UNIVERSITY OF COLORADO AT BOULDER • Spring 2008

oneonone

INFORMATION TECHNOLOGY SERVICES

Welcome to *oneonone with Information Technology Services* at the University of Colorado at Boulder! Once each semester, the *oneonone* is delivered to all faculty and staff mailboxes on the CU-Boulder campus. In addition to the *oneonone*, ITS publishes news stories that are timely and relevant on the ITS website at **www.colorado.edu/its/news**.

We hope you find this issue useful. Please e-mail **oneonone@colorado.edu** if you have any questions or comments. Additionally, if there is anything you'd like to see covered in this publication, please let us know.

Academic Technology

From vinyl to iPods: CU-Boulder's new academic technology unit

by Deborah Keyek-Franssen

Academic Technology might be the new kid on the block in the Chief of Technology Office (CTO), but it's headquartered in a space that has been home to similar units since 1931, when Academic Media Services moved to the third floor of the Stadium. Seventy-seven years of teaching and technology vibes keep us rooted in CU's history, even as we look ahead to shaping the campus's technology environment to best support teaching and learning.

The mission of Academic Technology is fourfold. The unit:

- Provides strategic leadership in academic technology use and deployment, facilitating faculty participation in decisions about IT and disseminating research about the effectiveness of that use;
- Plays a leadership role in shaping and improving the campus's IT environment by conducting evaluations of academic technologies and their use, as well as needs assessments to help determine what technologies might best support teaching and learning; and
- Provides consultative support (teaching, training, pedagogical brainstorming) for faculty using academic and classroom technologies and multimedia in their teaching, research, creative works, and outreach.

Consultative academic technology support has become a mainstay on campus over the past decade. Distributed Academic Technology Coordinators (DATCs)

Continued on page 5.

ITS Mission

Information Technology Services (ITS) is the primary information technology provider on the CU-Boulder campus, with services for telephony, media, computing, and networking. Our mission is to provide and promote information technology services that support the mission of the campus and provide leadership for the changing information technology environment.

In This Issue

Help Evaluate Emerging Technologies for Teaching

Do you like exploring new technologies and how they might be used in teaching? Would you be willing to participate on a team that scans the horizon for emerging technology, evaluates those new technologies, and publishes the results of those evaluations? If so, you may be interested in joining the Emerging Technologies Evaluation Group. This group was described in the campus IT strategic plan (see Section 1.2 of the report, which is located at **www.colorado.edu/vpact/itsp**. Between six and eight rotating members will work closely with the Academic Technology unit and with IT Council. Members will present the findings of their analyses to the campus and to the broader academic community, and will directly influence the campus's academic technology environment. If you are interested in participating, please contact Mark Werner (**Mark.J.Werner@Colorado.Edu).**

COLTT Conference is Revived

Back by popular demand, the University of Colorado at Boulder will host the newly-revived Colorado Learning and Teaching with Technology Conference (COLTT) in the ATLAS Building, August 12-13. Cosponsored by CU's Office of Academic Affairs, CU-Boulder's chief technology officer, and the ATLAS Institute, COLTT provides a forum for exploring practices, theory, and issues at the intersection of technology, learning, and teaching. More information about this year's COLTT can be found on page 4.

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A Word from Dennis Maloney

Norlin Learning Commons: Innovative Learning Spaces

Dennis Maloney, Chief Technology Officer

As the first phase of the grand Norlin Library Revitalization plan, the Learning Commons is considered to be the next generation of facilities to enhance student learning. It is well known that students are early adopters of emerging technologies, relying upon tools such as laptops and wireless networking, as well as making significant use of ever-evolving social and collaborative software. Meeting the learning needs of students necessitates an understanding of both the way students learn and where students learn best.

Since the primary motivation is to enhance student learning, Norlin Library, as the primary information and research resource on campus, is the ideal location for the creation of a transformed student learning environment. By combining library content, technology, and seamless information services, the new Learning Commons will become the focal point for student learning activities around the clock. The Commons will also include a renovated space for the Writing Center further supporting the Libraries' close academic partnership with the Program for Writing and Rhetoric.

As digital natives, students are forever evolving their learning methods and styles. Today's students are collaborating in informal settings where comfort and accessibility to learning resources are readily available. The creation of space that enables both learning and social interaction is important to today's students. Current trends show that students are collaborating in both formal (faculty assigned) and informal (ad hoc student study groups) ways. Key design criteria for the Learning Commons includes providing space that enables students to easily create informal collaborative areas. This flexibility is essential to introducing the notion of timelessness in the space design as student learning needs are guaranteed to change over time.

