

2010 – 2011 ITS Annual Report



UNC
INFORMATION
TECHNOLOGY SERVICES

STRATEGY SERVICE SUCCESS



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MESSAGE FROM THE CIO



Larry Conrad

This has been a challenging year for all of us in the Carolina community. Like the rest of campus, ITS has been strained by continuing budget cuts to find creative strategies to improve efficiencies and prioritize our services and resources to successfully meet the needs of the University. An increasing demand for those services and resources exacerbates the challenge.

Given the difficult economic times in which we find ourselves, it's tempting to just hunker down and focus only on existing requirements and services, waiting for better financial times to move technology forward. However, I believe this would be exactly the wrong thing to do at Carolina. Our University has become great because of smart, creative people who find inventive ways to solve problems and move things forward despite obstacles. We need to keep information technology moving forward BECAUSE of these difficult times. We need fresh, innovative solutions.

It may be a cliché to say IT is constantly changing, but it's true. The campus IT infrastructure needs to stay current to keep Carolina faculty, staff, and students competitive and productive. Frankly, when I arrived here three years ago, I was surprised to find that Carolina's IT infrastructure had fallen behind those of our peers, so there's a certain amount of catch-up needed to ensure that the University continues to progress. We have a number of important initiatives to help accomplish that. Although the details are covered elsewhere in this report, here's a list of what I see as the most important upgrades. Some have already been completed, while others are underway:

- Transitioning phone services to a Voice-over-IP (VoIP) solution
- Replacing the Topsail research computing cluster
- Transitioning from Blackboard to Sakai for the campus Learning Management System
- Deploying a new Distributed Antenna System to push cellular signals inside campus buildings
- Implementing the ConnectCarolina student system
- Planning for the HR, Payroll, and Financial systems replacement projects
- Creating a new Network Attached Storage infrastructure to provide cost-effective storage to the campus
- Increasing use of virtualized servers to reduce server costs
- Transitioning to Microsoft Exchange email and calendaring for faculty, staff, and students
- Upgrading on- and off-campus network connectivity to 10 GB
- Adding Apple to the CCI program
- Proposing a new research computing funding model to provide for lifecycle upgrades
- Recommending a new communications technologies funding model to include capital requirements
- Improving information security to better protect campus IT assets
- Re-imagining the student computer lab to have more of a "learning spaces" focus
- Re-imagining the CCI program to better support teaching and learning
- Assessing what's needed to better manage research data requirements

Outreach with the Carolina Counts IT Partnership Program

A key initiative this past year has been the Carolina Counts IT Partnership program. This program was put in place to work with the Carolina community to deploy the various Carolina Counts IT projects defined last year. The program promises to significantly reduce IT costs for the University. As much a marketing program as anything, this program promotes a number of ITS services to the campus. Many of these services have been in place for some time, but have not been adequately communicated. The partnership program involves meeting with campus leaders on an individual basis and tailoring specific proposals to meet their needs. It's also an opportunity to take a fresh look at ITS-provided services in light of our partners' present needs and budget pressures.

Keeping our customers at the forefront

Another key area of attention this past year has been to establish an ITS customer service initiative. This grassroots-level program, led by ITS staff, is designed to call attention to the need for an improved and consistent customer focus within the division and to instill customer service principles throughout the organization.

ITS could not have accomplished all that we have this past year without our staff, who have worked unceasingly to provide the best services possible to our University.

IT Governance

The final initiative I would like to highlight is the University's new IT governance structure. This structure has begun to operate effectively and is providing critical input and guidance from the University community on priorities and direction for IT infrastructure and investment at Carolina. The IT Executive Steering Committee, chaired by the Provost, is augmented by a set of Coordinating Committees (sub-committees) that focus on key aspects of our IT environment: Enterprise Applications, Communication Technologies, Institutional Data, Instructional Technology, and Research Computing. Each of these committees is chaired by a key campus leader, and they are all fully engaged with various strategic IT campus initiatives.

The initiatives highlighted in this report are but a sample of ITS' work this past year. Many other projects were undertaken but are too numerous to include. ITS could not have accomplished all that we have this past year without our staff, who have worked unceasingly to provide the best services possible to our University.

This next year looks to be another challenging one, but with hard work and dedication from ITS staff, working in concert with the campus IT community, we will continue to move Carolina's technology forward.

Larry Conrad
Vice Chancellor for IT and CIO

SENIOR MANAGEMENT TEAM

The ITS senior management team embraced the challenges of 2010-2011 with optimism, enthusiasm, and a strong dose of practicality. Through innovations of individual departments and collaborations with other campus units, ITS achieved significant milestones that better positioned the Carolina community to capitalize upon the exciting opportunities that lie ahead.



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CONNECTCAROLINA: TRANSFORMATIVE AND TRANSITIONAL

When Campus Solutions, the student services portion of [ConnectCarolina](#), went live in early 2010, it began fulfilling the promise of the University's enterprise administrative software system – to support all those who work and learn at UNC-Chapel Hill with an administrative system that makes interaction with the University easier for applicants, students, faculty, and staff.

Over the past year, Campus Solutions fundamentally transformed Carolina's business processes with and for students. Moving from project phase to operational status brought a number of pivotal transitions to Campus Solutions, including changes to its governance structure.

At the same time, the initial planning for the implementation of the ConnectCarolina components for Human Resources, Payroll, and Finance got underway.

Campus Solutions

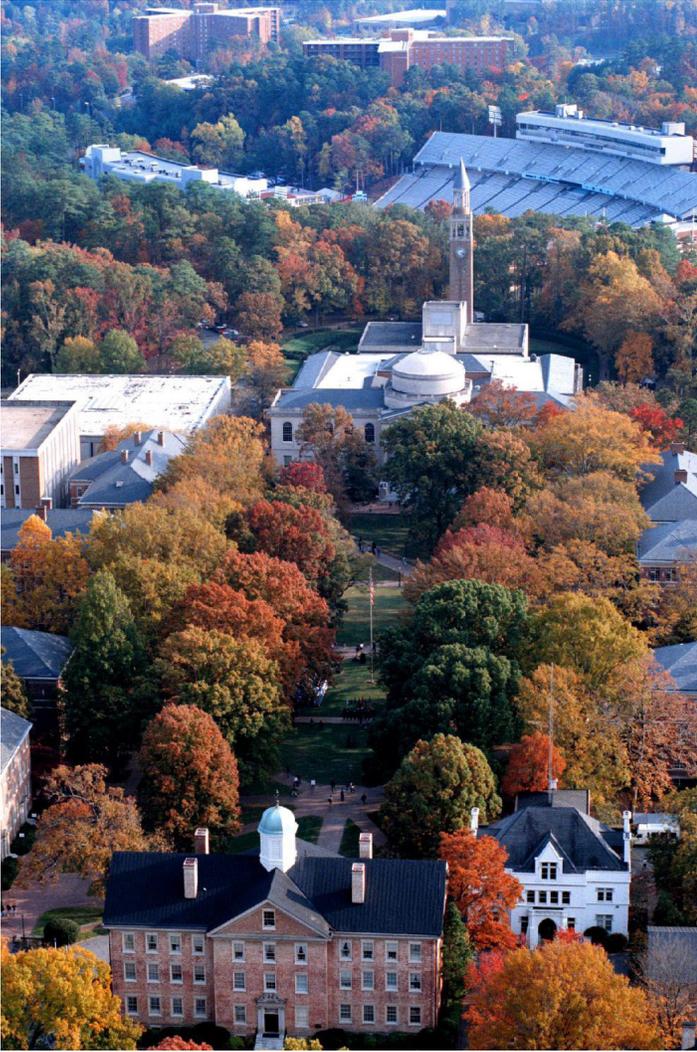
ConnectCarolina has been part of the University's business processes for some time now, but this past year, Campus Solutions introduced many new student services.

The first of these was Student Financials (the Cashier's Office). For the first time in University history, students received and paid their bills totally online through ConnectCarolina. A new feature, Third Party Proxy, allowed parents or other third parties to access and pay a student's bill. The summer 2010 transition of Student Financials included the migration of more than 13 million detail records from the old Student Information System to PeopleSoft, the underlying software for ConnectCarolina.

Also in the Summer of 2010, the Graduate Admissions Application (for Fall 2011 term) went live in ConnectCarolina. Undergraduate Admissions began its second year in the system. Based on feedback from staff and applicants, as well as response to business need, ITS worked with both admissions offices to transition to third-party admissions products for the Fall 2012 term. These products will integrate fully with ConnectCarolina, complementing the system's strength in student services.



Connect CAROLINA



Graduate staff and students also benefited from the launch of Starlight, a comprehensive system to collect and report all funds, especially departmental awards, given to a student in support of their academic career at Carolina. This custom-built system upgrades the previous award-tracking program (STARS).

One of the primary reasons for the ConnectCarolina implementation was to provide the University community with a powerful and fully integrated administrative infrastructure nimble enough to keep up with federal and state regulatory changes and evolving University needs.

ConnectCarolina's agility was amply demonstrated this year, when the Office of Scholarships and Student Aid (OSSA) packaged student aid at a record pace. By early September, OSSA disbursed over \$100 million in a span of 10 days, an amazing accomplishment in a new system, and with last-minute federal regulatory and state budget changes.

By the start of the Fall 2010 term, faculty and University advisors were introduced to the system. Faculty can access class rosters and enter grades. University advisors use the Advisor Center.

ConnectCarolina's agility was amply demonstrated this year, when the Office of Scholarships and Student Aid (OSSA) packaged student aid at a record pace.

Throughout the year, new functionality came online for Student Records, including:

- Course History: a view of the courses taken by a student and the awarded grade
- GPA Calculator: used by undergraduate and the School of Law students and staff
- Tar Heel Tracker: a new degree audit system for students with a catalog year of 2009-2010 and later
- Course Request Approval System: departments can now electronically add new courses, make revisions to existing courses, and inactivate courses no longer offered
- Online Ordering of Transcripts: transcripts can now be ordered online by students and alumni, processed by the University Registrar, generated in hard copy form, and mailed

Transition and Governance

As the Campus Solutions phase of the ConnectCarolina project completed its initial implementation and moved into full operational status, governance also needed to evolve to provide ITS with ongoing guidance and feedback regarding concerns, issues, and enhancement requests.

