Winter 2013

ACUTA Journal of Telecommunications in Higher Education

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Connecting Campus IT Professionals with Ideas and Solutions

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Own Your Future

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Quotes of Note

Willingness to take that extra step to make the university better—whether it's something specifically assigned to me or my identifying and taking on "other duties" not being covered by someone else—has helped get me to the position I now hold. You never hear a senior staff member say, “Not my job.”

Chris Fulkerson
Assistant Vice President for Technology/CIO
Elon University

Like many of my peers, my greatest challenges relate to the administrative demands of a large IT organization. Budgeting, project planning, surveying/assessing, etc., and all take a great amount of time. It's easy to get stuck behind the desk and become a little disconnected from what's happening in the trenches.

Doug West
Assistant Vice President, Telecom, Multimedia, User Services
University of Richmond

The Year Ahead

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
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<tbody>
<tr>
<td>43rd Annual Conference</td>
<td>March 30–April 2, 2014</td>
<td>Hyatt Regency Hotel Dallas, Texas</td>
</tr>
<tr>
<td>Fall Seminar</td>
<td>October 26–29, 2014</td>
<td>Park Plaza Hotel Boston, Massachusetts</td>
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Core Purpose and Values

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

ACUTA’s core values are to:

- encourage and facilitate networking and sharing of resources
- exhibit respect for the expression of individual opinions and solutions
- fulfill a commitment to professional development and growth
- advocate the strategic value of communications and collaboration technologies in higher education
- encourage volunteerism and contributions by individual members
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President’s Message
Truths We Can Find Among All These Changes
by Ron J. Kovac, PhD, Ball State Univ.

From the ACUTA CEO
Computers and Phones and More... Oh My!
by Corinne M. Hoch, PMP

Advertiser Index

Thanks to the companies that support ACUTA by advertising in this issue.
On a daily basis I provide more advice to people on how to get things done. Sometimes IT related, but not always. Sometimes staff related, sometimes home computer related, sometimes policy related. I feel like Dear Abby and Dr. Oz all rolled into one on some days.

Steve Vieira

Over the past decade or so, new technology has changed just about everything, morphing data and voice so that telecom professionals have become less hands-on, frontline techies and more hands-off, back-office managers. Such changes will only increase as cloud computing gains momentum.

Paul Korzeniowski

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As we slip and slide into winter, let’s take a moment to consider “IT...and other duties as assigned.” If you’ve been on the job for 10 years or more, think about all the ways your job description has changed. Chances are, your plate is full of tasks that didn’t even exist when you were hired.

Thinking about all the changes I’ve seen was a somewhat startling exercise. After I began to get my mind wrapped around this topic, three different truths emerged. First, it is true that the role of the IT professional has been constantly and rapidly evolving. We once were subject-matter experts (i.e., programmers), and now we are business analysts who continuously explore how technology can make things smoother in the transportation or business or registrar’s office. Or, we were the phone gurus who kept the wires humming and singing, and now we do that for all network traffic (phone, data, video, etc.) as it flows down to the user level. Not only is the technology constantly changing, but the roles never stop expanding.

The second truth is that technology has infiltrated virtually all other professions. Can you identify any profession that does not require the use of technology? I can’t. Technology can gain us effectiveness and/or efficiencies previously unimagined. Familiarity with how IT has enabled or improved work in other arenas is no longer just a bonus on your résumé, but a necessity. The need for technological literacy affects the job capability of many in the workforce. Those who cannot understand and quickly learn to operate the programs, apps, and tools that are a common part of most jobs today have lost their competitive edge in the job market. Look at the academic staff at your university or college. Professors can no longer just be experts and researchers in their field but must be able to operate smartboards, projectors, advanced phone systems, and course management systems like Blackboard for grades and course information. IT has spilled out of its borders and is now a part of the foundation.

Terrie Schultz, a contributor at Yahoo, talks about this very issue in an article titled “The Importance of Technology Literacy” (http://voices.yahoo.com/the-importance-technology-literacy-6535558.html?cat=4): “The increasing need for technological knowledge in the workplace is not limited to computer-based jobs however; it extends across every area of employment. Whether an airline pilot, cashier, accountant, or administrative assistant, it is almost certain that the job will require the use of some type of information technology. In addition, in a volatile job market, having the ability to transfer skills across jobs is a plus, and it is looked on favorably by employers. Educators are faced with the challenge of ensuring that their students attain proficiency in all of these varied technology skills.”

So what is happening? IT people are being required to better understand the environment in which their tools function, and non-IT people are being required to better understand the technology that supports them. Seems like there will be a middle ground of meeting somewhere along the line. IT is simply a part of the world now, and no one is exempt. It is no longer possible to have jobs that exist under a heading of being either IT or non-IT. There is no wall keeping the IT world contained in a technological cocoon away from all other jobs. In the future it would be more appropriate to broaden our understanding of what IT really means to a job function. IT will be used in every part of the working world.

Going back to our theme, "IT...and Other Duties as Assigned," the third truth is this: We all should recognize the importance of precise job descriptions for ourselves and each person in the organization. It is essential to work with position descriptions so that the lines are drawn that facilitate success. How can we set goals and establish standards if we don’t know where our responsibilities begin and end?

Below is a list of some of the more fascinating and intriguing “other duties” that I have found. I hope you pull out some good thoughts from this list for your job description, find some grist for other would-be job descriptions, and maybe find a bit of humor in these.
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What Are Your “Other Duties”? 

Early this year, ACUTA members were asked to name the top five responsibilities most relevant to your position. Here’s what you said:

<table>
<thead>
<tr>
<th>Other Duties Assigned</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional telephone services</td>
<td>44%</td>
</tr>
<tr>
<td>Voice hardware/systems</td>
<td>38%</td>
</tr>
<tr>
<td>Voicemail support</td>
<td>28%</td>
</tr>
<tr>
<td>Moves/adds/changes/trouble tickets</td>
<td>28%</td>
</tr>
<tr>
<td>Technology strategic planning/mgmt</td>
<td>24%</td>
</tr>
<tr>
<td>Mgmt/telecom/networking</td>
<td>24%</td>
</tr>
<tr>
<td>Infrastructure wiring/connectivity</td>
<td>21%</td>
</tr>
<tr>
<td>IP communications</td>
<td>21%</td>
</tr>
<tr>
<td>Unified communications</td>
<td>17%</td>
</tr>
<tr>
<td>IT support</td>
<td>16%</td>
</tr>
<tr>
<td>Cable or fiber infrastructure</td>
<td>16%</td>
</tr>
<tr>
<td>Wireless data</td>
<td>15%</td>
</tr>
<tr>
<td>E911</td>
<td>14%</td>
</tr>
<tr>
<td>Network hardware/software</td>
<td>14%</td>
</tr>
<tr>
<td>Purchasing/contracting/RFPs</td>
<td>14%</td>
</tr>
<tr>
<td>Campus LANs</td>
<td>12%</td>
</tr>
<tr>
<td>Overall mgmt of tech organization</td>
<td>12%</td>
</tr>
<tr>
<td>Billing/accounts payable</td>
<td>11%</td>
</tr>
<tr>
<td>Internet access</td>
<td>11%</td>
</tr>
<tr>
<td>Wireless voice</td>
<td>10%</td>
</tr>
<tr>
<td>Staff training &amp; development</td>
<td>10%</td>
</tr>
<tr>
<td>System architecture</td>
<td>9%</td>
</tr>
<tr>
<td>Administrative systems</td>
<td>9%</td>
</tr>
<tr>
<td>Help desk</td>
<td>9%</td>
</tr>
<tr>
<td>Network security</td>
<td>8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Duties Assigned</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems admin/IP operations</td>
<td>8%</td>
</tr>
<tr>
<td>CATV</td>
<td>8%</td>
</tr>
<tr>
<td>Department manager</td>
<td>8%</td>
</tr>
<tr>
<td>DAS</td>
<td>7%</td>
</tr>
<tr>
<td>Network management systems</td>
<td>7%</td>
</tr>
<tr>
<td>Inventory of comm eqpt &amp; facilities</td>
<td>7%</td>
</tr>
<tr>
<td>Construction project mgmt</td>
<td>7%</td>
</tr>
<tr>
<td>Mobility/fixed mobile convergence</td>
<td>6%</td>
</tr>
<tr>
<td>Emergency/event notification</td>
<td>6%</td>
</tr>
<tr>
<td>Multilocation WANS</td>
<td>6%</td>
</tr>
<tr>
<td>Academic technologies</td>
<td>6%</td>
</tr>
<tr>
<td>Desktop support</td>
<td>6%</td>
</tr>
<tr>
<td>Email systems</td>
<td>5%</td>
</tr>
<tr>
<td>Academic technology support</td>
<td>5%</td>
</tr>
<tr>
<td>Database management</td>
<td>5%</td>
</tr>
<tr>
<td>Audio/visual</td>
<td>4%</td>
</tr>
<tr>
<td>Hospital telephone services</td>
<td>3%</td>
</tr>
<tr>
<td>Computing servers</td>
<td>3%</td>
</tr>
<tr>
<td>Video</td>
<td>3%</td>
</tr>
<tr>
<td>Website management</td>
<td>3%</td>
</tr>
<tr>
<td>Campus security</td>
<td>2%</td>
</tr>
<tr>
<td>Custom-built or private networks</td>
<td>2%</td>
</tr>
<tr>
<td>Card activities</td>
<td>2%</td>
</tr>
<tr>
<td>Student resale services</td>
<td>2%</td>
</tr>
</tbody>
</table>

At the top of this page is a chart showing a number of “other” duties that have been assigned to actual ACUTA members. This information comes from the most recent Member Needs Assessment Survey conducted by ACUTA. The percentages indicate what portion of the respondents included that task in their list of assigned duties.

Other Duties Assigned

- Generate and manage information technologies necessary for the modernization and systematization of operation that is consistent with the trends and advances of today.
- Develop and coordinate the implementation and development of a technology plan to achieve an information system that supports the formulation of policies and strategies, planning, management, and research decisions.
- Coordinate and orient when it is necessary to outsource all or part of an information system application of the institution when required.
- Coordinate with those responsible for the computing process to define activities necessary for the development of information systems in accordance with a company's plan of information technology.
- Design and implement information technologies that enable the development of administrative areas: human resources, financial resources, and resources for materials and services.
- Coordinate and oversee the development and/or modification of programs and processing data according to user requirements.
- Analyze the information and activities of a work area and develop operational flowcharts.
- Perform programming of computer systems projects according to the rules and standards.
- Keep the department head up-to-date on the progress of work and pending jobs.
- Conduct training of the new systems to be implemented to users.

Conclusion

We all recognize that technology, and especially information technology, is becoming the fabric upon which we live our lives. With this comes some tremendous upsides, and also some detrimental points. Either way you look at it, it necessitates talk among ourselves, constant reeducation and professional development, and generally constant learning and change.

This is where ACUTA and other professional organizations come into play. Through conferences and seminars, the Journal, the eNews, and other publications, ACUTA provides the IT world to you in the specific and unique environment of the universities and colleges of our time. Please enjoy this issue and other avenues of professional development brought to you by ACUTA and, even more important, please share your thoughts, ideas, and experiences. Remember, we are a community.

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In planning this issue, the ACUTA Publications Committee said, “With the changes in technology over the past two decades, the lines between telecommunications and data communications have all but disappeared. Telephones and computers have merged so that all communication can be accomplished by one piece of equipment from just about anywhere on or off campus. The departments that traditionally provided voice, data, and video services on campus have also merged, meaning that everyone in the new information communications technology department—by whatever name it is called—wears many hats.”

One result of this evolution is the diversity of projects that the department must handle. Today’s CIOs, CTOs, or VPs of communications are likely to oversee a broad range of responsibilities that include not just support for voice and data communication, but also social media, security and risk management, DAS, VoIP, asset and inventory control, purchasing, environmental impacts, and more. Of course, they need a voice at the table when strategic planning happens, even as they address the need to keep IT professionals’ skills up-to-date and manage the impact of IT consumerization and BYOD.

The new ICT has a lot of “other duties as assigned” on today’s campus, and this issue provides many examples of how a few campuses are meeting the challenges. I asked CIOs at several campuses how they would define “other duties as assigned.” It is no surprise that the common denominators inherent within the definitions include the following:

1. Willingness to do those other duties
2. Capitalizing on opportunities to collaborate
3. Getting involved in fund-raising
4. Taking the lead in staff/professional development

What follows is just some of what I learned. As you read through this issue, you will see more of what these and others among your colleagues had to say about their "other duties."

1. Be willing to do those other duties. Chris Fulkerson, AVP for technology/CIO at Elon University, says, “Willingness to do the other duties means being able to take that extra step to make the university better—whether it’s something specifically assigned to me or just something I see that needs to be done and isn’t being covered by someone else. I think it has been my willingness to do those ‘other duties’ that has helped get me to the position I now hold. You never hear a senior staff member say, ‘Not my job.’”

The willingness to do whatever is needed to help our school or organization is, indeed, the common thread that binds all of us together.

