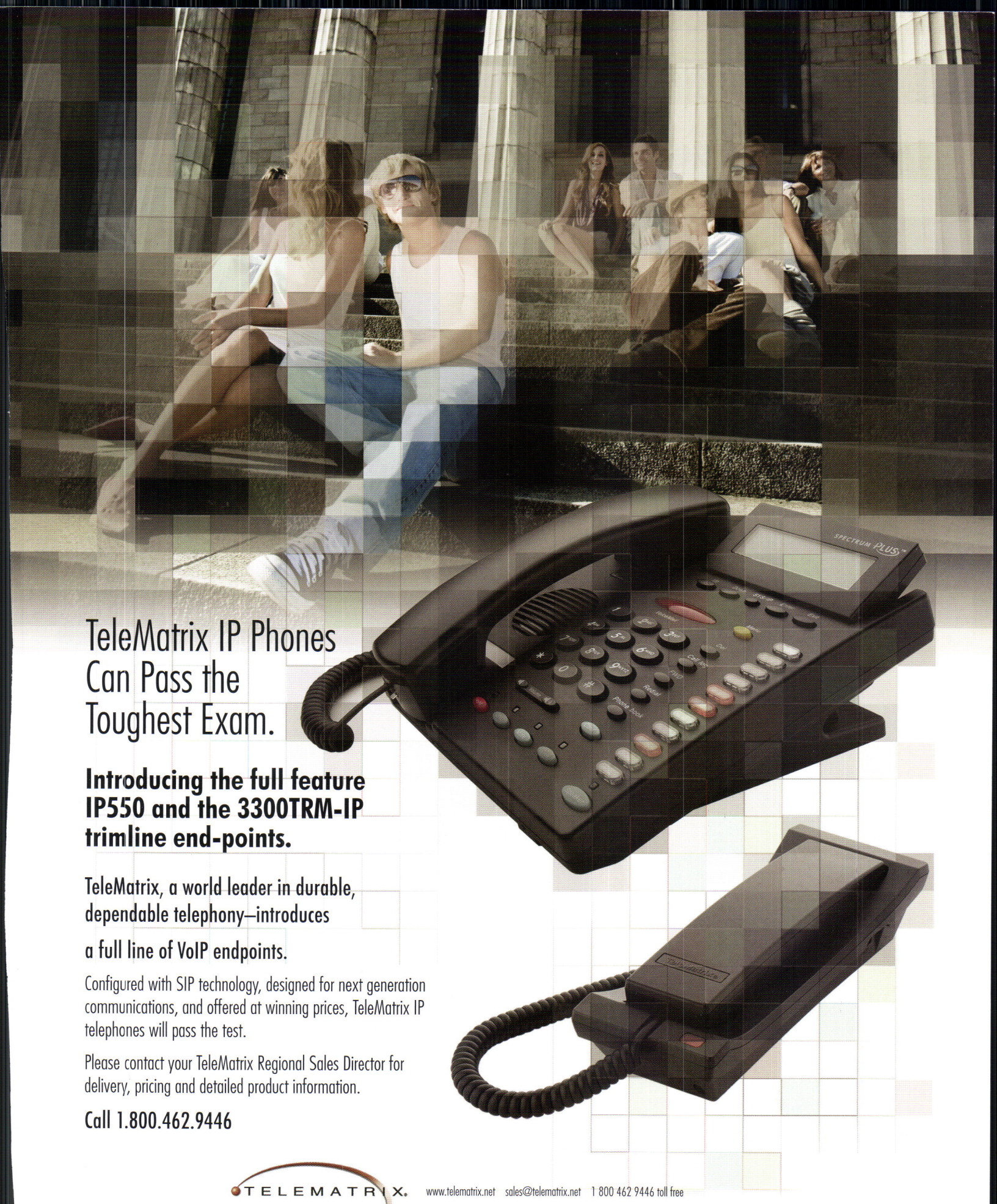
Based on our review of the recently enacted state of Florida legislation, other state universities (SUs), and approaches taken by other higher-education institutions with similar fees, the Florida State University (FSU) has planned various actions for establishing and implementing the technology fee for the university. An overview of a framework that FSU will use or modify to comply with the legislative mandate going forward includes the following:

- A tech fee home page containing information about the tech fee
- A tech fee plan with annual and multiyear initiatives that are aligned with the university's IT strategic plan goals
- A tech fee oversight committee with accompanying meeting minutes
- Instructions (and forms) for submitting funding proposals to enhance instructional technology
- Annual tech fee proposals—with documented funding approvals
- Annual report of tech fee usage
- A tech fee question-and-answer (Q&A) section for history and context

Overseeing the Journey—Road Map Guidance

Funding generated by the technology fee will be allocated by a committee created for that purpose. The technology fee oversight committee to be chaired by the associate vice president for technology integration/chief information officer (to vote in the event of a tie) will have student, student affairs, faculty, administrative, and information technology membership. Committee members will be required to recuse themselves from voting on a proposal submitted by their respective organization.

The technology fee oversight committee will review funding proposals and may bring in outside experts to help review a proposal's technical or financial details. The committee may also contact the author(s) of any proposal to clarify or obtain additional information about the proposal. It may provide full, partial, or no funding for



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a given proposal. The committee is not obligated to award all technology fee funds available at a given time, and any unused funds will be carried forward. In addition, 10 percent of projected annual fee revenues will be set aside to meet exigent contingencies. The technology fee oversight committee will issue an annual report to the provost and executive vice president for academic affairs accounting for the activities of the committee, funds awarded, and projects supported.

Are We There Yet?

The technology fee oversight committee will issue a request for instructional technology funding proposals during the fall semester of each academic year and provide for additional requests for funding proposals during the academic year. Each request will solicit proposals for projects that "enhance instructional technology resources for students and faculty," as required by FS 1009.24. "Instructional technology" shall be defined as information technology resources, services, or software that directly supports the development and delivery of instruction. All technology fee proposals receiving funding will be required to submit an annual report in May of each year during the proposed life of the project. Funding proposal initiatives should be aligned with the university IT strategic plan goals.

Proposals will be accepted in response to the request for instructional technology funding from students or recognized student organizations; FSU academic colleges and schools; and central IT (technology integration). Proposals shall be for projects that employ technology to enhance the development and delivery of instruction and promote student learning.

Two categories of proposals will be accepted: (a) one-time capital projects (e.g., implementing or upgrading a student lab computer cluster) and (b) ongoing projects (e.g., Blackboard infrastructure, continuing to construct or upgrade campus multimedia classrooms). Recurring initiatives and projects will be

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funded for no more than three consecutive fiscal years, and the project's sponsors must reapply for continued funding beyond the initial three-year term.

One-time funding may be requested for:

- information technology equipment;
- data network resources, including connecting instructional equipment to the campus network;
- installation labor;
- initial acquisition of software related to instruction;
- full-time or part-time personnel (recurring projects only); and
- ongoing maintenance and support costs (recurring projects only).

Proposals will be scored on a 100 point scale as follows:

- number of students to directly benefit from the project per year (15 points);
- access by students to the proposed instructional resources (e.g., full time, part time, limited access) (up to 15 points)
- evidence the project will benefit student learning (20 points);
- alignment with university IT strategic plan goals (15 points);
- project success metrics and assessment plan (15 points);
- evidence of a project plan and adequate resources to fully support the project over its projected life (10 points); and
- clarity and detail of budget and expenditure presentation (10 points).

All requested equipment and software must conform to campus standards. Proposals that show evidence of cooperation between colleges and/or other campus units will be given additional consideration.

Almost there.... A few more road signs and miles to go.

Michael G. Barrett is the associate vice president/chief information officer at FSU. Joseph A. Lazor is the director, administration and security management at FSU.

◆

FROM THE EXECUTIVE DIRECTOR

JERI A. SEMER, CAE
ACUTA EXECUTIVE DIRECTOR

Catalyst@EDU: A Catalyst for Change

Since the American Recovery and Reinvestment Act (ARRA) with its broadband stimulus programs was signed in February 2009, many higher-education institutions and networks have devoted considerable time and effort to developing proposals for broadband deployment. While it is widely acknowledged that the $7.2 billion in broadband stimulus funds allocated between the National Telecommunications and Information Administration (NTIA) and the Rural Utilities Service (RUS) are only a down payment on the investment that is needed, it does represent a substantial commitment of funds to improving our nation's vital technology infrastructure.

ACUTA is participating in this effort by taking a leadership role in a coalition of national and regional research and education networks, Catalyst@EDU. The coalition has submitted a proposal to establish a nationwide cooperative focused on high-performance broadband infrastructure for community anchor institutions, such as schools (both higher education and K-12), libraries, and healthcare centers. Known as Catalyst@EDU Adoption, the program that we propose to establish includes the following elements:

- A national grassroots public awareness campaign
- Detailed analysis of barriers to adoption
- Measurement of new adoption in targeted community anchor institutions
- Working groups aimed at increasing 100 Mbps-and-up broadband adoption

ACUTA, Internet2, National LambdaRail, and The Quilt (the national organization representing advanced regional research and education networks) have been working together since April 2009 to conceptualize our shared vision and goals for this program and develop a framework to accomplish them. Internet2 took on the challenging leadership role, providing funds for a facilitator to help create consensus among our diverse group and develop the proposal that was submitted to NTIA on August 18.

Throughout the process of developing a national vision, we were very conscious of the widely varying needs of the state networks that serve the research and education community. Our goal was to create a national framework that state networks and individual institutions could join in various ways, from issuing letters of support to using concepts and language from our proposal in their own proposals for broadband stimulus funding.

Anchor institutions are the key to our vision, because they are positioned to support their local communities, create jobs, and stimulate economic growth. After much discussion, the coalition agreed upon the broadband connectivity goals shown in Table 1.

Table 1. Broadband Connectivity Goals

Community Anchor Institutions	Target Connectivity
Research higher-education institutions and hospitals	10 to 100 Gbps
Nonresearch higher-education institutions	1 to 10 Gbps
Two-year higher-education institutions and central libraries	100 Mbps to 10 Gbps
Elementary and secondary schools, branch libraries, and health clinics	At least 100 Mbps

Leveraging the collaborative relationships that already exist in the education and research communities, the Catalyst@EDU Adoption project will provide a trained corps of staff, volunteers, and tools needed to create a national public awareness campaign; analyze barriers to adoption of broadband services; measure new or upgraded adoptions in anchor institutions; create working groups; establish public-private partnerships to innovate and integrate technologies and applications; and develop pilot projects for affordable high-performance solutions.

ACUTA serves on the steering committee of Catalyst@EDU, and participation is open to any institution that is a member of ACUTA or the other supporting organizations. For more information and a list of participating organizations, check out the coalition's website at www.educatalyst.org/Home_Page.html.

If this information is useful to you, remember that every time ACUTA members get together, they share information about legislative and regulatory issues as well as legal and policy challenges that their campus (and likely yours) may be facing. The professional networking that happens at every event is consistently rated as one of the most valuable benefits of ACUTA membership. Will we see you in Portland in October for the fall seminar? I hope so! Register today at www.acuta.org.

