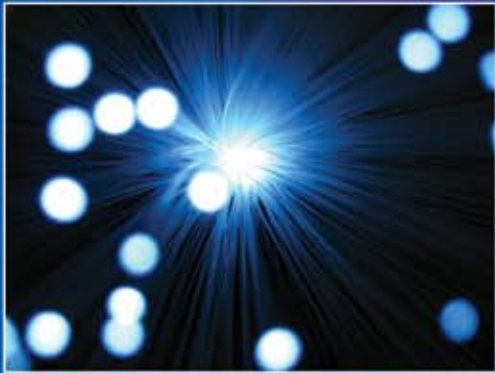


Campus Network Upgrade Project

Progress Report



CITES

Campus Information
Technologies &
Educational Services

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



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CAMPUS NETWORK UPGRADE PROJECT PROGRESS REPORT

Campus Information Technologies and Educational Services (CITES) at the University of Illinois at Urbana-Champaign and the Academic Network Advisory Group (ANAG) are pleased to announce that significant progress has been made on the Campus Network Upgrade Project.

“After more than two years of planning and work, we’re very proud of the progress that has been made so far on the project,” said Bill Goodman, assistant dean for administration and technology, College of Applied Health Sciences, and ANAG chair.

CITES is currently just over two years into the project, an ambitious five-year, \$20-million initiative that began in late 2004 to upgrade more than 260 campus buildings with the latest in state-of-art data networking technology.

In the majority of buildings on campus, most data cabling has not been updated in more than 20 years. Much has changed in networking technology in the intervening two decades, including computer and network usage on campus. In order to meet the increased demand, CITES staff, in cooperation with academic units, academic advisory groups, and Facilities and Services (F&S), is now in the process of upgrading the campus network to meet the current needs of the University and to plant the seeds for future growth.

So far, 55 percent of the project’s net-assignable square footage has been completed at 50 percent of the allotted budget, according to Paul Lucas, project manager of the Campus Network Upgrade Project at CITES. Work continues today so that by 2010 every building on campus will be equipped with a data network that will be orders of magnitude faster, more reliable and secure than pre-2004 campus levels, while also being scalable to meet the changing needs of the campus community networking technology and evolving networking technology.

According to Paula Kaufman, interim chief information officer (CIO), modernization of the network to meet the needs of a top-tier public research university is necessary for many reasons.

So far, **55%** of net-assignable square footage has been completed at **50%** of the allotted budget.

“Upgrading the campus network allows us to stay competitive with the networking capabilities of peer research universities, which helps us to attract and retain the best and brightest researchers, faculty, and students,” she said.

In the first two years of the project, CITES has completely upgraded 22 campus buildings, including David Kinley Hall, Altgeld Hall, Gregory Hall, the Graduate School of Library and Information Science (GSLIS) building, the Law Building, and Foellinger Auditorium, and the electronics (installing new routers and switches, for example) in 22 buildings, including Noyes Laboratory, Loomis Laboratory, and Everitt Laboratory.

Moving into its third year, the project’s focus will shift away from upgrading larger buildings to smaller ones. The savings in terms of manpower, cost, and time efficiencies that have been honed and refined for the past two-plus years will be put to the test in this new phase. Costs per square foot will increase but are expected to stay within the total budget.

WHY?

Why upgrade the campus network? Some of the benefits of the new network include:

Staying Competitive: An upgraded network guarantees that Illinois’s networking capabilities are ready for the demands of a world-class public research university.

Higher Quality: The improved connectivity allows for innovative methods of online teaching, learning, and scholarship.

More Information, Faster: Large files of data can move seamlessly from building-to-building on campus, to databases off-campus, and beyond to peer universities and research institutions. Transfers that once took hours can be completed in minutes or seconds.

Ready for Tomorrow: CITES has built scalability into the current network upgrade to stay ahead of the technological curve.

Increased Security & Reliability: Since the project began, network reliability has been 99-plus percent. The network is now more secure and less vulnerable to threats and malicious attacks.

GOALS

100 Megabits per second (Mbps) connections to the desktop of every computer on campus.

1 Gigabits per second (Gbps) connections to each campus building from the campus backbone network.

Multiple 1 Gbps connections to the commercial Internet.

10 Gbps connections to the national research networks, e.g., Internet2 (I2) and the National LambdaRail (NLR).

1 Gbps connections between Communications Equipment Rooms (CERs) in each building.

UIUCnet wireless coverage in all “public space” on campus.

Improved CERs for every building to allow all upgraded electronics to work in optimal conditions.

Category 6 data cabling to replace all Category 3 data cabling. (Category 6 cable can transmit data **almost 300 times faster** than Category 3 cable.)