2. Capitalize on opportunities to collaborate. Joanne Kossuth, vice president for operations and CIO at Franklin Olin College of Engineering, said, “In my experience, collaboration was once an optional activity, but with the challenges in the higher-education sector, it is more of a required activity. This activity is required as part of the due diligence process when making decisions, i.e., what a neighboring institution or school is doing. Could we possibly share or collaborate on a product or service? Do they have staff expertise that we do not have? How can we leverage that expertise?”

Steve Vieira, CIO and executive director of IT at the Community College of Rhode Island, actually developed titles for the many hats that he wears, and interjects a bit of humor in his descriptions: master schedule enabler, quasi entrepreneur, evangelist, registrar, process improver, babysitter, priest, sympathizer, and idea man. (See more of Steve’s thoughts on page 11.)

Anne Scrivener Agee recently retired as vice provost IT/CIO from the University of Massachusetts, Boston, where a lot of her other duties as assigned “were in the nature of committee assignments, like working on the university’s Strategic Planning Committee, serving on a search committee for a new dean, or representing the university at a particular event or on a statewide project. The head of IT often has a very broad perspective on the needs of the university, so I was often called on for across-the-university projects.” (See more of Anne’s responses on page 11.)
3. **Get involved in fund-raising.** At Marian University, CIO Peter Williams told me about his involvement in fund-raising for IT projects. “Most recently we have established our first technology endowment, specifically for funding innovation outside the normal budget process. So far, this initiative has had contributions near $1.4 million.”

4. **Take the lead in staff/professional development.** IT coaching for new CIOs and coaching for two new startup companies were also highlighted on Cal Poly CIO John McGuthry’s list. In addition to his IT responsibilities, John leads executive searches, makes presentations, participates on committees and boards, and hosts campus events.

Elon’s Chris Fulkerson added, “Recently, I was assigned a duty outside of my regular CIO duties. I’ve been asked to develop a professional development program for managers. I had experience developing one earlier in my career, and I have done a lot of development of the management staff within my department, so the president asked me to develop a new program for our institution. The president saw it as an unmet institutional need, especially for new managers, and I see it as improving the university as a whole. So, instead of complaining about more work, I smile and say ‘other duties as assigned.’”

And I also smile as I say thank you to the high-level, well-respected IT veterans who responded to my inquiries and contributed to this issue of the *Journal*. They support the missions of their schools by allowing ACUTA to be the premier source for connecting higher-education IT leaders with ideas, innovations, and solutions and to support you as you deliver superior communications and collaboration technologies to your campuses. I hope you enjoy this revealing look at how diverse higher-ed IT professionals’ other duties truly are.

I encourage you to connect with your peers through ACUTA events as well as online. Even when you think no one else in your position has a task to complete so unrelated to your job title, share the challenge. You might be very surprised.

*Contact Corinne anytime at choc@acuta.org.*

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IT...and Other Duties as Assigned

In this issue, we will explore how campus communications services have changed and what our members are actually doing. What, in addition to the expected duties required to keep faculty, staff, and students in touch with each other and all kinds of information, gets the attention of the CIO or director of networking and telecom or communications manager or whatever other title might identify our members. Throughout this issue you will see short descriptions such as the ones on these two pages that come direct from the trenches. Well, from your desks anyway... It’s an opportunity to discover just how diverse your responsibilities have become and to identify the real scope of your abilities.

Other Duties as Assigned

Mike Grunder (michael.grunder@vantagecg.com)
Senior Consultant
Vantage Technology Consulting Group

My experience has been that because Telecom/IT departments have project management experience, they’re sometimes (often?) asked to head up projects that have no or only remote connection to technology. ...These days technology overlaps with so many different things that project management is a significant category in the IT/Telecom portfolio of services.

Jerry Krawczyk (GAK13@psu.edu)
Information Technology Services
Penn State University

Here's what falls under my specific "command":
- RFP Development/Contract negotiations
- Communications Vendor Liaison
- Invoice Audit & Review
- Application Development & Support
- Database Administration
- Telecommunications Management System (e.g., MySoft/Pinnacle)
- LAN support and enterprise computing
- Desktop Support
- Financial Management & Reporting
- Cost Recovery Business Models and Rate Development
- IT Service Management Adoption
- Telephony/Voice Service Development

(If you are interested in TNS in general, the service catalog may be found at: http://www.tns.its.psu.edu/index.html.)

Cathy O'Bryan (caobryan@iu.edu)
Director, Client Support
Indiana University

Somewhere in my professional life I recognized the need to have and listen to (really listen to) mentors—those colleagues who exhibited the characteristics and had achieved goals that I aspired to emulate. Admittedly, I’ve been lucky to have found three such colleagues who continue to give me the straight-up, needed feedback with or without my asking.

So it is only karma that I also seem to have a sticker on my back—invisible to most, but apparent to others—that says “Ask me to be your mentor.” Since my arrival at Indiana University less than two years ago, at least four staff across three campuses have asked if I’d be their mentor.

It takes time, commitment, and a lot of awareness to mentor. Being a problem solver comes natural to me, but true coaching doesn’t provide answers. Rather, coaching is guiding someone’s thought process, awareness, and reflective analysis to their own conclusions. We grow best when we are given the opportunity to do the higher order thinking on our own.

Guiding questions are useful and so is the encouraging word as we struggle with the challenge. It takes time to understand the player, build the trust, and then ever so gently suggest a direction for further consideration.

So across many early morning coffees, monthly lunches, and the occasional stroll, I spend time with all four of my “mentees” and often wonder “who is really the learner?”
Other Duties as Assigned

Anne Scrivener Agee (anne.agee@comcast.net)
Vice Provost IT/CIO (retired)
University of Massachusetts, Boston

A lot of my other duties as assigned were committee assignments, such as working on the University Strategic Planning Committee or serving on a search committee for a new dean or representing the university at a particular event or on a statewide project.

Occasionally I was given a special project, like gathering information on library science programs to see how we might develop a technology-emphasis, or writing a diversity plan for the IT organization. Or serving on an accreditation team. Or serving on an administrative evaluation team for a senior administrator. Or being asked to serve on the team that was developing a residential housing plan for the university. Or developing a plan to enhance the university’s research activities.

The head of IT often has a very broad perspective on the needs of the university, so I was often called on for across-the-university projects.

Other Duties as Assigned

John McGuthry (jwmcguthry@csupomona.edu)
CIO
California State Polytechnic University, Pomona

Approximately 50-70 percent of my day will involve activities outside of my organization. The following list includes my collaborative C-level duties:

- Leading executive searches
- Building and assisting university-related processes (everything from hiring people to bringing students on board)
- Making presentations (on and off campus)
- Building relationships for the university (technology-oriented)
- Participating in campus-related events
- Hosting campus events (providing the campus welcome)
- Working on committees and boards (Lots of it on campus)
- Working on committees off campus (ACUTA/EDUCAUSE)
- Participating in community-related events

Other Duties as Assigned

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CIO & Executive Director of IT
Community College of Rhode Island

Master Schedule Enabler: The college is taking a long overdue look at their master schedule, and since the technology tools used to do room and resource scheduling are in my area, I get involved in the discussions which sometimes are pretty frustrating.

Quasi Entrepreneur: Whenever someone has an idea, I am the research and review person for every product under the sun that promises exactly what everyone wants to hear, but often what the vendor cannot quite deliver. The questions asked are seldom specific enough to describe the challenge, and the answers offered are always incomplete.

Registrar: It is very difficult to tell people who have been doing a job for many years that they are doing it wrong. Our use of co-requisites and pre-requisites is poorly done, so we don’t use the administrative system as well as we could to ensure that our students don’t register for classes for which they are not prepared. Using our administrative system to prevent mis-registration would be simple enough to correct, but the battle to get that done is often a tiptoe through a cultural minefield.

Process Improver: I often find myself asking common sense questions and getting a “deer in the headlights” look in return. I assume that people try to find easier ways to get the job done. So I find myself creating business processes for people who either ignore or adopt them.

Babysitter: Because I am concerned that when I say something will be done, I like to have people believe me. I am constantly checking on those within my department whose intentions are to collect the check and keep their heads down. I’m disappointed that our union shop has a number of people who report to me who can’t seem to maintain the least bit of work ethic on a daily basis.

Priest: On a daily basis I provide advice to people on how to get things done—sometimes IT related, but not always. Sometimes staff related, sometimes home computer related, sometimes policy related. I feel like Dear Abby and Dr. Oz all rolled into one on some days.

Idea Man: A lot of people present me with their problems, and because I am the technology guy, they figure I’ll come up with a solution. This can be time consuming, and I must be careful what I suggest because these ideas or discussions have legs. So, “Steve told me that…” is not out of the ordinary, and unfortunately sometimes what Steve said was not quite what Steve was supposed to have said. So the idea is presented, it morphs into something that somebody thought they heard, and then the next question I get is, “did you tell…”

ACUTA Journal Winter 2013 11
Transforming an IT Organization to a Service Organization: It’s about the People
Some common principles and practices that facilitate change

Is yours an IT organization providing services or a service organization providing IT solutions?

There is a lot of churn, discussion, and time invested in the realm of IT service management (ITSM) and the Information Technology Infrastructure Library (ITIL®) within higher education. Countless articles, webinars, and presentations describe how one university or another is implementing ITIL. Frequent discussions begin with the service desk or service catalog, implementation of certain software, and revision to a business process (e.g., change management).

While these articles and webinars are important and informative, they often underemphasize one of the more significant challenges of adopting ITSM: culture change. I believe this is the most important contributor to the success or failure of an ITIL-based ITSM initiative because, at the end of the day, ITSM adoption is about changing the way people think and behave. To successfully transform a technology-centric organization into a service-centric organization, we must look beyond the processes and technology and see the people and the organizational culture.

What Does a Technology-Centric Organization Look Like?

A technology-centric organization often sees technology as the service. Gartner describes a technology-centric organization as:

- Siloed around functions, skills, or technology platforms;
- Cost focused;
- Monopolistic, and therefore not necessarily competitive; and
- Accepting of their supply constraints.

Does this seem familiar?

On the other hand, a service-centric organization is focused on delivering value to the business, or in this case the university, by leveraging a broad-based set of IT services that may be composed of both on-premises and cloud-based solutions. A service-centric organization is aligned with the business it serves since the IT services are defined within the context of the business.

Within higher education, most can relate to the way a technology-centric organization is structured and behaves, but what about a service-centric organization? Unlike the strict hierarchical structure of a technology-centric organization where staff members are tasked (and their performance evaluated) up and down the administrative management silo, a service-centric organization works to eliminate the walls of the silo by sharing staff and resources throughout the organization.

The mission of a service-centric organization is to efficiently and effectively use the staff and resources at its disposal (not constrained by an organizational chart) to meet the business needs of the customers. Therefore, staffing and other required resources are not necessarily tasked via their administrative silos but provided by someone in a service management role (e.g., service owner) who is outside of the administrative silo. This is often viewed as a matrix organization structure and is reflective of the Stage 5 "Collaboration" organization in ITILv3. For comparison, most technology-centric organizations would be reflective of a Stage 2 "Directive" or Stage 3 "Delegation" described in ITILv3 documentation.

A successful transformation from a technology-centric (or functional organization) to a service-centric organization will require a shift in an organization’s culture, accountability, staff expectations, roles, and responsibilities. This is where most of the “resistance to change” associated with the adoption of ITSM will occur.

Challenges to Culture Change Within an ITSM Adoption

Many challenges come with the transformation from a technology-centric organization to a service-centric organization. One of the greatest is to get staff that are entrenched with what they do and how they do it to think and act differently. With a technology-centric organization, organized around functions, adopting ITSM will bring about new roles, responsibilities, processes, and a different level of accountability, requiring staff to do things differently.

Hypothetically, in a technology-centric organization, staff members are aligned
to fulfill their function, direction comes from their management, and their focus is most likely on developing and sustaining an underlying technology. Introducing service management concepts into this culture will be disruptive. For example, one of the activities that will need to be undertaken is the assignment of new service and processes ownership roles. Given the resource constraints within most universities, the new assignments will most likely fall upon the existing functional staff. This will be a friction point since the new ITSM roles will introduce a new paradigm and require a culture shift from a functional paradigm to a service-focused paradigm.

The newly minted service-management staff will be asked to think differently by thinking more about the "service" than the technology, act differently by collaborating beyond their typical sphere, and allow others outside of their normal management chain to influence or direct their activities. The tendency will be to try to fit this new role into the old way of doing business, or, depending on the level of accountability, treat the new role as a secondary or tertiary priority. As a colleague mentioned in a recent meeting, "higher education is a bastion of passive-aggressive behavior." Allowing this to happen will lead to staff frustration and an unsuccessful ITSM adoption. As highlighted by Malcolm Fry, the continued support of a silo (functional) approach is one of the top 10 reasons for an unsuccessful ITIL adoption. Only through strong and committed leadership will this shift have a chance of success.