As a major cost saver, PeopleSoft's eProcurement (ePro) was implemented ahead of other PeopleSoft Finance modules. ePro collects and provides departments and the University with more insight into and control over purchases.

The Campus Solutions Stakeholder Committee, which governed the implementation of Campus Solutions for more than three years, has transitioned to the Enterprise Applications Coordinating Committee (EACC) which is part of the University's IT governance structure. The EACC's charge includes approval and prioritization of changes to Campus Solutions, as well as communication of those decisions to the broader campus.

At the same time, the ConnectCarolina Users Forum was created to represent faculty, staff, and students who use ConnectCarolina. This group collects user concerns, issues, and enhancement requests and works with the EACC to provide guidance and feedback to ITS.

Human Resources/Payroll and Finance

Work has begun on the next phase of the Human Resources/Payroll and Finance components of ConnectCarolina. Subject Matter Experts from the central offices and campus have joined with ITS to form the core project team. Initial work has focused on capturing business requirements and analysis to determine if PeopleSoft will adequately support those requirements. Gaps are addressed by either changing existing business processes or, in some instances, customizing the system. The charge from the project's Executive Steering Committee is to minimize the number of customizations to the system

to reduce system cost and complexity, and to allow easier upgrades in the future. Campus feedback is being solicited from schools and divisions through Campus Working Groups. These volunteers bring in-depth knowledge and experience to the project, and will also serve the important role of taking information back to their schools and divisions to keep them abreast of key developments. Campus Working Group participation began in Summer 2011.

Additionally, the University's Office of Human Resources (OHR) has signed a contract with the vendor PeopleAdmin to use its recruiting system to replace its current custom-built recruiting systems. The ConnectCarolina project team will work with OHR in support of this implementation.

As a major cost saver, PeopleSoft's eProcurement (ePro) was implemented ahead of other PeopleSoft Finance modules. ePro collects and provides departments and the University with more insight into and control over purchases. Greater detail about purchases equals more negotiating power with vendors, which equals better prices for departments — and generated savings stay in the departments.

ePro is a front-end system; the back end remains the existing Financial Records System (FRS). When PeopleSoft Finance is fully implemented, the back end of ePro will be PeopleSoft. ePro is used for two types of purchases:

- Vendor catalog orders, to order items (similar to the former eCommerce system)
- Small order process, to pay the bill after a purchase is made (similar to the former Check Request System)

Other Transitions

With the transition to ConnectCarolina of most functionality and information formerly available on Student Central and Faculty/Staff Central, the "Centrals" were decommissioned, ending an era in student services at the University.

An upgrade of the behind-the-scenes PeopleSoft tools brought improvements to the front-end software used by University faculty and staff, including a new look and feel, as well as faster and more efficient ways of navigating within PeopleSoft. As ConnectCarolina continues to be upgraded, enhanced, and refined as an enterprise system, it will continue to transform and improve the administrative infrastructure at Carolina.





ITS' research clusters are named after North Carolina beaches.

KILL DEVIL TO REPLACE TOPSAIL

For several years, the [Topsail research cluster](#) was the jewel of ITS' research-computing resources. As the demands upon research computing increased, however, Topsail ran at more than 90 percent capacity and no longer served all the needs of campus researchers. Research Computing documented that Topsail supported researchers who brought in over \$430 million in sponsored research over a three-year period, so it has been highly successful as a research support resource.

To help relieve Topsail's load, a new research cluster called [Kure](#) was built last year. This year, a new cluster called Kill Devil will replace the legacy Topsail cluster.

The soon-to-be-retired Topsail cluster and the new Kill Devil cluster are similar in that both are large, high-capacity Linux clusters built upon commodity components. They both feature high-performance Intel Xeon processors and high-speed interconnects with large amounts of disk storage space.

The differences between the two systems, however, are striking. The Kill Devil system features a substantial increase in capacity, as well as provides additional capabilities that were lacking in Topsail. For example, the new system has GPGPU capability (general-purpose computing on graphics-processing units) on 32 Nvidia GPU cards. It also contains special hardware for extremely large shared-memory computing, namely two Intel X7550 processors, each with 32 cores and 1 TB of memory.

Between Kill Devil and Kure, approximately 9,000 processing cores will be available for both large parallel and single-core serial jobs.

When Topsail is decommissioned in Fall 2011, some of its components will be redeployed as a development platform in the Genome Sciences building.

COMPARISON OF THE TOPSAIL AND KILL DEVIL CLUSTERS

Topsail	Kill Devil
Homogeneous cluster	Heterogeneous cluster
520 nodes	704 nodes (+ 2 more high memory 1 TB nodes)
4160 total cores	8064 total cores of Intel Xeon X5670 (additional cores are associated with GPU and large memory nodes)
12 GB memory/node	48 GB memory/nodes on 636 nodes 96 GB memory/nodes on 68 node
IntelXeon E5410 CPU	Intel Xeon X5670 CPU
8 cores/node	12 cores/node
2.33 GHz processor speed	2.93 GHz processor speed
IntelCore Microarchitecture	Intel Nehalem Microarchitecture (faster memory bandwidth)
2 x 4 MB L2 cache	2 x 1.536 MB L2 cache 2 x 12 MB L3 cache
Infiniband 4x SDR interconnect	Infiniband 4x QDR interconnect QDR (Quad Data Rail) is 4x the speed of the single SDR on Topsail
27-31 TFlops*	79.80 TFlops**
Ibrix Fusion Clustered Parallel FileSystem DDN S2A 9550 w/160 300GB FCAL Drives [48 TB raw; about 39 TB usable] To disk 30k IOPS; 2 GB/sec Bandwidth MAX To cache 20k IOPS; 2 GB/sec Bandwidth MAX	Lustre Clustered Parallel FileSystem*** DDN SFA 10k w/300 600 GB SAS Drives [180 TB raw; about 125 TB usable] To disk 50k IOPS; 13 GB/sec Bandwidth MAX To cache 1,000,000 IOPS; 10 GB/sec Bandwidth MAX
Access method Ethernet via Ibrix Native nfs client	Access method IPoIB/SRP via Lustre client
N/A	2 large memory nodes, each with 1 TB (or 1,000 GB) memory and 32 cores
N/A	64 Nvidia Tesla GPGPU (M2070)
*trillion floating-point operations per second	
** would rank as #127 in the TOP500 supercomputing list as of June 2011	
*** Half of the top 500 fastest computers clusters in the world run Lustre http://www.top500.org/	

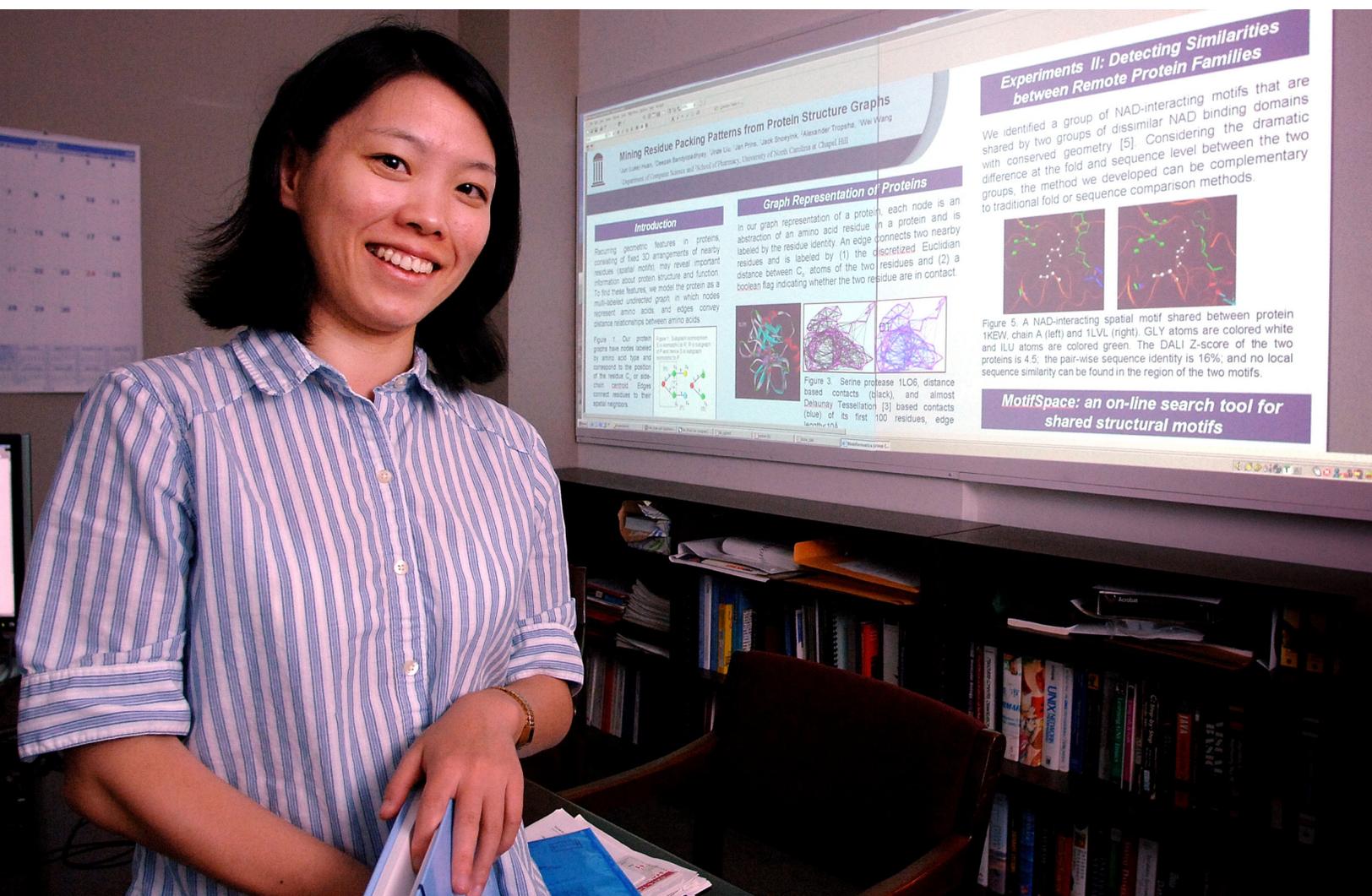
NEW RESEARCH COMPUTING FUNDING MODEL PROPOSED

Computation is strategically important to research; the ITS Research Computing central compute and storage resources are used by researchers from diverse disciplines and domains across campus.