The Learning Commons also exemplifies an ever-growing partnership of the Libraries and campus IT. The campus IT mission is to provide and promote information technology services that support the mission of the campus and provide leadership for the changing information technology environment. The Libraries' mission is to provide materials, information, and services central to the university community's discovery, communication, and use of knowledge. Our partnership in the Commons is critical to the support of the learning needs of the students today and in the future.

Thanks to contributor John Culshaw of University Libraries
Associate Professor, Interim Associate Director for Administrative Services

At left is an artist's rendition of the new Norlin Library vestibule, which will provide a direct entrance into the Learning Commons. The first floor reference desk design is pictured above. You can learn more about the project at: **http://ucblibraries.colorado.edu/learningcommons**.

A Look Inside IT Architecture and Program Management

by Jon Giltner

The IT Architecture and Program Management group within the CTO's office performs two related functions:

- Enterprise Architecture – Setting technology strategies and standards for campus IT infrastructure, and developing those strategies into actionable plans.
- Program Management – Setting strategies for IT services, developing strategies into actionable plans, and overseeing on-going service value and effectiveness.

Both functions focus heavily on the business mission, processes, and priorities of the campus and the university.

An example illustrates the difference between technology strategy and service strategy. The technology direction for the campus wireless network was to cover as much of the campus as practical with 802.11b/g—commonly known as Wi-Fi. The technology direction recognized that, while maximum coverage is a desired outcome, there is a trade off between maximizing coverage area by minimizing the signal overlap between wireless access points, and maximizing performance, which calls for stronger, overlapping signals. Considering how the campus wireless network will be used, favoring performance was our technical direction.

Technology strategy is also concerned with evolving standards such as evaluating when it is appropriate to upgrade to higher bandwidth 802.11n wireless and what the infrastructure implications of that change will be. The service strategy is more concerned with the user experience and business needs. An example related to wireless is whether to allow open access to the wireless network and if not, determining how the need for "guest" access will be addressed.

We try to view all IT applications and services in a programmatic context. In part, this means we attempt to answer the following questions relating to any particular application or IT service:

- Who is the customer and what needs are being addressed?
- How do those needs relate to the stated objectives and mission of the campus and the university?
- What similar needs exist within the university and how are they being addressed?
- What is the norm in the higher education community and in industry for applying IT to meet a set of needs?
- What is the state of the art or what novel approaches are being applied to certain business needs?
- Which needs appear to be unique to a particular business function and which appear to be more "infrastructure" in nature?
- When is it OK for a solution to drive the business?

Researching and documenting the answers to these questions guides the creation, deployment, and operation of the IT services that we support for the campus. It also helps us understand how we can better support specific departmental IT needs.

Considering services in a programmatic context also means thinking long term about services. Program management is part of the life-cycle management of any service, and service strategies are updated over time. Part of a service strategy is establishing the business purpose and objectives of the service. Program management and its corresponding long-term view include continually assessing whether services are meeting those business objectives.

Pragmatically, what we really do is talk with people, read stuff, and write stuff. We talk with people—many of you—to understand the needs of the campus and then collaborate to establish business objectives. We read stuff—lots of stuff—to research various technologies, products, and services and how other universities and private industry are addressing their similar business needs (this also involves talking with a lot of people). Finally, we write stuff to document conclusions and recommend actions.

To document strategic direction, we follow the model established for creating the most recent (2006) campus IT strategic plan (see **www.colorado.edu/vpact/itsp**). A strategic direction statement—whether it is technology-specific or service-specific—consists of a short summary statement, a brief background of the business need or problem, a list of very specific business objectives to be met, and a list of very specific recommendations for meeting them. As with the IT Strategic plan, our desire is to get as much broad input from customers and other stakeholders as possible.

Communication is our key challenge: how do we get all available input in a timely way? And how do we communicate strategic direction to campus? We very much rely on the relationships we have with IT, academic, and business leaders across campus and strive to make these relationships stronger while building new relationships. We are also working on an appropriate manner of making our work available via the web and using technology to foster collaboration. Stay tuned for more information. In the mean time, don't hesitate to contact any of us about any suggestions or thoughts you have on improving the campus IT infrastructure and services.