**Increasing the Chance of ITSM Adoption Success**

Numerous articles and books focus on leading change and dealing with organizational culture as well as characteristics of successful and unsuccessful ITIL/ITSM adoption. At the top of this list is Dr. John Kotter's 8 Principles of Change, which is often cited whenever the topic of leading change is addressed. Though the principles are simple in nature, how many organizations actually apply them when planning for or beginning to adopt ITSM?
Additionally, the book *Change the Culture, Change the Game* by Roger Connors and Tom Smith has been enlightening when it comes to addressing the challenges of changing an organizational culture. In short, Connors and Smith make a keen observation when it comes to culture: "Either you manage your culture or it will manage you." Also, they postulate that bringing about sustained cultural changes takes strong, committed, and involved leadership. Connors and Smith lay out the foundational concept that the results the organization achieves (in this case ITSM adoption) are related to the actions of the staff. The actions of the staff (either embracing ITSM changes or resisting ITSM changes) are related to their beliefs. The beliefs are built on previous experiences in and outside the organization. So, one of the conclusions the authors draw is that to bring about true culture change, leaders need to focus on changing the experience.

Based on the work of numerous well-respected authors and experts in the areas of change management and ITSM, as well as personal observations, I'd like to suggest some common principles and best practices of successfully transforming a technology-centric organization to a service-centric organization through ITSM adoption.

1. *Executive leadership must be involved and committed.* Common to virtually all the opinions is the need for executive leadership commitment and involvement. Malcolm Fry actually cites the lack of management commitment as the number one reason for unsuccessful ITIL implementation. Pink Elephant states that "CIOs, IT directors, and managers play a major role in helping cement a new service-management culture through role model behavior." From the cultural perspective, Connors and Smith emphasize that leaders must create the needed culture and shoulder the responsibility and that sustaining a culture is a never-ending role of leadership. This mindset, above all else, is the most important factor for addressing culture change and determining the success or failure of an ITSM adoption.

2. *Communicate why.* Communication is another key change-management best practice and a consistent theme with most experts in change management and organizational management. In terms of ITSM adoption, the vision and strategy need to be clearly explained and documented. This will be especially important as a communication tool when discussing front of the organization, being the catalyst for "creating a sense of urgency." ITSM activities and accomplishments should be an agenda item at all staff meetings and highlighted in organizational publications or newsletters, and accomplishments should be widely celebrated.

3. *ITSM adoption is a program/project.* ITSM adoption, as well as addressing the underlying culture change, needs to be recognized and treated as a program with multiple projects focused on business and process analysis, design, and implementation. As such, guidance can be found in the *Project Management Body of Knowledge* (PMBOK®), which is a standard for project management. A leadership action is to formally recognize that the ITSM adoption needs to have the appropriate resources assigned and to assign an official ITSM/ITIL project manager (PM). The ITSM PM should be tasked with overseeing, facilitating, and coordinating the ITSM adoption and continued support. The ITSM PM must be given the authority to implement new processes and policies and guide the development of the service portfolio and service catalog. In addition to the ITSM PM, additional supporting resources may be required.

4. *Identify and engage the “right” staff.* Identifying the appropriate staff to participate and "evangelize" the ITSM adoption will only improve the chances of successfully transforming from technology-centric organization to a service-centric organization.

An analogy comes to mind from Jim Collins’s book *Good to Great: Why Some Companies Make the Leap . . . and Others Don’t.* Collins says, “It is not enough to have the right people on the bus...you need to have the right people in the right seats on the bus.” How this analogy is relevant to ITSM is that it is important to survey the organization for the staff with the right competencies, such as the ability to look beyond the technology, the willingness to collaborate, strong communication and facilitation skills, and a passion for deliver-
ing the service; those who "personify new attitudes and norms."14 Through this process, the silos of an organization will start to erode since ITSM role assignment will be more of a function of competency than functional role.

Lastly, once the appropriate staff are identified, an investment in training should be made to ensure everyone shares a common language. As Dave McGuire, Associate Director of IT Services at the University of New Mexico suggests, "Having everyone share common language and mental models has allowed us to avoid many 'religious wars' and many arguments that turn out to be about semantics rather than substance. It's a great accelerator."

5. Bring in some help. The last principle is to bring in ITIL/ITSM expertise (preferably not associated with an ITSM product). While it might be appealing to follow many of the documented ITSM/ITIL adoption best practices, achieving success will still be challenging due to cultural and political barriers to change. Through the independence of a consultant, these barriers can be shrunk or significantly reduced. Call it the "consultant effect," but sometimes a recommendation from an independent consultant carries more weight than the same recommendation from internal staff.

Another reason to invest in an ITIL/ITSM expert is that they will bring the experiences and knowledge from prior ITSM adoptions, both successful and unsuccessful. A consultant should be able to help an organization navigate the complexities and minefields of transforming itself from a technology-centric organization to a service-centric organization. Not doing so would be like the doctor who operates on himself/herself.

Things to Remember
Transforming a technology-centric organization to a service-centric one is a complex, time-consuming, and challenging endeavor. Re-engineering processes and evaluating tools are hard enough, but the largest challenge facing an organization and its leadership is changing the culture. A successful transformation requires strong, committed, and involved leadership.

One last thought from Rob England in "ITIL Is Cultural, Not Technical": "A greater proportion of ITIL (ITSM) projects will succeed long-term when we get a typical spend of 40–50 percent culture change, 30 percent process reengineering and the rest on tools."15

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4. Ibid.
8. Fry, "Top Ten Reasons."
10. Connors and Smith, Change the Culture, Change the Game.
11. Ibid.
12. Published by the Project Management Institute (PMI®).
Beating the Odds: Implementation of a University Portal

MyIUP has become one of the more valuable pieces of campus online real estate

Over half of software implementations fail, due to factors such as changing requirements or “scope creep.” Indiana University of Pennsylvania (IUP) implemented a new university portal that went live seven weeks early and significantly under budget. How, and why, did it work at IUP?

About MyIUP

MyIUP is a new university portal for students, faculty, and staff featuring automatically updating content, social-media integration, and single-sign-on to the most frequently used academic tools. Since 2000, IUP has used Banner by Ellucian as its student information system. After getting a priority ranking from faculty and staff, IUP chose to implement Ellucian’s Luminis portal product, part of the Banner platform, going live on September 9, 2013. The implementation team branded the Luminis portal as MyIUP.

A key benefit of MyIUP is the tight integration with a student’s academic record and demographic data. Unlike a static website, the portal knows users’ characteristics after sign-in, enabling a customized user experience.

These features are part of MyIUP:
- Calendar feeds: academic, community, and student event calendars, including calendars specific to a student’s academic college and regional campus
- Automatically updating content: direct feeds from our daily student and staff e-mail newsletters
- Content and announcements customized by role: more than 50 dynamic groups, including ones for new students, students by campus, class level, academic college, veteran status, graduate level, distance ed, pending graduate, and more
- Embedded social media: Facebook and Twitter feeds, including the main university feeds and specialty feeds targeted to student roles
- Single-sign-on: authentication to frequently used applications, including Banner Self Service, learning management systems, and the help-desk ticketing system

Project Management Methodology

Too often, implementing a university portal becomes a “side project” of IT staff. Without a dedicated functional lead or project manager, it becomes yet another system for IT to implement and maintain. With the support of IUP’s Council of Trustees and the university leadership team from the president on down, IUP made the strategic decision to establish the project in the Division of Enrollment Management and Communication and to hire a full-time portal administrator.

Before project initiation, the implementation team spent a day with Shippsburg University, another school in the Pennsylvania State System of Higher Education, that had already implemented the same brand of portal. Shippsburg shared code used for custom development as well as lessons learned from their implementation.

Shippsburg also highlighted its struggle with being one of the first schools to implement a new version of the Luminis portal, and cautioned against implementing a new module that was recently released.

Reflecting on this approach, IUP’s CIO Bill Balint said, “This is one case in which a school benefitted from not being an early adopter. We did not experience a lot of the growing pains we had heard about from those who implemented in early generations of the product.”

Back at IUP, the implementation team held three days of requirement-gathering sessions, engaging stakeholders from vice presidents to division secretaries. During the sessions, the implementation team told participants that all the ideas were being recorded on a “wish list”: good ideas, bad ideas, and even technically impossible ones. The implementation team would then prioritize the requests and decide which ones to implement.

By interviewing students, the team learned that many students weren’t aware of registration holds on their accounts before trying to register for class. The team also learned that students wanted to see upcoming campus events relevant to them. They wanted to see the daily cafeteria menu, and they wanted to get a text message when a dryer was finished with their laundry.
Setting the stage for "wish-list generation" allowed frank discussion without promising specific features to any single stakeholder. To control scope creep, the implementation team then prioritized the features to include in the first release.

After requirements gathering, the implementation team conducted three days of structured design sessions with stakeholder groups. Team members designed each content block in a PowerPoint template before building the test or production environments. Adjusting PowerPoint slides instead of HTML code and system configuration saved many hours of development.

Despite spending a significant amount of design time with administrators, the decision was made not to leave the design of the portal up to administrators who are neither students (the primary users) nor online information design experts. The team decided to turn to research and usability studies to determine portal layout.

**What Goes Where? Structured Online Design Exercises**

How were the pages named? How did the team determine what items went on which pages without getting into university turf battles? In addition to traditional observational user studies, the team conducted research-based analysis using an online information-architecture-testing service from Optimal Workshop.

The three rounds of tests included the following options:

1. Page names: Users dragged and dropped tasks into categories and then named the categories. The pages in the portal were named: Home, Academics, Finances, Campus Life, Social Media, and Personal Info. (Figure 2)
2. Page choice for task: Given a set of tasks, users indicated on which page they expected to find the task.
3. Section label for task: Users were asked where they would click to find the task, and they clicked through the prepopulated navigation tree.

An example of a finding through the usability research was the placement of the university’s disability support services. This service provides learning support services to students with disabilities of all kinds. The team initially placed this task under Academic Resources on the Academics page. The usability test resulted in 44 clicks to the Academics page and 173 clicks to Campus Services. Although Disability Support Services is not housed under IUP’s Center for Health and Well-Being, it was placed under Health and Well-Being on the Campus Services page because that's where students expected to find it.

More than 175 students took part in these online exercises, enticed by the chance to win a $50 gift certificate from the campus bookstore. After the portal was built and stakeholders requested that links be moved, the team could then point to research that drove design decisions to justify the link locations.

**Going Live: Three Phases of Portal Deployment**

“Big bang” software releases often result in a significant number of production issues. IUP’s portal deployment consisted of three phases, each allowing for defect resolution and user feedback before critical usage periods.

During the first release in April 2013, MyIUP was deployed to incoming first-year students during orientation sessions. This achieved two objectives. First, the team could test the portal with a limited number of users in a controlled lab environment. Second, incoming students could start using the new portal and avoid a transition from the legacy system early in their first year.

Our second release in July 2013 was a soft launch, during which more than 20,000 user accounts were activated. During the launch, IUP’s Web team modified the log-in page to the legacy system, inviting users to try out the new portal.

Our third and major release in September 2013 involved planning and coordination with the communications and marketing team.

**The Valley of Despair**

How did the IUP team prepare users for the change and guide them through the process? Any large system change is accompanied by the “valley of despair,” a temporary period of confusion and loss of productivity. IT project managers and change-management professionals are tasked with reducing the severity and duration of these dips in productivity. At IUP, some staff had been using the same...
legacy system for 13 years. What was the team’s strategy to ease users through this change?

Best practices call for 10 percent of the end-user population to be trained as power users and/or involved with a change network. These people serve as ambassadors, contributing to the system’s design, training others, and spreading the good news of the system. By including more than 175 staff and administrators in focus group sessions and communicating with them throughout implementation, the team engaged key constituents in an informal change network.

To achieve buy-in and increase portal adoption, the implementation team leveraged the talents of IUP’s student workers. Students in the Communications Media department produced four promotional videos—two for students and two for faculty and staff. The videos were featured in daily e-newsletters to staff and students and were promoted via IUP’s Facebook and Twitter feeds.

The first two videos were distributed the week before the portal went live. They contained the “WIIFM” (What’s in it for me?) message. The brief, flashy videos explained the benefits that the portal would provide to end users. They got people excited about the portal while not going into a lot of detail.

The last two videos were distributed the day of go-live and provided a page-by-page overview of MyIUP with voiceover. In addition to being featured in the daily e-newsletter blasts, these were included on the portal’s homepage.

Student workers in IUP’s office of communications produced posters promoting the portal. Team members met with the student newspaper, which featured stories about MyIUP leading up to its deployment. WIUP-FM and WIUP-TV broadcast messages coordinated with the university’s network of television marquees.

This “communication blitz” resulted in more than 2,300 user log-ins to the portal on go-live day on September 9, 2013—a date chosen because it was after semester start-up and a relatively quiet day in terms of university business. Most help-desk tickets on the day of go-live involved forgotten passwords and users unable to find links to their applications (users just needed to look a little harder to find new link locations).

ROI: What Are the Goals of the Portal and How Will Its Impact Be Measured?

Western Pennsylvania, the home of IUP, faces declining university enrollment due to fewer high school graduates. The peak of 131,000 Pennsylvania high school seniors in 2007–2008 is expected to decline to 116,000 in 2014–2015, before starting to recover. With strategic enrollment management, the emphasis must be not only on student recruitment but also on student retention. MyIUP is an important part of this strategy.

Getting students involved in campus organizations and events is one way to retain more students. A student getting involved and building close personal relationships as a freshman is more likely to return as a sophomore. During MyIUP requirement-gathering sessions, students told us that “finding out what to do on campus” ranked high on their priority list.