In response to the recommendations of the 2008 Provost's Task Force on Research Computing, ITS Research Computing has focused its efforts on providing support for a broader portfolio of research across the campus. Collaboration with researchers from biosciences, humanities, social sciences, and clinical research has grown during the past two years, with each of these departments increasing their use of ITS' central resources.

The funding model for upgrades is no longer sustainable. Infrastructure components have typically been acquired through one-time funding requests or grant contributions from researchers. Rather than continue the practice of requesting significant one-time funding to provide new computational resources, the campus needed a better strategy to provide predictable and sustainable funding mechanisms for central resources.

In October 2010, a group made up of ITS staff, the IT Research Computing Advisory Committee, and the IT Research Computing Coordinating Committee proposed a new funding model to the IT Executive Steering Committee (ITESC). The proposal was endorsed by ITESC and is now being considered in light of overall campus facilities and administration (F&A) allocations.



PROVIDING RESOURCES TO THE SCIENCES AND HUMANITIES ALIKE

Research Computing continues to broaden its services to the campus community, building new relationships and strengthening existing ones. Here are some of the ways ITS is reaching out to campus:

“This Fall semester, I will undertake a comprehensive review of the technology needs of humanities researchers. Then I will explore which needs can be met by ITS and which ones can be better addressed at partner organizations like the Carolina Digital Library and Archives and the Institute for the Arts and Humanities. My hope is that I can help provide infrastructure and technical support for digital humanities projects so professors can concentrate more on scholarship and less on infrastructure.”

—*Joe Ryan, Humanities Research Associate,
Research Computing*

“In addition to working with numerous labs in the UNC Biology, Genetics, Microbiology and Immunology, and Biochemistry departments, we have been working extensively with the UNC High Throughput Sequencing Facility, the UNC Center for Bioinformatics, and the UNC Microbiome Core Facility Pyrosequencing Lab to leverage our computing resources and expertise in their daily operations. The sequencing products from these facilities are essential for labs and centers across campus, including those in the Lineberger Comprehensive Cancer Center and the Carolina Center for Genome Sciences, as well as the labs of UNC collaborators nationally.”

—*Jeff Roach, Senior Scientific Research Associate,
Research Computing*



THE INS AND OUTS OF VIRTUALIZATION

Server virtualization is the mantra these days in data center operations. In the “old days,” which is not that far in the past, servers were often dedicated to one task. This often left the server underutilized because the server was sized for peak/spike usage and the application/service it served was not always running at peak. Thus you had data centers full of partially utilized servers.

Virtualization came to the rescue by allowing data center staff to provision multiple virtual servers on a single piece of hardware, thus reducing “excess capacity” and being able to run far more virtual servers/machines on less hardware, reducing data center bloat and creating efficiencies. But virtualization is a broad term and there are many technologies that underlie this terminology. Below is a brief primer on what is currently in use today in UNC-Chapel Hill’s data centers:

VMware

Virtualization has become the norm at UNC, with over 500 virtual machines under management in ITS’ VMware environment. This equates to 55 percent of managed servers, up from 45 percent last year. The infrastructure teams also began working with campus IT leaders to better understand the costs associated with virtual environments. Through this partnership, ground is being broken on a new chargeback model that is based on consumption rather than allocation. This model should prove to be fairer to the consumers of these resources as they will only pay for what they use. It should also provide greater funding stability, as all resource consumption is taken into account rather than certain pieces of the infrastructure. Plans are to implement this model in 2012.

Oracle LDOMS and Zones

Both Oracle LDOMS and Zones are mature technologies. LDOM is a firmware-level hypervisor; Zones is a lightweight virtualization technology that runs within Solaris 10. Both are used extensively. This year (2010-2011) is the third year that ITS has been implementing these technologies. The Solaris platform is delivered by default as a virtualized container.

Both technologies are used as best matches for the technical requirements. LDOMS are imple-

mented on T-series chassis. Zones are implemented across all Solaris platforms. For example, UNC-Chapel Hill’s IMAP infrastructure is 100 percent virtualized, with a 4:1 ratio of virtual servers to physical chassis. Campus Solutions has 100 percent of Web servers virtualized and 80 percent of the application servers virtualized, with a 6:1 virtual-to-physical consolidation ratio. With respect to database servers, 100 percent of the Solaris systems are virtualized, with a 19:1 ratio of virtual systems to physical systems.

IBM vLPARs

ITS has been implementing this technology for more than three years. This is the default for AIX installation. IT consolidated 20 older machines down to three modern IBM P-series systems in 2010, achieving a 9:1 consolidation.

Citrix Xen

ITS has also put much effort into exploration of open source and/or open license virtualization technologies to further reduce our spend on compute resources. A 20-machine pilot of Citrix Xen utilizing some of ITS’ test and development environments was very successful. Some production environments have been added and the number of these machines will grow to 50-60 managed machines by the end of calendar year 2011.

ITS began trial implementation in 2010 by re-using existing chassis upgraded with more memory and SAN disk storage. Now there are four general purpose Xen pools for implementing Linux hosts. Already 56 servers have been implemented in the Xen pools. Due to reusing old systems with hardware limitations, ITS has not been able to build optimal pools, but even so has a 6:1 consolidation of physical to virtual hosts.

z/Linux

Linux on an IBM System z allows servers to be created as Linux guests running under the z/VM operating system. As a result, each server runs on its own virtual machine. Workloads that can be consolidated to Linux on System z vary widely and include various servers, such as file/print, DNS, LDAP, and Web serving. Last year, ITS conducted a proof of concept to create virtualized LAMP (Linux, Apache, MySQL, PERL) and Oracle servers on its IBM z9 mainframe system. Once the initial virtual server was defined for each type of server, cloning a new one was easy and, ultimately, could have been automated. User testing proved that the virtual servers worked just like the hardware-based versions.

Virtual Tape System

The IBM z9 mainframe uses a Virtual Tape System (VTS) that uses hard drives to emulate tape storage as logical tape volumes. Processing a

logical tape volume on the mainframe is the same as processing a real tape volume. Processing logical tapes, when compared to real tape volume processing, is faster, because the data is on a hard drive. When the logical tape is not being used, it is actually written to a real high-capacity tape volume used only by the VTS. Once the logical tape is needed again, it is written back and restored to a hard drive, where it can be read or updated. Ultimately, the logical tape will be written to a real tape volume. Our VTS emulates over 10,000 tape volumes in a fraction of the space that would be needed for a real tape library.

SVC

ITS uses IBM SAN Volume Controllers (SVC) to virtualize the delivery of block storage. The virtualization layer introduces key features to the delivery of the service, such as:

- A single set of storage device drivers, which simplifies system support.
- Enhanced cache. SVC nodes supplement the cache available to disk arrays, allowing for faster write and read ahead performance.
- Data mobility. SVC allows for both automatic and manual data tiering. ITS currently uses the manual method. Storage administrators can move data between storage arrays and move between fiber channel and data drive types without service impacts to clients.

Virtualization came to the rescue by allowing data center staff to provision multiple virtual servers on a single piece of hardware...reducing data center bloat and creating efficiencies.

This work is done routinely throughout the business day.

- **Zero-impact maintenance.** The data mobility feature means that data can be moved transparently off of a storage array before performing risky maintenance procedures.



Netapp

ITS uses Netapp's virtualization technologies in the delivery of Exchange Mailboxes as well as departmental file storage. Thin provisioning allows for the delivery of a synthetic quota, while reserving actual disk space until needed. ITS also uses its duplication technology to look for multiple copies of the same data and store it just once on disk, routinely seeing 15 percent savings for Exchange and for file storage. A Netapp technology called "copy on write" has also been implemented. This feature allows ITS to present snapshots of file systems so that users can go back 30 days to restore old data. The copy on write virtualization model allows ITS to offer the 30 days of history for an overhead of less than 20 percent of the file systems.

VTL

ITS uses Virtual Tape Library (VTL) technology to virtualize storage of backups. Take AFS backups as an example. Weekly backups generally require about 10 TB of space. Using VTL, ITS can store 16 weeks of backups in about 11 TB of total space. The technology looks for duplicated bits of data and stores the bits only once.

Other areas of activity

In the 2011-2012 calendar year, ITS will seek to

provide ad hoc system administration services, in addition to infrastructure services, to fill gaps left by budget cuts in departmental IT groups. Also to be explored is the utilization of cloud environments to augment current environments. This will allow for the rapid deployment of new incubation environments while allowing ITS to gauge the true resource needs of these environments before making major investments in more permanent on-premise resources.

Through strategic adoption of new hardware and software, ITS' virtualization efforts will continue to save costs on compute resources and administration while delivering better service than traditional physical computing environments.

Virtual computer labs

Virtual computer labs (VCL) give users remote access to hardware and software that they otherwise would have to install themselves or access by visiting a computer lab. This year, ITS has "virtualized" applications for students, researchers, and faculty.

VCL: For researchers and faculty

Based on the [Virtual Computing Initiative](#) developed by North Carolina State University, the Research Computing virtual computing lab (VCL) provides remote access to a variety of customized computing environments, tailored to specific applications. Users log in to the VCL through a Web browser, and can reserve a specific environment for their desired duration. The VCL automatically provisions the requested environment to a virtual server from a pool of servers, and provides the user exclusive access to it. When the reservation is over, the server is returned to the pool. If larger processing power and more memory are needed, some environments are also available to run on full physical servers.

The Research Computing VCL is all about customization. Environments are created to suit specific needs and configurations of various soft-

ware applications. In addition to Windows-based environments, many Linux-based environments, such as RedHat, Ubuntu, Fedora, and CentOS are available as well. Designated users can be given the ability to create their own environments for use by their departments. This can help reduce the need for departments to maintain their own dedicated hardware to run applications.