The IT Architecture and Program Management Group:

- Jon Giltner (jon.giltner@colorado.edu) – Director
- David Wood (david.wood@colorado.edu) – Networking and Voice Services Program Manager
- Michelle Clifford (michelle.clifford@colorado.edu) – Instructional Technologies Program Manager
- Jim Dillon (jim.dillon@colorado.edu) – Administrative Systems and Data Services Program Manager
- Eric Galyon (eric.galyon@colorado.edu) – E-mail and Calendaring Program Manager
- Jeremiah Adams (jeremiah.adams@colorado.edu) – Enterprise Architect

Faculty Focus

COLTT

Back by Popular Demand: The 11th Colorado Learning and Teaching with Technology Conference

On August 12 and 13, 2008, the University of Colorado at Boulder will host the newly-revived Colorado Learning and Teaching with Technology Conference (COLTT) in the ATLAS Building. Cosponsored by CU's Office of Academic Affairs, CU-Boulder's Chief of Technology Officer, and the ATLAS Institute, COLTT provides a forum for exploring practices, theory, and issues at the intersection of technology, learning, and teaching. The conference will draw faculty, instructors, graduate students, instructional technologists, faculty development experts, administrators, and staff of higher education institutions from across the Rocky Mountain region.

COLTT 2008 features both traditional and interactive sessions. Conference research presentations will highlight case studies of educational technology use and "big picture" topics such as emerging technologies in academe, and the theoretical and pedagogical frameworks that can be used to understand academic technology use. Learning circles, a new addition to the conference, encourage networking between participants through action-oriented discussions about how to apply technology to learning and teaching challenges. Finally, hands-on sessions, including formal workshops and drop-in sandbox sessions, allow participants to acquire the technology skills they need to enhance teaching and learning.

Carl Wieman, physics professor from CU-Boulder, 2001 Nobel Prize winner, and 2004 U.S. Professor of the Year, will give COLTT's keynote address. Other conference highlights include a workshop by Jennifer Serventi of the National Endowment for the Humanities that will educate participants about the agency's grants in support of work in the digital humanities. CU-Boulder's interactive theater troupe will present a performance about student experiences with social networking tools.

COLTT began in 1996 as a faculty development program for the CU system. The last event in 2005 attracted over 250 faculty, researchers, administrators and staff from colleges and universities across Colorado.

Conference details and a form for submitting presentation proposals can be found on the conference web site at **www.cu.edu/coltt**. Questions about the conference can be directed to either Deborah Keyek-Franssen, conference director (**deblkf@colorado.edu**) or Jill Lester, conference coordinator (**jill.lester@colorado.edu**).

Academic Technology Needs Assessment

The academic technology unit is embarking on a campus-wide needs assessment to gather data about what technologies will best meet teaching and learning needs of faculty and graduate students. The research design for this project includes three different data collection methodologies. DATCs (Distributed Academic Technology Coordinators) will interview select faculty in their schools and colleges about teaching challenges and needs, and how those can be met with existing and emerging academic technologies. Academic Technology leaders will interview faculty in the natural and social sciences, where there is no DATC coverage. A series of more technology-specific online focus groups will bring together faculty from across campus to discuss needs related to smart classrooms, incremental changes to CULearn, collaborative and social networking tools, and rich media serving. Time and energy permitting, an all-faculty survey will allow faculty who weren't part of interviews or focus groups the opportunity to provide much-needed feedback. The data collected during the needs assessment will be fed into the campus's IT project management process as we collectively determine what changes should and could be made to the campus's centrally-supported academic technology environment.

Questions that will be answered during the course of the needs assessment include:

- What incremental changes to CULearn would most benefit faculty and students? How do pedagogical needs influence classroom space design and technology enhancements?
- What should the smart classroom of the future look like and why? What technology tools should it include?
- How does the use of rich media (e.g., digital video and audio, video capture of classes) improve teaching and learning? What tools and services would be best for faculty and student use of multimedia?
- What collaborative and social networking tools and what immersing digital environments would best support the varied pedagogical approaches across campus?

If you would like to be involved in interviews or focus groups, or just want to get your two cents in, please contact Deborah Keyek-Franssen (**deblkf@colorado.edu**). Your participation and input are both valuable and welcome!

Notes from the Field of Academic Technology

Adriana Raudzens Bailey of CIRES didn't need to hang out at Schwab's Drug Store in Hollywood in order to break into the movie biz. In fact, her recent video, featured both on the CU home page and on the Boulder Daily Camera's website, was strictly a homegrown affair. Using CIRES footage and ATLAS media lab resources, Adriana produced a lovely short video that informs viewers of CIRES' involvement in carbon cycle studies in the southern oceans. That's a wrap!