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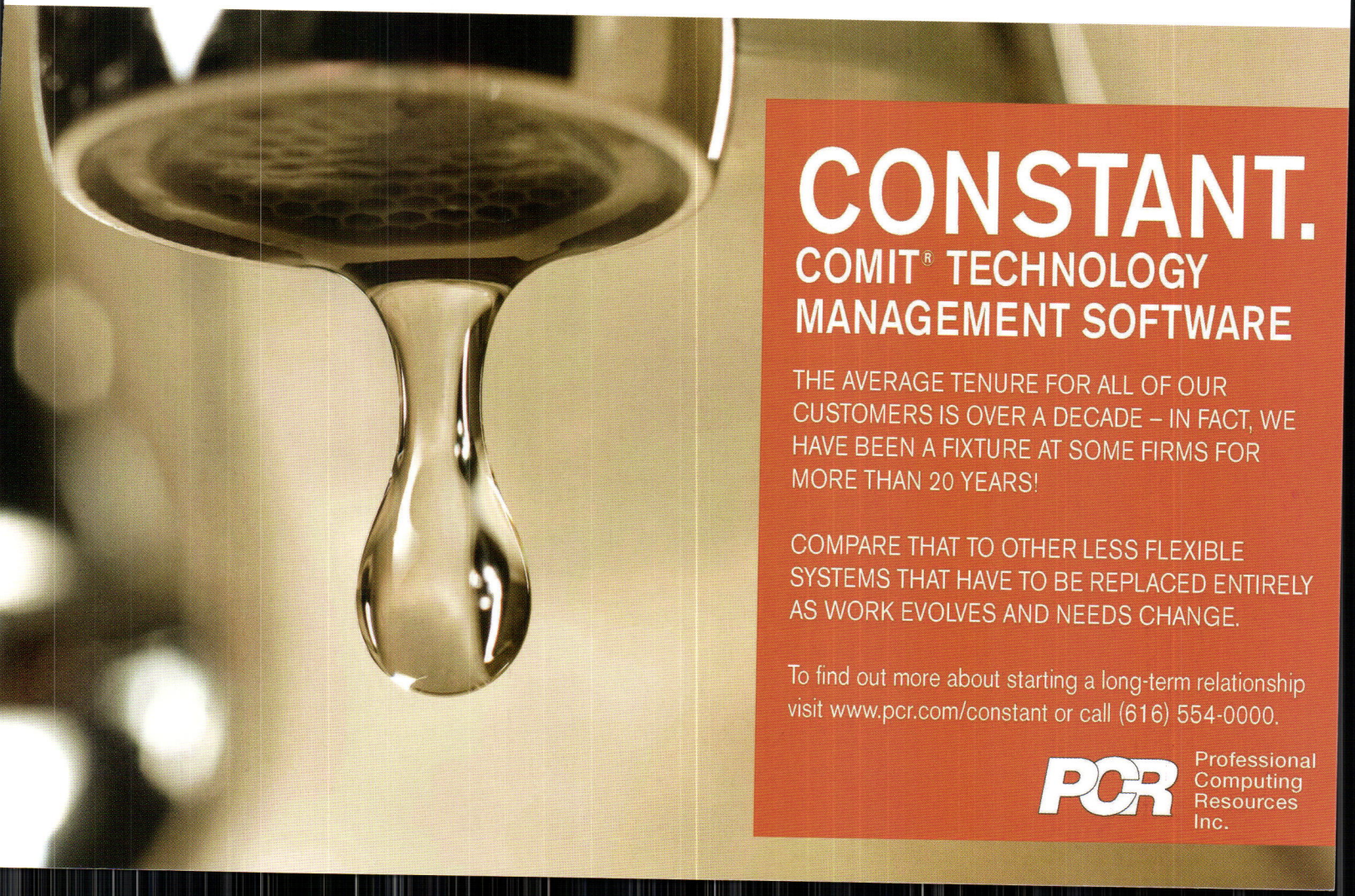

Current Legislative and Regulatory Issues

Wendell Barbour
Longwood University
Chair
ACUTA Legislative/Regulatory Affairs Committee

The Legislative/Regulatory Affairs Committee has been busy dealing with the many issues that were brought before it this past year and with President Barack Obama's emphasis on broadband initiatives that will be funded with stimulus monies. Some of the major issues we are still confronting are discussed briefly as the lead-in for the three articles on the National Emergency Number Association (NENA), cloud computing, and broadband stimulus activity found elsewhere in this issue of the *ACUTA Journal*.

Universal Service

The Legislative/Regulatory Affairs Committee prepared and sent an ex parte communication to the FCC on Universal Service Contribution Methodology. This statement argued for the FCC not to adopt any modification that uses telephone numbers to calculate business customers' contributions to the Federal Universal Service Fund (USF) and for the FCC to retain the current revenue-based system for business services until it can devise a system that does not impose an inequitable burden on large users of telephone numbers, including colleges and universities. Retaining the current revenue-based system for calculating contributions for business customers will avoid imposing this burden on colleges and universities.

The committee is continuing to watch USF proceedings at the FCC, with a focus on the numbers-based contribution methodology. Statements made by former FCC chair Kevin Martin to ACUTA give us hope that should the FCC move on a numbers-based contribution methodology, an exception will be granted to higher education.

On July 12, AT&T filed an emergency petition asking the FCC to implement a numbers-based collection method due to the increase in the contribution percentage to 12.9 for the third quarter 2009. The Legislative/Regulatory Affairs Committee and advisers agreed that it is time for ACUTA to re-engage with the FCC on this issue, and to meet with the new commissioners and staff members to discuss our concerns. We will continue to closely watch for developments under the new chair.

E911 for Multiline Telephone Systems (MLTS)

The committee has been tracking the NENA model legislation for E911 for multiline telephone systems. The executive committee of NENA has approved the updated version of the model legislation, which is designed to help states develop statutes and rules requiring sufficiently precise caller location information for 911 calls using MLTS. Currently, there is no federal 911 requirement for MLTS, and only 16 states have taken on the issue.

Department of Education HEOA-Negotiated Rule Making

ACUTA and the Legislative/Regulatory Affairs Committee submitted two names for two committees—one dealing with peer-to-peer (P2P) and copyright and the other dealing with distance education authentication. Matt Arthur, from Washington University in St. Louis, was selected as an alternate negotiator on P2P issues for higher education. Greg Jackson of

the University of Chicago was the primary negotiator. The other nominee was not selected for the Committee on Distance Education Authentication. The committee dealing with P2P reached a consensus on this issue; however, consensus was not reached on two of the other items being negotiated. Therefore, the Department of Education (DoE) will begin a rule-making process to adopt the Higher Education Act regulations. We hope that they will accept the P2P committee's recommendation because of the agreement among the participants on this issue.

Higher Education and IT in the 21st Century

ACUTA, EDUCAUSE, and Internet2 highlighted several key higher-education information technology issues for the incoming Obama administration. We believe that how the administration and Congress address these issues will profoundly affect higher education's ability to meet the needs of its students, foster discovery, and promote economic growth. The issues are as follows:

- To support broadband infrastructure deployment by higher-education institutions as well as commercial providers in the economic stimulus package
- To support privacy and security policies that strike the right balance between security concerns and the preservation of the innovative capacity of higher-education IT
- To support ongoing development of the nation's cyber infrastructure
- To urge the Obama administration to provide sufficient resources to make the Office of Postsecondary Education a national leader on teaching, learning, and technology issues
- To urge the administration to oppose efforts to mandate technology solutions for copyright protection
- To urge caution, however, when it comes to laws or regulations that would mandate particular procedures and technologies or eliminate the discretion of campus law enforcement and technology experts in determining the best methods to use in a given situation

ACUTA 2009–10 Legislative/Regulatory Affairs Committee

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Although we hope for the best and will work hard with our colleagues in the other two associations, in the current Congress, telecom will likely take a back seat to the economy, healthcare, climate change, and other issues considered higher priority than those in the stimulus package.

Net Neutrality

The committee continues to watch Net Neutrality issues and the actions taken by telecommunications carriers to defeat such legislation. Although legislation has not passed, it continues to be a very active issue. The higher-ed community, primarily led by EDUCAUSE, has made this a priority policy goal, and ACUTA supports their efforts. The FCC/Comcast order was upheld just recently by the U.S. Court of Appeals for the DC Circuit.

DTV

The DTV transition officially was completed on June 12, but the FCC continues to devote significant effort to follow up. Transition thus far has been smooth. There has been comment on the potential effect of removing TV Channel 6 spectrum from the broadband service. Some nongovernment commercial educational stations have experienced interference from this channel and have asked what the FCC will do about this.

Broadband Development—NTIA/RUS/FCC

With the kickoff for the broadband stimulus package application process, which is part of ARRA, funds will be distributed in two large chunks: $4.7 billion to NTIA to issue grants under a new Broadband Technology Opportunities Program for national broadband service development; and $2.5 billion to RUS for broadband expansion via grants, loans, and loan guarantees for broadband infrastructure. Higher-education communities are encouraged to participate in this grant process.

CAMPUS Safety Act of 2009

The House of Representatives unanimously passed the CAMPUS Safety Act of 2009 (H.R. 748) on February 3. The bill authorizes creation of the National Center for Campus Public Safety, which would operate within the Community Oriented Policing Services program of the U.S. Justice Department to assist higher-education institutions' responses to campus security challenges. The center would award grants to institutions and nonprofits to train campus public safety agencies, promote research on ways to improve campus safety, and coordinate the sharing of campus safety information. No companion bill has been introduced in the Senate. H.R. 748 was referred to the Senate Judiciary Committee, which has taken no action on it.

Issues Matrix Revision

The Issues Matrix has been revised into a more user-friendly format that is easier to navigate. The Matrix will be "cleaned up" once a year. Topics that are currently active will remain in that category, and those that are inactive will be retained in the "continuing issues" area of the Matrix. Those that are not relevant any longer will be removed.

FCC Appointments

Kevin Martin, the former chair of FCC, has been replaced by Julius Genachowski. Genachowski was the Obama campaign technology adviser and helped draft Obama's communications policy proposals, which included requiring Internet service providers to meet net neutrality requirements and additional investment in broadband services. Democratic Commissioner Michael Copps served as acting chair until Genachowski was confirmed.

The FCC's principal focus under Commissioner Copps had been the implementation of the DTV delay legislation. Genachowski's main thrust immediately will be the broadband initiative.

FCC commissioner Jonathan Adelstein has been nominated for director of Rural Utilities Service (RUS), which is an agency of the U.S. Department of Agriculture. This agency will be distributing 2.5 billion of broadband stimulus funds.

President Obama renominated FCC commissioner Rob McDowell, a Repub-

lican, for another term. The president previously nominated Mignon Clyburn to replace current FCC commissioner Jonathan Adelstein. Clyburn was a member of the South Carolina Public Utilities Commission.

In addition, Meredith Baker, the Bush administration's acting assistant secretary of the National Telecommunications and Information Administration (NTIA") was nominated to fill the vacant Republican FCC seat.

All of the nominees have now been confirmed by the U.S. Senate, and the FCC stands at full strength with three Democrats and two Republicans.