During the past year, the Research Computing VCL has seen increased use, especially for Windows-based statistical applications and for classes in which students learn how to use the product. For example, several classes have weekly reservations for 30 seats of Stata, a statistical analysis application. The Research Computing VCL is also used by developers who conduct remote training on software that they have developed, saving them from having to set up the software on a number of classroom computers.

In the past year, the Research Computing VCL has logged 22,000 reservations, more than 110,000 computer processing unit (CPU) hours, and 1,900 unique users. Upcoming improvements will add more virtual servers, larger and faster disk storage

to support the virtual servers, and upgraded host servers to increase virtual server performance.

VCL: For students

Over the past year, ITS, in collaboration with the UNC Student Technology Advisory Board (STAB), launched an effort to [virtualize](#) all the applications that students currently access in ITS Student Computer Labs.

The project allows students to access lab applications anytime and anywhere as long as they have Internet connectivity, helps instructors turn their classrooms into guided computer labs, enhances computer security by providing improved monitoring and maintenance, and helps ITS address the ever-increasing gap between limited resources and expanded requests for information technology services on demand.

Next year, ITS will work to increase faculty and student usage of this resource, ensure that our customers know how to use it to their best advantage, and make additional improvements to enhance service.

RESEARCH COMPUTING VCL USAGE

2009 - 2010

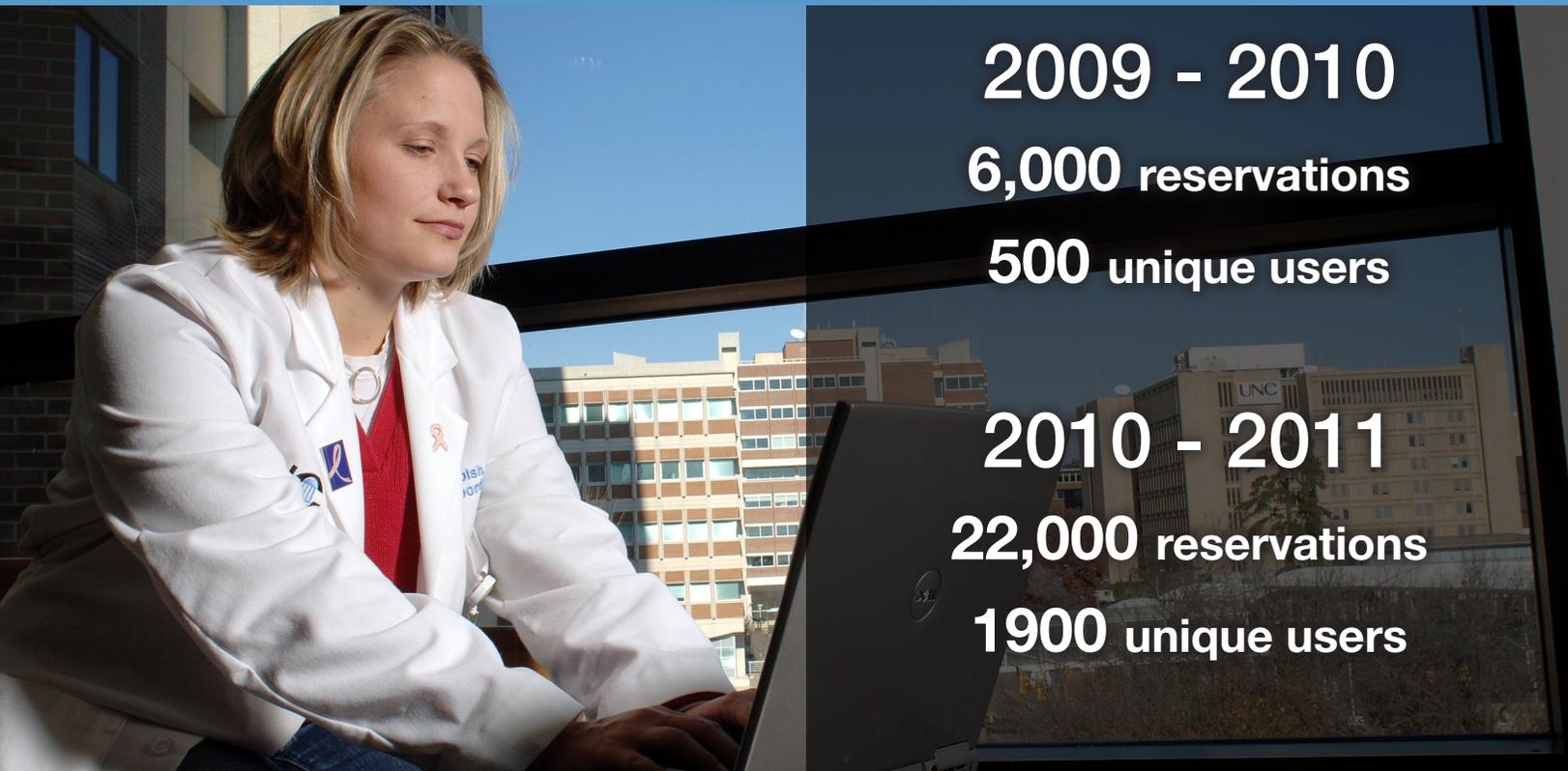
6,000 reservations

500 unique users

2010 - 2011

22,000 reservations

1900 unique users



TRANSITION TO SAKAI UNDERWAY

Sakai, an open-source collaboration and learning environment, will replace Blackboard as UNC-Chapel Hill's learning management system (LMS) by December 2012.

After more than a decade with Blackboard, one might ask, "Why move?"

The move from Blackboard to Sakai will achieve three goals: maximize integration opportunities between our student information systems and the campus' learning management system; provide a unified framework for the comprehensive delivery of electronic content to residential, online, and lifelong learners; and maximize the efficiency of campus resources dedicated to the learning management system.

In Fall 2008, ITS launched a Sakai pilot with 18 courses. In just two years, the pilot grew to 81 courses with 120 sections.

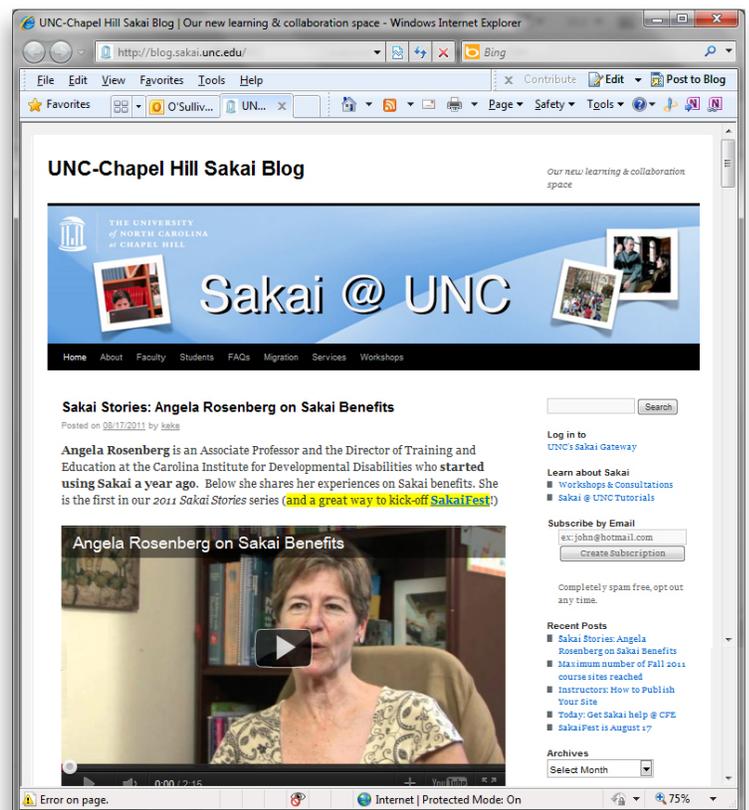
When surveyed in 2009, pilot participants indicated that when it came to functionality, Sakai tools were on par with Blackboard's, but Sakai offered additional flexibility for researchers, committee work, and other collaborations. Both students and faculty indicated that the open-source LMS was easy to use.

The Instructional Technology Coordinating Committee recommended that Sakai replace Blackboard. The decision to migrate to the Sakai system was finalized in October 2010 by the Information Technology Executive Steering Committee (ITESC), which is charged with overseeing the information technology governance structure and processes at Carolina.

"The potential opportunities—improvements in teaching and learning, making research collaboration across space and time easier, providing outreach opportunities to communities of interest, and affording greater institutional accountability efficiencies—help position ITS to better meet the needs of the Carolina community," said Charles "Charlie" Green, assistant vice chancellor of teaching and learning.

A number of UNC-Chapel Hill's peer institutions currently use Sakai. By participating in this active, vibrant community, Carolina benefits from a deep pool of existing expertise

Sakai @ UNC



The UNC-Chapel Hill Sakai Blog website

and can contribute to—and influence the future direction of—the application. In doing so, ITS will be better able to control and manage long-term costs and sustainability.

Running two learning management systems simultaneously

Although the Sakai application was vendor-hosted during the pilot period, when the decision was made to replace Blackboard with Sakai, it was also decided that hosting Sakai locally would be the preferable option.

Creating the infrastructure needed, purchasing and then setting up the hardware, planning for the data transition, and then transitioning from the hosted production system to the local ITS system required months of preparation and collaboration across many ITS teams, including Enterprise Applications, Infrastructure and Operations, Teaching and Learning, and the Project Management Office. Additionally, the ITS Response Center (ITRC) and other campus IT support units prepared to provide comprehensive support to faculty and students as needed.