On March 12, CU Jazz professor John Gunther hosted a multi-city Internet jam via iChat. Jazz students were able to musically interact with two east coast universities in real time. Thanks to telecom folks for 100 feet of loaner Ethernet cable at the last minute!

Kate Starbird (Ph.D. student in the ATLAS Institute) is working with Margaret Eisenhart (School of Education) to develop a visualization program to map and analyze Blackberry communications and website (drupal) postings of girls from seven high schools (three in Denver; three in the Des Moines, Iowa area; one in Columbus, Ohio) who are participating in a three-year NSF project designed to spark the girls' interest in engineering and information technology. The outreach and research project, "Female Recruits Explore Engineering" (FREE), began in fall, 2006 under Margaret's direction. Kate joined the team in Fall, 2007, and took responsibility for developing the computer program after attending a colloquium on visualization which was sponsored by the Institute of Cognitive Science. The girls use the Blackberry technology and a website to communicate with one another about their project work; Kate's computer program takes the data from the Blackberry server, organizes it by communication thread (who is talking to whom), and displays the connections visually.

Architecture and Planning students prepare to don those 3D glasses! Meredith Banasiak of Environmental Design has applied for a grant to fund the installation of a Geowall, a 3D projection system, for the college. She plans to teach a studio where students can design in immersing virtual reality in Second Life.

Students work on team projects in the ATLAS Building's TAM lab.

Mobile computing makes any space a learning place.

Academic Technology (continued from cover)

serve faculty in every school and college, assisting them in integrating technologies into their teaching, research, and creative work. The experts in the Digital Media Services unit, housed on the third floor of the ATLAS Building, assist faculty and students with the development of digital images, video, and multimedia content for teaching and as learning projects.

Academic Technology hosts several EDUCAUSE Learning Initiative webinars and roundtable discussions each year in Stadium 367, the conference room at the far northeast edge of the building. These webinars provide opportunities for faculty and staff to discuss how the topics may apply to our campus.

Two articles in this oneonone issue highlight other aspects of the unit's mission: a needs assessment for educational technologies is underway this semester (see "Academic Technology Needs Assessment" on page 4); faculty are invited to help influence the campus's technology environment through that process, as well as by participating in the new Emerging Technologies Evaluation Group (see "Help Evaluate Emerging Technologies for Teaching" in the sidebar on the cover).

Questions, opinions, even rants about academic technologies (the tools or the unit) are always welcome, and can be directed to Deborah Keyek-Franssen, Director of Academic Technology (**deblkf@colorado.edu**) or Mark Werner, Manager of Instructional Support Services (**mark.werner@colorado.edu**).

Deborah Keyek-Franssen, Ph.D., is associate CIO for academic technology initiatives in the office of academic and campus technology.

Campus Network Upgrades: A Higher Level of Performance

by David Wood

Several changes to the campus network are in the works – all designed to improve overall network performance and reliability. Most of these changes are part of the Information Technology Infrastructure Improvement Program Plan (ITIIPP) which has been funded with fees that students voted to assess themselves. Because this project is supported with student fees, we are permitted to use these funds for upgrades only in General Fund buildings.

The first part of this project dramatically increased the wireless coverage across campus, increasing the number of wireless access points on campus from about 300 to nearly 1,800. This has resulted in fairly ubiquitous coverage in most General Fund buildings across campus and, thanks to close collaboration with Housing, in many residence halls. The wireless network is designed to provide a uniform experience everywhere on campus; thus "UCB Wireless" looks the same in Williams Village as it does all the way across campus in Old Main. The campus wireless network does require that you register your wireless device but this does not seem to have been a problem for the over 20,000 wireless devices that have been registered.

The largest and most notable project is the rewire of the campus from category 3 cabling to category 5e cabling. While this means little to most people, the effects are large. Primarily, it means that we can provide 100 Mbps Ethernet service on all rewired jacks, and, in the future, that same wiring will support Ethernet at ten times that speed. This also allows us to more easily support network devices that get their DC power over the same wires as their network connection. Rewiring of the General Fund buildings on campus is about 50% complete. We are working with the owners of non-General Fund buildings to help them with similar upgrades to meet the needs of their occupants.

Following closely on the heels of the rewire is the conversion of all 10 Mbps Ethernet connections in the General Fund buildings to 100 Mbps by changing the ports on the campus network switches to "auto-negotiate" the speed. If the customer's system is similarly configured, the two systems will automatically decide to run at 100 Mbps.