IRS/Tax Issue

The Legislative/Regulatory Affairs Committee felt it would be desirable to file jointly with NACUBO, which is taking the lead for the higher-education community in drafting a response to this issue. As of late August, ACUTA joined NACUBO and other higher-ed organizations in supporting the IRS proposal to simplify the record-keeping requirements for employer-owned cell phones and similar devices. We would also support legislation to remove cell phones as "listed property," as well as the "minimal personal use" and "safe harbor" methods proposed in the IRS notice.

We are concerned about the potentially burdensome record-keeping requirements for both of these methods, but particularly the safe harbor method. This concern led to a discussion of the alternative of treating the full value of the cell phone as a taxable fringe benefit, regardless of the amount of business/personal use. We also discussed whether the IRS would consider establishing a safe harbor percentage without requiring record-keeping or substantiation. We will continue to follow this issue.

Conclusion

These are the current issues that the Legislative/Regulatory Affairs Committee has been concerned with during the past year. These may change, and if they do, we will adjust our priorities. If you have items that you think should be addressed by our committee, please let me know. We will consider them for inclusion in our monthly deliberations.

Wendell Barbour from Longwood University is chair of the ACUTA Legislative/Regulatory Affairs Committee. Reach Wendell at barbourwa@longwood.edu.

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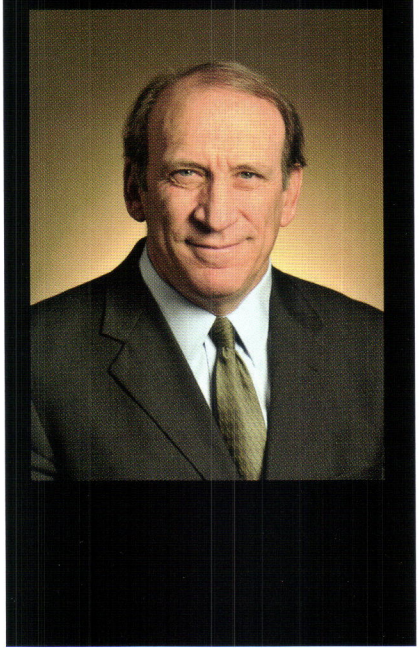

Blair Levin

Executive Director, Omnibus Broadband Initiative
FCC

Writing for internetnews.com on July 4, 2009, Alex Goldman quoted Blair Levin, coordinator of the FCC's national broadband plan: "I won't say what the national broadband plan should be because I have no idea what it should be, but I can talk about process," he added. "The process will be guided by three principles: be open, be data driven, and deliver a plan, not a report.

"The process will be transparent, inclusive, and participatory," he added. "Citizens will be No. 1."

The ACUTA Journal *posed some of our own questions to Mr. Levin. He and his colleagues, Kristen Kane, who heads up the National Purposes group, and Steve Midgley, who leads the education group, provided the following answers.*

ACUTA: You have been a supporter of the current administration's broadband stimulus. A number of colleges and universities have applied for these grants and are deploying or expanding systems in their areas. Do you feel that the program will have the desired goal of bringing America back into a leadership position in Internet access? If not, what more has to be done?

Levin: It's a great start, but we have a long way to go. Just getting universities and colleges wired with high speed connections won't get us to the goal line: We have to develop applications and solutions that utilize the broadband infrastructure. Things like:

1. Making expert instructors and courses available more widely
2. Developing online learning systems via programs like the president's recently announced Online Skills Laboratory and Carnegie Mellon's Open Learning Initiative
3. Supporting the changing models of content publishing so students can access content from any device, anywhere, any time
4. Supporting digital literacy for students and educators, to ensure that we close the digital divide so everyone can access these new solutions

ACUTA: Higher education has played a significant role in developing and using broadband over the years. Have you seen examples of higher ed practices that you think have been successful in helping the expansion of broadband? Are there areas for which you think higher ed could provide more guidance, research, or support? How better can higher ed help the FCC?

Levin: Internet2 is a doing great work as a vanguard for the future of the Internet, and we would encourage that work to continue. It probably will show us best practices on how to use telepresence, collaborative work software, personalized training, and other practices that the private sector is using but which also have

enormous potential in education settings. It will also probably show us best practices in terms of various devices such as e-books which clearly have a significant place in the future of education.

In addition, many researchers contribute to studies of the Internet, its culture, and the learning applications that can support education. Many also can contribute to understanding the economics and business models of the Internet. We are taking advantage of that as we are working with academic centers that have volunteered to do focused, data-driven studies that will help policy makers understand the context in which they are making decisions.

ACUTA: ACUTA: **Bandwidth demands continue to increase, but prospective broadband customers who are holding-out due to price want their cost to be based on their usage, not with overhead attached to account for the usage demands from heavier users. A new Georgetown University study says that more flexible pricing strategies, such as consumption-based pricing, would resolve these concerns and dramatically improve the uptake rates of broadband. What is your take on this, particularly in light of an economy that may be fragile for years to come?**

Levin: As part of the analysis we are doing to develop a national broadband plan, we are looking at a number of economic studies and evaluating them from both the supply side and the demand side. We are too early in the process to come to any conclusions about the policy implications of any one study.

Congress called for the plan to drive greater affordability and maximum utilization. We need to have a plan that encourages adoption but does not drive users away from using broadband, particularly in areas where there are public policy implications, such as using broadband to improve and lower the cost of healthcare.

ACUTA: Cost estimates for greatly increasing broadband bandwidth and making it accessible to every home and business in the United States range from $100 billion over the next three to five years (EDUCAUSE estimate) to $300 billion over 20 years (David McClure, head of the U.S. Internet Industry Association & John Ernhardt, Senior Manager of Policy Communications for Cisco). Given the $7 billion available for broadband expansion under the stimulus package, other current programs that promote broadband expansion, as well as the potential to use universal service funds for broadband, what do you see as the practical level of broadband expansion possible over the next five to ten years?

Levin: Again, we are early in the analytic process but we are looking at all kinds of alternatives in considering how to fund the expansion of broadband networks to the level the country needs.

ACUTA: There has been increasing pressure on the federal universal service fund over the past several years, as the high cost fund has grown larger and

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as contribution factors have increased, often faster than the size of the fund. State funds also have been facing similar issues. In this context, what role can universal service programs, at both the federal and state level, play in the broadband plan, and to what extent will that role be constrained by the current functions of those programs and the current funding mechanisms?

Levin: USF historically has played a key role in assuring that all Americans have access to the core communications service of voice. As that core service moves toward broadband, we would expect that USF will again play a key role though it will have to be looked at through the lens of economics and technology of broadband, which are different than they are for voice service.

ACUTA: We are encouraged that the FCC is actively seeking out best practices on broadband expansion from other countries. One idea from another country is allowing consumers to pay for their broadband service out of their pre-tax earnings. With so much of the discussion revolving around incentives or assistance to carriers and broadband providers, are you considering options that would directly involve customers?

Levin: We are looking at both demand-side and supply-side solutions and trying to determine which are the most effective and efficient at achieving the goals that Congress set.

ACUTA: Given the phenomenal growth of electronic communications devices and the anticipated surge in the use of smartphones and other devices by consumers (which would definitely include our members' student population), you recently commented on a need for more spectrum. What are some options for this, and how can decisions be made so that changes can be implemented ahead of demand, rather than lagging behind? How will the FCC ensure that there will be enough bandwidth available at a competitive price to support the continued technology expansion?

Levin: We are still looking at the supply and demand curves to try to figure out the details of the direction we need to go. We hope that others will be providing more detailed proposals for how to obtain the spectrum our country will need, but we expect that we will looking at more specific proposals later this fall.

ACUTA: What do you see as the most difficult technical challenge facing the FCC in the future after the broadband challenge?

Levin: There are many, but at this stage I would not say that it is clear which is the most difficult. Broadband is a constantly evolving ecosystem, so I am not sure the challenge will ever be fully met. We hope that as part of the plan, we provide the FCC and other government agencies not just with an agenda for immediate action but also a vision of an agenda for issues that require further work so that the Commission is able to chart a pro-active, and not reactive, course.

ACUTA thanks Mr. Levin and his colleagues for the time and thought they were willing to invest in this interview. If you have questions, direct them to Wendell Barbour, chair of ACUTA's Legislative and Regulatory Affairs Committee, at barbourwa@longwood.edu.

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The Broadband Stimulus: What We Can Learn from the Notice of Funds Availability

J.G. Harrington
Dow Lohnes PLLC
and
Ken Salomon
Dow Lohnes Government Strategies PLLC

On July 1, the Rural Utilities Service (RUS) and the National Telecommunications and Information Administration (NTIA) released their first notice of funds availability for grants, loans, and loan guarantees made available under the American Recovery and Reinvestment Act (ARRA), better known as the stimulus package. RUS and NTIA are now evaluating applications for funding under the notice and are expected to announce the awards on November 8, 2009.

This article focuses on what the notice teaches us about the interaction between a law like the ARRA and the agencies that implement the law. Like many telecommunications laws, the ARRA gave the implementing agencies explicit direction in some areas and great discretion in others. Agency responses to new laws often are as much the result of the agency's own idea of its mission as the legal requirements created by Congress, and that is as true of the broadband stimulus as of any other congressional program. With those considerations in mind, the Notice of Funds Availability (NOFA) illustrates four key principles of agency action:

- The requirements of the statute matter but do not completely determine what the agency will do.
- Surprises always are possible.
- There can be more than one way to approach an issue, even within a specific framework.
- Politics matter.

The Impact of Statutory Requirements

The ARRA contains a series of requirements for both NTIA and RUS. Some of those requirements, such as the dates by which the two agencies must spend the funds and the minimum amounts to be spent on public computing and innovative broadband adoption programs by NTIA, are not subject to interpretation; they are part of the framework within which the agencies must operate. However, the language of the ARRA gives both NTIA and RUS considerable discretion in other areas, particularly in interpreting the language of Congress in the ARRA.

For instance, in awarding grants, NTIA is required to consider whether projects will increase the affordability or use of broadband; provide the greatest speed possible to the greatest number of users; and enhance service for healthcare, education, or children's services. RUS, when evaluating applications, is required to give priority to projects that offer customers a choice of broadband providers; that provide service to rural customers who do not have access to broadband today; and that are proposed by entities that have borrowed money from RUS for rural telephone service in the past. These are only minimum requirements, and the ARRA does not prevent either agency from adopting other rules to govern the application process.

In fact, in some ways, the ARRA encouraged NTIA and RUS to look beyond the minimum requirements. NTIA, for instance, was directed to work toward meeting four policy goals. RUS was not given

specific goals to meet in the ARRA, in large part because RUS already has a mission of ensuring the availability of service in rural areas.

Although the two agencies clearly cooperated, NTIA and RUS have responded to their mandates in different ways. RUS, with some important exceptions, has focused on the specific requirements of the ARRA: RUS will give funding only to applicants that propose to serve areas defined as "unserved" or "underserved." It also will give higher scores to applications based on the number of rural residents that (1) would get new broadband service; (2) target rural and remote areas; (3) create infrastructure that can be used by more than one provider; and (4) come from companies that already have received RUS funding. All of these criteria are directly connected to the minimum requirements for RUS funding under the statute, and most of the other criteria RUS adopted are directly connected to the existing RUS funding mechanisms. The only significant application criteria that are not connected to requirements in the ARRA or preexisting RUS rules are that RUS will give higher scores to applicants that propose services with higher speeds and that RUS applicants will be required to meet the statutorily required nondiscrimination and interconnection mandates that apply to NTIA applications.