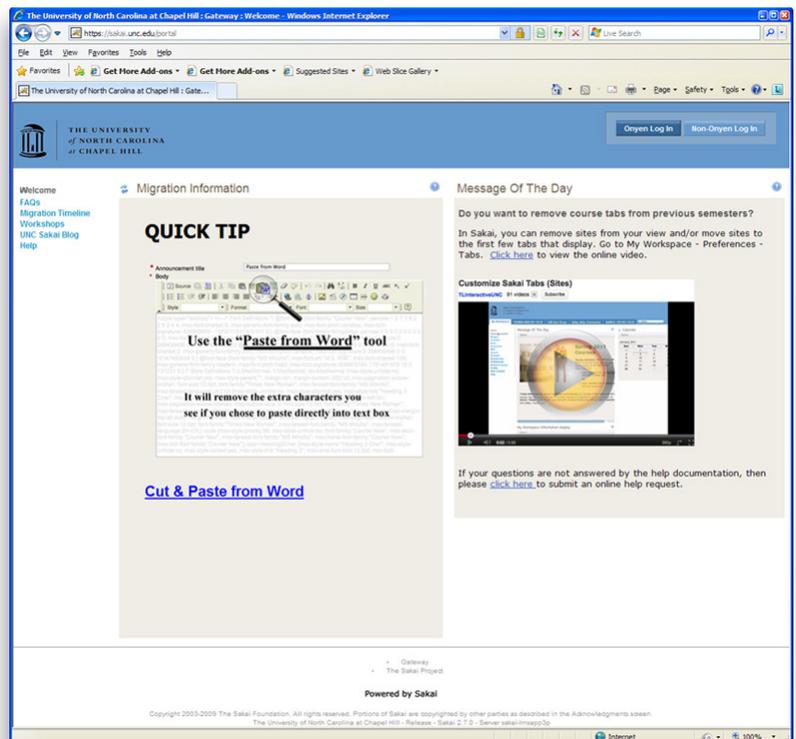
Until Blackboard retires in December 2012, ITS will host and support both Blackboard and Sakai. Running two learning management systems simultaneously requires intense planning, coordination, and resources.

How the transition will take place

With assistance from ITS and other information technology groups on campus, faculty and students have already begun the move to Sakai. The migration effort will continue through 2012.

One of the first initiatives mounted by ITS was to survey faculty about their preferred personal migration timeline and the type of Sakai assistance desired. The response was impressive, with 1094 faculty and instructors providing feedback. Results indicated that 43 percent of respondents preferred to start using Sakai for Fall 2011, and half reported wanting to learn Sakai on their own using the available resources.

Public information meetings, workshops and demonstrations, online tutorials, and one-on-one faculty consultations have laid a strong foundation for a smooth transition to the new learning management system.



The Sakai login page

IMPROVING CAROLINA'S INFORMATION SECURITY

In response to an audit of campus information security exposures last year by the State Auditor General's Office, Chancellor Thorp assigned Vice Chancellor for IT and CIO Larry Conrad overall responsibility for ensuring that the University's information technology systems, data, and infrastructure are appropriately protected.

With more than 30,000 attacks of varying sophistication and complexity each day on University systems, the scope of the challenge is extraordinary. Although there is no "magic bullet" that will guarantee safety, experience at universities around the nation has shown that a multi-layered approach with broad involvement and support from the University community can substantially reduce the risks.

ITS' Office of Information Security, in collaboration with IT leaders across campus, has designed a new, five-pronged approach to better secure the campus IT environment.

Policy Compliance

ITS is working to bring the campus into compliance with the ten existing Information Security policies, which can be found at <http://its.unc.edu/ITS/About ITS/ITS Policies/index.htm>.

Information Security Liaisons are first line of defense

Following the adoption of the [Information Security Liaison Policy](#) in June 2010, Stan Waddell, executive director and information security officer, began an initiative to expand the membership of the Information Security Liaisons. The current group now has more than 100 members, with representatives from all professional schools, the College of Arts and Sciences, research centers, and other major organizational units across campus.

The Information Security Liaisons group holds regular meetings to discuss policy, common goals, and concerns; share information about resources; and collaborate on information security issues. Current initiatives that involve the Information Security Liaisons group include laptop encryption, identifying servers that are mission-critical and/or host or process sensitive data, and the enterprise risk assessment project, among others.

...the scope of the challenge is extraordinary...

To recognize the contributions of the Information Security Liaisons in raising awareness of information security issues on campus, a luncheon was held in the Alumni Hall at the George Watts Hill Alumni Center on June 23. The keynote was delivered by Doris Gardner, special agent for cyber crime from the FBI office in Charlotte. She spoke on cyber attacks against universities, attack methods, the actors conducting the attacks, and motivations of the attackers.

Improve security for the campus network and servers from outside attacks

ITS deployed firewalls for approximately 30 clients this year, making an optional network firewall service available to departments and administrative units, whether hosted on campus or in the department. When requested, these firewalls protect high-risk servers, data storage, and the computers of

users handling sensitive data in the course of their work. ITS is also considering the configuration of existing devices to enhance security at the campus network border, including the blocking of problematic network traffic (e.g., denying hostile attempts at unauthorized remote control of desktops from the Internet), blocking file-sharing protocols in residence halls, and encouraging the use of the campus VPN by staff working off-site to secure access to campus resources.

Ensuring competent support and maintenance of servers

ITS is working to ensure that every campus server is supported and maintained by a competent systems administrator, appropriately trained in information security defensive techniques, and that IT security policies are followed. A new, multiphased approach will:

- Develop and identify all campus systems and system administrators—with a focus on servers with sensitive data and mission-critical systems
- Develop and conduct an on-campus information security training program for System Administrators
- Develop and implement a systems administration effectiveness assessment, monitoring, and remediation referral process
- Create a (fee-based) outsourced remediation process

Systems storing sensitive information should be assessed for vulnerabilities at least monthly and identified vulnerabilities must be remediated. A “three strikes” approach will be taken. After a third vulnerability failure, the system administration function must be outsourced.

Increased focus on research data and servers with sensitive data or that support mission-critical operations

It is important not to overlook research when attempting to reduce risk at Carolina. The data stored on research computers can be just as sensitive as the data on other campus computers. The information security plan for the University includes measures to manage risk in research environments. Research computers are also subject to review as part of the [System Administration Initiative](#).



Increased focus on encrypting laptops

[ITS' PGP Whole Disk Encryption Service](#) allows users to handle sensitive data securely on their laptops and mobile devices. When installed and used correctly, encryption can reduce the risk associated with the physical loss of such devices.

Encryption safeguards data from unauthorized access. If a protected system is lost or stolen while shut down or in hibernate mode, data stored on the protected drive is not readable without the proper credentials.

To enhance security, the University has implemented several new security solutions. In addition to PGP and departmental firewalls, tools for automated updates and authentication, as well as email encryption are being leveraged to protect sensitive data.

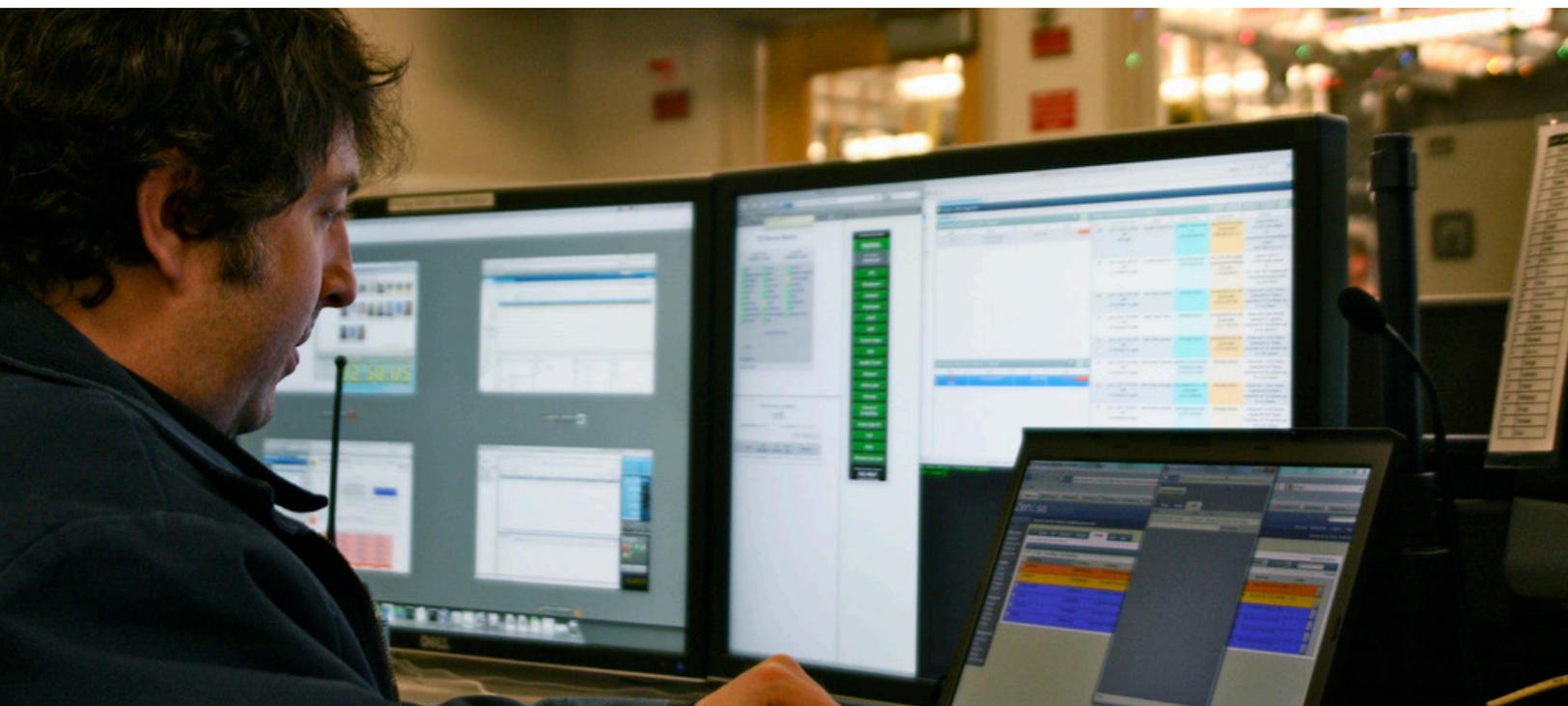
Encrypted email now available

[Encrypted email](#) is now available to users of the ITS-provided campus email system, in support of the Transmission of Protected Health Information and Personal Identifying Information Policy.

