Fall 2007

ACUTA Journal of Telecommunications in Higher Education

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Journal of Communications Technology in Higher Education

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**ACUTA's Core Purpose** is to support higher education 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
- Advancing the value of communications technologies in higher education
- Encouraging volunteerism and individual contribution of members
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I believe that we should provide regulatory parity whenever possible. All market players, whether they are IP providers, telephone companies, cable companies, or power companies, deserve the certainty and regulatory even-handedness necessary to spark investment, speed competition, and make America a stronger player in the global economy.

Robert McDowell, FCC Commissioner

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Faculty and Staff: Building the Bridges

One of the many initiatives that Carmine Piscopo set in motion last year as president (and he did start quite a few) was that of formalizing the relationship between ACUTA and ITERA. For those of you who are not familiar with ITERA, it is the association of colleges and universities that grant degrees in communication technology. While it is a relatively small organization (it has fewer than two dozen member institutions), it has the potential to have significant impact upon ACUTA.

ACUTA was approached by ITERA last year with an invitation to ACUTA board members to judge papers for a student competition. Carmine came back from the oral presentations and could not say enough about the level of professionalism, insight, and enthusiasm of the students.

This collaboration led to a follow-on retreat including ITERA leadership, ACUTA executive director Jeri Semer, and myself in which we explored other ways of leveraging the two associations’ strengths. As a result of this meeting we came up with several ideas, including continuation of ACUTA participation in the student competitions, submission of white papers and journal articles to ACUTA by ITERA students and faculty, possible student internships, and even possible co-location of our annual conferences.

While the relationship has not yet been formalized, it did bring home the fact that we have vast, untapped resources on our campuses: our faculty and students. It seems that there has always been this division between the academic side and staff, a line that many are hesitant to cross; but when you think about it, we all have the same overall goal, which is to make our educational institution the best that it can be. We just have separate, yet complimentary, roles in the accomplishment of the goal.

Usually, when we have an issue that requires research, we revert to the Web, vendors, consultants, and ACUTA resources such as the listserv (my favorite). We rarely think of consulting with faculty, students, and researchers on our campuses, passing up an opportunity that would have a win-win-win result. Bringing real world problems to students allows them to apply theory learned in the classroom and gives them a real sense of pride in improving their campus. The faculty benefit by making class more interesting, and we benefit by getting a view that is not tainted by the way we have always done things.

One additional benefit of getting students involved is that it could be a good source of recruiting future university (and ACUTA) leaders. When you ask students finishing IT degrees where they want to work, the major consulting firms, equipment manufacturers, and carriers are the leading answers. Higher education information technology careers have a lot to offer, and we need to do everything that we can to make students aware of the opportunities.

There is a lot that we can do to build (or strengthen) the bridge between academia and staff functions. You can guest lecture or even teach classes, look for issues in your office that offer possible student internship opportunities, and involve faculty and students in your decision-making process whenever possible. The initiative that the ITERA leadership and Carmine began is a great start. We have the opportunity to take this to the next level in ways that will benefit us all.

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FROM THE EXECUTIVE DIRECTOR

Jeri A. Semer, CAE
ACUTA Executive Director

Each year at the annual Business Meeting, I have the opportunity to report to the membership on highlights of the past year. For those who were not able to attend the Business Meeting, I would like to share some of the highlights of activities by the professional staff in the ACUTA office in 2006–07.

Strategic Planning

The professional staff works closely with committees to accomplish many of the action items in the ACUTA Strategic Plan. The Strategic Plan action items are incorporated into each staff member's plan of work for the year, and together we have made significant progress. The guiding principle for everyone involved in this effort is our most audacious goal: to become the preeminent authority on communications technology in higher education.

As milestones to measure our progress toward this goal, we envisioned several major accomplishments:

- Communications technology professionals utilize ACUTA as the career-essential source for education, information, and support;
- Member institutions value the importance of ACUTA in meeting their strategic goals; and
- Global entities view ACUTA as the preeminent and preferred resource on communications technology and related policy issues.

We have made good progress in completing the action items in this plan. In a five-year plan, we have accomplished over 65 percent of the action items, and the rest are in progress or scheduled for future completion.

As you know, ACUTA members work in a dynamic world, and there is no such thing as a long-term strategic plan in this rapidly changing environment. Many of the goals in our 2005 plan have already been completed or become ongoing regular activities of ACUTA. I am currently working with incoming president Walt Magnussen on a planning retreat for November 2007, which will be an opportunity for a major update to ACUTA's Strategic Plan.

Public Policy and Regulatory Affairs

As the staff liaison to the Legislative and Regulatory Affairs Committee, I continued to spend a large percentage of my time monitoring and analyzing regulatory proposals and actions at the U.S. federal level and working with committee and legal counsel to plan our advocacy efforts. It has been another very active year, but despite a lot of activity there were few major changes on the regulatory front. Many of the critical legislative and regulatory issues remain unresolved, including comprehensive telecommunications reform, universal service, spectrum allocation, net neutrality, and others.

ACUTA continues to collaborate with other higher education and networking organizations on public policy issues. I have the opportunity to represent ACUTA on the Network Policy Council. This is a group within EDUCAUSE that is analogous to the ACUTA Legislative and Regulatory Affairs Committee and includes representatives of higher education institutions; national, state, and regional networks; consultants; and EDUCAUSE national policy staff.

ACUTA has taken the lead in coordinating several issues at the national level,
including universal service. This joint effort allows us to rely on the expertise and resources of our fellow higher education associations in accomplishing common goals.

ACUTA has continued to benefit from the increased involvement of legal counsel from Wiley Rein LLP on regulatory and legislative issues, made possible by the commitment of our members’ and board of directors’ support for making this important investment.

Media and Industry Relations

It has been another successful year for ACUTA in the media, with a steadily increasing number of media stories in which ACUTA was asked for comments and interviews. Several of our officers and I were interviewed by major higher education and technology publications this year. The Summit on IP Communications this spring generated an unprecedented amount of media coverage for ACUTA. This has been a positive contributor to our long-term strategic goal of positioning ACUTA as the preferred resource on communications technology in higher education.

Collaborations

On July 25, our president, president-elect, Legislative and Regulatory Affairs Committee chair, and I met with the president and CEO of USTA, the United States Telecommunications Association. We were invited to this meeting to discuss the future of telecommunications in higher education and how the industry can support ACUTA’s efforts. We are hopeful that this meeting provided the foundation for future communication with this important industry organization.

I am very optimistic about the relationship that we are building with ITERA, the International Telecommunications Education and Research Association. This collaboration will provide an avenue for ACUTA to reach out to students and faculty in university telecommunications degree programs. We have committed to work cooperatively on a student paper competition, student case studies, publishing...
members in The ACUTA Journal, and a number of other fruitful areas. ITERA provided an author for the publication that will result from this year’s ACUTA Forum for Strategic Leadership in Communications Technology.

During the past year we also reached out and participated in various joint projects with ACUHO-I, the Association for College and University Housing Officers, and ADEC, the American Distance Education Consortium. We accepted an invitation to join the Ethernet Alliance and conducted a joint project with ATIS, the Alliance for Telecommunications Industry Solutions, to develop a hurricane preparedness checklist for colleges and universities.

All of these collaborations have been positive for ACUTA and our members, and we intend to continue to reach out to other professional and industry organizations with mutual interests.

ACUTA Conferences and Seminars

Every ACUTA seminar in 2006–07 had excellent attendance, capped off by the Summit on IP Communications in Baltimore this spring, which set all-time attendance records. This program received great industry support from our corporate affiliates and very positive ratings from the participants, in addition to generating major media exposure for ACUTA. Every member of the ACUTA staff contributed to the planning and success of this event, and I would like to thank them for their efforts. I believe that the board of directors and the Program Committee will consider repeating this format for future summits, based on the positive reaction to this program.

We are also very excited about the transition of the ACUTA Annual Conference to the spring, beginning in 2009. The staff is engaged in planning for this transition, which will affect nearly every aspect of the ACUTA annual calendar. At the same time, we look forward to holding our first Annual Conference in Las Vegas next summer, and I’m confident that it will be a very popular location.

Conclusion

None of these actions could have been accomplished without the dedication and energy of every member of the ACUTA staff and volunteer leadership team. I would like to thank every staff member for his or her professionalism and commitment to the continued success of ACUTA. I would also like to thank our elected and volunteer leaders—our board of directors, committee chairs and committee members—who continue to devote tremendous energy to guiding the association toward accomplishment of its goals.

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Current Legislative and Regulatory Issues

The Legislative and Regulatory Affairs Committee has many issues before it as we begin another year. As noted in the annual Business Meeting held August 2 at the Annual Conference in Hollywood, Florida, the number of issues keeps growing with few if any being removed from the list.

Network Neutrality
One of the significant reasons for this stalemate is that the very divisive issue of network neutrality has held back the resolution of several legislative items. This is an issue where higher education is concerned that prioritization of services such as Google or Yahoo and fees for bandwidth would stifle innovation and also make it difficult or impossible to deliver quality distance education.

On the other side, the carriers point out that a problem does not exist today and that regulation in this area might tie their hands to the point that they would not be able to assist higher education in delivering quality distance education. We will continue to monitor the discussion and hope to accept a recent invitation from the U.S. Telecommunications Association for joint discussions regarding network neutrality.

Universal Service Fund
An issue where we expect to see movement this fall is the drive by the FCC to correct the erosion of contributions to the Universal Service Fund by adopting a numbers-based contribution methodology. From past surveys issued by the Leg/Reg Committee we have shown that a pure numbers-based contribution methodology would increase contributions by colleges and universities more than 10-fold. We have also done our best to explain that there will be no easy way to identify working numbers versus assigned numbers in the PBX environment. The FCC has heard the message and indicated that it will consider an alternate methodology for higher education, and we will be working to keep others from defeating that exception.

We will also be proactive in responding to any notice of proposed rule making should a proposal be put forth that adversely affects higher education.

Taxing Cell Phone Usage
As more institutions are becoming aware of the IRS rule that requires the institution to collect income tax for the percentage of personal use of a business supplied cell phone, we will be attempting to raise the awareness of this problem with the goal of achieving a more favorable rule. Most institutions that have dealt with this issue have moved to a model where the employee is asked to acquire a personal cell phone with the institution paying a stipend for its business use. This defeats the savings that institutions have realized from pooling minutes and business contracts with the providers. In some states, such as Washington, the payment of stipends to civil service employees is not allowed, making it almost impossible to continue...
business as usual. As we have been advised that it may do more harm than good to approach the IRS with this issue directly, we will be looking for other venues where we can raise our concerns.

Illegal File Sharing

A legislative issue that will need continued attention by the committee begins with the amendment by Senator Reid to the Higher Education Reauthorization Act, which places obligations on higher education to inform students regarding the penalties for illegal file sharing. While the amendment is not too onerous, it is almost certain that the Recording Industry Association of America will make other attempts to force institutions to play a more active role in policing the activities of students even though file-sharing violations by our students constitute a small percentage of the total problem.

Emergency Response Act

We are concerned about the Campus Law Enforcement Emergency Response Act that has been introduced in the Senate and may or may not be brought forward. The act places requirements on institutions regarding emergency notification of students that might be difficult to meet.

One such example is the notification of all students, within 30 minutes, of a law enforcement emergency. Given the limited capabilities of our PBX systems to deliver calls, poor coverage within buildings, and limited cell tower capabilities, this might be difficult or impossible to achieve. The act also initially proposed funding at the inadequate sum of $5 million. We will continue to watch this act, and, should it move forward, we will be alerting our members as to its impact.

Disaster Planning

In the general area of disaster planning and emergency response, we are concerned about the role of college and university communications technology departments as “first responders” and the issue of credentialing. Our technology employees are not currently considered first responders although the restoration of communication services is vital in many cases. When an institution includes a hospital that serves as the major trauma center for a region, this becomes even more critical.