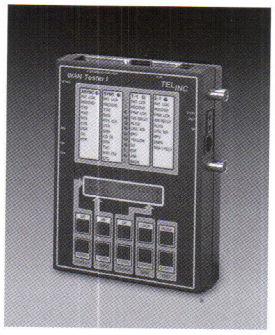
NTIA, on the other hand, has focused more on the purposes of the ARRA than on the limited number of requirements in the statute. Close to one-third of the total points available in NTIA's scoring regime are related to statutory goals, rather than to specific requirements, and NTIA will consider factors that are not related to either the goals or the requirements, including the level of community involvement in a project.

Most significantly, even though the statute does not limit where NTIA can grant broadband infrastructure funding, NTIA will not consider any broadband infrastructure request that is not for an unserved or underserved area. This restriction greatly limits the areas where NTIA infrastructure funding will be available. This is a particularly interesting policy choice that seems to elevate one of the statutory goals over all of the others when NTIA considers infrastructure applications. However, it may be an attempt by NTIA to preserve more funds for the second and third application cycles for its other statutory mandates: expanding public computing centers and innovative sustainable broadband applications.

Surprises

The power of agencies to adopt rules that do not exactly mimic the requirements in a statute means that they can act in surprising ways, often based on their understanding of their missions or of the real purpose of the statute, as well as on White House direction. This principle is illustrated by at least three elements of the NOFA.

The first example is the definition of broadband. For years, advocates for broadband deployment have been concerned that policymakers at the Federal Communications Commission and NTIA had not been sufficiently aggressive in pressing for the availability of truly high-speed Internet access, and it was



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widely expected that broadband would be defined in a way that would address that concern. In fact, when Congress was debating the ARRA, one of the most significant questions was whether the broadband stimulus provisions would require a minimum speed and whether that speed might be as high as 20 Mbps.

Rather than defining broadband in a way that recognized current technology, however, NTIA and RUS decided to define broadband as any service with a downstream speed of 768 kbps or more and an upstream speed of 200 kbps or more. At first glance, this would seem to be an endorsement of services that almost no observer would consider to be broadband. However, NTIA and RUS did not make funding available to anyone who was willing to offer 768 kbps service. Instead, they used the definition to limit funding to areas that do not have at least 768 kbps speeds available (called "unserved areas") and areas where there is only limited 768 kbps or faster service available (called "underserved areas"). As a result, this very liberal definition of "broadband" actually makes funding for infrastructure projects unavailable to areas where the vast majority of the population lives and works; it will have the effect of pushing infrastructure funding to places that have no broadband service today.

The NTIA and RUS decision to limit infrastructure funding to unserved and underserved areas also was surprising. This decision was not mandated by the statute; in fact, one of the criteria that RUS is supposed to consider is whether the funding would facilitate the availability of broadband service from multiple providers in a given location. While there are arguments that the best way to spend the infrastructure funding would be to focus on places where there is no service, this decision also means that this money will be spent on areas where there are relatively few people and where each additional connection will be relatively costly. As a practical matter, this decision also means that, at least for this first broadband stimulus funding cycle, the benefits of broadband infrastructure funding will be concentrated in the most rural states in the country, with little or no funding going to urban or suburban areas, where demand is greatest. RUS and NTIA could revisit the broadband definition (and accordingly the funding focus) for the second and/or third funding cycles.

Third, while NTIA was required to adopt nondiscrimination and interconnection conditions for its infrastructure grants, RUS adopted the same conditions even though it was not required to do so. This decision may be particularly significant because the rural telephone companies that typically apply for RUS funding may be reluctant to do so if they have to comply with nondiscrimination requirements. However, given the cooperation between NTIA and RUS, and their interest in coordinating their efforts, it is understandable that they tried to harmonize their programs to the extent possible, perhaps reflecting President Obama's long support of network neutrality legislation.

As often is the case, there are reasonable explanations for each of the surprising elements of the NOFA described above. In fact, some of these surprises may be more consistent with the underlying intent of the ARRA than the rules that many parties expected. In practice, these kinds of surprises are an inevitable result of a process that is not conducted fully in the open, which is true of most agency deliberations. And surprises are particularly likely when, as with the ARRA, agencies must adopt rules quickly and without the time to ask for public comment on specific proposals.

Multiple Angles

The NOFA describes decisions made by two different agencies on the same topic. This is unusual, since in most cases a single agency interprets the intent of a statute and implements the statute. As a result of this unusual circumstance, the NOFA also illustrates the differences in how NTIA and RUS viewed the goals and purposes of the ARRA. Although this is apparent in many areas, one of the best examples is how the two agencies approach the basic process of reviewing funding applications and awarding funds. Even though the ARRA sets out specific requirements and basic principles that both agencies are required to consider when they review applications, NTIA and RUS took very different approaches to doing so.

This is first evident when considering how RUS and NTIA score applications. RUS has a very specific scoring regime, describing the exact number of points to be awarded for meeting particular targets. Consequently, an RUS applicant can score significant parts of an application by itself (in fact, RUS requires applicants to submit a "self-scoring sheet" that tallies the points they earn in those parts of the application). NTIA, on the other hand, divides its scoring into four broad categories—purpose, benefits, viability, and sustainability—and allocates points only to those categories. Although both RUS and NTIA provide detailed information on what falls within each broad scoring category, only RUS allocates points within each category. As a consequence, NTIA has given itself much greater discretion in evaluating applications in the first instance.

The same distinction continues in the actual award process. RUS will make its awards based entirely on the scoring process—so, the higher an application scores, the more likely it is to receive funding. NTIA, on the other hand, will advance applications to step two of its process based on their scoring, and then will consider a variety of factors, including the scores; the extent to which the application is consistent with information obtained during a follow-up documentation process; state prioritization in ranking individual applications; geographic distribution of proposed awards; and the range of technologies and how they are used. Thus, an application that scores very highly in the initial evaluation may not be funded, while other applications that do not score that highly may be funded in its place.

Neither RUS nor NTIA is required to adopt a specific approach to its grant process, and either could have adopted the same approach as the other. The differences reflect both differences in the specific parts of the statute that apply to each agency and in the agency's philosophies and past practices for their existing funding programs. For instance, NTIA is required to try to spread its grants among all 50 states, while RUS is not. This means that NTIA has reason to factor geography into its process, something that is less amenable to a standardized scoring system than, for instance, the speed of facilities or the percentage of loans and grants requested in an application. At the same time, NTIA could have adopted more specific scoring for providing service to vulnerable populations, for proposing to offer higher speeds, or for the percentage of funding coming from the applicant, but it chose not to do so.

Conversely, RUS could have been less specific in its scoring or could have added a level of discretionary review to ensure that its awards, as a whole, met the goals of the statute, but it chose to follow its existing model for previous grant programs. This not only is likely to be more administratively efficient, but also reinforces the RUS mission of serving tradi-

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tional rural telephone companies, which already are familiar with how RUS scored applications in the past.

Politics

Even in cases where there seem to be objective criteria that an agency must apply, political considerations come into play when agencies implement statutes. Congress made this clear in setting up the NTIA grant program by requiring NTIA to attempt to issue grants in every state; but many other political factors influence the way applications will be processed.

Both NTIA and RUS ask for information from applicants that will help establish the extent to which those applications have political support. RUS actually makes this an explicit element of the scoring process, adding points if an applicant obtains letters of support from community leaders. NTIA will consult state governments to determine how to prioritize projects and will consider the level of community involvement in a proposed project. These factors create very strong incentives for applicants to obtain political support before and during the application process.

Congress also has a significant influence even after a statute is passed. Both Democrats and Republicans sought to have NTIA and RUS address specific concerns when setting up the funding process. Some of these concerns, such as an emphasis on infrastructure funding for unserved rural areas, were reflected in the decisions NTIA and RUS made. It also is no coincidence that one of the questions on the application form is what congressional districts are included in the area to be served if a project is given funding. While neither agency will decide to grant funding solely on the basis of this information, they both are likely to use this information to inform members of both houses of Congress about funding awards so that they can announce the funding to their constituents.

Conclusion

The path from enactment of a law to its implementation by the responsible agency is not straight and narrow. While the process that led to the NOFA was not entirely typical of federal agency rule makings, it does provide a window into how decisions are made and what influences them. Agencies like NTIA and RUS, even when constrained by specific terms in a law, have significant flexibility and discretion in shaping the rules to meet not just the literal wording of the statute, but their understanding of the intent of the law, their own agency missions, and the goals of the administration and congressional desires that do not appear in the law itself. Understanding these factors can make it easier to understand how a new law will be applied.

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More information on the broadband stimulus is available on the Dow Lohnes website at /www.dowlohnes.com/news/Detail.aspx?newsid=77109a1c-8ca6-4b05-9a6e-03280f25e9cf

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The Top 10 Cloud Computing Issues for Higher Education

Marla A. Hoehn
and John L. Nicholson

One of the hottest buzzwords in higher-education technology today is "cloud computing." While there is sufficient debate about what exactly "cloud computing" means, at the core is one party (the customer) obtaining information technology (IT) services from someone else (the provider). In the broadest sense, cloud computing means a provider assembling the infrastructure and capability to provide large-scale IT services to numerous customers simultaneously. It includes such things as data storage and processing and delivery of software as a service (SaaS).[1] According to the marketing hype, cloud computing frees colleges and universities from the need to buy hardware and software and maintain their own IT infrastructure, making them more nimble and better able to adapt to changing student, faculty, and administrator demands, not to mention curing the common cold. Unfortunately, as roughly 7,500 customers of online backup and storage provider Carbonite, Inc., learned recently, cloud computing has some of its own issues and risks.[2]

In some ways, universities strike cloud computing deals the same way they make any other type of service arrangement—they contract for a service; negotiate terms and conditions, service-level agreements (SLAs), and pricing; and make sure that what the supplier provides is the service they actually think they are getting.

However, due to the nature of cloud-based services, universities, in particular, should carefully evaluate a handful of issues before reaching contract terms with vendors. This may help avoid unpleasant and potentially costly consequences:

1. Privacy and security

Privacy and security are typically at the top of the list when universities consider cloud computing issues. Those concerns become even more important, given that universities typically host every variety of sensitive data imaginable, from health records and credit card numbers to academic files and proprietary research work. Security and privacy fears are primary reasons many entities, particularly large universities, may be reluctant to adopt cloud computing. In some cases and for certain services, educators will opt against using cloud services altogether because of these issues.[3] But for some types of services, cloud computing may make sense if the privacy and security risks can be mitigated.