According to policy, Protected Health Information (PHI) and Personal Identifying Information (PII) that is transmitted or received by the University's computer systems, including mobile devices, must be encrypted when transmitted over wireless or public networks, including when transmitted via FTP and electronic mail.

ITS-provided campus email offers message encryption between the sender and off-campus recipient and can be received by any email user, independent of email client or operating system, without installing any software.

ITS is working with the campus community to provide secure data transmission while balancing control with openness, and while minimizing impacts on both financial and human resources.



THE “GIGIFICATION” OF CAROLINA

Until this past year, the majority of campus inter-building network links connected to the Internet at one GB per second. That rate helped the town of Chapel Hill gain the title of second fastest city network in the country.

In spite of this, increased requirements of research computing and data-driven applications (particularly those associated with biomedical functions) pushed those links to – and beyond – their capacity. “Data sets are exploding and increasing exponentially,” says Jim Gogan, director of networking. “Interdisciplinary research is bringing areas to the technology table at levels not previously seen. Our one GB per second links were saturated in research traffic zones. We had to upgrade.”

*“...we have provided higher throughput
while maintaining high security.”*

—Jim Gogan, Director of Networking

Network connections didn’t need to be upgraded just from point A to B, however. Connection upgrades were needed from the ITS data centers - point A - to points B,C, D, and others. Over the past several months, a dozen buildings with high research traffic have been upgraded to 10 GB per second.

To put that into context, it takes three hours to transfer one terabyte of data over a 1 GB link. A 10 GB link requires just 20 minutes.

But upgrading a substantial part of the campus network at significant cost was more than ITS, with its limited life-cycle funds, could afford.

“So the research community, particularly the Lineberger Comprehensive Cancer Center and the School of Medicine, provided significant financial support,” says Gogan. “And by working with Information Security to remove legacy bottlenecks from the backbone of the network, we have provided higher throughput while maintaining high security.”

Although upgrades have been completed based on the current levels of bandwidth utilization, the network will still need to be enhanced for larger bandwidth capacity in the future.

Over the next year—budget permitting—the 10 GB per second links will need to be extended not only to other buildings, but within buildings as well. And that’s not all. According to Gogan, links of 40 or even 100 GB per second are in our near future.

PROTECTING OUR NETWORK WITH NETWORK ACCESS CONTROL

In March 2010, the first phase of [Network Access Control \(NAC\)](#) scanned resident students' computers to ensure the machines had up-to-date anti-virus software, a firewall, and current system updates, thus protecting the University network and its users from virtual threats. This year, phase two began.

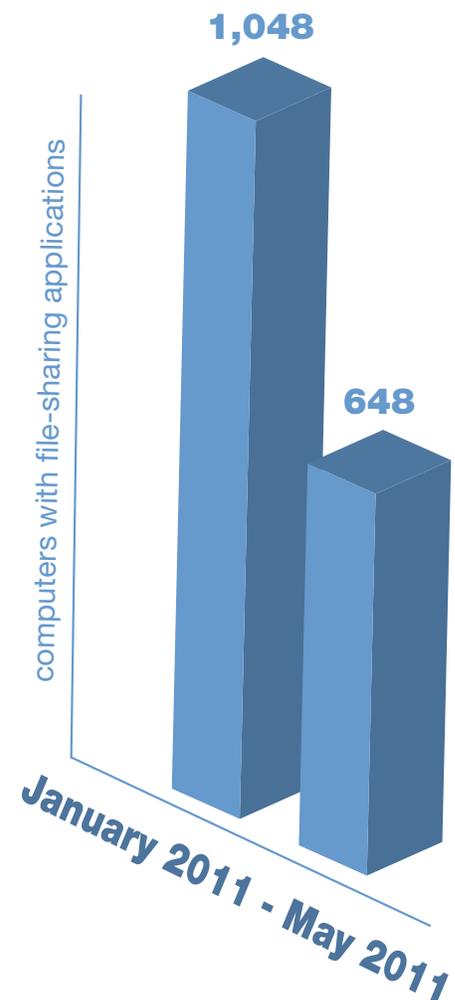


The majority of copyright complaints received by UNC-Chapel Hill are the result of the inappropriate use of file-sharing or peer-to-peer programs from on-campus residence hall computers. Many students who receive copyright infringement notices state that they were unaware that file-sharing software was installed or running on their computer. The Network Access Control (NAC) service now provides students with that information, hopefully before they are involved in a copyright complaint or worse, a lawsuit.

In January 2011, the NAC service began scanning student-owned residence hall computers for file-sharing applications (e.g., BitTorrent, LimeWire, etc.). If a file-sharing application is found, the computer's owner is notified via an automated pop-up that the program was found and that any inappropriate use (e.g., sharing copyrighted material) is a violation of the UNC Network Acceptable Use Policy. The service does not have the ability to inventory computer files or relay file information to ITS or any third party.

Has NAC been successful? The numbers speak for themselves.

After just five months, the number of computers with file-sharing applications dropped from 1048 to 683 out of a total of 8,025 scanned computers, a reduction of about 30 percent. The NAC service has improved the reliability, speed, and security of the UNC-Chapel Hill campus network. Not only has it reduced incidents of copyright violations, but it also has increased the bandwidth available to students for appropriate use.



ITS PARTNERSHIP WITH THE CENTER FOR FACULTY EXCELLENCE

ITS established formal ties with the [Center for Faculty Excellence \(CFE\)](#) three years ago through a creative staffing arrangement in which two consultants from ITS Teaching and Learning spend the majority of their time at the Center. This strategic partnership informs ITS support for academic technology by keeping faculty objectives and interests at the forefront. Through its active presence at the CFE, ITS is also better positioned to contribute to central instructional improvement and faculty development initiatives.

“CFE’s partnership with ITS has been an unqualified success with significant benefits to the CFE and, more importantly, to the UNC faculty and students,” says Ruth Walden, faculty director at the Center. The partnership continues to bear fruit during its third year.

Interactive classrooms

ITS and the CFE have initiated a campus discussion about the future of our classrooms and the importance of designing learning spaces around evidence-based teaching practices. Most college classrooms emphasize the presentation of information from instructor to students and use seating configurations that discourage interaction between students and movement throughout the classroom. With an increased emphasis on the importance of collaboration and active learning, ITS and CFE are partnering with several campus

units to implement experimental classrooms designed to facilitate interaction. Two new designs were piloted this past year.

311 Peabody, renovated in partnership with the School of Education, is designed to facilitate movement between lecture, small-group activities, and class discussion. The 48-seat room uses stationary desks that swivel 360 degrees and are configured in four clusters. Instructors and students who participated in the spring pilot reported higher levels of class participation and a greater sense of community.

The second experimental design, implemented in 208 Phillips in partnership with the Department of Physics and Astronomy, is based on a proven model developed at North Carolina State University that integrates separate lab and lecture activities. The 45-seat room uses round tables that seat nine students each, making it easy for instructors to move about the room. Classroom activities emphasize team-based, problem-solving activities.



Additional classrooms based on each of these designs will be renovated this year.



eQuality Essentials

ITS supports the CFE’s efforts to help faculty members and academic units deliver successful online programs and courses. In addition to the establishment of recommended quality standards and formal efforts to compare learning outcomes

of online and residential courses, the CFE worked with ITS Teaching and Learning Interactive to create a series of online short courses designed to prepare instructors to develop and teach online courses. The eQuality Essentials program launched last summer and has recently welcomed its third cohort of instructors.

Large-course redesign

The CFE and ITS continue to provide pedagogical, assessment, and technical support for large-course redesign projects in the College of Arts and Sciences. Building on campus course redesign projects in Math, Spanish, and Economics, a number of faculty members who teach large-enrollment courses are exploring the use of a new generation of online texts, simulations, and assessments that free up classroom time so faculty members can focus on higher-order learning activities. This past year instructors for two of the University's largest enrollment courses, Psychology 101 and Biology 101, have piloted redesigns.

In Professor Kelly Hogan's 400-student Biology 101 section, she has made extensive use of online learning activities to ensure that her students receive immediate feedback on key course concepts and are therefore prepared for class. She has also used a variety of instructional techniques during class to make the large lecture-hall envi-



ronment more stimulating. For example, students now use their cell phones and other hand-held devices to respond to questions during class. Initial evaluations suggest that the course enhancements have been particularly helpful for students at the highest risk of performing poorly in the course.

In Professor Beth Jordan's Psychology 101 section, the use of high-quality online exercises has allowed her to give up one of her two weekly lectures. During the spring semester pilot, students attended one lecture session and one recitation section each week. Early results suggest that students in Professor Jordan's class performed just as well as students in her traditional sections. Due in part to the structured use of the online exercises, students in the redesigned section were also significantly more likely to report coming to class prepared.

Professional Interests Manager

Given the competing demands on the typical faculty member's time, the CFE has to be careful not to inundate faculty members with information about professional development opportunities. The CFE has not had a convenient way to share information with faculty members and graduate instructors based on their individual interests.

Working with a team from ITS Enterprise Applications, the Center has developed a system called the Professional Interests Manager (PIM) that allows CFE staff to target resource updates based on profiles that users create online around their interests in teaching and learning, research, and leadership. The CFE believes that the system will:

- Improve the quality of professional development information sent out by making it more personalized and concise
- Provide a mechanism for engaging faculty members who do not generally participate in face-to-face CFE services and events
- Improve CFE awareness of issues important to faculty members

An eight-week pilot with 25 faculty participants was conducted at the end of the spring semester, and feedback was overwhelmingly positive. After several modifications are made to the system this summer, the CFE plans to roll out the PIM to all faculty members this fall.

CCI EXPANDS OPTIONS TO INCLUDE MACS

One of the first programs of its kind in the nation, the [Carolina Computing Initiative \(CCI\)](#) began promoting high-quality campus computing in the summer of 1997. CCI was developed to ensure that Carolina students, faculty, and staff have easy access to high-quality and affordable technology.

Students made the request, and ITS responded.