New conduit, raceway, and cable trays for easy installation of new and improved cabling in future decades.

100 MBPS TO THE DESKTOP OF EVERY COMPUTER ON CAMPUS

UIUCnet, the campus data network, has become an essential component of everyday life at Illinois. UIUCnet is a resource that virtually everyone on campus—students, faculty, staff—has come to depend on for carrying out the University’s mission of education, research, economic development, and public engagement.

Because the campus network has become so critical to the day-to-day functioning of the University, one of the goals of the Campus Network Upgrade Project is to bring 100 Mbps connectivity to every computer desktop on campus connected to a UIUCnet jack.

“Upgrading the campus network allows us to stay competitive with the networking capabilities of peer research universities, which helps us to attract and retain the best and brightest researchers, faculty, and students...in order to fulfill Chancellor Herman’s mandate to make Illinois the top public research university in the world and the best possible place to learn, teach, research, and work.”

— Interim CIO Paula Kaufman

Why is this increase in bandwidth so important for campus connectivity? Well, do you remember that old 56k dial-up modem so prevalent a decade ago? The time to download a 50-megabyte file (for example, podcasts of a professor’s lectures; a multimedia presentation; a large research project with data, pictures, and charts; an advertising project with photo illustrations) over dial-up would be anywhere from 5 to 10 hours. With 100 Mbps connectivity, that same transfer could be completed in a matter of seconds.

For students, faculty, and staff members at the University, a modern network will result in:

- Quicker, easier access to online courses, lectures, and research materials.
- Faster downloads of desktop video, multimedia, and other bandwidth-hungry applications prevalent on campus today.
- Easier access to online learning and collaboration tools (wikis, blogs, and course management systems, for example) thanks to improved network reliability.
- Increased UIUCnet Wireless coverage.

For researchers at the University, a modern network will result in:

- Decreased download and upload times of data and research, especially large data sets.
- The ability to share information more easily and faster with colleagues. Working with collaborators from across the country will be just as easy as if they were down the hall.
- Greater flexibility to adapt to emerging technologies (Voice over Internet Protocol (VoIP) phone service, for example), ensuring that the campus will be ready for the technologies of tomorrow.
- Increased firewall and traffic management capabilities at the network entrance and exit to and from campus, allowing data transfer speeds of up to 10 Gbps to satisfy the demands of research computing.

BLANKET UIUCNET WIRELESS COVERAGE

Another goal of the Campus Network Upgrade Project is to provide UIUCnet Wireless access to all interior public spaces on the Urbana campus. By the end of 2006, UIUCnet wireless coverage had expanded to more than 60 percent of classrooms and labs on campus. When the upgrade is complete, 100 percent of all “public space” in campus buildings will be covered by UIUCnet Wireless.

With blanket UIUCnet wireless coverage in all public spaces on campus, students (over 70 percent of whom own a laptop computer) will be able to take their network connection with them—to the Undergraduate Library, the Illini Union, or Foellinger Auditorium—and still be fully connected to UIUCnet. Faculty and staff will be able to communicate with students and each other without being tethered to an Ethernet jack.

Between classes, students can check their email, perform research on the Web, and prepare assignments. A wireless connection provides full access to all UIUCnet resources, including CITES Express Email, CITES NetFiles, and Illinois Compass. Through our licensed Virtual Private Network (VPN) system, they’ll be able to stay connected with full access to university resources wherever they are—off-campus, at home, out of state, even out of the country.

PREPARING FOR TOMORROW

Upgrading the network is a necessary prerequisite to prepare both for the future growth of the University and the upcoming convergence of voice and data communications. By building scalability into the project, CITES is helping the campus stay ahead of the technological curve.

“This is a golden opportunity for the University to capitalize on the work associated with the Campus Network Upgrade Project to lay the groundwork for future advances in telecommunications,” Interim CIO Kaufman said.

Initiatives and technologies that would not have been possible before the project began—VoIP, remote storage and backup (critical for successful disaster and business continuity planning), high-definition videoconferencing, and multicast machine imaging, for example—are now all viable options for the University thanks to advances in networking capability brought about by the Campus Network Upgrade Project.

Since 1998, data traffic on the University network has increased by 450 percent; since 2002, almost 200 percent. Network bandwidth usage at the University has grown (and continues to grow) at an exponential rate. Over the course of the next 10 years, CITES conservatively projects network usage to increase by at least 10 percent per year, which makes upgrading the campus network that much more urgent and necessary.

“With the increased day-to-day use of the network for communications, research, and information sharing,” Kaufman said, “having a modern, reliable, and secure network becomes even more critical in order to fulfill Chancellor Herman’s mandate to make Illinois the top public research university in the world and the best possible place to learn, teach, research, and work.”