At the forefront of a potential cloud customer's mind is, who can access and use my data? A related issue is, what rights, if any, does the provider reserve to use the customer data? Also, what level of security is the provider willing to provide? Is the provider's service consistent with my privacy policy? Will the data be encrypted? Details about these issues should be included as part of the contract, whether in the main body or in attachments. One way for providers to assure customers that they are taking security seriously is for the provider to

be compliant with one or more of the relevant ISO 27000–series of information security standards.[4]

One significant concern for universities with international campuses or for joint ventures considering a cloud-based service is compliance with the European Data Protection Directive (the EU Directive"), which requires a "data controller" to ensure that any third party that processes personal information in the EU (or exported from the EU) implements adequate organizational and technical security measures to protect the data. The EU Directive restricts companies and education institutions from exporting personal information outside the EU to any country that does not have, in the EU's opinion, "adequate" data privacy laws (the U.S. does not), unless certain specific requirements have been met. Many other countries have implemented data protection laws modeled after the EU; thus, educators considering the cloud services model, in general, and those with international operations, in particular, need to consider whether the provider's operating model creates cross-border data privacy issues.

One particular issue to consider, triggered by the EU Directive and similar laws, is the requirement that data controllers comply with "fair information practices," which include allowing data subjects to be informed of, and have an opportunity to consent to, the location where their data is processed and any parties (e.g., subcontractors) that might have access to the data. In a cloud services model, such compliance with fair information practices can be challenging at best for education institutions managing relationships with diverse user populations, such as students, staff, faculty, alumni, visiting researchers, and others who would need to provide consent in a timely fashion as needed.

Once the data is in "the cloud," what happens if it is somehow disclosed to unauthorized individuals? Many states have laws requiring certain protective measures for the security of personal information and/or requiring that if a security breach of certain personal information occurs, notice must be given to the affected individuals.[6] If the provider and the customer are located in different states, which state's law governs with respect to the customer's data hosted by the provider?[7] What if the data itself is located in yet another jurisdiction? What if the legal obligations of the provider and customer conflict?

Because of these issues, it is important for both the provider and the customer to understand their respective legal obligations with respect to the data in the cloud, to know what terms in the service agreement it can and cannot agree to. For example, if the provider is obligated to give notice to appropriate authorities and individuals of a security breach, the customer will want to ensure, to the extent permitted by law, that the provider does not do so without the customer's involvement. The customer also will want to require, of course, that the provider immediately investigate the cause of the breach and cooperate with the customer in mitigating damage caused by the breach.

In addition to the panoply of state laws, for healthcare companies, the Health Information Technology for Economic and Clinical Health Act (the HITECH Act), enacted as part of the American Recovery and Reinvestment Act of 2009,[8] provides new federal data breach notification obligations that require HIPAA-covered entities (universities among them) to report most security breaches directly to affected individuals.[9] In general, notices provided under these provisions must be sent within 60 days,[10] which may be a short period of time to investigate and mitigate a data breach in the cloud environment, since the data could be stored in one or more other countries.[11] Any contract with a cloud service provider will need to enable university hospitals and other campus stakeholders to comply with these requirements.

Another legal obligation a service provider may have is compliance with government requests for disclosure or when served with a subpoena.[12] Most providers will reserve the right to make these kinds of disclosures when requested, but the customer may want to try to negotiate some limitations on that. For example, a university exploring cloud hosting of its e-mail messaging system should require that notice be given to it before message contents are turned over to authorities, unless the provider is legally prohibited from doing so.

2. Regulatory Compliance

Universities may be subject to regulations with requirements that will pass obligations to their technology service providers. Take healthcare and HIPAA compliance, for example. Most of the early cloud computing service providers are general providers, rather than companies that specialize in handling medical or other specific information. The early providers are banking on their size and the attraction of low costs and other benefits to force customers to accept the providers' standard contracts (which will be discussed in more detail later), but universities handling health records may need their service providers to execute a Business Associate Agreement, which the current group of providers may not be willing to do. Higher-education cloud

prospects also need to confirm that cloud service providers can (and do) comply with both the HIPAA Privacy Rule and the HIPAA Security Rule, particularly since they were updated as a result of the HITECH Act.

The U.S. Department of Health and Human Services, through the Centers for Medicare and Medicaid Services (CMS), has recently begun to step up enforcement of these rules, notably, in 2008, Providence Health Services became the first entity to be fined for noncompliance with the HIPAA Security Rule.[13] The health provider was fined $100,000 for failing to provide adequate safeguards for PHI on backup media and laptops.

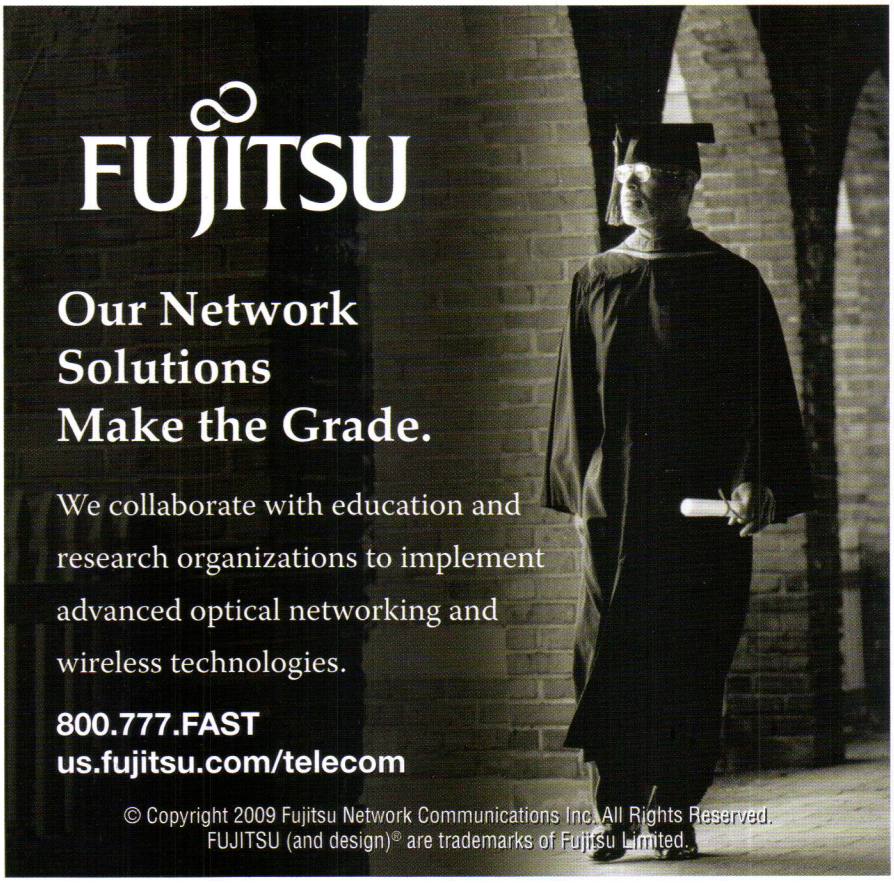
Contracts should allocate the cost of the provider's compliance with changes to regulations and new regulations. If a new or modified regulation forces a provider to modify the service solely because of the requirements of the customer, it's reasonable for the cost of those changes to be passed on to the customer (or allocated directly among its affected customers). However, if the change is due to the nature of the service the provider is offering, in general, then the cost of those changes should only be recaptured in the provider's rates, not passed directly to customers. Depending on how a customer's rates are calculated (i.e., are they fixed for some period of time or can the provider change them through some process?), this may place the risk of regulatory changes on the supplier or the customer, but it should be negotiated in advance as part of the deal.

3. Service Level Terms

What service level commitment is the provider making, and what do today's universities need? Cloud computing providers are looking to maximize their economies of scale, which means that (a) they want to standardize their offering as much as possible, which could decrease their desire to provide the kind of flexible service that educators are used to receiving in-house or from a dedicated provider, and (b) they want to minimize the commitment they have to provide their customers in terms of service levels and service level credits. Does the service level at least match what the customer has been providing on its own if the resource has been in-house or what the customer has been receiving from a third party? In some cases, the customer may need to determine internally what service level it needs if the service is new to the organization. Along these lines, the downtime maintenance windows (and notice requirements) reserved by the provider should be considered to ensure they do not conflict with the customer's expected usage of the service.

In addition, what metrics are being used to track the service level commitments? The provider should analyze and determine upfront, when designing the service, the metrics that customers will demand, since the provider does not want to be in a position of applying different metrics for different customers.

In addition, what remedies are provided in the agreement for failure to meet those commitments? Often the provider will limit those remedies to service level credits, usually expressed in terms of a percentage of monthly fees paid, or termination of the agreement if the failure to meet the service levels is severe. Moreover, these credits usually must be



requested by the customer, within a certain time period, in order for them to be applied against the customer's account. Universities must consider whether they have processes in place to make these requests and comply with these procedures if a less strict process cannot be negotiated.

4. Ownership of Data

Cloud computing contracts should also address who owns the data generated through use of the service and what rights, if any, the other party would have to it. This includes not only the data input by the customer (which the customer would own), but also data processed by use of the system (which the customer typically would own), as well as "metadata" (the application and network infrastructure information describing the customer's operation and use of the system, which the provider would usually own but which the customer might want to be able to use in order to obtain the service elsewhere once the relationship is terminated).

5. Indemnification and Liability

What liability is the provider willing to take (for example, intellectual property infringement claims as to the service), and what liability does it disclaim? Is the provider's overall liability capped, and if so, does it have any exclusions (such as for infringement or willful misconduct)? Universities must consider whether other liabilities (such as for confidentiality or security breaches) should be excluded from these limitations. From the provider's viewpoint, it may suffer certain liabilities for the customer's use of the service (e.g., uploading infringing materials, spam, etc.). How, if at all, is the customer's liability limited, and does this limitation also have appropriate exclusions?

6. Disaster Recovery and Business Continuity

Service agreements should clearly spell out the service provider's responsibility, if any, for customer data backups, including the frequency with which backups are to be performed. In addition, universities will want to ensure that service providers have appropriate disaster recovery and business continuity plans, including redundancy, recovery time objectives, and appropriate notification and escalation processes, in place to handle disasters and catastrophic events that cause service outages. Higher-education buyers attracted to the "seamlessness" of cloud computing should also recognize that a cloud provider can create a single point of failure, as the Carbonite customers learned. Both ends of the Internet connection and the cloud service itself could cause your data or the service to be inaccessible. Outside the issues of SLAs and credits, the customer needs to have a plan for dealing with that possibility.

7. Termination

Issues relating to termination of the relationship also need to be considered up front. What if a university's cloud provider goes out of business? Is there a mechanism for affected customers to regain data access? Some technology escrow service providers now offer data backup services as a protection against service provider failures. The customer should consider whether the use of such services, or other backup capabilities, is needed. From the provider's perspective, what if the customer fails to pay or goes under? What obligations does the provider have to maintain or return data?

Since re-vamping IT systems is difficult for education and corporate customers alike, educators should require cloud providers to assist with their transition to another vendor, regardless of the reason for the termination (i.e., even if the provider is terminating the customer for cause). If the provider is terminating the customer for failure to pay, then it's reasonable for the provider to insist on payment in advance for the transition assistance, but if a provider could terminate the services and effectively shut down a customer's business until the customer can find and bring up the services with another supplier, that puts too much leverage on the provider's side.

8. Are You Locked in a Cloud?

There are a couple of additional issues to consider with respect to termination of the relationship. Depending on the level of abstraction in a university's proposed cloud computing environment, this customer may have difficulty porting its data and applications used in that environment to a different environment. If it's a low level of abstraction, for example, such as that offered by the Amazon platform, portability is less of an issue than at the higher level of abstraction offered by such cloud providers as SalesForce.com.