At IUP, all students receive a daily email newsletter containing campus news and upcoming events. During the first month of launch, the portal’s home page featured a graphic explaining how events posted to the newsletter automatically display in MyIUP, with a link to a form used to submit events to the newsletter. On the day of system Go-Live, more students clicked through to the form than any other day of the year.

Another focus of the portal is providing access to academic support and services that can benefit students. All students use the portal to register for class and check their grades. We’ve positioned other academic services, such as the writing center, academic support and tutor-
ing, and major and career exploration, at the top of the page. The intent is to make students aware of additional academic support services that they otherwise wouldn’t see.

Marketing academic services to students who may be unaware of them can improve not only student retention but also student success. During an early testing session, one of the student testers remarked, “I didn’t even know all of these existed!”

MyIUP is proving to be an important tool for promoting events and including targeted announcements. From the student population, about 10 percent log in at least once a day, and about 50 percent do so once a week, making MyIUP one of the more valuable pieces of campus online real estate.

The MyIUP project surprised many by coming in under budget and ahead of schedule. Leveraging lessons learned from other institutions, controlling scope creep, investing time in the design phase, and conducting usability research that limited portal revisions contributed to the success of the project. Winners include staff, faculty, and students who receive access to news, upcoming events, and content that are relevant and help them to find their success.

Eric Barker is the portal administrator for Indiana University of Pennsylvania. A graduate of Carnegie Mellon University, Eric spent nine years as an IT and change management consultant with Accenture before joining IUP to start up the university’s first student portal.

To learn more about MyIUP, visit www.iup.edu/enrollment/myiup, search YouTube for MyIUP, or e-mail myiup-admin@iup.edu.

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Other Duties as Assigned

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CIO, Information Technology Services
Centre College

My list of responsibilities has included the following (just to name a few) over the years at Saint Mary’s, UVa-Wise, and now Centre College:
- Consultation with public planning commissions and IDAs on regional infrastructure development
- Membership and leadership of economic development efforts by chambers of commerce and other groups
- Engagement and collaboration with state and federal political leadership
- Work on on-campus projects ranging from HVAC monitoring and LEED certifications to building design and renovation
- Development and management of college-run television and radio operations
- Involvement in state and federal investigations into Internet crimes by faculty, staff, and/or students
- And, of course, teaching a course every now and then to stay engaged with students, the real reason we are in higher education!
Journey to the Cloud

Transitioning to the Cloud Changes the Skills Required of Communications Directors

If higher-education communications technology has been your career, you’ve probably noticed that things are not the same as when you took over the phones. Let’s look at some of the changes that have happened in our industry and what impact they have had on our job description.

Traditionally, telecom directors were purchasers and maintainers of communication equipment, responsible for selecting, installing, and maintaining complex devices supported by small armies of technicians. They oversaw complex voice systems that were largely hands-on. They spent lots of time managing a group of technicians who were responsible for delivering clear dial tone and updating the PBX as faculty, staff, and students came, moved, or left the university.

Over the past decade or so, new technology has changed just about everything, morphing data and voice so that telecom professionals have become less hands-on, frontline techies and more hands-off, back-office managers. Such changes will only increase as cloud computing gains momentum, so telecom professionals have already begun to develop a new skill set based more on analyzing service contracts than perusing technical manuals.

The role began to shift at the turn of the millennium for a variety of reasons. First, telecom systems became smarter and more automated. Voice vendors mimicked the data world and delivered computer-based systems, with the smarts to configure themselves. Users became responsible for making their own systems changes. Manually intensive processes that once took months (such as installing a new PBX) now required weeks—and in some cases just days.

Network design evolved with the rise of the TCP/IP protocol. Autonomous voice, data, and video networks were consolidated. Allocating bandwidth and keeping the network up and running became simpler. Telecom personnel were no longer stuck in the wiring closet trying to figure out which piece of cable was not working. Instead, they were looking at reports about uptime, availability, and outages.

Finally, new communication tools emerged. E-mail, instant messaging, videoconferencing, and social networking systems provided employees with more ways to connect to customers, partners, and coworkers. The range of devices that users rely on to perform their work grew. In addition to servers, PCs, and laptops, workers embraced smartphones and tablets. This change moved device purchases out from the IT department to the nearest retailer.

Clouds in the Forecast

The public cloud takes this transformation one step further: The burden of infrastructure moves largely away from the communications manager. While that job previously included responsibility for ordering new circuits or debugging software, it increasingly entails sifting through a growing array of reports.

"With cloud, executives need to focus more on business issues and less on technology," explained Dean Meyer, founder of IT consulting firm N. Dean Meyer and Associates Inc. The transition is quite dramatic for technical personnel, but not difficult for managers and executives who may actually prefer contract language, performance standards, and penalties for nonperformance to technical descriptions.

Cloud technology has become very popular: Gartner Inc. estimates that spending on public cloud services will reach $180 billion in 2015, up from $131 billion at the end of 2013. The promise of reducing costs and increasing business flexibility are two factors driving academic institutions to this new computing model.

As the technology gains momentum, telecom directors now manage relationships more often than devices. They must make sure that their vision of how the technology operates is in concert with their supplier’s view about service delivery. In the cloud, this position is no longer responsible for purchasing, deploying, and monitoring distinct devices. With the move to the cloud, a university transfers its top technical folks from its staff to its supplier. When problems arise, the phone call to fix them no longer has a local exchange.
Instead, the communications manager becomes responsible for overseeing the management of contracts outlining how various communication services are expected to perform. Such a contract, which can be a few or dozens of pages, usually addresses issues in three categories: service, support, and performance expectations. What type of application or service is provided? What devices can access it? How is it delivered, and how is it priced—per user or bulk fee? What type of support is supplied, when is it available (24/7, 9/5), and how will support calls be escalated? How do you define performance expectations (99 or 99.999 availability), how is performance measured, and what penalties, if any, will be incurred if those expectations are not met?

Welcome to the Cloud
With the move to the cloud, the IT department’s role changes. They are no longer the front-line support personnel; instead, they are one step removed from device management.

As the transition to the cloud begins, each step needs to be clearly defined—within the university, from the university to the vendor, and then within the vendor’s organization. The university needs to know roles (ideally names), phone numbers, time period of availability, number of support tiers, and the definition of the escalation process.

After that, the negotiating becomes more complex. The reality is that the two parties involved approach these contracts from opposite vantage points. The university wants the best communications resources available to users at the lowest cost, taking into consideration performance and total cost of ownership. The vendor needs to get a return on the service that it provides, so the higher the price, the better the return.

Contract details must always be carefully scrutinized so that the results work for each party. "Customers are often surprised that the boilerplate contract that many vendors provide offers virtually no protection for the customer if the service is not available for any reason," said Michael R. Overly, a partner at Foley & Lardner LLP, who specializes in IT contracts.

Indeed, the area where the most significant disagreements arise is the service level agreement (SLA). Like many complex, legally binding documents, the devil is in the details, so there are a number of items that universities need to closely examine. SLAs focus on two features (availability and response time) that are hard to define. The SLA’s goal is to break communication service delivery into trackable, measureable units and periodically examine how well the vendor is performing.

Clarifying Availability Details
Universities would like their networks to be available 100 percent of the time, but that objective is unrealistic for a couple of reasons. In some cases, maintenance work needs to be done, so online resources have to be taken offline. The university needs to be aware of such periods and try to ensure that vendor-scheduled maintenance windows match up ideally with their own maintenance windows, or at least low-use or nonusage periods, so that maintenance will not negatively affect delivery of the school’s services.

Unforeseen problems arise, equipment does not work as designed, and unscheduled downtime happens. A university must determine how much downtime it can tolerate.

As networks have become larger and underlying components (servers, applications, network switches, and end devices, such as PCs, smartphones, and tablets) more complex, determining availability...
has become more difficult. A wide (and ever growing) array of tools measure how quickly a database-management system processes transactions, how much extra available bandwidth is on a wireless link, and everything in between. The user has very basic concerns: access, security, and response time.

In cloud engagements, the SLA often does not offer a similar focus. The provider concentrates on what it delivers, and its responsibilities may stop at various points along the line from the user's systems to the data source. So, the cloud provider and the university first must agree on what availability means.

"In some cases, availability is defined as simply the ability to 'ping a device," said Foley & Lardner's Overly. In this case, the physical connection from the employee to the service may be up, but the user on campus is not able to open up a software program or access needed data. In essence, the vendor considers the service available but the university does not; so, a mutual understanding of terms is essential.

Next, they need to determine how availability performance information will be captured and presented to the customer. Vendors have a variety of tools to keep their systems up and running. With cloud, they must extend these tools and provide various reports to customers that summarize system performance. A best case is transparent access to each other's systems. Currently, that feature is more a wish-list item than a deliverable. Consequently, the customer may want to supplement the vendor's tools with a third-party service designed to measure performance from multiple points around the country.

The time period determining availability performance also has to be established. The vendor typically consolidates the information periodically; weekly, monthly, quarterly, or annually. The contract may provide detailed descriptions of different types of availability shortcomings: minimum disruption (impacts a user or two), noteworthy (one line and tens of users are knocked offline), and major infractions (system down for everyone—or close to it—for minutes, not seconds). If the cloud provider has a certain number of minor infractions in a certain period, they could equal a noteworthy or even a major infraction.

What recourse the user has if the vendor does not meet its availability goals is also open to interpretation and negotiation. The school could receive rebates if service is especially poor in a particular period. If there are consistent declines in service, then the provider may agree to make internal changes, improve availability, and monitor that progress.

One of the chief benefits of cloud computing is its elastic nature and the agility it gives customers to dynamically scale their IT usage based on their exact demands. If the university expects to need such changes, parameters need to be discussed with the provider. How quickly will the new service be delivered? How similar or dissimilar will its performance metrics be?

**Two Big Issues: Security and Costs**

Security breaches are all too common in IT today, and they become a red flag when universities discuss cloud services. The SLA should outline how the vendor will deal with them when they occur. First, how does the service provider inform the university about the breach? Does the vendor make the breach public? Who informs the university users about the problem?

While providers should share information about suspected security breaches ASAP, that is not always possible. In some cases, they are not sure they are under attack. Or the breach may have been going on for a while, so they need to research it and find out the specifics. The contract should outline a reporting process as well as guidelines for what information is provided to the client as a vendor investigates a possible security breach.

Beyond agility, another top reason why many customers embrace cloud computing is potential cost savings; yet, sometimes schools do not pay close enough attention to potential revenue streams that can be slipped into a contract by a vendor unnoticed. In some cases, the vendor may not identify the items as fees or list them in the "Fees" section of the document.

Minimums are one example of hidden fees. A university has 100 Gb of storage at one rate (often quite low) but incurs a higher fee when additional storage is needed. In another case, the vendor provides conservative estimates on how much transferring data into or out of the cloud costs, but when the service is performed, the costs are much higher. Also, a vendor may stipulate that if a reported problem is found to be the user's fault, the customer can be billed for the time and material needed to investigate the issue.

The vendor may tilt the contract toward locking in the customer. Ideally, the contract includes a transitioning clause, which kicks in when there's a breach of contract or the client decides to move to a different supplier. This clause should make distinctions between existing and transitioning service expenses, so the school doesn't pay duplicate costs during the transition.

**Conclusion**

The traditional role of the communication manager is changing. Tried-and-true techie functions are becoming less relevant as the cloud is embraced. Consequently, even the most competent and technologically astute communications professional now needs a new skill set that includes the ability to sift through complex contracts and ensure that a cloud provider delivers the proper level of service to the university.

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Near Field Technology Opens Doors
Beta Tests Promise Smartphone Security

by Curt Harler
Contributing Editor

Whether responsibility for access to buildings falls under IT, campus security, or housing services, eventually IT must weigh in on technology discussions. One area gaining traction on campuses is use of near field communications (NFC) and smartphones for access control.

Colleges like the University of San Francisco (USFCA) and Villanova University, near Philadelphia, are making smartphone-based NFC part of their security technology roadmap. But there are bumps.

"NFC for access control and payments is the wave of the future," says Jason Rossi, director of One Card and campus security systems at USFCA. He adds a caveat: The industry needs to introduce more connecting applications that will complete the loop to make it work.

NFC appliances include tags, cards, and cell phone handsets and soon will include household appliances like refrigerators, which will be able to inventory their contents and generate a shopping list. In fact, LG's Smart ThinQ line already allows users with smartphones to tap their phones to monitor, access, and control NFC-enabled features on their appliance.

Nokia claims to have released the first NFC appliance for the mass market in 2011 with its 6131 handset.

"This is the way to go," agrees Kathy Gallagher, director of the WildCard Office at Villanova. She notes that students have a propensity to lose plastic ID cards. "No student can walk three feet away from their smartphone and not realize it is gone."

Like Rossi, she wishes Apple and other smartphone manufacturers would make near field technology (NFT) access native on their phones.

For those not familiar with NFC, think Bluetooth-style communications. Recently both colleges and vendors have proved that NFC is viable technology for physical and logical access control on campus. Users wave their cell phone, instead of an access badge, at a reader to gain access to labs, office suites, or dorms.