As a part of this, our technology employees need the proper credentials in order to gain access to communications facilities during an emergency, and we are hoping for national standards in support of this. Many different states responded to the Katrina emergency, and credentialing was noted as a major challenge during this event.

CALEA

While most institutions consider themselves exempt from the recent Communications Assistance for Law Enforcement Act (CALEA) requirements, we are aware that there is some desire by the Department of Justice (DOJ) to increase the scope of the requirements to include all institutions. We will continue to watch for any movement in this area in cooperation with our partners in the higher education coalition on CALEA.
The DOJ has also stated its desire to have ISPs keep logs of all Internet access for two years based on a need to increase prosecution of illegal activities, including transmission of child pornography. We are concerned that this obligation might also be extended to higher education, and we will be watching this issue and responding as required.

**Multiple Dwelling Units**

The FCC has initiated two proceedings that could affect whether campuses can enter into exclusive contracts for the provision of video services in multiple dwelling units such as residence halls. ACUTA recently filed comments justifying the need for higher education institutions to retain such contracts, and we will watch the reply comments closely to make sure that an exemption granted to higher education in a ruling from several years ago is retained.

It would be a real challenge to institutions to have to allow multiple providers access to our limited infrastructure in the residence halls. It might be almost impossible to satisfy the needs in the case where two or more individuals share a living space.

**Broadband Internet Access**

Finally, there are a lot of possibilities for legislation concerning the deployment of broadband Internet access. These initiatives will be watched as to how they are funded and for their potential positive impact on higher education's ability to deliver distance education.

**Conclusion**

Having shared all the above, it is quite possible that other issues will arise that will move to the top of the priority list. It does not seem likely at this point that a major rewrite of the Telecommunications Act will happen anytime soon, nor do we anticipate any significant legislation that would affect institutions in the homeland security area. However, a single incident, such as the Virginia Tech tragedy, can cause priorities to change quickly.

Dave Ostrom, Washington State University, is chair of ACUTA’s Legislative and Regulatory Affairs Committee. Reach Dave at ostrom@wsu.edu.

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Robert M. McDowell was nominated by President George W. Bush to a seat on the FCC on February 6, 2006, for the remainder of the term expiring June 30, 2009. He was unanimously confirmed by the United States Senate and sworn in as FCC Commissioner on June 1, 2006.

Commissioner McDowell brings to the FCC approximately 16 years of experience in the communications industry. Immediately prior to joining the FCC, Commissioner McDowell was senior vice president and assistant general counsel for COMPTEL, an association representing competitive facilities-based telecommunications service providers, emerging VoIP providers, integrated communications companies, and their supplier partners, where he had responsibilities involving advocacy efforts before Congress, the White House, and executive agencies. He has served on the North American Numbering Council and on the board of directors of North American Numbering Plan Billing and Collection, Inc.

Prior to joining COMPTEL in February 1999, McDowell served as the executive vice president and general counsel of America’s Carriers Telecommunications Association.

McDowell was graduated cum laude from Duke University in 1985 and attended the Marshall-Wythe School of Law at the College of William and Mary. Upon his graduation from law school, McDowell joined the Washington, D.C., office of Arter & Hadden, a national law firm based in Cleveland.

Interview

Robert M. McDowell
Commissioner, Federal Communications Commission

ACUTA: What are your thoughts on the pending wireless spectrum auction? What do you see as the options for and barriers to spectrum reform? What will be the impact on higher education as a stakeholder in areas such as wireless?

McDowell: The 700 MHz Order, which was adopted by the Commission on July 31 and which established the service rules for the spectrum to be auctioned in January 2008, contained certain positive attributes. Among them is the plan to spark a public/private partnership for public safety by allocating an additional 10 megahertz of spectrum to aid in the construction of a nationwide, interoperable network. This plan has been assembled as the result of close coordination with the public safety community, and I am pleased to support it. I am hopeful that higher education will benefit from the added protection and security associated with this new first-responder network.

On the other hand, regarding some of the other more-publicized issues, I am disappointed that my colleagues didn’t try to work with industry to forge a consensus solution rather than rushing to regulate without thinking through possible unintended consequences. As background, my original vision for the 700 MHz auction was for our rules to maximize investment, innovation, and consumer choice by promoting competition through the crafting of a wide variety of unencumbered market and spectrum block sizes. We had the opportunity to help foster the development of a fourth, fifth, or sixth new broadband pipe offered perhaps by small-town entrepreneurs or new regional players. In fact, we heard from a broad array of potential bidders, and an overwhelming number of members of Congress on this important point.

Unfortunately, the encumbered spectrum structure supported by the majority will force many large wealthy bidders away from the upper band and into the smaller, unencumbered blocks in the lower band, thus rendering those licenses out of reach for many smaller competitors. Depriving the nascent 700 MHz market place of smaller new entrants will result in less innovation and competition, not more. Consumers, including higher education staff, faculty, administrators, and students, could be shortchanged as a result.

The wireless market is starting to deliver device and application portability because it has been allowed to function freely and has been responsive to consumer demand. For example, over the past couple of years, wireless carriers have offered at least ten different phones that are compatible with any WiFi network, including those common on and near college campuses. This capability allows consumers to navigate the Internet just as they can on their home com-
puter and download software such as voice over Internet protocol applications or popular search engines. Unfortunately, the FCC's July 31 mandates may distort natural market progressions by causing unintended consequences. For instance, will the Commission now have to mandate a European-style technical standard for the 700 MHz band in order to allow any device or application to operate according to the new rules? This and many other questions are left unanswered.

ACUTA: How do you define network neutrality as an issue, and what impact do you see for a large bandwidth user such as higher education, if any? Do you have any comments or opinion on the recent FTC report?

McDowell: The Internet already is the communications lifeline of the world economy and is becoming the primary means of communication for American consumers. It is absolutely essential that broadband network and service providers have the proper incentives to deploy new technologies. It is equally as important that consumers of all types, including higher education, have the option of pulling the content of their choice anytime, anywhere, and on any device. In fact, a huge new wave of consumer demand is shaping a beautiful explosion of entrepreneurial brilliance that will change our lives for decades to come. Anyone who tries to frustrate that consumer demand does so at their peril.

In 2005, the Commission adopted a Policy Statement that sets forth four broad principles that encourage broadband deployment and promote the open and interconnected nature of the Internet. On March 22, 2007, we adopted a Notice of Inquiry to examine the status of broadband market providers and how consumers' interests could be best protected. Comments have been filed. I look forward to reviewing the comments to determine whether additional policies are warranted. I am particularly interested to see whether commenters focus on actual or potential abuses.

The Federal Trade Commission (FTC) recently adopted a unanimous and bipartisan report that
found that there is no need for net neutrality regulations. Only one month ago, the FTC’s Internet Task Force recommended that policymakers proceed “with caution before enacting broad, ex ante restrictions in [the] unsettled, dynamic environment” of broadband Internet access. Specifically, the report indicates that the effect of potential conduct by broadband providers on consumer welfare is “indeterminate.” The report adds, “No regulation, however well-intended, is cost-free, and it may be particularly difficult to avoid unintended consequences here, where the conduct at which regulation would be directed largely has not yet occurred.” The report also cites growing consumer demand, increasing access speeds, falling prices, and new market entrants as evidence that competitiveness in the broadband Internet access industry is moving in the right direction.

I welcome the discussion on net neutrality and find the airing of different views to be a healthy endeavor.

ACUTA: In September 2005, the FCC released an order concluding that CALEA applies to facilities-based broadband Internet access providers of interconnected VoIP service. This order is subject to ongoing controversy. As more and more higher education facilities are moving toward VoIP, do you see CALEA remaining in its most recently changed form, or do you see success for the Justice Department in its attempts to expand the scope of CALEA—again?

McDowell: While I am committed to allowing new technologies to be deployed in the marketplace and do not want to overburden new entrants to the telecommunications market with legacy requirements, the Commission must fulfill its statutory obligations to promote safety and life. This must include adequate protections for citizens by law enforcement. A component of law enforcement being able to adequately do its job is CALEA. A customer of VoIP service uses the service in the same manner as a wireline local exchange service and this means that law enforcement must have the tools necessary to protect our citizens, particularly as technology expands and provides more communications options for consumers.

ACUTA: What is your general view of the USF, the current debate to change or fix it, its sustainability, and its future? When do you anticipate that the “contributions” side of the Universal Service Funding will begin to be addressed? Do you see this as a separate rulemaking or part of the overall review of USF? What do you think about the USF potentially supporting new or additional services such as broadband expansion, for example? Has the Commission considered how colleges and universities will bear the burden of
exponentially higher USF expenses when asked to pay for individual numbers?

**McDowell**: The Universal Service system has been instrumental in keeping Americans connected and improving their quality of life. However, this system is in dire need of comprehensive reform. As I approach this crisis, I will follow five principles when considering these and other reforms to Universal Service. We must:

1. slow the growth of the fund;
2. permanently broaden the base of contributors;
3. reduce the contribution burden for all, if possible;
4. ensure competitive neutrality; and
5. eliminate waste, fraud, and abuse.

We must be bold in our approach to reforming this system. No one stakeholder can expect to remain whole. I will consider all options. The Commission has received a *Recommended Decision* from the Federal-State Joint Board to adopt an interim, emergency cap on the amount of high-cost support that competitive eligible telecommunications carriers (CETCs) receive for each state based on average level of CETC support distributed in that state in 2006. Comments on that proposal have been filed, and I look forward to reviewing the positions of all the parties and a possible draft order by the FCC’s Wireline Competition Bureau to decide what action to take. In addition, the Joint Board is considering more fundamental reforms to the Universal Service Fund, which we expect to receive this fall. I will also consider the merits of those recommendations and all other proposals to reform the system. With regard to specific contributions proposals, such as a number-based contribution system, we will have to address the effect of those proposals on different classes of users as we act on the Joint Board recommendations.

**ACUTA**: Do you expect that college and university campuses will be exempted from the exclusive contract provision for multi-tenant developments?

**McDowell**: We will be considering whether to exempt college and university campuses from any rules we adopt regarding exclusive contracts for multi-tenant developments. In the notice of proposed rulemaking we adopted in March, we seek comment on the current market environment for video service providers with respect to obtaining access to multiple dwelling units (MDUs) and other real estate developments. Specifically, we want to uncover whether there is a need for the Commission to regulate exclusive contracts for the provision of video services and whether the Commission has the authority to craft such regulations.

With the advent of the “triple play” of video, voice, and high-speed Internet access services being offered by cable, telephone, and other companies, it is important that the Commission’s regulations treat all competitors the same when possible. I understand, of course, that there may be reasons for exemptions for colleges and universities, however, and will consider those distinctions carefully when making my decision on these issues.

**ACUTA**: With the Missoula Plan still being widely debated, what is your view on reform of intercarrier compensation (ICC) regulations?

**McDowell**: We have to reform the intercarrier compensation regime; otherwise, it won’t survive. Compensation under the current system varies depending on the type of carrier involved, the nature of traffic, and the direction of traffic. All carriers should be compensated for the costs of carrying others’ traffic on their networks. We need to step back and see how competition and technology are changing the marketplace and examine where the current regime is in need of reform. We also need to promote efficiency, competition, and technological innovation.

The outstanding *Intercarrier Compensation* rulemaking proceeding seeks to develop a single unified compensation plan. Comments and reply comments have been filed on a proposal advanced by a segment of the industry, known as the Missoula Plan. Separate comments have been filed on the phantom traffic (or call identification requirements) issue. Also under consideration in this proceeding is the appropriate treatment of all types of traffic, including ISP traffic, as it relates to intercarrier compensation.