This difficulty in porting and interoperability, referred to as "cloud lock-in," is a critical consideration for university IT decisionmakers. Generally, the more specialized and customized the cloud platform is, the less readily convertible its data is for a competitor's platform. This has implications for recompeting contracts and RFPs and needs to be factored in to contract terms at the outset. For example, even if a university were to obtain some level of outgoing transition assistance from its cloud provider, that provider is unlikely to agree to completely re-porting the data or application in question simply to make the school's jump to a competitor easier.

Unlike traditional software licensor/licensee relationships, cloud customers do not own the underlying software. In

addition to escrow services for customer data and transition assistance to the customer, some cloud customers may wish to obtain a license to some or all of the software used to provide the cloud computing service, much as they would do in a software license arrangement. The provider may not agree to this for a couple of reasons. First, the platform for its service is built on the software, and the provider would not want to release this "secret sauce" (much as a software provider is protective of its source code). Second, many cloud computing implementations use open source software,[14] some of which are likely subject to licenses that require that if the software is modified and distributed, the modifications must be made available in source code form. Making the software available, even through an escrow arrangement could trigger this obligation, which cloud providers will undoubtedly wish to avoid.

9. Pricing

Like any deal, the pricing structure for cloud services needs to be carefully examined before universities sign the deal. Cloud services providers like to sell their services on a "utility" model, emphasizing the ability to "dial up" or "dial down" the services to reflect the customer's needs. When it comes to the contract, however, the deal frequently includes minimums that make it much less of a utility model and much more of a "take or pay," with pricing specified for growth. If the specified floors are reasonable, that may not be a bad thing, as the commitment to a minimum level enables the providers to provide certain pricing incentives that would not be available in a pure utility model. But if the past 12 months have taught us anything, it should be that you never know what an economic downturn is going to bring.

10. Contracts and Terms Still Evolving

Most cloud computing vendors are rushing their complex services to market and are developing their contracts in the same "release the beta" model that has become the norm for technology services. Because of that, suppliers are using contract forms that are sometimes incomplete and sometimes internally inconsistent. The service providers are also looking at these contracts more like online terms of service that they can amend and modify at will—including the pricing and SLA provisions. Even if the provider's service agreement is presented to a university as an online, "click-through" agreement to which the customer has little choice but to accept or find another vendor, the university is still well-advised to read and understand how key issues are addressed in the agreement, since it may be possible to negotiate certain of these provisions. Of course, educators

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finding their providers' terms to be completely non-negotiable have a good idea of how issues in their relationship will be resolved in the future.

Cloud providers naturally have somewhat of an incentive to avoid troublesome terms of service changes—witness the recent firestorm triggered by social-networking site Facebook's changing of terms, and subsequent retreat. Still, the prospect of signing up for such a critical service where the contract can be changed by one side should give universities—and any potential customers—pause.

Conclusion

Cloud computing services offer colleges and universities the promise of greatly extending IT resources in this environment of cost-consciousness and resource constraints. However, both cloud service providers and potential higher-education customers should ensure that the terms of the service agreement enable both parties to meet their legal obligations and satisfy their business and mission requirements. Universities looking to take advantage of the cloud need to remember that this is a new area and that service providers are not experts in your field. They haven't thought through all of the issues associated with specific industries or business models. Similarly, companies looking to provide cloud services need to remember that potential customers are not used to thinking about legal issues inherent to the cloud model. Helping them think through those issues before signing a deal will lead to a happier, longer, more successful relationship, even if it requires a bit more time and contemplation.

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[1] Eric Knor & Galen Gruman, *What Cloud Computing Really Means,* INFOWORLD, April 7, 2008, http://weblog.infoworld.com/archives/emailPrint.jsp?R=printThis&A=/article/08/04/07/15FE-cloud-computing-reality_1.html.

[2] See "Data backup firm sues 2 hardware suppliers," Weisman, Robert, *Boston Globe*, March 21, 2009, available at www.boston.com/business/technology/articles/2009/03/21/data_backup_firm_sues_2_hardware_suppliers/ (last visited March 23, 2009).

[3] For interesting discussions of which applications seem most suited for the cloud, see Ephraim Schwartz, *The Dangers of Cloud Computing*, INFOWORLD, July 7, 2008, www.infoworld.com/article/08/07/07/28NF-cloud-computing-security_1.html; and Galen Gruman, *Early Experiments in Cloud Computing*, INFOWORLD, April 7, 2008, www.infoworld.com/article/08/04/07/15FE-cloud-computing-utility_1.html.

[4] For a general description of the ISO 27000-series of standards, see www.27000.org/index.htm (last visited March 24, 2009).

[5] EC/95/46.

[6] An early example is the "California Security Breach Information Act" S.B. 1386, (Cal. 2003). More recently, broad and stringent security breach law and regulations have been passed and are being implemented in Massachusetts. "Standards for the Protection of Personal Information of Residents of the Commonwealth." 201 Mass. Code Reg. Section 17.00.

[7] The California security breach notification law, for example, does not require encryption of computerized data, while the Massachusetts law does.

[8] Pub. L. No. 111-5 (2009).

[9] Pub. L. No. 111-5 (2009) at 13402.

[10] Id. at 13402(d)(1).

[11] Covered entities are also required to notify the secretary of HHS of all data breaches on an annual basis, and must provide notice of any breach of more than 500 records immediately. These notice provisions apply to "unsecured" protected health information (PHI). Under the HITECH Act, the secretary of HHS will provide guidance to covered entities as to the steps necessary to properly render PHI "unusable, unreadable, or indecipherable to unauthorized individuals" within 60 days after the date of enactment of the HITECH Act and will update that guidance on an annual basis. See Pub. L. No. 111-5 (2009) at 13402(h).

[12] For example, the Stored Communications Act, Title II of the Electronic Communications Privacy Act of 1986, Pub. L. No. 99-508 Section 201, 100 Stat. 1848, codified as amended at 18 U.S.C. Section 2701-2711, requires service providers to disclose the contents of their customers' electronic communications under certain circumstances.

[13] See Providence to Pay First HIPAA Fine of $100,000, http://www.thompson.com/public/news-brief.jsp?cat=BENEFITS&id=1853 (last visited on Jan. 29, 2009).

[14] Jon Brodkin, Open Source Fuels Growth of Cloud Computing, Software-as-a-Service, Networkworld, July 28, 2008, available at www.networkworld.com/news/2008/072808-open-source-cloud-computing.html?page=1

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"9-1-1. What Is Your Emergency?"

Guy W. Clinch
on behalf of National Emergency Number Association
Data Technical Committee
Multi LineTelephone System Working Group

Information, or the lack of it, can be the most significant hurdle in a response to an emergency call. What responders know about the facility and the possible location of those still inside who are dialing 911 to save their lives can be a key determinant of the success of a rescue.

It was never easy to accurately identify the location of a caller who, experiencing an emergency, had dialed from an extension of a multiline telephone system (MLTS); but it has become significantly more difficult as MLTSs have evolved from the technology of timed division multiplexing (TDM) to the technologies of Internet Protocol (IP) telephony. Recent tragic events in which unnecessary delays in providing public safety response have resulted in avoidable injury—and, in a number of cases, death—have spurred action by many state lawmakers as well as organizations including the National Emergency Number Association (www.nena.org).

What's the Problem?

MLTS is the acronym chosen to represent the private "switchboard" that is typically used by enterprise-style businesses or other organizations, including educational institutions for telecommunications. Traditionally referred to as the private branch exchange or PBX, modern MLTSs use advanced technologies to distribute calls across private networks that can serve local offices as well as reach across vast distances.

In the TDM world, the MLTS served many types of deployments from single buildings to multistory single buildings to multi-tenant single buildings to campuses. With traditional wide area network (WAN) connectivity, MLTSs can also span city blocks and operate between cities, states, and even across countries. Locating a caller who has dialed to report an emergency, even in the legacy telephony model, could be a complex problem. Callers may be located on a single floor with many doorways. They may be disbursed on multiple floors that may not be contiguous. They may be across the city or even in more distant locations.

To truly understand why this challenge is important, consider the position of a responding public safety official who arrives at the front door of the address given. Amid a scene of chaos, he sees a multistory building billowing with smoke. He knows there are people trapped inside, and every moment of delay decreases the probability of a successful rescue. The granularity of information available will drive the speed of decision making and increase his ability to save lives.

The physical aspects of finding people in danger are just the beginning of the challenges to today's MLTS owner or operator. Because today's MLTS may be part of complex private networks into which a public safety official's view is limited to the information he or she has been granted, it is the responsibility of the owner or operator of the MLTS to provide the information necessary to propel response. Unfortunately, relatively few owner/operators of MLTSs today understand the complexities involved, the tools that are available to help, or the respon-

sibilities that they shoulder. Too often it has been a tragic event that has provided the proof point.

This is why organizations including NENA, the member-driven organization that supports the people responsible for answering 911 calls in North America, have taken action. These actions include the creation of the NENA Model Legislation Enhanced 911 for Multi-line Telephone Systems, Version 2, February 19, 2009. The NENA website (www.nena.org/mlts-pbx) provides this document as guidance for developing state statutes and rules, as well as several technical reference documents to assist with implementation of E911 for MLTS.

911 and the PSTN

The second major challenge for E911 in the MLTS world is making sure that the 911 call from an MLTS-connected device emerges to the public switched telephone network (PSTN) in the governmental jurisdiction responsible to provide public safety response. When a call does not emerge in the right jurisdiction, more valuable life-saving time is lost.

In recent years new technologies have emerged that are adding complexities to the MLTS location challenge. IP telephony has become the dominant technology for connecting MLTS nodes across the WAN. Driven by decreased costs of connectivity and efficiencies gained, organizations have rapidly adopted an approach that cost effectively allows an MLTS to span large distances and complex deployments.

In the local area network (LAN), packet-switched technologies have also transformed the way that devices and applications connect to the MLTS. MLTS administrators once knew precisely where each extension was connected, but today users have almost total freedom to move locations. Users may be connected by wires to LAN switches on a campus, may be roaming the campus with IP-based wireless devices, may be using software applications that mimic physical devices, or may be connected over packet-switched circuits from anywhere on the planet. Unfortunately the communications technologies used in support of public safety response have not kept pace with the revolutionary changes that have occurred in the MLTS world.

In North America, the E911 system used in support of public safety agencies, a revolution for its time, remains based on assumptions that are no longer relevant in the face of today's communications technology realities. Band-Aid approaches have been made to the E911 system, for instance, to accommodate the proliferation of cell phones and residential VoIP services; however, these approaches have not fundamentally changed the underlying logic.

In the MLTS world, the E911 system lags in significant ways. As an example, where private organizations have adopted technologies that are no longer tied to geography, the E911 system is very much geographically based. For each physical location, there is typically one organization with primary responsibility to dispatch emergency service personnel to respond to that physical location. The idea that someone on one side of the country might dial 911 from an MLTS-connected device and that the call might emerge to the PSTN on the other side of the country is counterintuitive to E911.