Another, mostly behind the scenes, upgrade has been the replacement of 500 network switches in the General Fund buildings. The new switches are more secure than the old switches and have more capabilities to manage traffic flow. For example, the new switches are much better at ensuring that one misbehaving system cannot degrade the service for the other systems on the same switch.

The campus has three, nearly independent, connections to the commodity Internet. Late in the fall semester, one of those connections was running at its maximum limit and was causing some performance problems. By the time this publication reaches you, we expect to have that connection back in full service at the desired level. This has required some hardware changes that should last us another year until we upgrade to a new Gigabit Ethernet connection from some yet to be determined Internet service provider.

Lastly, we are in the process of upgrading the campus backbone from 1 Gigabit Ethernet links to 10 Gigabit Ethernet links. This will help us ensure that the backbone links are not overwhelmed by all those systems that we have upgraded from 10 Mbps to 100 Mbps. Additionally, at some point we will want to be able to achieve Gigabit speed across the campus backbone for special applications while not degrading performance for the rest of us.

Upgrading to 10 Gigabit Ethernet links required that we change the power for all of our backbone routers from 120 VAC to 208 VAC. Since all of our backbone routers are on Uninterruptible Power Supplies (UPSes), this required that we upgrade most of those UPSes too. We have taken this opportunity to increase the length of time that we can continue to provide backbone network service in the face of a power outage, and in the Telecommunications building we have completed the first of several steps to improve the reliability of the power for not only the campus backbone, but also for the telephone system and several critical servers.

David Wood is program manager for Networking

Fourth Phase of Wiring Upgrade Update

The project to update voice and data wiring in general fund buildings is about to enter the fourth phase. This phase includes the following buildings:

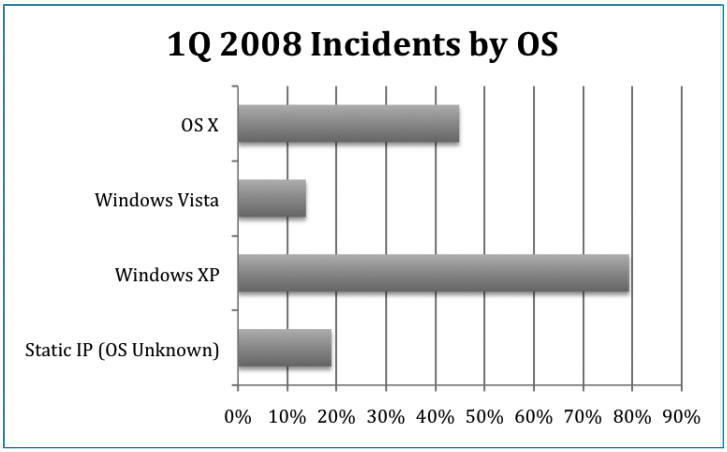
- ARCE - RL3
- Benson Earth Sciences
- CASA
- Computing Center
- Continuing Education
- Discovery Learning Center
- Economics
- Ekeley
- Humanities
- IBG
- ITLL
- Ketchum
- Litman Research - RL1
- LSRL - RL4
- Marr Alpine Lab
- Norlin
- Regent
- Res. Park Greenhouse
- SLL (Nuclear physics)
- TB97
- University Club
- Woodbury

Check out the voice and data wiring upgrade site at **www.colorado.edu/its/networking/rewire.**

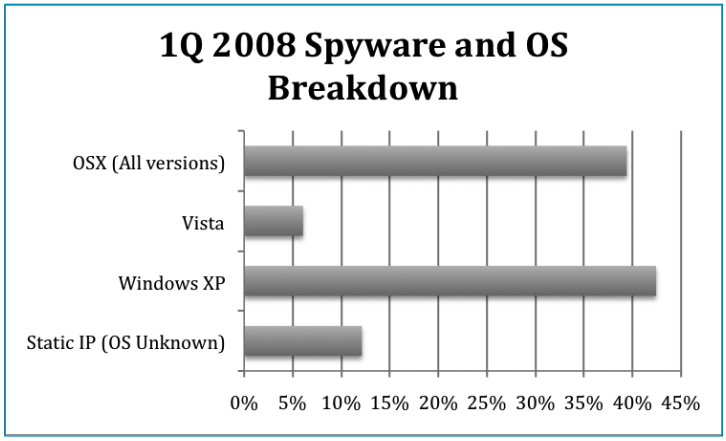
Network Security Enhancements and Apple Surprises