There are a lot of stakeholders, and no one plan is going to make everyone happy. Distilling the positions of all the parties will be a long, cooperative process, but I look forward to working with everyone on this challenge.

**ACUTA**: Concerning future technology—such as broadband over power lines or dual mode—what is the stance of the FCC on IP communications? It is desirable for colleges and universities as they move toward VoIP to be able to transition to cellular network off campus. Is this going to be legal? Is the FCC doing anything to encourage technology in that direction?

**McDowell**: The FCC encourages the deployment of new technologies in the marketplace and new services that can
be offered over those technologies for the benefit of consumers. These new services offer competitive alternatives to more traditional communications services that have been regulated as common carrier services. The Commission has taken several actions since 2004 to classify specific IP-enabled services as unregulated information services. I believe that we should provide regulatory parity whenever possible. All market players, whether they are IP providers, telephone companies, cable companies, or power companies, deserve the certainty and regulatory evenhandedness necessary to spark investment, speed competition, and make America a stronger player in the global economy.

This regulatory approach should also allow consumers, whether they are individuals or large users, such as colleges and universities, to have a choice of service providers. The FCC does impose certain regulations on all service providers, such as number portability, so that consumers can freely exercise their option to move from one provider to another without undue burdens.

ACUTA: Regarding the future of the FCC: In light of the rapidly evolving landscape of communications technology, how do you see the FCC role evolving?

McDowell: The FCC was created for the purpose of “mak[ing] available, so far as possible, to all the people of the United States . . . a rapid, efficient, nationwide, and worldwide wire and radio communication service . . . .” With the incredible explosion of technology occurring in the telecommunications market, consumers should have the freedom to have their demands satisfied. And entrepreneurs should have the freedom to innovate and bring their products and services to market so they can satisfy those consumers’ demands. I trust free people acting within free markets to make better decisions for themselves than those of us in government. Free markets and free ideas are the twin cornerstones upon which we have built our free nation. Government, in this case the FCC, should not adversely interfere with the relationships between consumers and entrepreneurs. Rather, the Commission should try to remove barriers to entry and allow competition to flourish.

However, there are times when the government should address market failure so new entrepreneurial ideas have a chance to compete in the market place, and succeed or fail on their own merits — and their own merits alone. Any remedies applied to market failure should be narrowly-tailored, and sunned to, to maximize freedom for all market players. This is the limited role that I believe the Commission should exercise in the evolving telecommunications marketplace.

ACUTA appreciates Commissioner McDowell’s willingness to speak to us on issues of importance to today’s campus.
What to Do When Both Sides Are Right: RIAA and Academia

Mick McKellar

Few issues are as hot as finding a solution for the illegal downloading of audio and video files (music and movies). This form of piracy of intellectual property is nothing new, but it has become easier, faster, and more expensive to battle. This article looks at the issue from alternate points of view and seeks a framework for considering possible solutions. The biggest stumbling block to discussion and resolution is that both sides are right.

Defining the Issue

Four statements define the issue.

1. The Recording Industry Association of America (RIAA) is absolutely right that illegal downloading is stealing. Period.

   There is no legal or ethical way to establish that copying a copyrighted piece of intellectual property is right.

2. The colleges and universities are right in objecting to acting as agents for the RIAA, the government, or the record companies.

   If the issue is doing the so-called “dirty work” for attorneys, then the educational institutions have every right not to comply. A couple of years ago, some ISPs who were approached by the RIAA to provide names to attach to IP addresses the RIAA discovered might have been participating in illegal downloads were able to protect the identities of their customers.

   Now the schools are in the same boat. The responses from the 25 top piracy schools, recently publicly identified by the RIAA, have been varied, from compliance to refusal unless ordered by subpoena. Most schools are opting for an approach that allows them to handle things internally, with education of potential violators leading the way.

   One school has even sent a bill to the RIAA for the cost of doing the work. Many schools do not routinely retain the information about assigned IP addresses because a student machine is assigned a different address each time it logs in. Maintaining such records would be expensive and time consuming.

   Divulging the information is anathema for most. In any case, schools are upset about the concept of doing the RIAA’s work for it—at their own expense.

3. Theft is a moral issue as well as a crime. As a crime, it is nearly impossible to defend against and very difficult to police. One cannot legislate morality—if we learned nothing else from Prohibition, we should have learned that little rubric.

   I may not like the fact that my neighbor can afford 15 cars because he is excessively rich, but that doesn’t mean I have the right to take one of his cars. The record companies may be making exorbitant profits, but stealing from them doesn’t balance the inequity, because they just pass the cost along to their customers. These are moral and ethical issues, and are not part of this equation.

   However, educational institutions do take on some in loco parentis responsibility for minors in their care, and they
do run ISPs for their students. Turning a blind eye to the use of university resources for illegal acts is wrong. Let's face it: if a student stole another's ideas or published intellectual property, and passed it off as his or her own work (plagiarism), he or she would likely be expelled and could face legal action from the copyright holder. Educational institutions make it the responsibility of their educators to discover and report such behavior for disciplinary action, despite the fact that they may be acting on behalf of the author as well as their own moral and legal codes.

4. **Technology is opening doors faster than we can put locks on them.** This issue is not going away, and new ideas of what constitutes intellectual property and what legal rights are retained upon publication must be debated and considered, or the future is going to be a difficult place to earn a living. We have well begun our transition from a product-based economy to an information-based economy, and ideas are a lot harder to package and secure than widgets.

This is not a new issue. Consider the heavy restrictions and the implications in the text shown on page 22 from a label on a 1908 recording and imagine trying to enforce its draconian regulations in today's world.

Attempts were made to block the proliferation of video-recorders when they first came on the market, because it was going to "spell the end" of the entertainment industry. However, the entertainment industry found a way to adapt and moved on. The move from physical media to digital files is not going to stop. Such files are too convenient and too cheap to produce and distribute for the entertainment industries to not pursue the move. However, to try to treat these ephemeral bits and bytes as we currently treat CDs and DVDs is a losing battle.

As soon as a new encryption scheme is created for DVD and CD media, the software to defeat it appears online. Schools can spend hundreds of thousands of dollars to upgrade and apply new technologies to track and prevent illegal P2P downloads only to suffer an end run by motivated students who are able to defeat or circumvent the technology. It could draw the universities into an ongoing arms race.

### What Options Are Schools Considering?

Four mechanisms spring to mind: content analyzers, firewalls, traffic shaping, and automated copyright notice systems (ACNSs). Content analyzers, such as Audible Magic, are powerful tools that are expensive in both dollar outlay and staff time. They also suffer from inability to read encrypted material—an end run being used by some P2P applications.

Firewalls and technology bans are effective in removing the technology used for illegal downloading, but they also limit or remove the technology for legitimate uses—an expensive and negative result.

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COMMUNICATIONS

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Traffic shaping is a matter of limiting the amount of certain kinds of packets or traffic. However, the same technological end runs (encryption or protocol tunneling) can be employed to defeat this approach.

An ACNS can be effective but in essence gives the copyright owners an unprecedented level of third-party control over campus resources. Automated systems make mistakes, and it takes expensive IT personnel to sort out the errors and correct them. This kind of outside access also opens the door to spoofing by pranksters and vandals.

What Else Can a School Do?
Examples of softer, less technical, and automated solutions schools are considering or implementing include:

- Publication of clearly defined acceptable use policies. Not only is it appropriate to be very clear about what is acceptable use, it is also wise to be absolutely clear about penalties and procedures. Tell the students what constitutes copyright infringement, what will be done if they violate the school’s trust, what their options are in that circumstance, and where they can get more information.

- Open legal doors for downloads. Adopt an authorized download service (as Penn State has done) with a company like Napster. Show the students what legal downloading looks like, and offer the service free to the students. Lure them away from illegal activity.

- Teach your children. Show them, face-to-face, what the policies and procedures are. Make such education mandatory for anyone using the university network.

Conclusion
It is wrong to expect educational institutions to police new-age crime based on outdated ideas and unenforceable laws. It behooves the RIAA, the government, and ISPs of all kinds (including .edu's) to find a way to resolve this issue before it becomes a windfall for the legal profession and an even more serious drain on our court and police systems.

The fact is, universities cannot wash their hands of this problem and pretend it doesn’t exist and doesn’t affect their bottom lines. Huge files are moving illegally through their systems, draining away bandwidth that could be put to better use. They are also allowing their systems to be used for illegal trafficking in stolen goods, much the same as allowing their student unions to be safe places for drug sales. One cannot ignore the problem. Could the solutions be as simple and nontechnological as P2P communication with students, staff, and faculty?

Mick McKellar is retired from Michigan Technological University and is a frequent contributor to the ACUTA Journal. Reach Mick at mick@pasty.net.
Considerations for Enterprise Emergency Notification Solutions

Over the past decade, several significant events have brought to the forefront a focus of what processes are in place and what technologies are utilized to execute emergency response plans as part of an overall emergency preparedness initiative. As defined by the US Department of Homeland Security in the TARGET CAPABILITIES LIST (Version 1.1) there are four basic categories in their Universal Task List (UTL) that apply to a comprehensive plan.

- Prevent
- Protect
- Respond
- Recover

In the area of prevention, one of the most prevalent technologies being deployed is video surveillance. The addition of video surveillance, typically facilitated by closed circuit television (CCTV), provides a significant enhancement to the efforts of preventing emergency situations. Video surveillance can also provide improvements for real-time assessment of ongoing situations and the investigation following an event.

However, in regards to the area of response, emergency notification is an area that is receiving the most attention at this time. Emergency notification is a significant and complex component of an overall emergency response plan.

When reviewing the requirements of emergency notification, it is important to remember the basic definition that an emergency is not predictable by nature and must be dealt with urgently. In order to provide a comprehensive solution, several requirements must be addressed. The delivery of the notification must facilitate flexibility. A situation may require notification at any point in time and/or simultaneously diverse directions. For example:

- get people out of a building
- get people into a building
- cover only part of a building
- cover the entire enterprise campus
- notify only your response team
- interact with your response team and/or others in real-time
- notify the entire surrounding population

A comprehensive emergency notification solution must also encompass the ability to provide information in real-time. The best solution for notification in real-time is a siren. However, this solution only facilitates a notification without any information pertaining to the

Guaranteed notification, flexibility, real-time execution, and contingency plans are the keys to addressing the basic fact that an emergency is not predictable by nature and must be dealt with urgently.
situation. Delivering real-time information pertaining to the situation is critical once the notification is initiated. What information is delivered can include prerecorded messages that are selectable and repeatable, but should not prevent real-time updates as a situation evolves. The information should be able to be delivered via a variety of media and technologies. A multi-layered approach increases delivery success and provides backup delivery capabilities. Yet the core solution should be based on technology with proven performance, reliability, and redundancy. To maximize the resiliency of an emergency notification solution, implement a combination of a premise-based solution and a hosted solution. Access to the control and reporting of the emergency notification functionality should be available from any location via multiple media and technologies that range from the PSTN to the Internet. However, all forms of access should be secure and adhere to modern security policies/practices.

Once the notification has been initiated, effectively facilitating the “pull for information” is essential. Independent of the media used to provide the notification and subsequent information, an inordinate demand will be generated for current status updates. Ensuring that solutions serving these requests can survive the demand levels and still facilitate the requests is critical.

Status and historical reporting of the notification is also a critical component. During the event, having a real-time status of the delivery of a notification allows contingency plans to be executed in the event of notification failures. Following an event, historical reporting will provide valuable information when reviewing the reactions and outcome.

The return on the investment of a comprehensive emergency notification solution can be measured in the form of dollars, but more importantly in the form of human and property safety. The same investment can also be leveraged for day-to-day operations for ‘non-emergency’ situations.

In summary, think ‘outside of the box’ when reviewing and creating solutions for emergency situations. For more information on guaranteed notification, flexibility, real-time execution, and contingency planning visit www.aastraclearspan.com/acuta907.