Even in jurisdictions geographically adjacent to one another, functionality is not natively built into E911 to transfer a call. In an urban environment, where one physical location might have addresses in one or more emergency response jurisdictions, making sure that a 911 call goes to the right jurisdiction can be complex. The more dispersed an MLTS, the more complex the challenge can become.

The ALI Database

The third major challenge for MLTS location is the legacy system used in public safety to identify the location of a caller. In yesterday's world, only a limited amount of information could be transmitted along with a phone call. Location of a caller in the E911 system remains based on the ten-digit telephone number signaled as part of the telephony transmission. It is the only piece of information used to relate the location of a caller to the lifesaving help who will respond. For this system to work, it is imperative that the location information related to the caller be pre-populated in the automatic location information (ALI) database maintained on behalf of the government by various private third parties.

If the information in the ALI database does not accurately indicate the location of the caller whose originating device or application transmitted the ten digits, more valuable lifesaving time will be lost. In emergency situations, where seconds can mean the difference, any step in the process that adds time increases the danger.

In the MLTS world, various entities offer a service referred to as private switch ALI (PS/ALI). In this service, the MLTS owner/operator may provide location information that is used to update the ALI records. Here the granularity of the information provided is a choice. The decisions on the level of granularity provided are up to the MLTS owner/operator and are based on risk tolerance, physical facility layout, resources available to establish the PS/ALI records and maintain them, and other factors.

These important decisions need to be made in an informed way. They should be made in consultation with a number of parties, which may include those responsible for the organization's risk mitigation, local public safety officials, and MLTS vendors, and with guidance from organizations including NENA. MLTS E911 Caller Location Discovery and Reporting (www.nena.org/standards/technical/data/mlts-e911-caller-location-discovery-reporting) is an important document that accompanies the model legislation. This document from NENA describes the challenges in more detail and suggests strategies that organizations may use to accomplish the MLTS location goal.

Conclusion

For organizations that use MLTS technologies, especially in loco parentis institutions, the urgency of dealing with this issue cannot be overstated. The 22 states that have enacted laws, rules, or regulations compelling MLTS owners/operators to comply understand this. Recent tragedies underscore the problem. (The NENA website provides a summary of current legislation in each state at www.nena.org/mlts-pbx/state-legislation.)

You may avert a tragedy by ensuring that your organization has done what is necessary to manage the risk associated with locating those who place E911 calls on your campus.

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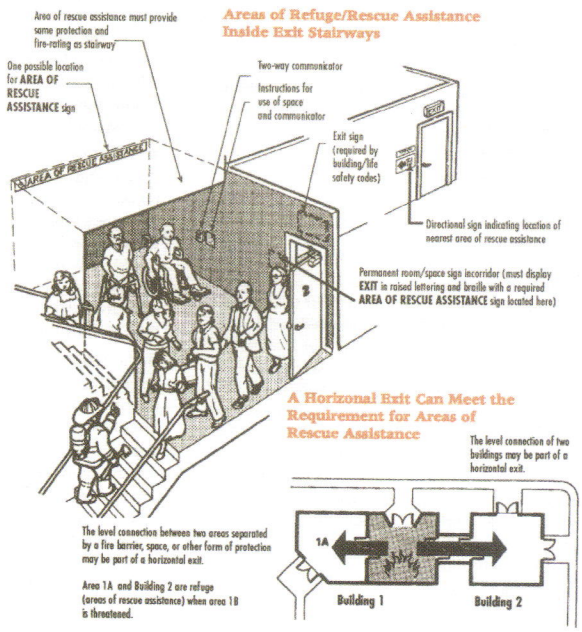
Shelter from the Storm

ACUTA Members Try to Decipher Varying Rules for Areas of Refuge

Curt Harler
Contributing Editor

Technology to help telecom professionals meet the emerging new flock of regulations for Areas of Refuge (AOR) is coming to the market. The question for ACUTA members is what is required in their locale. States such as California are among the leaders in requiring telecommunications AORs. But the rules are scattered and inconsistent.

Perhaps more easily understood by its other names—Area of Rescue or Areas of Rescue Assistance, as the Americans with Disabilities Act (ADA) calls them—the AOR is basically a location in a building designed to hold occupants during an emergency, when evacuation may not be safe or possible. Occupants can wait there safely until rescued by firefighters or other emergency personnel. An AOR requires an identifiable emergency lifeline link to a central station.



Source: http://fems.dc.gov/fems/cwp/view,a,3,q,637710.asp

According to the Alarm Detection Systems Inc. website, "The Americans with Disabilities Act requires that an Area of Refuge (also known as an Area of Rescue) system be included in all newly constructed multi-story buildings and public accommodations, as well as in existing multi-story facilities undergoing significant renovations."

Since elevators are often unsafe in evacuation situations, an Area of Refuge serves as a designated meeting point—a safer area on the other side of a firewall within a building where disabled persons, or anyone unable to evacuate, can gather and await assistance or rescue. These areas are generally prescribed by various local and state codes and are usually enforced by the fire marshal. (Source: www.adsalarm.com/compliance/RefugeArea.aspx)

AORs are generally defined in the International Building Code (IBC), the International Fire Code (IFC), NFPA 101 provisions of the National Electrical Code (NEC), and ADA.

The simple part taken care of, both telecom administrators and vendors find themselves trying to untangle a web of requirements. At the moment, there seems to be no single source of information or regulation.

"There's not much out there on the subject," states Rocco Petrunti, I&M manager in the IT Services Department at Stanford University. He has done a lot of digging into the subject.

"It seems the states pretty much leave it up to local authorities to enforce the code," Petrunti adds. That means what works in the Bay area might not work in Los Angeles. Syracuse's AOR rules differ from Buffalo's.

"We're trying to get copies of the codes ourselves," says Peter Rampf, general manager at Webb Electronics, Inc., Vancouver, British Columbia. While Webb has supplied hands-free, push-of-button elevator call systems for a decade, Rampf is utterly perplexed about where AOR is going.

Likewise, Rampf has been unable to determine whether AOR requirements will be dictated by federal or state regulation (or both). "As far as we can tell there is no cohesion," he says.

"Part of the trouble ACUTA members will have tackling this issue is that there are actual construction requirements for AORs," says Kyle R. Hamilton, vice president of marketing at Kings III Emergency Communications, Coppell, Texas. In his experience, AORs are usually enforced at a municipal level by the fire marshal.

"There are modest requirements in ADA, IBC, IFC, and NFPA 101, so those are good sources," he continues.

While those bodies have certain requirements, the local AHJ (authority having jurisdiction) often has more specific rules and the final say. "So, fire resistance, size of rooms, distance between AORs, smokeproofing, and separate ventilation come into play along with items an AHJ or even an individual inspector wants," Hamilton says.

With the professionals searching for answers, it is no wonder it is confusing to a college.

"We believe that AORs are emerging codes or standards," Hamilton says. He agrees that no dominant code-writing body has defined the complete AOR system or process.

Fire marshals began looking for ways to prevent recurrence of the tragedy that occurred at the Cook County (Chicago) Office Building during a fire in 2003. In that fire, the building was "grandfathered" from sprinkler requirements. Several people were overcome by smoke while trapped in a stairwell. That pointed out problems that needed to be addressed: There was a lack of clearly designated areas for occupants to retreat to when smoke and fire blocked their escape. Stairwell doors locked behind people trying to escape, which prevented them from exiting the stairwell and trying another exit route. And it was impossible to alert fire rescue personnel that people were trapped in a stairwell in need of rescue.

"Had there been appropriate AORs with communication systems, the deaths might have been avoided," Hamilton says.

Getting Started

Rampf says that Webb Electronics', and the industry's, original understanding of the goal for AORs was to develop systems like those in use in elevators today. These are simple units that allow a person with a medical emergency to connect with someone in a central emergency center simply and quickly.

Most companies that supply emergency equipment (including Webb and Kings III) designed systems to allow a person to punch a button and summon help. There is no need to dial any phone number or even to use any specific part of one's body to push the button. A head-butt works as effectively as a finger-push or a foot-kick.

As California goes, so typically goes much of the rest of the nation, so the data Petrunti unearthed may be helpful to any school.

The California Building Code, Section 1007.6.3 "Two-way communication" defines the need for communications in an AOR: "Areas of refuge shall be provided with a two-way communication system

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between the area of refuge and a central control point. If the central control point is not constantly attended, the area of refuge shall also have controlled access to a public telephone system. Location of the central control point shall be approved by the fire department. The two-way communication system shall include both audible and visible signals."

Petrunti found the building code to be fairly explicit, "but the local authorities seem to have jurisdiction," he says.

Code Spelled Out

In several cases, there are separate requirements for indoor spaces (i.e., stairwells) and outdoor areas (pool areas, athletic fields). California's building code requires some sort of visible communication method under Section 1007.6:

"A button ... in the area of refuge shall activate both a light in the area of refuge indicating that rescue has been requested and a light at the central control point indicating that rescue is being requested," the code specifies. It continues: "A button at the central control point shall activate both a light at the central control point and a light in the area of refuge indicating that the request has been received."

In areas of refuge that have a two-way emergency communications system, instructions on the use of the area under emergency conditions shall be posted adjoining the communications system, according to California code.

Rampf says that two-way communications typically means that the box is linked to a location staffed by authorized personnel. That site can be on-site or off-site. "Anywhere an appropriate response can be taken," he says.

A system will have a call-first number. However, if it is not answered or if it is answered by a non-human system or fax, it must hang up and redial a second location. "The important issue is that whoever receives the call must be able to respond appropriately," Rampf says.

AOR guidelines for buildings generally fall under "accessible means of egress." "I am not aware of rules applying to outdoor areas, but there may be local or municipal rules addressing this," Hamilton says.

Codes generally require that AOR devices be located on the accessible means of egress and adjacent to an exit. Common locations for AOR devices would be next to an elevator or in exit stairwells. Some municipalities require AOR devices on every floor above or below the main egress level. Others require them on every fourth or fifth floor above or below the main exit level. Check the local code.

From a technology standpoint, there are a couple of simple ways to ensure against interruptions in power and communications in an AOR. One is a self-charging battery backup for a phone system that requires electrical power beyond telephone line current. Another is the use of fire-rated cabling.

"One could use alternative means to call for help, such as cellular or two-way radio technologies rather than building phone systems. These are reasonable steps that are not specifically defined under IBC, IFC, or ADA but may be defined in local codes," Hamilton says.

Building the RFP

Any ACUTA member's shopping list for AOR equipment should include such features as self-diagnostics (alerts when "out of action"), ability to call in and out, and compliance with ADA standards. Also important, especially for equipment that may be used in turbulent times, is good sound quality and sufficient volume.

Rampf sees the future in redundant systems and battery backup. "Alarm panels often use wired and wireless, but, to my knowledge, this is not mandated for emergency communications yet," he says.

AOR communications typically connect in the main network via the telephone network. "Network-based systems are growing in popularity, especially VoIP," Rampf says. This is probably of greater interest to ACUTA members. And it is another ball of twine to untangle.

There appears to be no requirement that these communication systems connect to a main campus network or that they be answered by campus law enforcement or the local 911 center. In fact, Hamilton notes that the 2009 IBC Section 1007.8 specifies that the communications from the AOR be connected to a communication device at the fire control or main egress point in the building in which the AOR is located.