MORE ABOUT THE CAMPUS NETWORK UPGRADE PROJECT

For more information about the Campus Network Upgrade Project, please visit the Campus Network Upgrade website, a clearinghouse for all network upgrade information:

<http://www.cites.uiuc.edu/projects/netupgrade/index.html>

To follow a building’s upgrade progress, or to track its metrics and milestones, please visit the Campus Network Upgrade Project Building Status page:

http://www.cites.uiuc.edu/projects/netupgrade/build_status.html

NUMBERS

The first two years of the Campus Network Upgrade Project, by the numbers:

27,766

New 10/100 Mbps Ethernet switch ports installed.

18,785

New Category 6 data jacks installed.

2,650

New Gigabit Ethernet ports installed, each capable of transmitting data orders of magnitude faster than pre-upgrade electronics.

1,002

Additional wireless access points installed across campus for increased UIUCnet Wireless coverage.

95

New or retrofitted Communications Equipment Rooms (CERs) built with state-of-the-art cabling, proper power, controlled access for additional security, and vastly improved temperature controls for optimal operating conditions.

SUCCESS STORIES

INSTITUTE OF LABOR AND INDUSTRIAL RELATIONS

For Mark Johnson, manager of system services with the Institute of Labor and Industrial Relations (ILIR), the Campus Network Upgrade Project has helped ILIR's networking needs in numerous ways, but none more so than with basic file backup.

"Before, we were limited in that there was no way to back up our data with the 10 Mbps feed in our building," he said. "Once our building was upgraded, we were able to back up all of our data with no problems."

Previously, no one at ILIR moved data to a shared server because "it was too slow," he said. "Now, if a computer goes down, it's not the end of the world because their data is backed up on the shared server."

Another advantage to having an upgraded building is the ease of sharing data with peer universities and institutions.

"We can share data with our colleagues at Cornell University a lot easier than before the upgrade. Previously, we had to mail them a disc of files. Now, we can just share it with them over our high-speed connection."



Institute of Labor and Industrial Relations

"Before...there was no way to back up our data with the 10 Mbps feed in our building. Once our building was upgraded, we were able to back up our data with no problems."

— Mark Johnson, ILIR

DEPARTMENT OF CROP SCIENCES

Charlie Smyth, manager of system services for the Department of Crop Sciences, College of Agricultural, Consumer and Environmental Sciences (ACES), said the network upgrade to Turner Hall represents a huge saving in terms of time and reliability.

"It used to take eight to 12 hours to image the computers in our teaching lab, and I would constantly have to worry about crashing our network," he said. "We had three different sets of network hardware plus software that didn't play well together and could bring down the network if used incorrectly."

Now, with uniform hardware and software along with better switches and wiring through the Campus Network Upgrade Project, Smyth can do it in under 25 minutes and doesn't have to worry about crashing the network.

Smyth also noted that the increased connectivity brought about by the upgrade has also led to greater ease in moving and sharing data to other parts of campus.

"Now, we have servers in three buildings plus a server at the South Farms that can all work together seamlessly," he said. "We can simply do a lot more now than we could before the upgrade."



Turner Hall

"It used to take eight to twelve hours to image the computers in our teaching lab....Now, I can do it in under 25 minutes....We can simply do a lot more now than we could before the upgrade."

— Charlie Smyth, Dept. of Crop Sciences

FULLY-UPGRADED BUILDINGS

1101 St. Mary's Road
1207 Oregon Street
1210 Springfield Avenue
Altgeld Hall
Animal Science Laboratory
Architecture Building
Atmospheric Sciences Building
Children's Research Center
Davenport Hall
David Kinley Hall
Foellinger Auditorium
Freer Hall
Gregory Hall
Graduate School of Library and Information Science (GSLIS)
Ice Arena
Illini Hall
Institute of Labor and Industrial Relations (ILIR)
Law Building
Main Library
Meat Science Laboratory
Music Building
Rehabilitation Clinic
Speech & Hearing Building
Surveying Building
Technology Commercialization Laboratory
Turner Hall
University High School
University Press
Veterinary Medicine, Basic Sciences
Veterinary Medicine Teaching Hospital

FULLY-UPGRADED BUILDING ELECTRONICS

1203 Oregon Street
608 S. Matthews Street
Assembly Hall
Astronomy Building
Campbell Hall
Center for Advanced Study Building
Chemical and Life Sciences Laboratory
Coble Hall
Edward R. Madigan Laboratory
Engineering Sciences Building
Everitt Laboratory
Illini Union Bookstore
Loomis Laboratory
Materials Science and Engineering Building
Mechanical Engineering Building
Medical Sciences Building
Motorcycle Safety Office
Newmark Laboratory
Superconductivity Laboratory
Talbot Laboratory
Transportation Building
Waste Management Building
Willard Airport (selected buildings)