David Chambers is Chief Technology Officer of Aastra Intecom. Under his direction, the company has pioneered telecommunications innovations which include the first PBX with converged voice and data, blended call center functionality, the first PBX/ACD platform to provide a multi-site solution with centralized control, and is now focused on innovative Emergency Notification solutions. For more information contact david.chambers@aastra.com.
Telephony and the Creation of the Continuous Campus

It is the end of the first decade of IP telephony. The view from 1998 said that by now traditional phones and voice networks would have been entirely replaced by IP phones and converged voice and data networks. The reality is that while many have investigated, dabbled, piloted and even deployed some IP phones the majority of end users are still using the same technology they had in 1998. What happened? Was it just an over-hyped solution in search of a problem? Were the financial justifications unattainable in the real world? Was the technology lifecycle too short? Was the collateral investment in infrastructure, training and staffing too burdensome?

Frankly; the answer to all of those questions is yes. But the real reason for the glacial move to VoIP on many campuses was the lack of an answer to an even simpler question: why should I replace a perfectly good digital phone that does everything I need it to, at predictable cost using my existing network, staff, organization and training? There was simply no universal answer to that question and in many cases no believable answer at all.

Individual productivity and “cool” technology don’t justify a migration to IP telephony. The mission of the organization must be significantly advanced or another project will get the funding. Don Van Doren, President of Vanguard Communications and co-founder of UCStrategies.com defines it this way:

The Iron Law of Budget Priorities: If a new product isn’t either customer facing or demonstrating bottom-line impact, it won’t get a favorable reception from the corporate custodians of the Capex purse.

For a commercial enterprise this means improving revenue, reducing net costs, or creating a competitive advantage that results in long term improvement in one or both of these. For institutions of higher learning the definition of bottom-line impact is a bit more elusive. Certainly significant reduction in net cost still applies, but impacts to revenue and competitive advantage may not be easily understood or measured. The goals in these environments frequently include one or more of the following:

- Enhancing the reputation of the institution
- Making it easier to attract and retain top academics and students
- Increasing grant funding for research
- Advancing the goals of the local or regional community

Productivity alone does not directly advance these types of goals.
Integrating communications into the fabric of the institution can create value but is hard to measure. A more concrete approach may be to examine typical campus voice communications with corresponding data networking and application capabilities. Modern local and wide area networks, remote secure access and wireless capabilities have removed many of the physical boundaries of the institution. The resulting mobility, collaboration and open access to information enable an institution to greatly extend its scope and influence.

Yet this freedom from information boundaries frequently does not have a corollary in voice communications. Professors and school administrators use the campus PBX while students, local community members and outside collaborators have no linkage at all. Phone numbers represent machines not humans; people endure multiple devices, directories, and message stores. The overhead resulting from this inherent complexity saps productivity rather than enhancing it.

IP Telephony and Unified Communications will truly provide value by removing the remaining physical boundaries and redefining the meaning of “campus”. These technologies can foster an environment where voice and video are exchanged as easily as instant messages and email - an environment where a cell phone, home phone, PC, smartphone or PDA are as functional and integrated as any desk phone.

The ability to create this boundless continuous campus is a reality. Imagine: robust systems that are truly device independent and based completely on open standards, yet possessing the highest levels of scalability, resiliency, reliability and performance available. More importantly, envision solutions that provide immediate advancement without immediate replacement of existing systems. It is now possible to make a significant impact on the objectives of the institution with a net reduction in total cost of ownership. For more information on how to evolve your environment to a Continuous Campus, visit www.aastraclearspan.com/acuta907.

As Senior Director of Marketing for Aastra Intecom, Charlie Henderson guides the team responsible for bringing Aastra’s award-winning voice infrastructure and call center solutions to market. Henderson has over 20 years experience in design, sales and marketing of IT, network, telecom and contact center systems and applications. For more information contact charles.henderson@aastra.com.
Key Findings from the ACUTA 2007 Trends Survey

Phillip Beidelman  
President, WTC  
and  
Jeri A. Semer, CAE  
ACUTA Executive Director

In 2005, ACUTA and the consulting firm WTC conducted the first Trends Survey to identify the most important communications technology issues facing ACUTA member institutions then and in the future. In 2007, ACUTA and WTC revised the survey and asked ACUTA institutional members to update their ranking of the most important issues and trends in higher education communications technology.

The survey asked members to rank the most important issues in several key areas, including management, strategy, infrastructure, technology, organization, policy, and external issues. Additionally, members were asked to identify the top five areas they believe will require the most funding in the next three years. Following is a summary of the results from the 2007 survey and selected comparisons of the results to the 2005 survey.

Survey Method

The survey was conducted by WTC using the Web-based survey software Survey Monkey®. The survey was introduced at the ACUTA Winter Conference in Austin, Texas, in January 2007. An invitation to participate was e-mailed February 16 to 1,663 ACUTA members with responses due by March 30. We received 316 (19 percent) responses to the survey. Sixty-two percent of the participants represented public institutions, and 38 percent represented private institutions. The average student FTE was 15,438, and the average faculty/staff FTE was 4,319. Eighty-nine percent of the participants provided technology services to residence halls. Fourteen percent of the participants provided technology services to a hospital. The participants were well distributed across Carnegie classifications.

The results of the survey provide a comparison of past and current high-priority issues and how the importance of those issues might shift over the next five years. In most instances, there was not a significant difference between the current and emerging issues, indicating that members feel they will be working on similar issues over the next few years. Most issues never moved more than two places up or down from their ranking in 2005.

Table 1. Management issues identified as the top 14 today include the top 11 issues from our 2005 survey.

<table>
<thead>
<tr>
<th>Management Issues</th>
<th>2007</th>
<th>Future</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing a vision of the future</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Creating new funding sources</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Keeping up with demand for services</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Identity management/security</td>
<td>4</td>
<td>4</td>
<td>Not an option</td>
</tr>
<tr>
<td>Promoting the importance of the technology investment</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>to senior officials</td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Keeping up with current technology trends</td>
<td>7</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Retaining community image</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Promoting image on campus</td>
<td>9</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Marketing the value of communications technology to</td>
<td>10</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>upper administration</td>
<td></td>
<td></td>
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<tr>
<td>Promoting &amp; maintaining the interrelationship with</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>technology staff within academic departments</td>
<td>11</td>
<td>11</td>
<td>Not an option</td>
</tr>
<tr>
<td>Reacting to external policies/regulations, such as</td>
<td>12</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>CALEA &amp; Electronic Discovery</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Marketing communications technology services on campus</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Promoting &amp; maintaining the interrelationship with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>administrative departments</td>
<td>13</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Maintaining vendor relationships</td>
<td>14</td>
<td>14</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 2. Strategic issues identified as the top 12 today include the top six issues from our survey in 2005.

<table>
<thead>
<tr>
<th>Strategic Issues</th>
<th>2007</th>
<th>Future</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and systems security</td>
<td>1</td>
<td>1</td>
<td>Not an option</td>
</tr>
<tr>
<td>Business continuity planning</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Strategic master plan development</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Current technology funding models</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Network survivability</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Infrastructure to support high reliability/business continuity</td>
<td>6</td>
<td>5</td>
<td>Not an option</td>
</tr>
<tr>
<td>ERP and information systems</td>
<td>7</td>
<td>7</td>
<td>Not an option</td>
</tr>
<tr>
<td>IT services funding models</td>
<td>8</td>
<td>8</td>
<td>Not an option</td>
</tr>
<tr>
<td>Reorganizing staffing structures to react to the integration of data, voice, and video delivery</td>
<td>9</td>
<td>9</td>
<td>Not an option</td>
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<tr>
<td>VoIP services funding models</td>
<td>10</td>
<td>10</td>
<td>Not an option</td>
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<tr>
<td>Outsourcing</td>
<td>11</td>
<td>11</td>
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<tr>
<td>Support of distance learning</td>
<td>12</td>
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... down in comparing current and future issues.

The following results offer a valuable insight into what ACUTA members responding to the survey believe are the most important issues they will be dealing with on their campuses now and in the near future. Having this information creates opportunities for a strategic approach to communications technology planning.

**Management Issues**

As shown in Table 1 on page 27, Developing a vision for the future, Creating new funding sources, and Keeping up with demand for services were identified as the most important current and future management issues. Creating new funding sources moved to a top issue in comparison to 2005. Identity management/security appeared as a new issue for 2007, while Keeping up with current technology trends moved down in priority. The participants did not rate Marketing technology on campus, inter-relationships with administrative departments, or Maintaining vendor relationships as high priorities.

**Strategic Issues**

Information and systems security appeared as a new top issue in 2007 (see Table 2). Developing a strategic master plan, Funding models, and Business continuity planning were all closely rated as top strategic issues both currently and in the future. Network survivability moved from number 2 in 2005 to number 5 in 2007. As projected in 2005, Supporting distance learning lost priority status and moved to the bottom of priorities.

**Infrastructure Issues**

Survey respondents kept Network infrastructure performance as the number 1 issue in 2007. Wireless LAN appeared as a new top priority in 2007. Preparation of the physical infrastructure to support VoIP moved out of the top 5 and became less of a priority. Considering the widespread investigation and/or deployment of VoIP that was happening in 2005, with most campuses realizing their answer regarding VoIP, this drop in the ranking is not surprising. What is interesting is the relatively high ranking of Full convergence and Cable plant refresh, which implies an interest in preparing for convergence but perhaps implementing more slowly.

**Technology Issues**

When asked to rank technology issues in order of importance, institutions responding rated the Identity-based networks, Role of mobility, Full convergence to VoIP, and High performance computing grids as both the top four current issues and the top emerging issues over the next five years. These results confirm that many campuses are in the process of moving to some version of VoIP. It was also interesting to note the technologies that were rated lower in 2007 in either current or future importance, including Voice recognition, Migrating remote access from modem pools to different technology, and IPTV.

**Organization Issues**

Organization model to support IT services appeared as the new number 1 issue in 2007. Internal relationships with other departments such as IT, Telecom, and Facilities and Development of a network security office remained as top current and future organizational issues. We might conclude from this that most institutions now have a fully functional IT department that will need to converge with the existing voice and data departments. This finding is also supported by the appearance of Migration of legacy staff to new technologies as a top issue.

**Policy Issues**

Development of network security policy and procedures and Refreshment cycle of network systems were listed as top policy issues, which fall in line with the organization, technology, and strategic issues previously identified. Technology fee to sustain infrastructure appeared as a policy issue for the first time. Although funding sources have been talked about for years, they now have reached a priority in campus policy such that funding sources can be addressed and reconciled. Outsourcing ranked at the bottom of the list of policy issues, which is consistent with the low rating of outsourcing among strategic issues.

**Funding Resource Issues**

Refreshment cycle of network systems, Information security systems, and Full convergence to VoIP were identified as
requiring the most funding resources. Rounding out the top five were Network infrastructure performances and Keeping up with demand for services, which came in fourth and fifth. With the rapid changes in technology, obsolescence of current technology is accelerated and life cycles are shortened, which creates shorter refreshment cycles. This finding is consistent with the implementation of VoIP, wireless LANS, the need for continuing network refreshment, and investment in new technologies, which carry the biggest impact on the technology budget.

Conclusions

After reviewing the survey responses, it can be concluded that the top issues identified in 2005 are perceived as being addressed and reconciled and that new issues for 2007 have appeared. VoIP is here to stay, and now the demand for super-high-speed, safe, wireless networks is the main concern. There was no significant difference in results when looking at public vs. private or large institutions vs. small institutions. In addition, there were few major differences between perceived current and future issues in any of the areas that we studied. However, there was a definite increase in priority for the future in wireless LAN, full convergence of VoIP, identity-based networks, and information and systems security.