This year, for the first time in its more than 10-year history, the Carolina Computing Initiative will offer Lenovo products and Macintosh laptops to incoming students. With the growing popularity of Apple products and the decreasing differences between supporting Macs and PCs, the timing was right to extend the same high level of service that CCI Lenovo customers have enjoyed to students who prefer Macs.



Three MacBook Pros are now available through CCI. The computers come with a four-year AppleCare warranty, four years of all-risk insurance coverage, a customized software load, and on-campus support and repair. ITS negotiated on students' behalf to obtain discounted pricing beyond the standard educational discounts; they also negotiated the extension of the AppleCare warranty from the standard three years to four. Because Apple does not offer accidental damage insurance, CCI added Safeware insurance to ensure that students have coverage for almost anything that could happen to their laptop during their time at Carolina.

...the timing was right to extend the same high level of service [to] students who prefer Macs.

ITS staff underwent training to obtain Apple certification and will now repair both Apple and Lenovo products on campus. Additionally, students who choose a CCI laptop package will now be offered a Mac or Lenovo loaner laptop while their repair is being executed.

SASB MAKEOVER INCREASES UTILIZATION

It is counterintuitive to think that reducing the number of workstations in a computer lab would result in twice the usage, but that is exactly what happened this past year at the ITS computer lab located in the Student Academic Services Building (SASB).

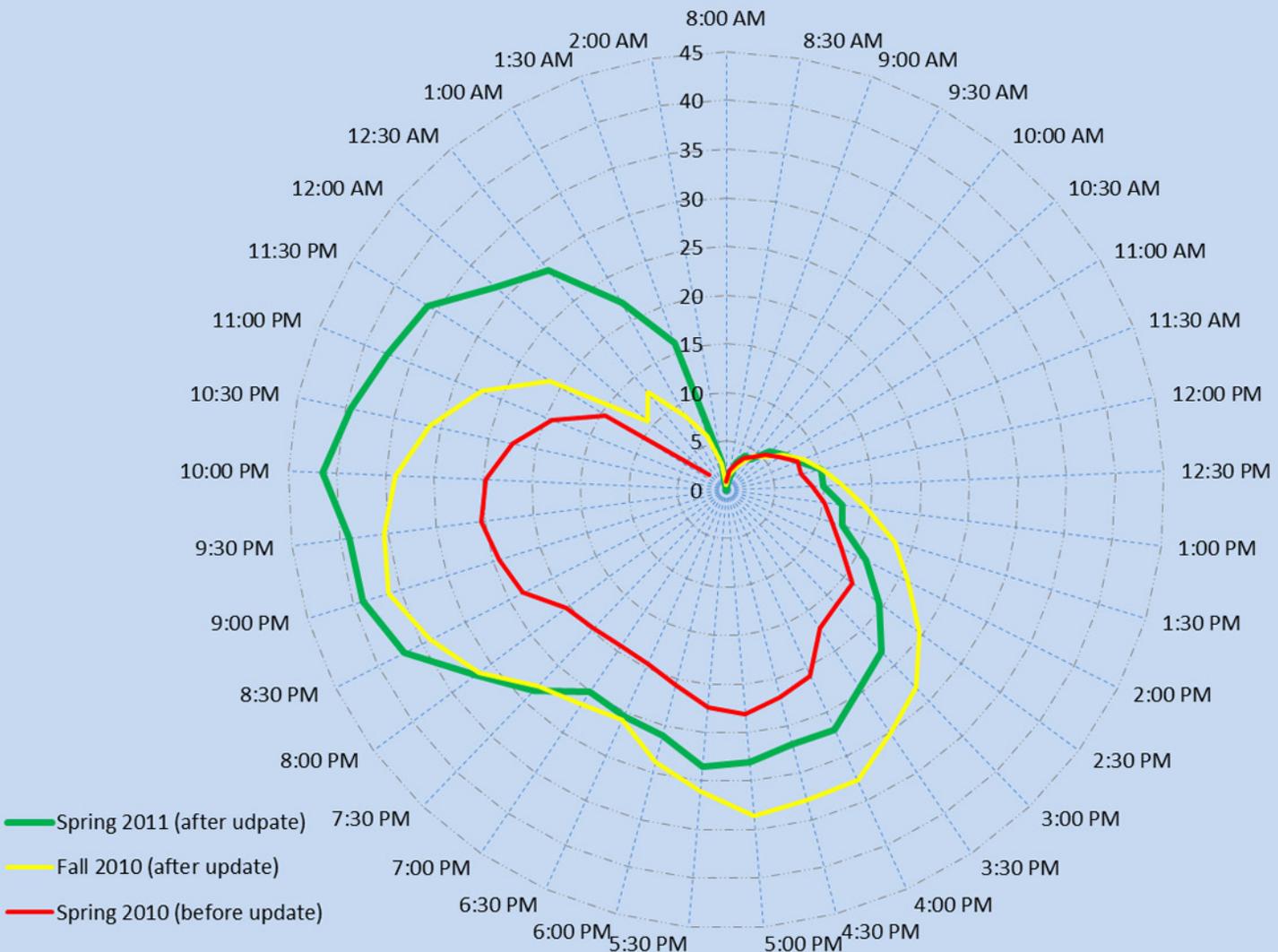
Redesigned to provide casual study areas for group collaborative work, the SASB lab is a hit with students. Response has been so favorable, in fact, that the lab extended its operating hours to 2:00 a.m.

While mobile computing is ubiquitous, inviting study space that encourages student group interaction is not. The SASB computer lab prototype has been so successful that discussions are underway to replicate the concept in library locations across campus. Early focus groups and student discussions have been supportive of the initiative.

The reinvention of the SASB Study Commons was a joint project between ITS, UNC Libraries, the Executive Branch of the UNC-Chapel Hill Student Government, and the Learning Center.

STUDENT USAGE OF THE ITS COMPUTER LAB LOCATED AT SASB SHOWED A MARKED INCREASE AFTER THE REDESIGN

AVERAGE USAGE BY HOUR PER SEMESTER



Redesigned to provide casual study areas for group collaborative work, the SASB lab is a hit with students.



TLI WINS NATIONAL AWARD

A promotional piece created for the William and Ida Friday Center by [ITS Teaching and Learning Interactive \(TLI\)](#) won the University Professional and Continuing Education Association's Bronze prize for Interactive Marketing: Streaming/On-demand Content.

The award-winning media, *UNC Friday Center: Real Life Continuing Education Stories*, represents a partnership between ITS-TLI and their Friday Center clients.

The ITS-TLI team collaborates with UNC-Chapel Hill faculty and instructors to create custom instructional media for use in traditional classrooms, hybrid classes, and e-learning courses. The TLI team also works with schools and departments to support their course and program design (or redesign) initiatives.



MONITORING SERVICES: HARD DATA IN REAL TIME

The ITS Control Center serves internal ITS colleagues, campus IT support, and the campus community as a whole through its service and system monitoring, and by facilitating and coordinating communications.

Having hard data in real time is vital to effectively monitoring the health of information technology services at Carolina.

Until recently, the ITS Control Center had an aging set of monitoring applications that had been created in-house some years ago. To reflect new ITS services, such as ConnectCarolina and Microsoft Exchange, the ITS Control Center upgraded its monitoring system from in-house custom applications to an out-of-the-box monitoring solution that integrates with ITS' incident management system, Remedy.

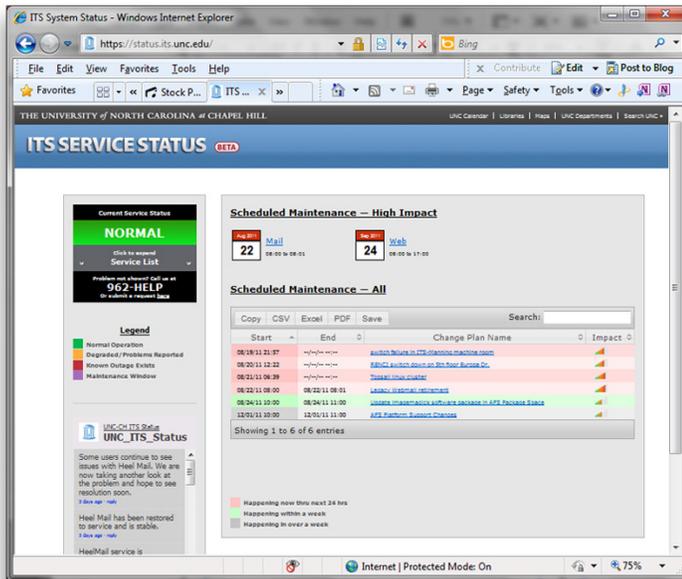
The site [status.its.unc.edu] is a one-stop destination for up-to-the minute information on ITS services status, including details of planned and unplanned service interruptions.

Service Assurance Monitoring, or SAM, is a suite of applications that provides multiple methods of monitoring to generate comprehensive data on the health of ITS services in a real-time environment.

With SAM, the ITS Control Center will be able to ascertain almost immediately when there is an outage or service issue and identify the service dependencies by determining if the failure lies within a server, database, or network switch. It will then use that information to quickly communicate the appropriate alert to the system administrator(s), in many cases before the customer is impacted.

SAM is being implemented in a phased approach. In 2010, the first three services moved into SAM: Remedy, Blackboard, and Kure (a research computing cluster). SAM now provides monitoring for 23 services affiliated with both ITS and non-ITS campus organizations. Next steps in the SAM implementation include the addition of the ITS-supported Microsoft Exchange service and applications in ConnectCarolina.

Also launched this year was status.its.unc.edu, which is available to any member of the campus community to check the health of a specific ITS-provided service. The site is a one-stop destination



for up-to-the minute information on ITS services status, including details of planned and unplanned service interruptions.

Although status and SAM are not yet fully integrated, ultimately the two will combine to provide real-time information directly from the Service Assurance Monitoring applications to anyone who needs it.

NETWORK ATTACHED STORAGE (NAS)

As part of the Carolina Counts initiative, and in partnership with campus departmental advisors, ITS has developed a scalable network attached storage (NAS) service. This long-term sustainable service will significantly reduce the cost of storage for campus units. The service is geared toward office productivity data.