IN-PROGRESS BUILDINGS

1203 W. Nevada Street
1208 Springfield Avenue
708 S. Matthews Street
Agricultural Engineering Sciences
Agricultural BioProcess Laboratory
The Armory
Art & Design Building
Art East Annex I
Burnsides Laboratory
Ceramics Building
Child Development Laboratory
Computer Applications Building

Education Building
English Building
Foreign Languages Building
Harding Band Building
Harker Hall
Huff Hall
Illini Union Bookstore
International Studies Building
Krannert Art Museum
Krannert Center for Performing Arts
Medical Science Building
Milking Parlor

Minority Student Affairs Building
Natural History Building
The Observatory
Personnel Services Building
Plant Sciences Laboratory
Seitz Material Research Laboratory
Stock Pavillion
Turner Student Services Building
Taft House
Veterinary Medicine, Surgery &
Obstetrics
Waste Management Laboratory

All building progress as of May 1, 2007

Academic Network Advisory Group (ANAG)

In managing the five-year Campus Network Upgrade Project, one of CITES responsibilities is to ensure that all campus units receive equal representation in the network upgrade planning process.

In order to ensure equal representation, the Academic Network Advisory Group (ANAG) was convened to advise the Chief Information Officer (CIO) on all matters related to the project.

Bill Goodman (Chair)

Assistant Dean for Administration and Technology
College of Applied Health Sciences

Paul Hixson

Assistant Dean
College of Agricultural, Consumer, and Environmental Sciences

Deanna Raineri

Associate Dean
College of Liberal Arts and Sciences

John Rossi

Assistant Dean
College of Law

Beth Sandore

Associate University Librarian

Michael Bragg

Associate Dean for Research and Administrative Affairs
College of Engineering

Ex Officio

Michael Andrechak

Associate Provost for Budgets and Resource Planning

Bill Riley

Associate Vice Chancellor for Student Affairs

John Dempsey

Executive Director of Facilities and Services

Deb Forgacs

Assistant Director of Facility Management and Scheduling

Paula Kaufman

Chief Information Officer (Interim)

Beth Scheid

Director of Communications Technologies, CITES

Mike Smeltzer

Director of Network Communications, CITES

Clark Wise

Director of Capital Projects, Facilities and Services

Stan Yagi

Assistant CIO, Information Technologies, CITES

Academic Deans' Liaisons (ADL)

The Academic Deans' Liaisons (ADL) act as the sole and final authority for programmatic priorities within their respective colleges, working collaboratively with representatives of their respective units. The liaisons also determine whether CITES efforts on the network upgrade meet the needs of the colleges.

College of Agriculture, Consumer and Environmental Sciences

Robert Easter (Dean)
Paul Hixson (Liaison)

College of Applied Health Sciences

Tanya Gallagher (Dean)
Bill Goodman (Liaison)

College of Business

Avijit Ghosh (Dean)
Zvi Ritz (Liaison)

College of Communications

Ronald Yates (Dean)
Eric K. Meyer & Mitch Kazel (Liaisons)

College of Education

Mary Kalantzis (Dean)
W. Ryan Thomas (Liaison)

College of Engineering

Ilesanmi Adesida (Dean)
Michael Bragg (Liaison)

College of Fine and Applied Arts

Robert B. Graves (Dean)
Lew Hopkins (Liaison)

Graduate College

Richard Wheeler (Dean)
Sally Mikel (Liaison)

Graduate School of Library and Information Science

John Unsworth (Dean)
Ken Spelke (Liaison)

Institute of Labor and Industrial Relations

Joel Cutcher-Gershenfeld (Dean)
Mark Johnson (Liaison)

College of Law

Heidi Hurd (Dean)
John Rossi (Liaison)

College of Liberal Arts and Sciences

Sarah Mangelsdorf (Dean)
Deanna Raineri & James Kirkpatrick (Liaisons)

College of Medicine

Brad Schwartz (Dean)
Richard Schimmel & Tod Jebe (Liaisons)

School of Social Work

Wynne Korr (Dean)
Debora Huisinga (Liaison)

University Library

Karen Schmidt (Acting University Librarian)
Beth Sandore, Jeff Schrader & Scott Walter (Liaisons)

College of Veterinary Medicine

Herbert Whiteley (Dean)
Ginger Winckler & Craig Flowers (Liaisons)



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