"There is certainly a demand for readers and credentials that are NFC ready, so schools will be prepared to support the technology if and when it reaches a wide enough adoption for them to want to incorporate it into their programs," confirms Sarah Ledwith, marketing manager, colleges and universities, with the CBORD Group, Inc., in Ithaca, New York. "Our customers who have already implemented NFC agree that the infrastructure was a good investment whether NFC takes off or not," she says.

"The adoption of secure, contactless credentials is a positive from security, convenience, and maintenance perspectives, with or without NFC. In all cases, they were already using these secure credentials before ever considering NFC," Ledwith says.

As a pilot, USFCA tested NFT in a residence hall for door access and laundry payments. Instead of presenting their USFCA One Cards, participating students used the aptiQ mobile app on their personal iPhones to enter the building and pay for laundry using their existing credentials. The NFC credential seamlessly integrates with USFCA's CS Gold campus card system from CBORD.

Students reacted positively. "Our students have embraced it, telling us they prefer the convenience of their iPhones to digging for their One Cards. This convenience is important to us, but equally important is the security of using their existing contactless credentials, keeping our transactions secure. The combination makes for a first-rate experience for our students and our staff," Rossi says.

Gallagher ran a betatest and was more than happy with the results. "Students who participated had to be in certain dorms where I was beta testing," she says. They were able to unlock the dorm's exterior doors and the door to their suite, and to use vending or laundry machines in that dorm only.

"We had zero problems. The technology works," Gallagher says. There was one inconvenient requirement to be part of Villanova's beta: Students had to have an iPhone 4 or iPhone 4S. Thus, it is not all paradise. If there is one problem with this emerging technology, it is with the access device.

Hurdles to Jump
The first drawback to NFT is that not everyone carries an iPhone or other smartphone. On most college campuses, well over half of the students—usually 60 percent or more—do have smartphones. The numbers are somewhat less for faculty and for staff.

Gallagher estimates 85 percent of students at Villanova carry a smartphone of some sort and sees that number increasing as students look to a single device to house their music, texting, Internet, and voice calling.

Rossi and Gallagher both point to a second, more immediate challenge. Rossi...
lays that hurdle at the feet of cell phone manufacturers. "We need Apple and Google to include the NFC chip natively in their phones," he says.

Most phone users, Rossi notes, love their cell phone case. They do not want to be bothered with an appliance to allow them to use their smart phone as a key.

"That is the big barrier to widespread adoption," Rossi says. "Students love the concept. They do not like having to add on an accessory to their phone."

Gallagher agrees, noting it seems to be more a problem for women than for men. "My [student] daughter has 12 phone cases and changes them with her mood," she says. Using the currently required external NFC appliance case is a fashion disaster for some young women.

Gallagher sees another small impact from migrating to NFC. Her office will lose a good revenue stream that comes from replacing lost plastic IDs. "Most of the IDs are not truly lost or stolen," she has found. In many cases, the student simply misplaced the ID or was too lazy to go back to their room to get a forgotten card and is willing to pay for the convenience of obtaining a new one.

**Nova Solution**

Last year, instead of their traditional WildCard ID cards, Villanova let select students and staff use their personal smartphones to access residence halls. CBORD deployed the CS Gold/aptopMobile Web-based solution in partnership with Ingersoll Rand Security to students. With the smartphone app, students simply open the aptoMobile app on their phone and present their smartphones at building access-point readers. More than 70 percent of students surveyed prefer using their phones to enter buildings over their WildCards.

"Today's students are so technologically advanced that it is second nature for them to put everything on their phones and, most of the time, it's already in their hallway while walking across campus," explains Gallagher. "We want to provide our students the utmost in convenience and flexibility through the technology we offer. It's easier for students to use an app on their phone than to dig for their card."

It is easy on her office's personnel count, too. "NFC had zero impact on my staff. I did not need additional head count at all," Gallagher says. "It had no impact on my student workers or staff."

CS Gold, Villanova's campuswide one-card system, fully supports NFC credentials. The university's existing door-access readers accept the NFC credentials, and students and staff walk through the credential download process with ease.

After a simple student configuration change, CS Gold automatically sends a student's phone an invitation to download the aptoMobile app from the iPhone App Store. Students then use the app to download their WildCard credentials directly to their phones.

Gallagher says it takes about one minute to enroll a student in the NFC program.

"The beauty of the aptoMobile NFC solution is that the organization may not need to change out its locks when it becomes commercially available," adds Raj Venkat, Ingersoll Rand Security Technologies vice president for commercial marketing. "If smart-enabled AD-Series locks or XceedID smart readers are already installed, it's simply a matter of downloading the credentials to the students' phones and they are ready to go. If nonsmart access technology is being used, multitechnology readers can be installed to help ease the transition by reading both the ID badges and the smartphones."

**Expanding the App**

Both USFCA and Villanova indicate they plan to move forward with NFC once smartphone manufacturers catch up. Meanwhile, USFCA continues its smart card reader deployment. It allows entry using a contactless card.

"It's going full steam," Rossi says. During the course of this and the next academic year, any access points will be migrated to a contactless smart card reader. These include residence hall perimeter and hallway doors, administrative building perimeter doors, high-security access points, high-traffic access points, and access points installed via new construction/renovation. Campus dining locations and many point-of-sale locations also will be migrated to contactless smart card readers.

"We want our use of NFC to enhance the USFCA One Card experience on many levels, which is why we introduced it for both door access and laundry payment," Rossi says.

Gallagher, too, is certain Villanova will roll out NFC once the enabling technology is available on smartphones. She says, however, this does not mean that they can completely abandon cards.

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**Other Duties as Assigned**

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I oversee the Media Services group (http://mediaservices.wustl.edu) in addition to my role as incident communications solutions director. You can get an idea of the former by going to our website. The latter covers my work as the IT person involved with the emergency preparedness effort on campus and primarily deals with emergency communications. In addition, I tend to be the point person from IT on university-level incidents. That could include events like the Clinton Global Initiative University we hosted last spring. I represent central IT and bring in others in the organization as appropriate to the planning process.
“I don’t see mag going away. I cannot get rid of plastic,” she says. “I cannot mandate a person buy a smartphone.”

**Improved Security**

No NFC device is 100 percent secure. NFC does provide users an extra layer of security since most handsets can be set to allow transfer of information (whether financial or access) only when the user expressly authorizes the transaction via a password. This contrasts with fobs or tags, which work for anyone who has them in their possession. That said, a lost phone with a weak password is a problem.

NFC works with a radio signal...and all radio signals can be intercepted. With NFC, an eavesdropper would have to be closer than about 25 feet to grab a signal. But it is not impossible. There are apps that allow a user to “double-down” on security making it that much more difficult to hijack a signal.

Gallagher says she feels NFC gives heightened security. If the wrong person finds a plastic WildCard on campus they can try it in nearby doors, use it to buy things, and otherwise create havoc. On top of that, a student can give a friend a card to buy food or do laundry. “When was the last time you saw a student give someone else their phone for a couple of hours?” she asks.

Villanova asks the students to protect the app with a four-digit PIN code. Since each student has to be invited to download the app to his or her phone, they cannot pass off their credentials to a friend without giving up their phone.

“it can’t be forged, either,” Gallagher says, and it’s safer for students, too. Most students carry their phone in their hand or back pocket. That eliminates fumbling through a backpack for a card when trying to get into a dorm.

“A mobile ID is a safer, more convenient way for students to have access,” Gallagher adds. “Once Apple releases the technology in their phone, this will be the way to go.”

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To learn more about NFC technology, read “Near Field Communication Brings Convenience to Campus” by Hugh Griffiths in the summer 2013 ACUTA Journal, or visit the NFC Forum at www.nfc-forum.org. The Near Field Communication Forum was formed to advance the use of near field communications technology by developing specifications, ensuring interoperability among devices and services, and educating the market about NFC technology. Formed in 2004, the Forum now has 170+ members.

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Legal Considerations in DAS Deployment

What to think about before the big decision

As distributed antenna systems (DASs) are increasingly being deployed across communities—particularly college and university communities—a timely consideration of the merits of DAS with particular attention to legal obligations and strategies for successful implementation may be a worthwhile undertaking.

At its most basic level, a DAS is a hybrid collection of small wireless antennas that exists to support wireless networks. A DAS is perfectly suited to the campus environment, particularly the campus in need of network capacity. Given the ubiquitous presence of smart phones and other bandwidth hogs, it’s probably not that big of a stretch that DAS solutions will soon be required in nursery schools.

Planning for DAS deployment includes a great deal of detailed work, not solely from the engineering perspective, but also from public safety, finance, and legal angles as well. This article, with the active participation of DAS consultant Jim O’Gorman of Communications Engineering, LLC, and past president of the Society of Telecommunications Consultants, Inc. (www.stcconsultants.org), will highlight some issues that should be considered not after DAS is installed, but before even the most basic decisions to proceed are made. Relevant federal laws will be presented in detail, although for state- and municipal-specific information, legislation, rules, and guidance will likely be different, based on conditions that exist at individual locations.

While the federal government has often been slow to exert its regulatory muscle in many issues associated with telecommunications infrastructure, this has not been the case—or at least is not currently the case—with respect to rules governing DAS deployment. Specifically, the federal government, supported to some extent by recent court decisions, has tried to create an environment where local authorities can call the shots—unless those shots mean preventing the expansion of wireless services within communities. Translating, that means the decisions can be local unless they would deny the market to potential participants, in which case federal law intercedes.

Motivated by a clear understanding that a DAS can provide a healthy amount of bandwidth over a controlled area at a reasonable cost, the federal government has taken some important steps to ease the regulatory hurdles that have often made deployment of new technologies difficult.

There are three primary federal statutes that address, and potentially affect, local authority over wireless communications facilities.

I. The most recent of these comes from §6409 of the 2012 Middle Class Tax Relief and Job Creation Act of 2012 (Pub.L. 112–96, H.R. 3630, 126 Stat. 156, enacted February 22, 2012), which, in relevant part, addresses the challenges of collocation of new and replacement equipment on existing wireless towers.

II. 47 U.S.C. § 332(c)(7), which was included in the original Telecommunications Act of 1996 (P.L. No. 104–104, 110 Stat. 56 (1996)), preserves local authority over wireless-tower placement, while also setting parameters for local action on requests for placement of new wireless facilities.

III. In contrast, 47 U.S.C. §253 preempts local laws and regulations that prohibit (either directly or effectively) any entity from providing telecommunications services.

I. Section 6409 – Collocation

This section of the law addresses the installation and modification of wireless facilities on existing support structures (such as towers and poles). This section of law, which became effective immediately upon passage, was drafted in response to complaints by wireless providers that, despite increasing demand for services, municipal governments were often less than cooperative in allowing providers to place or modify additional equipment on existing structures. While the full text of the relevant statute is available at http://www.gpo.gov/fdsys/pkg/CRPT-112hrpt399/pdf/CRPT-112hrpt399.pdf, additional guidance is available at http://www.fcc.gov/document/local-review-collocation-applications-interpretive-guidance. At the most basic level, the important information for end users is that some modifications to existing antennas and towers are permissible, whether local government is supportive or not.

Section 6409(a) reads as follows:

(1) In general, a state or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.

(2) Eligible facilities request – for purposes of this subsection, the term "eligible facilities request" means any request for modification of an existing wireless tower or base station that involves

1. collocation of new transmission equipment
2. removal of transmission equipment or
3. replacement of transmission equipment.

(3) Applicability of environmental laws.
FCC Guidance Document

1) That the mounting of the proposed antenna on the tower would increase the existing height of the tower by more than 10%, or by the height of one additional antenna array with separation from the nearest existing antenna not to exceed 20 feet, whichever is greater, except that the mounting of the proposed antenna may exceed the size limits set forth in this paragraph if necessary to avoid interference with existing antennas:

Comments by Jim O’Gorman

This information is critical to those seeking to install DAS, since interference reduces both capacity and signal quality. Carriers are careful to monitor and eliminate as much interference as possible, so it’s highly likely that a carrier would have a strong argument to be granted variances in height and configuration since the real losers when such changes are not permitted are the carrier subscribers in the area being served.

2) That the mounting of the proposed antenna would involve the installation of more than the standard number of new equipment cabinets for the technology involved, not to exceed four, or more than one new equipment shelter;

Carriers will try to plan for expansion and generally will have space for two BSTs [base station transceivers] within a single shelter. However, the landlord should expect that the carrier(s) will want to add additional equipment needed to address future technologies and capacity requirements.

3) That the mounting of the proposed antenna would involve adding an appurtenance to the body of the tower that would protrude from the edge of the tower more than 20 feet, or more than the width of the tower structure at the level of the appurtenance, whichever is greater, except that the mounting of the proposed antenna may exceed the size limits set forth in this paragraph if necessary to shelter the antenna from inclement weather or to connect the antenna to the tower via cable;

This language, although a bit “legalese,” simply requires that antennas and supporting structures that extend less than 20 feet, or less than the width of the tower, will not require additional approval.