The purpose of this survey was to seek input from ACUTA members as to their perceptions of the most important communications technology issues and challenges they expect their campuses will be facing now and in the near future, and to measure any changes in perceived priorities since we first conducted this survey in 2005. In actuality, all the issues that were studied are important to some degree on nearly every campus, and ACUTA members need to monitor these issues and stay informed in order to provide advice and direction to their constituents. The survey results provide an interesting glimpse into current and near-term priorities.

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Trolling for Security Breaches and Digital Forensic Evidence

Until about five years ago, the only companies hot on the trail of fraud were organizations that had been victimized (Harrington 2006). But the explosive growth in the use of technology to gain access to information anytime anywhere has brought with it serious fraud and security issues. Trolling for security breaches and digital forensic evidence is an exacerbating challenge that is sometimes messy, sometimes dirty, sometimes ugly, sometimes inconvenient, and sometimes a costly undertaking. Fraud detection is not a one-time event. Because fraud risk changes daily, the assessment must be a sustainable process built into the fraud and security practices.

According to Chris Sonderby, chief of the U.S. Department of Justice’s Computer Hacking and Intellectual Property Unit, “Some companies just don’t realize that there are dedicated hackers out there, talking to and working with other hackers, who could be trying to steal their resources. Companies need to look hard at what kind of protections they have in place” (IT Compliance Institute 2006).

Protecting an organization’s digital intellectual resources involves a number of strategies, including bolstering hardware strength, informing users about proper computer usage, simple network monitoring, sophisticated techniques of data mining, and following approved standards for the collection and exchange of digital evidence.

According to the Association of Certified Fraud Examiners, organizations lose on average about 6 percent of their revenue to fraud. If multiplied by the U.S. GDP, the cost of fraud may well be more than $600 billion annually (Albrecht 1992). Security and fraud are extremely costly problems. Fraud is estimated to account for 3 to 10 percent of the nation’s $2.0 trillion health care spending tab (Appleby 2006).

Around the world, enterprises have been forced to reexamine security strategies with an eye toward how to mine transaction databases for fraud and protection of critical data. Borrowing techniques from insurers, banks, and financial and credit service organizations, companies are increasingly mining databases of transactions for suspicious patterns. Aetna Insurance reported that its fraud-detection data-mining software had saved more than $89 million in 2005 (Appleby 2006). Using similar software, Independence Blue Cross in Pennsylvania flagged claims for more than $1 million (Appleby 2006).

If the information technology revolution matures as many believe, it will hold fascinating potential for efficiency gains, but the technology will spawn a host of security concerns and opportunities for fraud. Against this background, those looking for a quick fix to their security concerns and vulnerabilities are sure to be disappointed.
Identifying and Dealing with Fraud on Campus

Forensic computing and digital forensics have been characterized as the most sizzling professions in the first decade of the 21st century because of the prolific rise in fraud and security breaches (Roberts 2006).

Fraud may be broadly defined as personal gain and enrichment through the deliberate misuse of organization assets (Wells 2004). In its broadest sense, fraud includes any crime for gain that uses deception, force, trickery, or larceny that causes damage. By the breadth of the definition, it involves a wide array of conduct ranging from swindling and petty theft to disruption of services. On campus we see fraud of various types: academic, intellectual, journalistic, Internet, and e-mail, to name a few.

According to the National CyberSecurity Strategy for Higher Education, the higher education community agreed on the following framework for dealing with security and fraud (National Strategy to Secure Cyberspace 2007):

1. Make IT security a priority in higher education.
2. Revise institutional security policies and improve the use of existing security tools.
3. Improve security for future research and education networks.
4. Improve collaboration among higher education, industry, and government.
5. Integrate work in higher education with the national effort to strengthen critical infrastructure.

The National CyberSecurity Strategy for Higher Education recommended two specific actions to be taken by higher education institutions (National Strategy to Secure Cyberspace 2007):
Standards for the Collection and Exchange of Digital Evidence

1.1 All agencies that seize and/or examine digital evidence must maintain an appropriate SOP document. All elements of an agency's policies and procedures concerning digital evidence must be clearly set forth in this SOP document, which must be issued under the agency's management authority.

1.2 Agency management must review the SOPs on an annual basis to ensure their continued suitability and effectiveness.

1.3 Procedures used must be generally accepted in the field or supported by data gathered and recorded in a scientific manner.

1.4 The agency must maintain written copies of appropriate technical procedures.

1.5 The agency must use hardware and software that is appropriate and effective for the seizure or examination procedure.

1.6 All activity relating to the seizure, storage, examination, or transfer of digital evidence must be recorded in writing and be available for review and testimony.

1.7 Any action that has the potential to alter, damage, or destroy any aspect of original evidence must be performed by qualified persons in a forensically sound manner.

- R3-13: "Each college and university should consider establishing a point-of-contact, reachable at all times, to Internet service providers (ISPs) and law enforcement officials in the event that the school's IT systems are discovered to be launching cyber attacks."

- R3-14: "Colleges and universities should consider establishing together: (a) one or more information sharing and analysis centers (ISACs) to deal with cyber attacks and vulnerabilities; (b) model guidelines empowering chief information officers (CIOs) to address cybersecurity; (c) one or more set of best practices for IT security; and (d) model user-awareness programs and materials."

Current Fraud Situation

With the number of incidents skyrocketing every year, security and fraud have become the Achilles' heel of organizations of all sizes. The loss of consumer confidence in a trusted online community took another big hit with the discovery of a new-generation trojan that encrypts files on an infected host and demands ransom payments for the decryption password (Naraine 2006). Cyber-extortion and stealth attack ransomware are emerging as one of the largest threats facing the cyber community. Despite their best efforts, organizations continue to be attacked at an alarming rate.

Taking various sources into account, it is reasonable to estimate that the highly reactive perimeter-focused defensive measures employed by most organizations are simply unable to keep up with the rapidly changing threat landscape in the always connected environment. With more threats emerging and spreading more quickly than ever before, the result is a steadily increasing degree of chaos. The threat landscape continues to morph as evidenced by the following (Armstrong 2006):

1. Threat volume is rising.
2. Threat generation time is falling.
3. Threat propagation speed is increasing.
4. Threats are becoming more elusive.
5. Threats are becoming more sophisticated.
6. Threats are focused on system/application-layer weaknesses rather than network-layer vulnerabilities.

As national infrastructures become intertwined with global networks, this leaves enterprise network assets vulnerable to the rapidly escalating threats. While the integrity of the two has become synonymous, there is a growing mismatch between the level of protection that organizations' security measures are providing and the level needed to adequately address their actual degree of risk.

When it comes to cyberspace security, the enterprise, the upstream ISPs, and the global Internet address these threats differently. Against this backdrop, as the number of threats increases there is a greater demand for digital forensics data collection. IT system professionals now have to factor this into how they look at their world and develop security strategies. They have to strategically evaluate how to handle not only the onslaught of technology but also fraud, security, disaster recovery, and digital forensic evidence collection.

Federal Rules of Evidence

Most courts generally admit computer records upon a showing that the records fall within the business records exception, Fed. R. Evid. 803 (The Good, the Bad, and the Ugly 2006), and that they were kept in a manner that ensures their
accuracy. Computer records for evidence generally can be divided into three categories: computer-generated records, records that are merely computer stored, and computer records that are both computer generated and computer stored. The difference is whether a person or a machine created the records' contents or some combination of the two.

According to Orin S. Kerr, a trial attorney, "Computer-stored records refer to documents that contain the writings of some person or persons and happen to be in electronic form. E-mail messages, word processing files, and Internet chat room messages provide common examples. As with any other testimony or documentary evidence containing human statements, computer-stored records must comply with the hearsay rule. If the records are admitted to prove the truth of the matter they assert, the offeror of the records must show circumstances indicating that the human statements contained in the record are reliable and trustworthy, see Advisory Committee Notes to Proposed Rule 801 (1972), and the records must be authentic.

"The third category of computer records consists of both computer-generated and computer-stored. For example, a suspect in a fraud case might use a spreadsheet program to process financial figures relating to the fraudulent scheme. A computer record containing the output of the program would derive from both human statements (the suspect's input to the spreadsheet program) and computer processing (the mathematical operations of the spreadsheet program). Accordingly, the record combines the evidentiary concerns raised by computer-stored and computer-generated records. The party seeking the admission of the record should address both the hearsay issues implicated by the original input and the authenticity issues raised by the computer processing." (Kerr 2001).

The Federal Rules of Evidence cover the use of evidence in the courts of the United States, U.S. bankruptcy judges, and U.S. magistrate judges. The rules are meant to ensure fairness in administration, eliminate unjustifiable expense, minimize delays, and ensure consistency to the extent that the truth may be ascertained and justly determined (Kerr 2001).

Definition of Digital Forensics

Digital forensics may be broadly defined as the recovery, preservation, and examination of digital evidence, including audio, imaging, and electronic devices (SWGDE 2000). Digital forensic examiners and security experts are now able to meticulously reconstruct detailed raw trace data into admissible, actionable digital evidence. Tools and techniques are available that can reveal intentional data destruction; programs executed; file creation, access, modification, and deletion times; document creation, access, and revision; and other information that may appear to be destroyed, deleted, encrypted, or password protected.

Every network transaction leaves an information footprint that can be recovered to reconstruct computer user activity, content accessed, and network activity, including browsing history, viewed pages, and information transfer to external storage media.

To ensure that digital evidence is collected, preserved, examined, and/or transferred in a manner safeguarding the accuracy and reliability of the evidence, organizations must establish and maintain documented quality-control guidelines supported by proper case records and use broadly accepted procedures, equipment, and materials.

In 1998, a collaborative effort of the Federal Crime Laboratory Directors initiated a project for the development of cross-disciplinary guidelines and standards for the recovery, preservation, and examination of digital evidence. The group developed a set of seven standards (shown on page 32) for

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the collection and exchange of digital evidence (SWGDE 1999).

Looking Ahead

Why are fraud and security such huge problems for organizations? The most obvious response is greed. Although greedy people do not always lie, cheat, and steal, a more complete answer involves the rise of e-commerce, lax security, lack of reasonable organization safeguards, poor controls, and inadequate audit trails.

Today, the really sophisticated hackers are able to slip through threat management countermeasures most organizations have shields against (Armstrong 2006; IT Compliance Institute 2006).

McAfee, Symantec, Trend Micro, Robot Genius, Signacert, Websense, Surf-Control, Secure Computing, and other security vendors are developing new approaches to threat management as the traditional signature-based methods of detection are increasingly seen as inadequate. That raises the question: What’s next in threat management?

A survey of the literature indicates that the security vendors are investing in technologies to determine malware based on patterns of traffic, behavior-blocking capabilities, whitelisting technology for policy-based control of applications, encryption-based signature technology, driver-based filtering and monitoring techniques, and Web crawlers that look at Web pages to find executables that are malware (Messmer 4/30/07). Some users indicate the user-profile distributed model has the ability to tighten security and cut the costs of securing network resources. Although the degree of confidence and opinions vary, many users believe the perimeter-based model surrounding networks today can be replaced with a distributed model that relies on a user profile to secure tasks, access, and personalizing services (Fontana 2007).

Finally, some experts recommend the use of heuristic protection, a method that measures a user’s unique identity through a series of calculations rather than just password access. These tools usually contain threat-detection engines that combine antivirus and antispam options and are able to discover intrusion across the network as soon as it occurs (IT Compliance Institute 2006).

While some may debate Michael Douglas’s famous words “Greed is good” in the movie Wall Street, there is little debate that greed is a major factor in fraud, and organizations must be ever vigilant to protect themselves.

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References

Campuses Taking a Hard Look at Emergency Response Plans

If any good has come of the Virginia Tech tragedy, it might be that other colleges and universities have re-evaluated their emergency response systems and taken steps to make their campus safer. Faculty, staff, and students all benefit from the emphasis on safety and security that comes not just from good sense but also from a whole package of regulations and laws. Such rules range from public health and safety laws to the protocols followed by the highway department, and they address every imaginable safety and security issue.