The NAS initiative will provide 10 GB of home directory space for each faculty and staff member for personal use. An additional 10 GB of free storage for each faculty and staff member will be owned and managed by their respective department.

The NAS service will provide the following basic features:

- Common Internet File System (CIFS) network-accessible storage
- Centrally funded allocations
- A departmental option to buy additional capacity at modest cost
- Hosting in ITS data centers

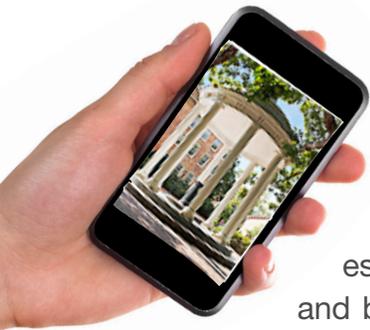
The service will use a shared administrative model. ITS will provision spaces and manage the environment, backups, disaster recovery, and business continuity. Departmental administrators will manage user access and access controls, and conduct restores within their own spaces. End users will be able to service their restores themselves.

The NAS service will be available in late summer 2011.

IMPROVING OUR CUSTOMERS' MESSAGING EXPERIENCE

The move to Exchange

When the UNC-Chapel Hill campus community expressed the need for an improved messaging user experience with better integration for calendars and mobile devices, ITS responded and began the campus-wide migration of units using ITS' centrally-managed IMAP e-mail system (webmail.unc.edu, imap.unc.edu) to a centrally-supported Microsoft Exchange platform.



A robust solution that includes integrated email and calendaring, Microsoft Exchange is designed to provide “anywhere” access; deliver rock-solid integration with mobile devices; improve quality of service and security; and be more operationally efficient to deploy, manage, and maintain.

The move to Microsoft Exchange also provides a messaging and calendaring service under one central ITS-supported platform, which was strongly urged by the Carolina Counts initiative.

ITS collaborated with campus units over several months to identify and work with unit coordinators, who determined the email transition timeline for their organization and acted as the communication channel between ITS and the migrating unit. ITS, campus unit coordinators, and the ITS Response Center worked together closely to facilitate the transition to the Exchange platform, ensure clear and timely communications, and resolve challenges as they arose.

As part of the transition to Exchange, users migrated from the Oracle calendar system to Exchange in October 2010. This complex move to a new calendaring system was challenging, but with the collaboration of several ITS teams and the campus unit coordinators, the challenges were overcome and all active Oracle calendar users were simultaneously migrated.

In October 2011, all remaining faculty and staff using the ITS-managed IMAP service began the final transition to Microsoft Exchange in a phased process over several weeks.

QUOTA INCREASE

In response to campus feedback, all Exchange inboxes were increased from one gigabyte to two gigabytes. The quota increase helped remove any barriers that could impede the campus transition to Exchange. For users who require more than two gigabytes of storage, a for-fee service that supplements the default quota and provides increased storage is now offered.

HeelMail, the student solution

After a lengthy evaluation process, the UNC-Chapel Hill Executive Branch of Student Government chose Microsoft Live@edu as the new student email solution. The selection was based on its customizable options and its ability to integrate with the ITS-managed Exchange service for faculty and staff.

...the new system offers students a more modern interface.

Dubbed “HeelMail”, the new system offers students a more modern interface than the current Web-mail, as well as collaboration tools, a calendar, and integration with the ITS-managed Exchange email system for faculty and staff.

Beginning this past spring, students were able to self-migrate from the centrally ITS-managed IMAP system (webmail.unc.edu, imap.unc.edu) to HeelMail. Activities sponsored by Student Government encouraged students to opt in and included a Last Day of Class barbecue, giveaways, drawings for Xboxes, and more.

The move to HeelMail will be mandatory for all students in fall 2011.



UPGRADING VOICE SERVICES

ITS examined the University's 20-year-old telephone technology and saw an opportunity for substantial improvement. Initiating a Request for Proposal (RFP) in May 2010, ITS sought to obtain a robust, cost-effective telecommunications solution that met the needs of faculty, staff, and students, while capitalizing on existing campus infrastructure and emerging technologies.

The Voice Services RFP Evaluation Committee, composed of representatives from across campus, reviewed and evaluated the proposals. After in-depth study, the committee awarded the bid to Verizon Business on the basis of cost and advanced Voice over Internet Protocol (VoIP) services.

Implementation is scheduled to begin Sept. 1, 2011 and will take two years to complete.

NEUTRAL HOSTING: BETTER RECEPTION, NO COST

"Can you hear me now?" Too often the answer is "Barely," or worse, "No!" Faculty, staff, students, and visitors frequently report areas of marginal or no mobile phone or cellular coverage on campus. To improve those communications, ITS has initiated a neutral hosting solution to provide ubiquitous voice, 4G, and Long Term Evolution (LTE)* coverage.

A consortium of carriers led by Verizon will construct, operate, and maintain a system that distributes carrier signals through fiber-optics and a distributed antenna system to various campus locations, providing and improving coverage both inside and outside of buildings.

One hundred percent of the cost for the neutral hosting is paid by the carriers. Although the carri-

ers will use the University's fiber-optic infrastructure, floor space, and power, they will construct and pay for the distributed antenna system that carries and broadcasts the signals.

Construction on the distributed antenna system began in early June 2011. The entire project is scheduled for completion by Dec. 31, 2011.

So in 2012, if someone asks, "Can you hear me now?" the answer should be a resounding "Loud and clear!"

NEW COMMTECH RATE MODEL

The Communication Technologies Coordinating Committee has completed an approximately yearlong task force study to produce a [recommendation on a new rate model](#). The recommendation has been reviewed by the Budget Committee, Chancellor's Cabinet, Dean's Council, and Information Technology Executive Steering Committee.

The new rate model differentiates core services from optional services. The core services, including the on-campus data networks and public safety phones (among other things), will be funded from a percentage assessment against diverse sources, along with direct funds where possible. The optional services, including telephony services and off-campus data networks, are funded on a pay-as-you-go basis through chargeback to units who elect to use them. Overhead costs will be distributed by prorated shares across core and optional services.

The target date for implementation is the start of fiscal year 2012-2013.

**An advanced wireless mobile radio technology*

“7” SAVES TIME AND MONEY

Accidentally calling 911 has been an easy mistake to make at Carolina. To make long distance calls from a landline, customers dialed “9,” then “1”. All too often, a second, unintentional “1” followed.

Each year, there are about 4,900 misdialed or hang-up 911 calls at Carolina. These calls require the University’s emergency dispatchers to verify that there is no true emergency, sometimes by dispatching a Department of Public Safety officer to locate the caller and confirm that he or she is safe. The annual cost of such calls exceeds \$48,000.



To save time and money, ITS and the Department of Public Safety partnered to change the dial-out prefix to [“7” instead of “9”](#) for outside calls. Substantially reducing mistaken 911 calls allows public safety officers to focus on genuine safety situations.

TASK FORCE TO CONSIDER RESEARCH DATA STEWARDSHIP

In March 2011, ITS and other campus representatives attended the first meeting of the Provost’s Task Force on the Stewardship of Research Data.

The group is tasked with making recommendations concerning the storage and maintenance of digital data produced in the course of UNC-based research. It will address the roles of individual researchers, departments and schools, and the University as a whole.

Topics under consideration include different data types, data sets with substantial size variation, appropriate security for different data sets, and which data needs to be retained and for how long. Governance issues such as data ownership, stewardship, and access will also be addressed.

The Task Force, chaired by Gary Marchionini, Dean and Cary C. Boshamer Distinguished Professor, School of Information and Library Science, is currently identifying its deliverables, researching best practices, surveying faculty, and defining stewardship principles.

Recommendations are expected to be submitted to the Provost at the close of the 2011 calendar year.

WELCOMING NEW EMPLOYEES TO ITS

As the saying goes, you have only one chance to make a good first impression. This year saw the implementation of a new onboarding and orientation process to welcome new employees more effectively to ITS.

Feedback from extensive staff meetings with Larry Conrad, vice chancellor for information technology and chief information officer, made it clear that ITS needed to dedicate additional time and resources to ensure that new ITS employees fully understood the basics of ITS' role and responsibilities.

The result was a new onboarding procedure, created by representatives from several ITS teams. The procedure includes the assignment of a "buddy," who acts as an information resource, answering both unit-specific and organizational questions; a checklist that ensures the new employee has all the necessary information and resources to be effective immediately; and an in-person orientation.

“The orientation was thorough, explained the key resources and touchpoints, and really made me feel a part of the ITS organization.”

AN ITS COMMITMENT TO OUR CUSTOMERS

This past year, ITS made a strong commitment to enhancing both internal and external customer service. The [ITS Customer Service Initiative](#) was created in response to feedback received from the Bain Report and the findings and recommendations of an outside consultant.

The Customer Service Initiative (CSI) Committee, consisting of ITS employees from all units and levels, was established in November 2010 with a mission to develop a grassroots program that will drive a cultural shift in our organization and promote a unified and positive service model.

Over the past months, the CSI Committee has developed a multi-part strategy, with subcommittees designing and enhancing various strategic elements. As these strategies are implemented, they will further advance our goal of providing excellent customer service to all.

The mission of the Customer Service Initiative is to develop a grassroots program that will drive a cultural shift in our organization and promote a unified and positive service model.

STRATEGY, SERVICE, SUCCESS

Information Technology Services' mission is to empower the University community through information technology. We hope that this annual report, with its highlights of selected initiatives we've undertaken in the past year, gives you an idea of how ITS is working to support the University's goals and meet the technology needs of our campus customers in a changing and demanding IT environment. Specifically, we hope that the projects and services we've touched upon in this report offer a clear indication of how we:

- *Provide reliable IT infrastructure to the University community*
- *Maximize the utility of IT assets*
- *Lead the development of University IT strategy*
- *Develop and implement standards and services consistent with IT strategy*
- *Provide leadership and guidance in the use of IT*

ITS' vision is to be not just an IT leader, but also a valued strategic partner in the University community. This past year has provided many opportunities to be both. As we leave one fiscal year behind and charge ahead into an even more challenging one, we're confident that ITS will continue to achieve its vision—one initiative, one innovation, and one success at a time.



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