4) That the mounting of the proposed antenna would involve excavation outside the current tower site, defined as the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site

Nothing in paragraph (1) shall be construed to relieve the Commission from the requirements of the National Historic Preservation Act or the National Environmental Policy Act of 1969. The original statute’s language is inherently vague for its failure to define key terms including “collocation,” “tower,” “base station,” and “substantially change.” However, key definitions that were not included in the original legislation have now been issued in a non-binding guidance document (key phrase there is “non-binding”) issued by the FCC in January 2013. The information in the chart on the next page quotes from the FCC’s guidance document providing some useful clarification, with italicized commentary by O’Gorman.

Also left vague by the language in § 6409(a) are the definitions of “wireless tower” and “base station.” The FCC’s recent guidance document also refers to the National Collocation Agreement where the following information is provided:

“A ‘tower’ is defined … as ‘any structure built for the sole or primary purpose of supporting FCC-licensed antennas and their associated facilities.’ (This definition applies to a donor antenna. Signals obtained via donor antennas are referred to as OTA or Over the Air.)

“A ‘base station’ is defined as consisting of ‘radio transceivers, antennas, coaxial cable, a regular and backup power supply, and other associated electronics.’"

According to the FCC, “Section 6409(a) applies to the collocation, removal, or replacement of equipment on a wireless tower or base station. In this context, we believe it is reasonable to interpret a ‘base station’ to include a structure that currently supports or houses an antenna, transceiver, or other associated equipment that constitutes part of a base station.” Moreover, given the absence of any limiting statutory language, the FCC believe[s] that a ‘base station’ encompasses together.


2 See also 47 C.F.R. Part 1, App. C, Nationwide Programmatic Agreement Regarding the Section 106 National Historic Preservation Act Review Process, § II.A.14 (defining “tower” to include “the on-site fencing, equipment, switches, wiring, cabling, power sources, shelters, or cabinets associated with that Tower but not installed as part of an Antenna as defined herein”).
such equipment in any technological configuration, including distributed antenna systems and small cells.

According to Jim O’Gorman, “What’s interesting is that the FCC defines a DAS as a base station. This is most likely because the carrier’s backhaul and radio equipment terminates in its BTS located at the DAS head end. But a DAS, especially an in-building DAS, is 95 percent internal construction, so there are few external antennas (oDAS antennas and donor antennas excluded) where the landlord would have concerns about exceeding height or area limitations. Nonetheless, this definition is something that the landlord should understand.”

O’Gorman advises, “Perhaps most importantly, the landlord needs to have a clear understanding of the obligations that both the carrier and/or tower companies have regarding FCC rules, and should play an active role in the design process. This participation should start when the real estate or source signal process begins. To assume that the carrier (whose work will be performed by subcontractors) will provide design and oversight in the landlord’s best interests is a mistake. It is important to remember that carriers and tower companies would [always] prefer to keep the lease approval period as short as possible… often leading to less than complete lease exhibit drawings.” He recommends that the landlord request that “Construction Drawing” quality drawings, signed and stamped by a licensed PE, be part of the lease package.

II. 47 U.S.C. § 332(c)(7)

This relevant section of law was included in the original Telecommunications Act of 1996 [P.L. No. 104-104, 110 Stat. 56 (1996)]. It was designed to preserve local authority over wireless-tower placement, while also preserving some sense of local control with respect to land use and zoning on requests for placement of new “personal wireless service facilities.” [H.R. Conf. R. 104-458 at 113 (1996)].

Roughly speaking, the drafters of the Telecom Act of 1996 recognized the huge power (greater now than it was then) of the wireless carriers to force municipalities to comply with their wishes in terms of deploying national networks without having to deal with every individual community that sought to extract its own set of concessions in the name of local sovereignty.

The existing local regulatory authority is subject to these important restrictions:

• Regulation cannot unreasonably discriminate among providers of “functionally equivalent services;

• Regulation cannot prohibit the provision of personal wireless services;

• Regulation requiring local authorization must be acted on within a reasonable period of time after filing;

• Denials of a request must be carefully documented in writing and contain substantial evidence supporting the denial; and

• Regulation cannot be based on environmental effects of radio frequency emissions when the proposed facilities comply with the FCC’s regulations concerning such emissions. [Clear Wireless LLC v. Bldg. Dept. of Lynbrook, 2012 U.S. Dist. LEXIS 32126, 14-23 (E.D.N.Y., Mar. 8, 2012), http://law.justia.com/cases/federal/district-courts/new-york/nyedce/2:2010cv05055/310778/41]

• Local ability to exercise regulatory authority may have greater force than previously described in the case where the municipal government is acting not only in its capacity as zoning authority but also as landlord. This is particularly true with respect to issues and concerns associated with RF emissions. [See Sprint Spectrum L.P. v. Mills, 283 F.3d 404. 421 (2d Cir., 2002), https://bulk.resource.org/courts.gov/c/F3/283/283. F3d.404.01-7116.html]

III. 47 USC §253

This section of federal code, which was also part of the landmark 1996 Telecommunications Act, prevents, by federal preemption, any state or local requirement that “prohibits or has the effect of prohibiting the ability of any entity to provide telecommunications service.” As is often the case with broad pieces of legislation, there are two important exceptions to this federal preemption. The first, 47 USC §253(b), preserves nondiscriminatory police power regulations necessary to “protect the public safety and welfare” or to “safeguard the rights of consumers.” The second exception, 47 USC §253(c), preserves local authority to manage “public rights-of-way” and requires “fair and reasonable compensation from telecommunications providers, on a competitively neutral and nondiscriminatory basis, for use of public rights-of-way on a non-discriminatory basis, if the compensation required is publicly disclosed by such government.”

There has been a good amount of litigation regarding this section, although as is often the case, the litigation is driven by a wireless carrier thwarted in its path.

Summary

DAS planning and installation projects require a great deal of input—not just from IT or Telecom personnel, but from potential providers, public safety officials, engineers, and lawyers. As is the case with any complex project, the more knowledge that the end user has, the better able he or she is to make the best decision.

Martha Buyer is an attorney whose practice is primarily focused on the practice of telecommunications law. Her practice is a certified New York Woman-Owned Business. She is also a frequent contributor to No Jitter. She can be reached at martha@marthabuyer.com.
Managing BYOD and Mobile Devices in a University Environment

MSU hopes to offer a wireless network that provides security as well as freedom of choice

The number of mobile devices such as smartphones and tablets present on college campuses has grown dramatically in the past five years, and these devices may now outnumber traditional desktop and laptop computers. Campus IT professionals can no longer permit only school-owned and -approved devices on their networks. Users have grown accustomed to bringing their own devices into the campus environment and expect to have the same level of access as they have from school-owned computers. We call this BYOD—bring your own device. Organizations are struggling to provide simple BYOD processes for users while ensuring adequate security for campus networks.

Solving the BYOD problem is complex because of the variety of devices running different operating systems (OSs) present on a campus network. A university environment is typically an open community where people can come and go without stringent network check-in procedures.

There are numerous security implications in BYOD environments. These devices could contain viruses or malicious software. Network access requests must be processed without any knowledge of mobile device health, such as the presence of antivirus and patches or updates. An IT department is incapable of enforcing policies and security settings on these devices as they do on school-owned machines. Users of a university network could include visitors, temporary or part-time staff and faculty, and supporting vendors. IT and security staff are unlikely to have prior notice about the visitors or the manpower to handle visits on a case-by-case basis.

Even when mobile devices are owned by the university, supporting them is difficult. Faculty members may purchase iPads to facilitate lectures. Staff members may acquire Android tablets to monitor alarm systems across campus. All-in-one appliances or software for managing security, applications, and policies can be costly.

**Current Wireless Network**

Murray State University (MSU) currently controls wireless access with the use of Adtran’s Bluesocket product. This allows us to push 802.1X authentication to RADIUS servers that query our Active Directory (AD) environment. Users must have an AD account and use these credentials for access. Three SSIDs are broadcast from access points. MSUsecure is a secure and encrypted network using 802.1X protocol with TKIP encryption with EAP authentication. RADIUS authentication servers verify user credentials and group membership from Active Directory. MSUwireless is an open 802.11 network for devices that may not support 802.1X. It forces Web browsers to a splash page where an acceptable-use policy must be agreed to before proceeding. Guest is a final 802.11 network providing a self-registration splash page based on a valid e-mail address allowing Internet access only. The access points support these different networks and protocols over the same radio. The Bluesocket controller acts as a firewall, controlling networks and ports available to users based on AD accounts and group membership. While this solution is sufficient and provides a level of security and regulation, it does not provide a means to detect additional information about the devices that connect to it. The Bluesocket controller is nearing the end of its support life cycle, forcing network managers to study replacement strategies that might provide more granular control based on device attributes.

**User Categories**

A first step in managing BYOD is to categorize users and their requirements. Our categories are:

- Students. The majority of our 11,000 students are BYOD users, and they require Internet access only. Student workers who must be granted privileged rights to network resources are given separate credentials with employee group membership through AD.
- Faculty/staff. All faculty and staff are provided full Internet access and selective access to network resources. IT staff have unrestricted system access. Most faculty and staff are provided a workstation owned and managed by the university. Many of them routinely use multiple mobile devices that fall into the BYOD category.
- Vendors/privileged guests. Many non-employee visitors to campus require access.
to network systems for valid reasons, such as vendors who support a product or system. Some guests might be permitted access to specific servers and sensitive data for research or as a guest lecturer. These users typically fall into the BYOD category.

- Traditional guests. Traditional campus guests expect Internet access from our open guest wireless network. This is always a BYOD scenario and requires a self-registration process.

**Securing Unknown Devices with VDI**

Currently iOS and Android do not offer support for operating in a Windows domain using AD, which is the common approach to manage access by Windows computers. Managing mobile device network access is referred to as mobile device management (MDM). Our proposed solution for managing unknown BYOD devices eliminates the need to directly manage the devices or deploy agents to them.

MSU currently houses persistent and nonpersistent virtual desktop interface (VDI) desktops within a virtual cluster using VMware View. We have also begun using it to replace Remote Desktop back to workstations either through VPNs or from other devices. The university will move forward with this approach, which provides a relatively inexpensive solution for the BYOD and MDM tasks since we have already invested in the infrastructure supporting it. VMware View uses the PC over IP (PCoIP) protocol to establish a connection to the virtual desktop OS. A user can interact with the same desktop environment from any client. The VMware View client app is available for most OSs, including iOS and Android.

A nonpersistent pool of virtual desktops will be established that can be accessed from the wireless network. Devices may use these connections as entry points to other locations. Faculty and staff wishing to use their personal devices will be forced to utilize this virtual environment to establish connections to network resources. Tablets provided by the university will also fall under this rule until an MDM solution is in place. Privileged guests will also be directed to this virtual desktop pool. As a result, users will operate within a secure Windows environment controlled and managed by the IT staff. This allows IT personnel to maintain the health status of these virtual machines and enforce the same policies that are enforced for school-owned equipment. Antivirus, updates, and domain group policy will be present, resulting in fewer security risks associated with mobile devices accessing network resources over our wireless network.

Many network access control and MDM solutions require a software agent to be present on the mobile device with health validation capabilities to ensure the device meets specific criteria before elevating network privileges. These methods are intrusive and require certificates to be issued. If health validation is not provisioned properly or analysis and detection fail, it causes additional security concerns. Many MDM solutions offer a remote wipe service, but this does little to protect sensitive data that has been read or copied before a device is reported missing. A major disadvantage to this approach is the user learning curve if they are not yet experienced with controlling a Windows desktop environment from a mobile device.

A standardized registration process will be in place to allow nonemployee users to request access to network resources through a VDI session. User information and acceptance of our acceptable use policy will be collected during this process. An AD account will be created granting membership rights for complete Windows authentication to the virtual desktop.

We currently spend $100–$150 per nonpersistent desktop provided by our VMware cluster. Considering storage space and licensing fees, setting up a virtual server for this solution would cost around $5,000 depending on what virtualization product is used and the number of desktops. For example, MDM solutions from Centrify and Aruba Networks require a per-device license in addition to management, support, and software licensing fees. For 100 managed devices, costs could exceed $100 per device. These MDM solutions are typically separate software suites that must be managed and supported. Despite the cost, they do not fully address BYOD issues, while our proposed solution addresses both the MDM and BYOD problems at a fraction of the cost.

Excluding cost, using a software-based MDM solution that can push policy and track and secure devices would be preferred. (See Figure 2.) Until these solutions are more affordable and mobile device OSs are more secure, the proposed method is a satisfactory approach to meet our requirements.

Windows 8 Professional appears to be a step in the right direction because of its ability to act as a traditional desktop with domain capabilities and as a tablet using the Metro interface. As the lines between OSs for mobile devices, workstations, and hybrids become less apparent, separate management solutions may no longer be as necessary. Thin apps and browser-based apps will also assist in this regard in the future.

**Wireless Network Changes**

The MSU wireless network currently supports a maximum of 4,000 simultaneous device connections. IP addresses
are provided through the DHCP service in the Bluesocket appliance. Mobile DHCP service will be moved to a Windows DHCP server separate from the DHCP server for wired clients. This will reduce the workload of wireless controllers and other DHCP services as the number of wireless clients increases.

Current SSID broadcasts will also be changed. Separate student and faculty/staff broadcasts would make network segmentation for management purposes easier, while simultaneously making it obvious to users which network they should access. AD group membership will continue to be the gatekeeper for authentication on the back end into the wireless network. For example, an account placed into the Student_Wireless group will be prevented from associating with the faculty/staff network.