The Clery Act is one of the laws that many campuses are taking a hard look at today. According to The Handbook for Campus Crime Reporting (www.securityoncampus.org/schoolscleryact/handbook.pdf), “In 1990, Congress enacted the Crime Awareness and Campus Security Act, which amended the Higher Education Act of 1965. This act required all postsecondary institutions participating in Title IV student financial aid programs to disclose campus crime statistics and security information.”

Renamed in 1998 in recognition of a Lehigh University student who was slain in her dorm room, the Clery Act also requires colleges and universities to issue “timely warnings of crimes that represent a threat to the safety of students or employees, and to make public their campus security policies.” It is this “timely warning” requirement that has many campuses hustling to find the best method of communicating with the campus community and emergency notification companies busily touting their wares.

What does emergency notification mean on today’s campus? Methods to implement emergency communications are as varied as the schools themselves. The goal, however, is always the same: In the face of eminent danger, alert as many people as possible as quickly as possible.

While the Clery Act addresses criminal activity, an emergency can be anything from a hostage situation to an ice storm that closes the campus, from a fire at Old Main to a traffic jam after a basketball game. A proper emergency notification system works in whatever circumstances arise.

A Four-Piece Puzzle

“When looking at any emergency notification system, think about the size of your institution, both in terms of people and geography,” advises Brian Dunn, assistant director of teledata services at the University of Central Florida (UCF). “Think about it holistically.”

UCF is a big school with 47,000 students, 25 remote campus locations, and almost 10,000 employees.

Dunn sees security as a four-piece puzzle with prevention, detection,
notification, and response the pieces that must fit together at all times.

• Prevention. Realistically, prevention of all emergencies is impossible. With sound policies and practices in place, some situations that could lead to emergencies may be prevented. Security guards at public events, traffic control at a football game, no alcohol in residence halls, and other policies and procedures no doubt avert disaster in many cases. In addition, individuals who may become a danger to themselves and others often provide warning signs in advance. Faculty, staff, and students should all be alert to individuals who exhibit behaviors out of character that may be early warning signs.

Some events, however, are unpredictable and out of our control. Campuses along the Gulf Coast can attest to the fact that regardless of how well prepared they may be, hurricane season frequently results in catastrophe.

• Detection. Detection mechanisms allow authorities to determine that there is a problem. This mechanism can be a human or a feed from a CCTV camera or an alarm system. For example, UCF can monitor all of its doors with 362 cameras, but the overload on human systems would be ridiculous. Instead, it uses software that helps monitor open doors or other suspicious activity and accelerates problems to security staff.

• Notification. Once a problem is identified, the next step is notification. There are many ways to alert or notify people, says David Wirth, manager of operations at Princeton University, Princeton, New Jersey. He lists low-tech solutions like runners, fire alarms, sirens, PA systems, radio and TV announcements, hotlines, and Web pages as ways to get the word out to different communities.

On the more high-tech side are solutions like electronic message boards, sophisticated cameras, TV scrolls, reverse 911 calling systems, voice calls, pagers, SMS (short message service, commonly called text messaging), e-mail blasts, and the like.

A poll of 70 ACUTA member colleges showed that broadcast e-mail is the current runaway favorite for reaching students in times of emergency. Posting information on a Web site is second. Radio, TV, and mass voice mail blasts also were popular among the group surveyed at the end of May 2007.

However, almost no ACUTA schools use IM (instant messaging) and only a couple use text messaging as ways to communicate in times of disaster.

When looking for a system for Princeton, Wirth looked for one that is proactive, rather than passive. That meant things like e-mail, hotlines, and voice messages were low on his priority list since they all require the target audience to look for the information. Instead, Princeton opted for a system that allows it to push information on a disaster out to the people affected.

• Response. Notification is always one of the first responses to an emergency. A siren, as Dunn notes, typically means to take shelter in a building. He says sirens are fine for lightening warnings or tornadoes. But what if the situation is a chemical spill or biohazard and security wants people to move out of an area? You need follow-up,” he states.

Providing direction is another part of the response to an emergency. Whatever the message—“Leave the campus,” “Don’t leave your room,” “Lock external doors,” “Avoid parking lot C”— instructions should be provided quickly and succinctly.

Assembling appropriate personnel to handle the criminal, remove debris, or repair power lines are other responses that come simultaneous to or on the heels of detection and notification. Having response plans in place minimizes the damage.

Currently, Ron Kovac, professor and consultant at Ball State University, Muncie, Indiana, is compiling the results of a survey of ACUTA colleges with the goal of providing sound advice for setting up or improving an emergency response plan. “You need to have a plan. You need to have ways to implement that plan,” Kovac says. This report should be available from ACUTA before the end of the year.

What Is an Emergency?

Kovac concludes that emergencies generally fall into one of four categories: (1) health emergencies such as chemical or radiation spills; (2) crises involving violent activity resulting in death or severe injury or threats to public welfare, such as bomb threats, hostage situations, or downed aircraft, for example; (3) natural disasters, such as earthquakes or tornadoes; and (4) physical plant failure or structural failures, which may result in fire, loss of potable water or water pressure, or building collapse.

Every campus needs to have an action plan that deals with the first hour when the crisis must be contained and the campus community notified of any danger. There needs to be a plan for the next 12 hours, when press and parents become involved; for a period three days out when things are somewhat under control; and finally, the post-mortem review to help the school better prepare for the next emergency.
“Buck” Buchanan, director of telecommunications at Florida State University (FSU), Tallahassee, says his campus, at 451 acres, is smaller than many and bound by the surrounding city. But its numbers are large: 40,000 students and 6,000 faculty and staff who must be alerted any time trouble strikes.

“Diversity of communications is essential for adequate response to emergency situations,” Buchanan says. But there are limits to how far a school can go and still be communicating.

“Reducing the noise in an emergency is important,” Buchanan states. That means having the right systems reaching out to the right communities on the right media.

FSU is prone to hurricanes and flash flooding, due to low areas on the campus. But more common things requiring communications include athletic events, keynote lectures, small fires, road closures, and the like.

FSU has 106 full-time IT employees and manages 10,000 phone lines, 360 blue light phones, 2,400 cable outlets, 600 cell phones, and 130 pagers plus 40 CCTV cameras. “Our typical incident is not at all in the nature of what happened at Virginia Tech,” Buchanan says.

The solution of choice at FSU is Red Alert from Amtelco. The school purchased the system in March 2006 with IVR software. In addition to features like Web management and voice and text messaging, it offers group control—the ability to handle defined groups differently.

**Princeton Solution**

Princeton wanted a system that would allow it to record messages with a “Princeton voice” and not an automated or mechanical voice, whether for a weather emergency, road blockage, or more serious problem. In the area of disasters, diversity of communications media is key. Princeton liked being able to send messages from anywhere via the Internet or phone. It also wanted a system that would not go down when the university needed help most. That added up to a hosted, off-site vendor.

“We wanted someone who would not be affected by the same disaster that hit campus,” Wirth explains.

Princeton came up with five finalists for its system. They include Public Telephone’s Group Messaging product; SWN Communications’s Send Word Now; Omnilert’s e2Campus; NTI’s Connect-Ed; and AvTex’s City Watch.

While every campus will have different needs, Wirth says those vendors most closely suited what Princeton required. One core technology is cellular service.

**Cell Phone Blasts**

Students increasingly use cell phones rather than campus phones. “Cell phones are the primary method of communication on campus,” Wirth says. “Our system allows us to reach out to them.”

However, students in class are more likely to sneak a glance at an SMS message than to answer a ringing cell phone, Brian Dunn at UCF notes. Wirth agrees. He wanted a system that had SMS text messaging.
Another criterion at Princeton was to have a system that would interface with existing data systems automatically, rather than manually. “We have a big database, so we wanted to be able to update it automatically,” Wirth says.

Yet another must-have was the ability to sort and create call groups. “We need to be able to create groups on the fly,” Wirth says. “You never know what you will need in the future. Any system has to be flexible and be easy to modify as needs arise.”

In addition, Princeton wanted good reporting functions. A key here is a listing of which targets actually received an emergency message and when it was received.

Any kind of cell phone or landline blast or mass text messaging will stress any carrier’s system. “It is important to work with your hosted system provider or carrier to throttle your messages and calls to balance against the capacity of the networks you are dealing with,” Wirth says. “Our system provider knows the capacity of the SMS and cell phone provider capacities. We have advised them of our inbound trunk capacity, and they worked with us. Tests proved that they approached but never exceeded our total capacity during the tests.”

Cell phone users have real capacity problems during football games and other major events, but that does not uniformly hurt emergency use of cell phones. GSM carriers have reserved bandwidth that can be used for emergency uses. However, CDMA does not.

Law enforcement is eligible for elevated privileges from the federal government. But expecting 40,000 messages to be received at once is optimistic. Text messaging is best-effort service. That is why diversity is the key.

At a football game, for example, the best way to get vital info to a lot of people may simply be an announcement from the press box.

History says cell phones are not reliable. In New York on September 11, 2001, cell phones did not work at all since the cell sites near Ground Zero lost power. But they still are a valuable tool.

Knowing what carriers are most widely used is important for planning capacity. The information also makes a good talking point when FSU is in discussion with carriers, giving the school a head start when discussing services and the number of students on a carrier’s plan.

FSU asked its students to log on and provide some basic emergency notification information: their “real” address (not home address or the place they want grades sent), their cell phone number and carrier, and their IM address.

“We need to know how many messages we are dropping on a carrier,” Buchanan explains. Text messages are delivered on a best-effort basis, and FSU did not want to swamp any carrier.

Buchanan says response to the survey was good. He attributes the good response rate to three factors: first, chronological proximity to the Virginia Tech situation; second, FSU asked only a few simple questions; and, third, the request came from the provost.

“An SMS system is one of the best ways to reach masses of people quickly,” Dunn says. “It is ubiquitous. Students look at SMS.” UCF has a free, opt-in service that is supported by advertising.

“Unfortunately,” Dunn says, “it does not address faculty and staff.” Instant messaging is not now being used at FSU but is under discussion, Buchanan says.

UCF’s Reverse 911

UCF has its own hardware-based Reverse 911 brand system that works via connection with the T-1 PBX. The Reverse 911 is hosted and managed by Computer Services and Telecommunications but activated and mainly used by the police department dispatch office with input from Environmental Health and Safety. “We care for it, but don’t fire it off,” Dunn explains.

UCF can send SMS via its own carrier e-mail gateways. However, this is quite limited. “With our 48-channel system, delivering even a short message would take over an hour-and-a-half to reach 10,000 people,” Dunn says. “Clearly, that is only a small fraction of our population and is not the ultimate answer.”

He says that internal-hosted systems like theirs can be good to facilitate emergency management teams and to deliver text alerts to the community, but voice notification about critical events is better accomplished by a hosted system offsite because of capacity issues. However, an internal system might be better for reaching internal e-mail since it is not constrained by the Internet pipe.

UCF also uses its cable TV emergency alert system. Administered by the police department, it reaches thousands of TVs across campus. “People immediately recognize the scroll as a critical alert,” Dunn says. Provided by Bright House Networks, the system is totally redundant, with two of every component.
Follow-Up Tasks
Campuses should not overlook low-tech solutions. Lighted message boards are great to place at traffic points and keep people informed. Loudspeakers reach many people in a crowded setting.

The telecom department and public safety need to be part of the process, too. They should constantly review plans, update contact and action lists, and check equipment.

"In general, I like to see two of everything," Dunn says. "I like layers of redundancy." Buchanan says that should include basic supplies, such as extra batteries and radios, and updated lists of internal cell phone numbers.