by Dan Jones

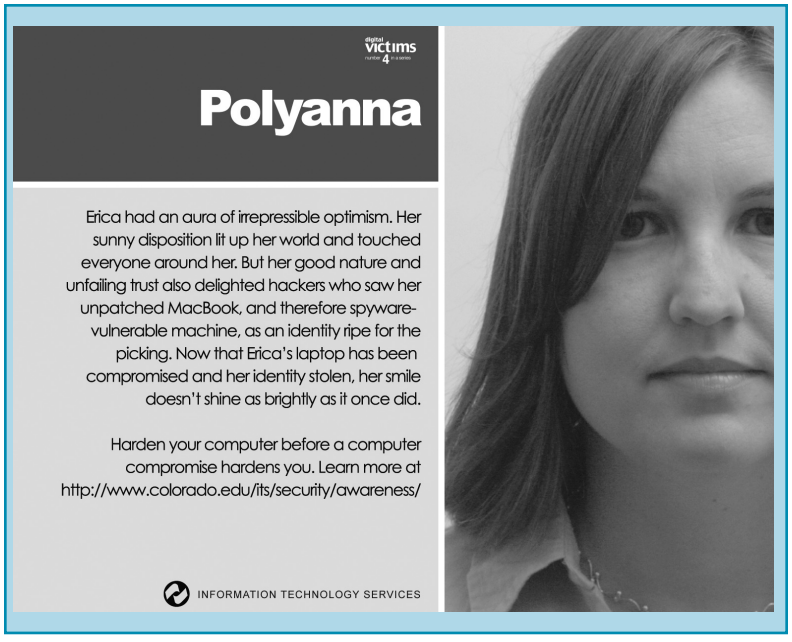
Work completed in January by ITS Networking and the IT Security Office (ITSO) to implement network security improvements is already showing rewards. New systems allow the ITSO to rapidly filter for anomalies and other signs of attack. Examples of what the ITSO is looking for include systems that may be sending spam or systems connecting to malicious servers or "botnet" controllers. In less than a month, the ITSO has quarantined close to thirty infected computers.



One filter reveals systems attempting to send DNS traffic to a network known to be the source of many attacks: the Russian Business Network (RBN). The ITSO has quarantined quite a number of hosts—both Microsoft Windows and Apple OS X—that have been attempting to send DNS queries to an RBN DNS server. So, why is it a problem that the system is pointing to a rogue DNS server? An attacker can learn a lot by monitoring the rogue DNS server while the customer does not even suspect anything is amiss since the DNS server will—at least initially—just pass on the correct address. Soon, however, the attacker learns a great deal about the unsuspecting victim such as that the owner of the system banks with Bank of America or that the computer checks Apple for updates on a daily basis. The attacker can then create a bogus Bank of America site to collect passwords and, with a quick change to their DNS server, they can force the system to now go to their malicious banking site.



Some might be surprised that Apple OS X is mentioned in the previous paragraph. Ever since the *Month of Apple Bugs* (January, 2007 **www.securityfocus.com/brief/397**) many in the security community have predicted that we would see increased attacks against Apple's OS X operating system. For the entirety of 2007, we did not track a single incident of spyware for OS X. In general, most OS X incidents involved weak passwords allowing an attacker in via SSH or other remote access. Unfortunately we are now seeing a definite increase in successful attacks against OS X involving spyware. In fact, OS X currently accounts for 39% of spyware incidents.



What do we think is involved in this recent trend? One theory is that, with Apple's increase in market share, there is a corresponding increase in its juiciness as a target (juiciness is a highly technical security term). Given the perception that OS X is more secure, many OS X customers do not take necessary security precautions with their systems. We believe, in most cases, that the user actually had to agree to install the spyware. Perhaps Apple's marketing campaign alluding to freedom from security concerns does not serve their customers well.

Dan Jones is the director of campus IT security at CU-Boulder.

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ITS Associates and Partners Recognized

The Spring 2008 IT Support Community Event recognized Computer Support Representatives (CSRs) who have completed the work for certification. They include, front row, left to right: Cheryl Foland, Housing & Dining IT Services; Patrice Thoresen, Housing & Dining IT; Elizabeth Barton, School of Law. 2nd: Rebecca Rowley, ATLAS Institute; Karen Sites, Philosophy; Bryan Walker, UMC Administration; William Franz, EBIO. 3rd: Bryan L. Friberg, Sr., Housing & Dining IT; Jeffery Buffington, Housing & Dining IT; Tim Gendorf, Libraries. Not pictured: Tim Price, Housing & Dining IT Services; Trent Warren, Libraries.

The Small Print

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