**Aruba ClearPass**

For a complete BYOD or MDM solution, obtaining device information is crucial. There are not enough resources to handle each BYOD case individually, and even handling university-owned devices is a problem. Since the university has adopted an "any device, anywhere" approach to network access control, an acceptable BYOD and MDM solution must "profile" devices based on a set of criteria and then manage access automatically based on that criteria.

Moving forward, we have chosen to proceed with an Aruba Networks product that will integrate with our current infrastructure. Other replacements considered include solutions by Cisco, Aerohive, and Adtran's vWLAN. All university access points and wireless controllers are Cisco products. The Aruba ClearPass controllers provide an important piece of a secure and manageable BYOD approach.

Aruba ClearPass will allow all devices connecting to the wireless network to be profiled based on a number of attributes. This profiling service will be the primary source of information on the ever-increasing number of mobile devices on our campus.

Once Aruba ClearPass has been deployed, wireless devices joining the network are placed into a posture state initially. Authentication occurs via 802.1X and is forwarded onto ClearPass as a RADIUS server where LDAP authentication takes place. During this time, ClearPass will interpret various attributes of the credentials provided, group membership, the type of device being used, and if it is a member of the Active Directory domain. Based on these attributes, ClearPass completes the profile and assigns a VLAN interface once EAP authentication has completed. This process can place phones, tablets, laptops, and so on into different VLANs, each with its own configured level of access through associated ACLs.

**Device Profiling**

The profiling approach with ClearPass can obtain information about endpoints prior to completing authentication. Connection categories include: User Distinguished Name, Group Membership, DHCP, Mac Address, Hostname, DNS, OS, and SQL Databases.

The results of these predefined parameters can be used as conditions within a Boolean type statement. Only a few of these will be used in the beginning to lay the groundwork for what we hope to accomplish in controlling the wireless network.

The initial plan for the faculty/staff network is to determine whether the device is managed by the IT staff. Devices can be manually added to the ClearPass database, but automatic provisioning is a necessity. Since all Windows and Mac OSX workstations are currently bound to our AD domain, detecting this attribute is the ideal approach for segregating owned devices from the BYOD or MDM categories. A rule detecting the FQDN name of the device and the existence of an Active Directory object within an organizational unit matching

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**Other Duties as Assigned**

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With the opening of one medical school and the merging of a school of osteopathic medicine into Rowan all within the past year, the number of functions I have has changed. Below is a list of all that report through my office:

- Network and Systems Services
- All infrastructure, telecom, networking, servers, storage, desktops and laptops, workshop for repairs, and support desk
- Enterprise Information Systems
- All administrative type applications support, including implementation, ongoing maintenance, programming additional functionality, and operational reporting
- Clinical Systems and Project Management
- Support for all EMR systems used by the more than 60 physician clinics we now operate as well as scheduling and billing systems. Full project management office that is required for us to meet HIPAA compliance on system implementations and upgrades
- Instructional Technology
- All academic support including LMS, computer labs (both physical and virtual), technology-enhanced classrooms, and faculty training
- Information Security
- Training staff
- Training for Banner and all productivity software that is officially supported
ClearPass determines that the account is a member of the Faculty/Staff_Wireless group and that the FQDN of the device contains "msunet2k.edu" in the hostname and is located within an approved organization unit within Active Directory. ClearPass switches the endpoint to a VLAN where it will obtain an IP address from the wireless DHCP server. Current ACL rules on that faculty/staff VLAN permit access to specific hosts and servers.

The same professor then accesses the faculty/staff network using an iPad. This time ClearPass does not find it to be a domain machine and detects that it is an iOS device. The endpoint is placed into a different faculty/staff VLAN, where ACL rules only allow traffic to the Internet and assigned networks. The professor at this time does not currently have a virtual desktop assigned to him, so he must resort to creating a session from the nonpersistent pool of virtual machines using the VDI View app. From there, domain policies are applied to the virtual Windows OS based on AD credentials, and the user may function as if he were sitting in front of a physical workstation on campus. (See Figure 3.)

**Conclusion**

Although network access control methods such as this have been available for some time, the university has been reluctant to implement a solution because of the costs and complexity. Providing sufficient security and openness for networks in higher-education environments can be more challenging than in corporate environments. With the solutions described here, Murray State University hopes to offer a wireless network that addresses security concerns while allowing users a certain level of freedom, no matter what device they choose.

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Special thanks: LaMarr Baucom, wireless engineer at Murray State University

**Notes**

One-Size-Fits-All Websites Don’t Always Fit
What You Should Know About Responsive Websites

By Joe Dysart

While often ballyhooed as a panacea for the wide variety of computing screen sizes company websites must accommodate, one-size-fits-all websites are actually a trade-off that often end up being more trouble than they’re worth.

The problem: These responsive websites—sites that auto-sense a device’s screen size, and then respond by re-configuring text and graphics to fit that screen size—often render on desktop PCs with ridiculously large text and other overblown features that are tedious to wade through.

“I have been to many websites of big companies that have not adapted for responsive design,” says Sean B. Jamshidi, owner, DesignFacet (www.designfacet.com), who has been designing websites for years and has little love for responsive Web design. “There must be a reason why.”

The Good…

The impetus behind the approach makes sense. Web designers using responsive design take great pains to ensure that anything that appears on a website of traditional size will look good on the smallest of screens—even a smartphone.

“When I reworked the Milligan College website to be responsive in the spring of 2012, the visual of the site didn’t change,” says Thomas W. Parker, Web manager and designer, Milligan College. “In fact, most desktop users probably never noticed the difference. But it made a world of difference to our mobile users.

“If colleges/universities want to stay competitive in their online presence, they need to be accessible to all screen widths,” Parker adds. “How they choose to go about doing it will differ. But static-width websites are going the way of dinosaurs.”

Adds Rupinder Dhariwal, co-founder, Creative Cranes (www.creativecranes.com), a Web design firm: “We are heavily pushing responsive websites to our new clients and updating a lot of existing sites to include this functionality.”

Plus, by sticking with one website for all screen sizes, institutions can generally save on design costs compared to attempting to maintain one site for desktops and laptops, a second for tablets, and a third for smartphones.

“Updates are also easier to apply to versions for all screen resolutions, since there is no need to work on multiple website versions,” says Michael Dobkowski, president, Glacial Multimedia, a Web design firm.

In addition, a single website generally translates into higher rankings on the search engines, given that all the traffic to your institution goes to one location on the Web. Split up your presence with three websites—traditional, tablet, and mobile—and search engines like Google will split the traffic ratings to your presence on the Web three ways.

“I have been building responsive sites for a year already,” says Edwin James Lynch, manager, Geoffrey Multimedia, a Web design firm that updates websites for universities. “They work everywhere.”

Also, some big guns in the tech industry—including Google—are “all in” when it comes to responsive Web design. “Many website marketing firms had provided a minimalist mobile website in addition to a site designed to be viewed on a desktop,” prior to the rise of responsive design, says Dan Goldstein, president, Page 1 Solutions (www.page1solutions.com), a Web design firm. “While Google had originally stated that this was a good option, more recently Google has made clear that responsive is better.”

Cyndi Miller, CEO, Miller Public Relations, which offers Web design as part of its services, adds, “For our clients, responsive Web development is our current standard of practice. It’s not an upcharge or an add-on. It’s part of every Web design package we offer. That’s how vital we believe it to be.”

…the Bad and the Ugly

Even so, generally speaking, the problem dealing with the “tyranny of the tiny”—or ensuring that every website design looks good on the smallest of smartphones—is that responsive sites often render as ridiculous monstrosities on desktops and laptops, and are often difficult to use on bigger screens.

In addition to poster-sized headlines, you’ll often find that responsive websites make generous use of wide swaths of blank space—space that you must scroll through with repeated spins on your mouse when using a desktop PC but that usually looks just fine on a smartphone.

Plus, responsive websites that need to feature a great deal of text—including descriptions, college backgrounds, student testimonials, and so on—also often look more like train wrecks than anything else on a desktop.
One glaring example: On a desktop PC, the text on a responsive site often runs the full length of a 23" screen, so it will shrink down nice and tidy when viewed on a smartphone screen. For the mobile user, that's convenient, since the responsive website reconfigures text margins to fit a palm-sized screen. But for the desktop user, trying to read a sentence 23 inches long is not nearly as much fun—unless you're a giraffe.

Says Russel Uresti, a Web developer with Schoology (www.schoology.com), a learning management system, and an avid advocate of responsive design: “Often, so much emphasis is placed on mobile devices and making the site look good on a phone or tablet that designers will overlook extremely large monitors and fail to design for them.”

Incredibly, the scores of designers championing responsive Web design are either unaware of the unacceptable usability they’re creating for desktop and laptop users or they’re silently willing to sacrifice desktop and laptop usability all in the name of the iPhone and related trendables.

“It kinda becomes a fanatical point of view that they keep about their work,” says DesignFacet’s Jamshidi, “They design more for themselves than for the client.”

Media Queries (http://mediaqueri.es), for example, an ever-expanding gallery of the best and brightest that responsive Web design has to offer advanced by the responsive Web design community, in fact showcases dozens of examples of company Web presences that, when viewed on desktops, are simply bad.

The Republic of Quality (www.republicofquality.com/), for example, a Web design and marketing firm whose site is featured prominently on Media Queries as a shining example of responsive Web design done right, is actually emblematic of everything that is wrong with the design approach.

Visit the homepage for the company, and you’ll find bloated text and graphics that look better suited for a children’s book than for a company trying to market to other businesses. Click for more detail to the site’s “Our Projects,” page, and you’ll find text that runs the full length of a 23” desktop screen. Plus, you’ll be treated to one-sentence project descriptions that take four times longer to read on a desktop than they normally should because the text and linespacing is unnecessarily gigantic.

Ditto for The Republic of Quality’s blog: If you like blogs that look more like posters on a desktop PC, you’ll love this blog. Otherwise, not so much.

Meanwhile, you’ll find similar, unnecessarily overblown text and graphics at another website showcased by Media Queries as the ideal of responsive Web design: the site for The Next Web (http://thenextweb.com/). Ironically enough, the Next Web is a magazine, conference, and education company that reportedly stays on the “bleeding edge” of where the Web is headed.

Other designs heralded by Media Queries that leave many desktop users scratching their heads: Build (http://www.buildwindows.com/), a site for a Microsoft-sponsored trade show; Paid to Exist (http://paidtoexist.com), a personal growth site; and Modo Design Group (http://mododesigngroup.com/), a Web design firm.

When challenged by desktop and laptop users regarding usability, champions of responsive Web design often insist that bad responsive Web design is an indictment more of the designer behind the website than the responsive Web design method. "RWD, like anything, can be done well or it can be done poorly," says Milligan College’s Barker.

The Numbers’ Story

Responsive Web design proponents also maintain that given the frenzied proliferation of smartphones and tablets, mobile is the de facto standard. The days of desktops and laptops are numbered, they say. And any rational designer, they insist, must proceed with a “mobile first” strategy.

Unfortunately, on that point, the statistics tell a starkly different story. In an April 2012 study conducted by Comscore (www.comscore.com), which has been chronicling the Web’s evolution for many years, 91.8 percent of all devices connected to the Web were PCs. Only 5.2 percent of that traffic was from smartphones surfing the Web. As for tablets: a paltry 2.5 percent of that category of device was actually accessing the Web during the study period.

Granted, there have been millions of smartphones and tablets shipped since April 2012. But even so, Deloitte (www.deloitte.com), the market research firm, predicts that for 2013, more than 80 percent of all the surfing on the Web will still be done on desktop and laptop PCs, according to Jolyon Barker, managing director of global technology, media, and telecommunications at Deloitte.

Put another way: Sure, there are plenty of people with smartphones tagging the Net for a minute or so while waiting in line for their latte at Starbucks. But any serious and substantial use of the Web will continue to be overwhelmingly done on desktops and laptops.

Conclusion

Here’s the bottom line: The next time a Web designer shows up at your institution promising to build you a state-of-the-art, responsive website that will deliver a consistent and optimized user experience across the wide variety of devices and platforms that Web surfers use, make sure you read the fine print. Fortunately, if you’re reading it on a responsive website, it’ll most likely be the size of a wooly mammoth.

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Institutional Excellence Award 2013
Future Proofing Our Network: Sewanee’s Wireless and Network Infrastructure Project

Sewanee: The University of the South’s Information Technology Services (ITS) team is responsible for the campus computing infrastructure, wired and wireless networks, voice networks (IP and cellular), and database management, as well as the security of the institutional management of access control. Recently, ITS carried out a major overhaul of the campus wireless and wired network infrastructure. This carefully conducted Wireless and Network Infrastructure Project (WNIP) with its campuswide impact on teaching, learning, and overall operation of the institution was the focus of this submission for an Institutional Excellence Award.