"Catalog all of your resources and what they will do," Buchanan says. Know how quick they are and how many people they will reach.

It is also important to know who makes the "call" to declare an emergency. Kovac says that responsibility typically falls to the university president in major situations. However, it is necessary to have two or three people on the chain of command in case the president is out of reach.

When this was his responsibility, Kovac says he "used to carry around a red loose-leaf binder three inches thick with everything I needed in it." That included everything from utility system descriptions (fire alarms, water, HVAC, electric, and other) to the actual floor plans of various buildings.

Communications is the lifeline in an emergency. More than just access to information, technology should also enable us to minimize danger in an emergency. If we have learned nothing else from the tragedy in Virginia, perhaps we have learned the importance of having an emergency response plan in place and ready to implement at a moment's notice.

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Survey Finds 81 Percent Upgrading Emergency Response Plans

Kevin Tanzillo
Dux PR

Driven by concern over recent high-profile crimes and natural disasters on campus, colleges and universities are aggressively upgrading their emergency communications systems, according to a survey done at the recent ACUTA Annual Conference. As many as 81 percent of those surveyed either have upgrades in progress or will begin them within the next 12 months. Asked if these upgrades are in response to high-profile events of this year, 89 percent said there was a connection.

Sixty-three percent of respondents at the schools planning or implementing upgrades said their upgrades are in progress, while 20 percent expect the upgrades within a year, and the remainder are still in the discussion stage.

The areas where most colleges and universities are focusing their attention are e-mail and text alerts, voice alerts, alarms and sirens, and emergency annunciator systems. Other frequently cited areas are video surveillance, 911 and E911 systems, call boxes, electronic signage, and safety personnel.

While 71 percent of survey respondents said their school is well prepared or adequately prepared for a natural disaster—with 29 percent judging themselves poorly prepared—when it comes to a major crime on campus, that percentage dropped to 57 percent judging themselves well or adequately prepared, with 43 percent considering themselves poorly prepared.

Asked how important the various elements of campus emergency notifications are to them, the ACUTA survey respondents emphasized 911 and E911 systems as most important, followed by e-mail and text alerts, safety personnel, voice alerts, call boxes, alarms and sirens, and video surveillance.

Finally, asked who has been the primary driver for upgraded emergency notification systems, 55 percent said their school's senior administration, while 23 percent said it was the telecommunications and IT departments driving the changes.

Kevin Tanzillo is vice president of Dux PR. He also writes the Tech Talk column in the ACUTA eNews. Reach Kevin at kevin@duxpr.com.
Roles and Regulations—Taking Back Control of the Network

As recently as 10 years ago, we had it easy: Users stayed put at desktop machines, IP addresses never changed, and IT wasn’t on any lawmaker’s agenda. Solutions focused on the threats of the time, which, compared with today, weren’t many. But now technologies and threats are changing so fast that it’s hard to keep up. We can no longer count on a fixed IP address or even on a single device for a given user. We all want network access from the increasingly large pool of devices and access methods, and this has dramatically complicated the security task.

If mobility and increasing device sophistication weren’t enough, lawmakers have jumped headfirst into the fray with a variety of regulations that put even more pressure on IT from a compliance perspective. When TCP/IP, IPsec, SSL, NAC, RADIUS, and 802.1X go head-to-head with FERPA, DMCA, CALEA, PCI, and HIPAA, who wins? At this point, no one, because the regulations don’t answer the fundamental question of what technologies to use to satisfy them. As a result, organizations must digest and interpret the daunting regulations themselves, reconcile the requirements with the current IT infrastructure, then try to plug the holes without excessive costs—not a formula for success.

While the task of protecting networks and satisfying regulatory requirements may seem overwhelming to even the most senior administrators today, there is a technology that can be brought to bear in a common-sense way to both protect the network and improve regulatory compliance. The technology isn’t really new either. Back in the 1990s it started life as authentication, authorization, and accounting, or AAA, and today’s moniker is role-based access control, or RBAC.

Originally used to authenticate dial-up modem users and remote-access VPN clients, AAA’s main purpose was to check a user’s credentials to validate that the user should be granted the same access as those users “in the building.” Users in the building were given full access by virtue of their physical location. All AAA did was give network managers a way to verify that remote users should be treated the same way. But mobility hasn’t stopped with remote access.

Now there are wireless networks and new mobile devices, and validating identity is more important than ever. Combine that with the rise of multiple types of users on the network—faculty, staff, students, visiting sports teams, parents, guest researchers, and temporary contractors—and we’ve got a much more complicated problem. It is now less about proving someone should be treated like those in the building, and more about figuring out which group of people in the building the user should be treated like.

That’s where RBAC comes in. RBAC is a superset of network access control...
(NAC). While NAC is focused on device health, RBAC is focused on the device itself, the device health, and most importantly the user. It supports multiple network types and multiple groups of users. And the more types of network access and groups of users an organization authenticates, the more beneficial RBAC becomes.

RBAC in its current incarnation is made possible by 802.1X, a new authentication technique focused on the LAN. 802.1X has given network managers a way to authenticate wired and wireless LAN connections in addition to the remote VPN connections they’ve always authenticated. This is useful in a regulated network because network managers can provide a centralized audit log of all network access. Want to know every administrator that logged in with student record access over the last 90 days? With RBAC, it’s all in a day’s work. Organizations can now have a single solution that can ensure that devices on the network are healthy.

RBAC can also report on who is on the network and what they’ve been given access to, regardless of access method or device type. This broad capability also has relevance as a compliance mechanism for many recent government regulations, for example, the Communications Assistance for Law Enforcement Act (CALEA) or the payment card industry compliance standards. An RBAC solution based on 802.1X is the single most effective way to authenticate users and ensure compliance with this regulation.

RBAC in Action

The Southern University Law Center (SULC), located in Baton Rouge, Louisiana, provides exceptional legal training to a diverse student body and gives educational opportunities to underrepresented racial, ethnic, and economic groups. The institution’s IT group faced a complex set of requirements for managing network access for the 100 faculty and staff, 500 students, plus campus administration. The requirements included unrestricted access to the Internet, remote access to the SULC network, multimedia classrooms with full distance-learning capabilities, and simple connectivity for the students. The IT staff of just three full-time employees was also responsible for training and IT support.

As a 100 percent wireless campus, SULC recognized the need for a fully authenticated and encrypted wireless network. The solution needed to support full mobility for laptops (between classrooms and the library, for example) and provide students and faculty—and only students and faculty—with secure access to student information services and to the subscription-based WestLaw and LexisNexis legal search databases.

SULC opted for an RBAC solution that allows the university to maintain a secure, authenticated network and ensure compliance with SULC’s network access policies. The solution:

- Enables end-to-end wireless encryption;
- Authenticates each user against SULC constituent groups;
- Provides control over classroom, guest, and library network access;
- Limits wireless access to online course and subscription-based research materials;
- Keeps any work done by students private;
- Prevents students from accessing administrative applications (including transcripts); and
- Keeps student and faculty identity information, as well as tuition payment data, private.

With its RBAC solution, SULC is confident it can ensure data privacy and comply with relevant government regulations, including CALEA.

Until recently, RBAC solutions like SULC’s were slow to appear because of the complexity of implementing the 802.1X standard, but today’s approaches to 802.1X address the entire rollout, not just the central policy server. When considering RBAC within your own organization, start in a manageable way. Many organizations with mixed wired and wireless networks use their wireless network as the first testing ground for RBAC. They set up just a few roles to begin with: student, faculty, administrator and guest. Just these four roles represent a huge improvement in the capabilities of most networks today and should be considered by any school that seeks to balance the demands of regulations with the evolving security requirements of today’s IT infrastructures.

Sean Convery is CTO of Identity Engines. He can be reached at sconvery@idengines.com.

Bill D. Morris Award
John Bradley

John Bradley, retired from Rensselaer Polytechnic Institute (RPI), is this year’s recipient of the Bill D. Morris Award. This award is one of ACUTA’s two prestigious individual awards. It is presented annually to an ACUTA member deemed by the president to best exemplify the dedication, vision, professionalism, and leadership brought to ACUTA by the late Bill Morris. Bill, who was the director of operations analysis at the University of Central Florida, was president of ACUTA in 1988-89, and this award was established in his memory in 1991.

In his remarks leading to the announcement of Bradley as this year’s winner, ACUTA President Carmine Piscopo said he was “consistently impressed by [Bradley’s] wisdom, suggestions, ideas, and comments.... [He is] a special person who can consistently assess and analyze a situation, come to a conclusion, and articulate a response that is often both prophetic and profound.”

Most of Bradley’s professional career—28 years—was at RPI. He spent the first several years as manager of computer operation and in 1985 was offered the opportunity to manage telecommunication, too.

“The leadership at RPI was early to embrace the concept of convergence,” says Bradley. “As we moved toward a converged environment, I was fortunate to become director of a newly formed department that included networking, operations, customer service, and central servers.”

Bradley joined ACUTA in 1988 and played an active role until retiring in 2007. He served one term as ACUTA’s secretary/treasurer from 2001 to 2003, plus two two-year terms as director-at-large from 2003 to 2007. He participated in the events as a panelist/presenter on more than one occasion.

When asked about winning the award, Bradley said, “Getting the Bill D. Morris Award was both an honor and a very humbling experience—to have my name included with the names of past honorees is a wonderful feeling.”

ACUTA appreciates the time and energy that John has brought to the association over the past 19 years. We wish him the best in his retirement.
The ACUTA Ruth A. Michalecki Award was created in 2001 to recognize outstanding leadership among the ACUTA membership. The award honors the memory of ACUTA past president Ruth A. Michalecki, University of Nebraska Lincoln, for her leadership of ACUTA and the communications technology profession. The person selected for this award:

- Motivates and fosters collaboration to accomplish the goals, objectives, and mission of his or her institution;
- Actively participates in the education, professional development, and mentoring of other professionals;
- Demonstrates initiative in creating programs, projects, or activities that impact the community; and
- Engages in activities that directly benefit ACUTA or the broader higher education community.

The award consists of a beautiful crystal sculpture and a complimentary registration to the ACUTA Forum for Strategic Leadership in Communications Technology, along with air fare and hotel expenses. This is consistent with the principles of Ruth Michalecki, who was a true believer in the value of professional development and lifelong learning.

In reviewing nominations for this award, the Awards Committee was faced with the difficult task of making a selection from nominees whose contributions to ACUTA and their institutions have been outstanding. The committee believes that this year’s recipient, Sandra Roberts of Wellesley College, unquestionably demonstrates the leadership characteristics that this award was created to recognize.

Sandra has served in numerous volunteer roles within ACUTA, culminating in four years of service as chair of the Vendor Liaison Committee. She has been a skilled, inspirational, and diplomatic leader of the committee, which serves as the primary voice of the vendor community within ACUTA. She has participated in numerous ACUTA conferences and seminars, always serving as a welcoming guide and mentor to both institutional members and vendor participants who are first-time attendees.

The member who nominated Sandra for this award wrote, “Sandy has maintained a steady influence on her ACUTA peers, remaining loyal to ACUTA’s overall mission. She has never been afraid to embrace new technology and has influenced other members in this direction. Sandy’s approach has always been one of ‘due diligence’ in researching any new project.”

Congratulations to Sandy, who will continue to participate in the ACUTA leadership as a newly elected director-at-large.
Institutional Excellence Award
University of Notre Dame

Award sponsored by PAETEC

The University of Notre Dame undertook an ambitious communications infrastructure and business process upgrade in 2006. The initiative was based on a mobile communications model that could continually adjust to the changing demands of the population it serves and transform the communication experience at the University.