"The assumption is that the emergency responders could answer a call for help from an AOR or call all of the AORs to see which ones were being used. Then they could send rescuers to those locations rather than having to check them all physically, which would delay rescue," Hamilton says. Further, fire control rooms and main entrances are areas familiar to emergency responders. "We feel like our system with connection to our call center for call recording and dispatch notification is the best overall solution, but codes generally don't go into such detail," Hamilton adds.

"I do not think the communications systems should routinely go to 911 or campus police directly," Hamilton says. "Resources are a big deal right now, and 911 centers have to dispatch local emergency resources that may not be available to respond to false or possibly false calls; so having a monitoring center that can dispatch other assistance to the scene is an advantage."

Using campus police dispatch may sound faster on the surface, but police

dispatch has resource issues, too. Hamilton adds that while he would defer liability discussions to attorneys and insurance companies, "Obviously, there are risks associated with noncompliance with codes."

Some colleges self-insure. "One has to wonder how much it would really cost a campus to build up their emergency call center and dispatch processes to do as good a job as an outside entity can do," Hamilton says. Kings III monitors and maintains emergency telephones. Cost for this service typically runs around $30 per month per phone. "Compare that to staffing and training a dispatch center to handle the calls from 50 AORs," Hamilton says.

Of course, liability and insurance issues are best addressed by insurers and attorneys. However, Hamilton points out, failing to meet local code requirements and attempting to provide an AOR solution where no code requires them may both have liability implications. The latter, he says, may depend on the nature of protections afforded under a particular state's Good Samaritan laws.

Wherever it resides, the question of what group should control the communications is a thorny one.

"If by 'control' you mean what department should be responsible for purchasing a system and overseeing its installation and maintenance, I would say that the department with the experience relating to purchasing electronic security or telecommunications is appropriate," Hamilton says.

On the other hand, if "control" means who should answer the call from an AOR, that may be one of the few places where there is a set answer. "In IBC at least, the phones in AORs have to ring to an area by the main entrance or fire control inside the building in which the AOR is located, unless local AHJs prescribe a different location," Hamilton says. This would be nearly impossible in a campus setting, says Mike Grunder, consultant with Vantage Technology Consulting Group.

In buildings not staffed around the clock, the calls must either transfer automatically to a location that is answered 24x7 or be primarily programmed to ring there. "In those cases, an emergency call center is appropriate as is 911 or campus police, etc.," Hamilton says, adding, "Any are fine as long as they are continuously available and the AHJ does not object."

Where It's Going

Given his company's position, Hamilton says a call center dedicated to answering and dispatching two-way voice emergency calls with (1) CPR-trained operators and advanced emergency medical dispatch certified supervisors and shift leaders, (2) automatic location identification capabilities, and (3) instant access to other emergency contacts for notification, dispatch, and response to the specific location is best.

However, such detail is not specified by the code-writers like ADA, IBC, IFC and NFPA 101. "Suffice it to say that each group will think they are the best equipped to 'control' AORs, but when it comes to needing money for additional training of dispatch personnel and maintenance of systems, suddenly it will be better for some other department to handle and pay for it," Hamilton says.

While he sees the value of regulations headed toward making access to emergency services more available and more reliable, Rampf says, "There are issues. This is a moving target, getting more onerous day-by-day."

Hamilton agrees. "Until the code-writing groups harmonize with each other on AORs, it will be difficult to say with certainty in every case, 'This is what you do' regarding AORs," he says. "And bottom line, if nobody's enforcing it, nobody's going to do it."

Curt Harler is a freelance journalist and contributing editor to the ACUTA Journal. Reach him at curt@curtharler.com.

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Additional Resources

If AOR is a topic you need to investigate, start on campus with your facilities department and legal counsel for local regulations. After that, here are some additional resources.

While it is beyond the scope of this article to provide links to AOR data for all 50 states, to scout AOR requirements in any given state the following list should help:

- ADA Accessibility Guide, U.S. Department of Justice
- International Building Code Chapter 10 published by the International Code Council
- International Fire Code Chapter 10 published by the International Code Council
- NFPA 101 published by the National Fire Protection Association

There are also state accessibility codes that are nearly verbatim copies of ADA. For example, the Texas Accessibility Standards are found by searching for "State name" and "accessibility." Or, try contacting the office of your state's attorney general.

Other good sources of information are major metropolitan fire marshals or fire inspectors, as well as city building inspection departments.

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tal, web streaming, and electronic bulletin boards, to name a few.

ACUTA: Since higher education seems to be perpetually in challenging budget times, what is your most important financial issue? How are you addressing it on your campus?

Lewis: Budgetary challenges are not new for IT organizations, as investments in major campus IT projects are significant. With respect to the current economic environment, we moved very quickly to support the university's response to this global situation. We continue to work very closely with leadership across the university on effective governance practices to ensure there is strong ownership and understanding of the IT initiatives that move forward. It is essential to prioritize efforts and to focus on the ones that will have the most impact to move the missions forward. As an integral part of the University of Rochester's strategic planning process, we have realigned information technology in support of the university's missions of research, teaching and learning, healthcare, performance, and student experience. This new collaborative approach to IT has enabled significant results and institutional support for multi-year financial planning.

ACUTA: Aside from funding, what issue are you, as the CIO, currently spending most of your time addressing?

Lewis: At the University of Rochester, our strategic planning guideposts have resulted in five prioritized areas of opportunity for information technology that are aligned with the university missions:

1. Enhancing research through high-performance computing (Supporting the Mission)
2. Creating and maintaining a modern and secure web presence for the university's electronic image (Developing Enabling Systems)
3. Maintaining existing functionality in administrative systems (Developing Enabling Systems)
4. Establishing a university-wide identity management program (Solidifying Infrastructure)
5. Initiating and maintaining an institutional commitment to information technology security and compliance (Solidifying Infrastructure)

ACUTA: What is the impact of this issue for your campus? What is your strategy for addressing this issue?

Lewis: One example is the Center for Research Computing—a signature program that represents a more effective and efficient approach to computational research.

Research is a core component of the University of Rochester mission. While the University of Rochester is ranked in the top 30 institutions for receiving research funding, President Seligman has raised an ambitious goal of elevating the university into the top 20. To support this endeavor, a collaborative effort to bring faculty researchers from across the institution together resulted in a more effective and efficient approach to computational research. Last year, the IT strategic plan advocated for and then established the Center for Research Computing (CRC), a bold and innovative program for high performance computing.

The CRC is faculty researcher centered and driven. It is staffed with individuals who have deep expertise in the use and management of high-performance computational resources. The Center emphasizes the alignment of appropriate resources to support the pursuit of specific scientific problems. The success of this program is evidenced by the following:

- Use of the center by faculty researchers has quadrupled over the inaugural year.
- The center has supported several external grants.
- Researchers have logged over five million computing hours on the centrally provided systems.

ACUTA: Given that a key function of the CIO's responsibility is preparing the campus to support future technologies, what technology changes do you see for your campus as you look forward five to seven years?

Lewis: As faculty, staff, and students become increasingly reliant on technology to enable and support their day-to-day activities, there will be an increased need for hardening of systems to enhance the reliability as well as the flexibility of IT systems and services. As university leaders, CIOs will need to continue to provide leadership that creates more institutional efficiencies and provides more with less. These results can be achieved by transparency in actions and the development of true collaborations that result in multiple positive outcomes for the university community.

ACUTA: How are you readying the campus for these changes?

Lewis: Leading by example, by developing small pilots with results that scale and demonstrate what is possible through effective collaboration. Across higher education and healthcare, there is a major shift in the role of information technology—IT is no longer regarded as a tactical resource but as a strategic asset that can be leveraged to achieve transformational results. Significant opportunities exist to realize programmatic benefits from coordinated investments. Information technology, strategically focused, will create opportunities for collaboration and interdisciplinary synergies that will enhance our profile as a world-class research university.

As previously mentioned, an outstanding example of this is the Center for Research Computing—a signature program that represents a more effective and efficient approach to computational research. This bold and innovative program for high-performance computing was established as the result of a collaborative effort by faculty researchers across the institution. Today, this faculty researcher–centric program is continuing our strong tradition of interdisciplinary studies.

Thanks to Dave Lewis for sharing his experience with us. Reach Dave at david.lewis@rochester.edu.

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DAVE LEWIS
VICE PROVOST & CIO
THE UNIVERSITY OF ROCHESTER

Q&A with the CIO

ACUTA: Much of the technology we now support in higher education is driven by consumer electronics. What decisions about your technology infrastructure have been affected by this and how?

Lewis: The university community has ever-increasing expectations as it relates to consumer electronics and how they interplay with the university missions of teaching and learning, research, healthcare, performance, and community service. Leaders must keep abreast of usage trends and offerings to ensure that we are making the right investments in infrastructure to best support a dynamic environment. As our community widens its geographic reach, service offerings are increasingly reliant on technology. Mobility, ease-of-use, and availability have redefined point-of-care health services, academic tools, and the continuum of services available to users. As the university continues to grow and new opportunities present themselves, services must be scalable, flexible, and reliable.

Our university community lives, works, and studies in an anytime, anywhere environment. Interdisciplinary research and community-based learning opportunities that extend the classroom experience require skilled resources that work broadly and effectively across disciplines and spatial constraints to expand collaborations beyond the university's physical boundaries. As we look to the future, we will continue to take advantage of technology developments that improve connectivity and collaboration across the university and beyond.

ACUTA: Freshmen at most institutions today are far more extensive users of technology than those of even five years ago. What is the most challenging technical aspect this presents for your campus?

Lewis: The modern-day university exists in a digital global world where information technology has become a uniquely transformational and pervasively enabling resource. The student of the future has increased expectations for everyday use of technology. The Generation X student learned and used technology; today's Generation Y student assumes and expects "technology transparency."

As a leading research university, we welcome and anticipate the high technology expectations of our students. What some institutions might view as a challenge, we view as an opportunity. One of our biggest opportunities is to understand how expectations and ways of working are changing for today's "net generation" students. Our institution has studied the behavior and expectations of these students quite extensively and leveraged lessons learned to build better staff, services, and facilities to meet the changing needs, with very positive feedback from our students.

ACUTA: In what ways has this affected how you deliver support services?

Lewis: One of the key aspects we recognize in today's environment is that it needs to be flexible. For example, our Hajim School of Engineering and Applied Sciences attracts top engineering and computing science students to campus. It is not unusual for an incoming freshman to arrive with a UNIX computer that is comparable in scale and speed to what is required to run some administrative services for the university. We provide flexible support in this instance and in a variety of other technologies that faculty and students bring to campus.

We also recognize that our students have a major interest in technology, and we hire several undergraduate students as part-time staff in our IT organization, where they provide support through a variety of roles. It is important that we always remember that this generation of students grew up with technology integrated into their lives. They don't ask for it—they expect it and assume it. IT support and resources are available to students as part of their relationship with the university. This includes their academic life—both in and out of the classroom—as well as their role in the university community. Strategically positioned in the university library, our IT Center provides computing support to students and operates with extended hours to accommodate their study habits and lifestyles. In addition, information technology plays a strategic enabling role in residential life, public computing, student services, and athletics through technology solutions, such as the student por-

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