Getting Started
Over a period of about 18 months, we identified current and future challenges that had to be met in order to provide a robust, secure, environment that was ready to support the bring-your-own-device (BYOD) culture. The physical infrastructure of the university information network was in serious need of a major upgrade and expansion. Faculty, students, and staff were requesting increased network speed, bandwidth capacity, and ubiquitous network access. The aging cable plant was not robust enough to deliver streaming multimedia, teaching and learning applications, and high-speed access to research and scholarship. In addition, many smaller specialty student residence houses and dormitories were without direct access, or had severely limited access, to the university network.

In the winter of 2012, ITS participated in the Measuring Information Services Outcomes (MISO) survey (www.misosurvey.org), a nationally recognized annual survey of library and IT resources and services at liberal arts institutions across the country. The item that uniformly received the greatest level of dissatisfaction among all constituents was wireless connectivity. Wireless also consistently ranked as one of our most important services.

Beyond the survey, we identified other significant areas that needed attention, including encryption/decryption, threat detection, attack prevention, policy enforcement, and compliance reporting, none of which was available on the existing wireless network.

ITS had been working for several years to upgrade the university network using limited operational funds. This piecemeal approach resulted in our making very limited headway in realizing any significant improvement across the campus as a whole. It became apparent to decision makers that a more comprehensive approach would be necessary.

In July 2012, because they deemed this to be a high-priority objective, the Board of Trustees approved $900,000 (bond initiative) to be used to upgrade the wired and wireless networks. The overall goals and objectives of the upgrade were to foster a BYOD environment, to allow for greater mobility, and, most importantly, to improve teaching and learning opportunities through more bandwidth and greater coverage. Additionally, we established user types and profiles allowing security on the wireless network by using Microsoft’s Active Directory (AD) authentication.

Our rural setting and the nature of the town of Sewanee being situated within the larger university-owned domain made this project especially unique. Our

Figure 1. Sewanee: The University of the South is a national liberal arts university located between Chattanooga and Nashville, Tennessee. Our 13,000-acre Domain (as the campus and surrounding area is known), provides a remarkable academic and recreational resource, and an unparalleled place in which to study and reflect.

The university has had 26 Rhodes Scholars as well as 27 NCAA Postgraduate Fellows, 42 Watson Fellows, and dozens of Fulbright Scholars, and has an acceptance rate to graduate and professional schools that far outpaces its peers. The School of Theology has added to its alumni ranks countless bishops, including three of the last four presiding bishops of the Episcopal Church. Sewanee offers 36 majors, 32 minors, and 15 special programs, along with pre-medicine, pre-nursing, pre-law, and pre-business. It is imperative that the technology we offer be as advanced as our students.
Supported by the National Institute of Standards and Technology (NIST), the project was planned to provide wireless coverage for all buildings, student residences, and outdoor areas. Providing robust wireless technology assists in the effort to recruit and retain students and top-notch faculty.

The success of the project hinged on the processes we utilized, as well as key partnerships we forged during the implementation of the project. Some of these are highlighted here:

1. The RFI process involved proposals from five wireless vendors plus the trials of each product. The right solution had to provide Wi-Fi and enhanced network capacity to over 80 buildings, and provide security and role-based access. The scope included academic and administrative buildings, student residences, recreational spaces, and outdoor venues. In addition, the infrastructure as well as building switches (27) had to be upgraded to gigabit capacity. Upon completion of the project, there will be over 8 miles of (12, 24, 48) single mode fiber pulled to 37 buildings, 10 miles of category 6 cable pulled to over 600 indoor wireless access points (increasing from 269 access points) plus 45 outdoor units and installation in over 80 campus buildings, 2 miles of trenching, and approximately 2.5 miles of conduit laid. We also considered and have an upgrade path to 802.11ac. Aruba Networks was selected as our partner for the wireless network.

2. Another aspect of this project was our partnership with AT&T, where a 4G cellular site was installed within the confines of our carillon tower. In addition, the university installed more than 40 outside Wi-Fi access points for outside coverage, preparing the campus for the Passpoint standards architecture (known as Wi-Fi Al-
The university Internet connection is provided by NetTn (the state of Tennessee education network). We increased our bandwidth from 250 to 750 megabytes/second. We purchased a new Allot NetEnforcer to accommodate this expansion and are ready for gigabyte access.

3. We evaluated fixed mobile technology and continued our discussion of various opportunities in an effort to provide a seamless handoff for cellular and wireless outside or inside our buildings.

4. We leveraged our installation of Active Directory in provisioning mobile and desktop devices based on their network access profile.

Promotion of Technology and Maturity of Effort

The Plan

Due to the size and complexity of the project, planning and active involvement of the whole university community was essential. Interruption of service, trenching, cabling, and installation of new switches and wireless access points had to be planned around classroom schedules, as well as the need for residential privacy.

Planning began 18 months prior to the implementation of the WNIP. During this process, we analyzed and assessed the entire network (wireless and wired) and all the peripheral equipment linked to the network. This included mapping our current network and the creation of the new network map (underground cable, conduit, in-building cable plant, and wireless heat maps).

Project Phases

Phase one: Justification for funding for network expansion to the university's Budget Priorities Committee and the Board of Trustees for $900,000.

Phase two: We developed multiple RFIs.

This effort was broken into three areas: trenching, cable installation and termination, and installation of wireless access points. Everything was outsourced with the exception of work in smaller buildings, where we found it more economical to utilize ITS staff.

In addition, cable installations, closet terminations, and all the network switches were planned to be installed by our internal technical support group. This was done in advance of budget planning so we could estimate funding requirements and internal staff responsibilities. Of course, all crews fell under the supervision of our ITS technical staff. Our vendor partners included these companies:

- Digital Group (DG), Nashville, TN: Installation of cable, fiber, and fiber terminations
- Communication Contractors, Inc. (CCITN), Kingston Springs, TN: Trenching and installation of conduit for fiber
- Aruba Wireless, Nashville, TN: Wireless vendor
- Excalibur Integrated Systems, Inc., Chattanooga, TN: Installation of the 600+ indoor and outdoor APs

Phase three: Coordination of vendors over a four-month period so trenching, cable installation, and copper and fiber terminations would stay within the projected schedule. Scheduling was an essential component. In addition, ITS considered co-location points with the AT&T cellular project and the physical plant chiller addition, cutting costs by sharing trenches.

Phase four: Installation of wireless access points and network switches, which also involved the creation of acceptable-use policies, creating authentication profiles, as well as setting up and establishing the new management software system(s). Components of phase four included:

- Install and configure two 6000 controllers that manage authentication, encryption, and virtual private network (VPN) connections.
- Install and configure ClearPass to establish policy management and the provisioning of devices for secure network access and posture assessment.
- Install and configure AirWave. This management software provides user location and mapping, real-time monitoring, proactive alerts, historical reporting, and efficient troubleshooting.

Project Progression

The project began with research on the future of wired and wireless networking technology. The objective was to future proof our network infrastructure and to improve the overall Wi-Fi and wired network experience at the university. The infrastructure is permanent, but the devices and applications will evolve with technological trends and improvements. This project will provide greater density and increased capacity and improve wireless and wired service on the university campus for years to come as the pathways...
are permanently in place for future expansions.

Nine months prior to developing the plan to upgrade the network, Active Directory was brought online. Although this was a separate ITS project, having this in place allowed users to easily authenticate on the Sewanee Secure wireless network. The use of organizational units (OUs) within Sewanee’s Active Directory structure simplified the configuration of security settings within the Aruba wireless installation. The decision was made by our team to keep the wireless authentication simple with two access levels. (See Figure 4.) During the implementation period we kept the old Sewanee SSID, making it easier for everyone to connect to the network. This decision kept down any major frustrations during the conversion process.

The planning of the cellular tower in the middle of the campus was another necessary link in our complete mobility solution for our campus. Contract negotiations began eighteen months prior to the beginning of the WNIP, but this was a part of the overall plan to improve mobility.

The trenching, wiring upgrades, and wireless access point installations began in August 2012, with the expected project completion of March 2013.

**Quality, Performance, and Productivity Measurements**

Although this project originated in the ITS division, this was a collaborative project, the success of which has required ITS to work with the entire campus and our local community residents. Communication was—and remains—critical to our success. We have been broadcasting weekly e-mail notices of work locations, as well as offering a link to our Google calendar to keep classroom disruption at a minimum and dormitory life as normal as possible. We periodically reviewed and maintained the scope of the project via an Excel spreadsheet. As each area was completed, the columns were color coded. Our technical support person reviewed each day’s plans with our vendors, thus controlling the quality of the project and keeping the project’s progress on target. Coordination among vendors was critical. This included reviewing the floor plans and maps, as well as being available as a resource for each building’s layout.

Additionally, we created a Facebook page and a Twitter account so students, faculty, and staff could easily see our progress. At the same time, we used these social media tools to educate our audience. This provided them an opportunity for instant feedback, which helped us respond quickly to issues. We encouraged everyone in the university community to notify us with questions or alert us of potential conflicts prior to the beginning of each week’s work during the multiple phases of the project. The type of impact expected during the construction phase and the locations affected were also noted. As buildings came online, we produced posters and published help desk locations and associated numbers. Faculty and students were encouraged to login to the secure profile not only to take advantage of the increased speed, but also to be connected to secure servers behind the firewall.

After the completion of the project, we planned to revisit each area and perform a post-project survey. This would allow us to perform tweaks at each wireless location and analyze activity at student gathering points. Heat maps and floor plans were to be updated in the AirWave database, an ongoing process. In addition, our student technology assistants will provide feedback based on their experiences assisting their peers, and ITS will conduct the MISO survey every other year.

**Cost, Benefit, and Risk Analysis**

One of the noted benefits of this project was the provisioning of the single-mode fiber backbone as the core of our network, making it simpler to change out switches in wiring closets and new wireless access points at the edge. The ability to offer state-of-the-art technology anywhere in the enterprise will sustain future developments. When coupled with the addition of management tools, ITS will be proactive instead of reactive to our end users, which will allow us to plan for the next technological advancement, rather than being in a position of catching up.

Financial resources are tight on all university campuses, and the need for a cost-effective solution was essential. Our new wireless system will allow for growth in a manner that is fiscally sound. With the AC and Passpoint technology opportunities, we will be advancing at minimal cost impact and very limited disruption in service because our Aruba controllers will be compatible. 802.11n technology supports up to 40MHz channel bonding and up to 4 spatial streams. Second generation 802.11ac will support up to 160MHz channel bonding and up to 8 spatial streams. Recently, Aruba Networks, Inc., announced that its wireless LAN solution has been certified for interoperability by the Wi-Fi Alliance® for their Wi-Fi CERTIFIED Passpoint™ Program. We made the decision not to use a distributed antenna system, but to work on interfacing with the Passpoint architecture.

**Customer Satisfaction/Results To Date**

Although we view this project as an ongoing effort due to inevitable technological changes and upgrades, we consider the WNIP project a success. Single-mode fiber has been placed and terminated to ALL major buildings on campus, assuring we will be ready for future network
Other Duties as Assigned

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IS at the University of Richmond includes all IT services as well as the library. We are very centralized, which can be "pro" from the standpoint of supporting standards in the enterprise, but then there are occasional "cons" in terms of the special needs in all of the schools/disciplines, especially in research-intensive areas. We get spread pretty thin. My responsibilities include:

- Telecommunications, including oversight of voice services on campus and a number of ACD/call center environments
- Cable TV services for the campus, including support for all of the TVs/displays
- All infrastructure responsibilities, voice, data, catv, and security cable, and fiber distribution on campus
- Coordination of cellular services programs for the university community: we resell services to the faculty/staff (departments) as well as students
- Multimedia and A/V support for the campus: classroom technology; videotaping of lectures; A/V support for special events on campus
- Control systems operation: video-switching capabilities in athletics and special venues such as performance theater spaces
- Closed circuit operation
- Digital signage/electronic menu boards
- User services/help desk
- Computer hardware and software support (PC and MAC), including oversight of antivirus use on campus; installation work; upgrades and patch management; printers / scanners, etc.
- IT procurement/asset management, including software management. We manage a central software budget for the university focused mainly on enterprise applications (i.e., MS, Blackboard), but we also purchase/support/management licenses for many non-enterprise software apps.
- Recycle and disposal
- Proper management of hardware and software assets on campus is one of our greatest "administrative" resource commitments
- Support for emergency communications on campus and management/support of our mass communications product (Blackboard Connect)
- Although the final responsibilities for managing the security cameras on campus fall to our Campus Police, the spec/cabling/installation, etc., are mine.

Like many of my peers, I think that some of my greatest challenges relate to the administrative demands of a large IT organization. Budgeting, project planning, surveying/assessing, etc., all take a great amount of time. It's easy to get stuck behind the desk and become a little disconnected from what's happening in the trenches. This is where organizations like ACUTA bring so much value to us; it connects me with others in my boat, as well as with managers and others doing real tech work, and sharing real info, lessons learned, etc. I need resources like ACUTA to keep up. And then there is the "work harder, work smarter, and work more" strategy as well!
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For the past 17 years (that’s 68 issues), the ACUTA Journal has brought you the insights and experiences of campuses from coast to coast about every imaginable topic of relevance to higher ed technology. We consistently hear that campus case studies are the most useful articles of all. You like to know what others are doing—what has worked and not worked—to help you make important decisions.

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—Ron Kovac
Ball State University

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—Sharon Moore
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