Consisting of four main components, the project encompassed:
1. Installation of a stealthy multi-carrier cellular distributed antenna system (DAS) to provide enhanced cellular communications across campus.
2. Removal of 3,364 land lines in the dorms and the redirection of the respective revenue stream to meet student IT-centric priorities.
3. Adding 500 WiFi wireless access points (1200 total APs across campus) in 28 dormitories.
4. Introduction of CATV services in all the residential spaces providing both domestic and international programming.

Why Did Notre Dame Choose to Undertake This Communication Transformation?

University leaders recognized that by hanging on to traditional communication methods we were compromising our ongoing ability to communicate effectively with constituent groups.

It became increasingly clear that the needs and expectations of the Generation Y and iGeneration now moving through high school and post-secondary schools were not in alignment with structures that Notre Dame had depended upon for so long to inform and educate our students.

Moreover, Notre Dame determined that its telecom cost models were outdated and uncompetitive. In addition, most of our data infrastructure was not ready for impending converged services.

Beyond the indicators for change, Notre Dame suffered from poor cellular coverage in residential dorms and across campus. Students complained they often couldn't connect or stay connected. Employees couldn't rely on wireless devices for day-to-day usage. Notre Dame experienced cellular-capacity issues during sporting events preventing public safety and athletics department personnel from using cell phones as a tool during game days.

Planning, Leadership, and Support

An enterprise project of this size and scope is not entered into lightly, and Notre Dame maintains a conservative and cautious approach to change. Taking into consideration the sizable investment in infrastructure and staff hours along with a culture that is risk adverse, chief technology officer Dewitt Latimer spearheaded the campaign to
transform the tools of communication under the leadership of the chief information officer, Gordon Wishon. The integrated communications services division of the office of information technologies played a critical role in the planning, design, implementation, and testing of all aspects of the project. Additionally, the project and planning resources of the OIT were instrumental in tracking and reporting the progress of the various aspects of the endeavor. The OIT also coordinated and facilitated the multi-departmental campus committees that were assigned respective responsibilities for oversight of specific solutions.

The scope of the operation can best be exhibited through the five main goals and the breadth of the stakeholders involved.

1. Rewrite the 27 residence halls with state-of-the-art data cable and provide the coax cable outlet to each dorm room.
2. As part of the rewiring of residence halls, wireless access will be extended throughout each residence hall.
3. Build a new fiber-based cable TV distribution system throughout the campus. This system will deliver digital cable TV to all residence halls and the academic/staff buildings.
4. Enhance the cellular telephone reception throughout the campus with the installation of a “microcell” system.
5. End mandatory telephone service in each residence hall room after the spring 2006 semester. Students would be given the option to opt-in for phone service in their room at an additional cost. The charge currently levied to pay for phone service will be used to cover the basic cable provision in the dorm room.

The operational stakeholders and partners involved throughout the planning and execution phases included: dorm staff, reslife staff, student accounts, registrar, admissions, student affairs, ND security, first year of studies, maintenance staff, provost, general staff, general faculty, C.S.C. residents, OIT helpdesk, ICS helpdesk, and OIT RCA staff. However, identifying the tasks and the key players was the easy part. Cultural, technical, and external obstacles lay ahead.

The concept of introducing a paradigm that promoted electronic interaction and the potential to diminish interpersonal connections through face-to-face discussion was not eagerly received. Furthermore, Notre Dame places great emphasis on co-curricular experiences, and at the vanguard is the community bonds nurtured within residential life. The introduction of cable television in the dorm rooms was seen by some as a potential detractor to the communal spirit of the Notre Dame experience. Finally, the university is fervently protective of its architectural vistas and opposed to the construction of traditional cellular towers. All of these factors had to be considered and innovative solutions derived to achieve success.

Beyond the culture challenges, Notre Dame had neither the expertise, time, nor desire to build a cellular solution itself. We did not want to redirect capital away from the core business of instruction and research for a new communications solutions, and, furthermore, we only wanted to solve the cellular coverage problem once—not once per carrier.

Notre Dame is convinced that advanced communication services with a heavy emphasis on wireless will be required to run the modern university and that doing so was not a core competency of the university. The project to transform communications was further refined into four concurrent but distinct tracks:

1. Remove the Centrex lines in the residence halls.
2. Partner with NextG Networks to deploy a start-of-the-art, multi-carrier, distributed, cellular antenna system that preserved the traditional vistas of the campus.
3. Introduce cable television to the residence halls for the first time in university history.
4. Increase the WiFi cloud in the dorms from 25 percent coverage to 100 percent by adding 500 additional access points.

Financial Considerations

As the university set out to redesign communications systems that would provide greater flexibility to our students and employees, it also turned its existing telecommunications business model on its ear. Leaders decided to remove landlines from the residence halls and redirect the voice revenue to cover the top student communication priorities.

New options for students include the exchange of mandatory landline fees with an “opt-in” model. Every student is assigned a voicemail box. Students can pick from any voice service, including cellular, VoIP, Skype, and even Notre Dame service.

The first major hurdle was to convince university leadership that
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traditional Centrex was not going to provide the services needed to support the institution into the future. Supported by a great deal of research gathered through internal student surveys, usage metrics, and external sources to develop the business case for transitioning to a wireless/cellular architecture, key individuals from across campus were assembled to oversee the respective aspects of the multi-pronged effort. Committees worked to develop requirements, review vendors, oversee projects, and coordinate work. IT leadership and staff from the integrated communications division of the OIT worked with campus architects and vendors to map, design, and install the stealthy cellular antennae system. Residential housing played an important role in the decisions and programming for the CATV deployment as well as providing input into the requirements for WiFi in the dorms.

Perhaps the most challenging and innovative component of Notre Dame’s endeavor was the design and implementation of the distributed cellular antennae system. A no-towers-on-campus policy prevailed, even in the face of complaints from students, football fans, and business users regarding poor campus coverage and capacity.

The solution came in the form of an agreement between Notre Dame and NextG Networks to oversee the design and deployment of a start-of-the-art, multi-carrier, cellular distributed antenna system. The solution preserves Notre Dame’s long-cultivated landscape and historical vistas while providing unsurpassed cellular coverage and capacity. Moreover, cellular carriers who provide service over the DAS contract with and pay NextG, not Notre Dame. The model takes Notre Dame out of the middle and offsets 100 percent of the capital and operating costs of the distributed cellular system, greatly reducing the university’s budgetary exposure.

Notre Dame did not go into this venture to generate additional revenue. We went in to solve the coverage and capacity problems and meet specific needs for our campus community. We made money the old fashioned way—by not spending it. Notre Dame redirected $1.1 million previously collected for landlines and is generating revenue on rent and DAS royalty payments.

All Things Cellular

Notre Dame had the perfect mixture of high demand and low service from the carriers. Our non-metropolitan campus meant the carriers couldn’t solve the ND problem through traditional means. An innovative, custom solution was needed. As a private institution, we had the advantage of choosing the technology and solution provider we wanted without any outside factors. Being a 14,000 line Centrex shop since the early 1990s provided an opportunity to realize immediate cost savings from shutting down landlines.

The DAS was designed to be carrier independent with operating specifications of 850 and 1900 MHz, CDMA/GSM/UTMS. The no-cell-tower constraint was overcome by designing a distributed antennae array close to the ground, and ensuring that each node could accommodate multiple carriers. And finally, utilizing available dark fiber to backhaul carrier BTS to a co-located facility on campus resulted in a near zero-footprint solution in the field.

However, Notre Dame leadership knew that hiring a telecommunications management company like NextG would not solve all our problems. Success depended on the dedicated commitment of key leaders to remain diligent and focused on details. In short, Notre Dame had to become very smart in the telecommunications space in a very short period of time.

Notre Dame has accomplished the goal of moving from 1- to 3-bar cellular coverage on the first floor of our facilities. We’ve leveraged 90 percent of our single-mode dark fiber and preserved the campus architecture with a low-visibility antennae array. Students now enjoy 100 percent ubiquitous coverage in the residence halls.

To meet the infrastructure needs of WiFi and CATV access in the dorms, Notre Dame partnered with Comcast Cable. The cable company provides expanded basic programming and advanced digital CATV/HDTV services that are billed to the students. Moreover, Comcast underwrote the cost of the cable plant upgrades to provide the CATV and the addition of 500 wireless access points.

The introduction of CATV has eliminated student-constructed satellite dish farms for access to programming resulting in a sizable cost savings for our facilities department that was tasked with repairing damage to window sashes and grounds. Affinity agreements with Comcast Cable provide lower rates for high-speed data for the surrounding community and reduced Notre Dame’s costs to support off-site Internet access through modem pools. Comcast underwrote the cost of the cable plant upgrade in 28 residence halls to provide
CATV and the WiFi upgrade. This effort produced a significant improvement in our cable plant documentation. Additionally, facilities were enhanced with new wiring closets and appropriate HVAC environments.

In the consensus culture of higher education, the complexity of a multi-pronged endeavor such as this is challenging. Managing and overseeing the progress of the project, coordinating cross-functional committees, negotiating with vendors and dealing with unforeseen issues required the support and commitment of the top leadership of Notre Dame. Formal project plans were developed and executed through the project management office of the OIT. Contracts were negotiated with the help of general counsel. The university architect played a major role in the placement and construction oversight of the cellular antennas. Student affairs and residence life worked to develop the communication plans for students and ensure that the deliverables in the dormitories met the expectations and needs of the student population.

With the support of the senior administration of the university, this comprehensive project has positioned Notre Dame to provide a wide range of communication options to our students, faculty, staff, and constituents. This investment in transforming communications at Notre Dame supports the OIT’s mission to provide:

• Information technology to enable and empower faculty, staff, and students
• Information technology to transform and benefit Notre Dame processes
• Information technology to serve and support the Notre Dame community

This endeavor exemplifies a spirit of teamwork and willingness to confront complex tasks that rests at the foundation of Notre Dame’s success.

Promotion of Technology and Maturity of Effort

Currently, students have access to 100 percent WiFi coverage in the dorms compared to 25 percent prior to the project. The university is now providing expanded basic cable television service in each individual room in the undergraduate residence halls as part of the room and board package. In addition, the university has contracted to provide foreign language programming and negotiated a local broadcast channel reserved for Notre Dame content and emergency messaging.

An added bonus to the partnership with Comcast was the development of the Notre Dame and Comcast Affinity Plan. Notre Dame faculty, staff, and students living off campus can subscribe at a reduced price to Comcast’s high-speed Internet service. Plus, local “network peering” between Comcast and Notre Dame networks gives computer users particularly fast access to Notre Dame network services, such as e-mail, calendars, shared storage, and Notre Dame websites.

“Realize the Potential”

The OIT vision is embodied in its recurrent theme, or motto: Realize the Potential. We must realize the long-offered, but never completely attained, potential for information technology to enable and empower, to transform and benefit, and to serve and support the Notre Dame community. Most important of all, however, is to realize the potential of our people to become leaders in their profession.

Specifically, OIT’s vision is to realize the potential of:

• Information technology to enable and empower faculty, staff, and students
• Information technology to transform and benefit Notre Dame processes
• Information technology to serve and support the Notre Dame community
• Our people to become leaders in their profession.

This comprehensive project has positioned Notre Dame to provide a wide range of communication options to our students, faculty, staff, and constituents. Timely, accurate, and effective communications with the campus community have never been more important or challenging given today’s mobile and distributed population. This investment in transforming communications at Notre Dame is directly aligned with the OIT’s mission.

This endeavor, guided by the OIT leadership with the support of many additional departments across campus, exemplifies a spirit of teamwork and willingness to confront complex tasks that rests at the foundation of Notre Dame’s success. Their efforts in transforming communications will enable the university to explore new ways of conducting our business, and more importantly, provide new avenues to inform and educate our students.

ACUTA congratulates the University of Notre Dame for its successful undertaking. For more information about the project, contact chief technology officer Dewitt Latimer, PhD, at dewitt@nd.edu.
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