



<http://it.ucdavis.edu/it.times/>

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IT Revamps Divisional Web Site

Workgroup Addresses Administrative Unit Review Recommendations

By DONNA JUSTICE

The Division of Information Technology (IT) has a new Web site. To be launched on November 29, IT's new divisional Web pages will provide intuitive, user-centered navigation and content.

Over the years, various IT units have developed their own Web pages in an effort to make information available to the campus. Consequently, IT ended up with multiple versions of the same information and a fragmented image. Users are sometimes unaware they are viewing information about IT, unable to discern the connections between departments within the Division or to find the services they need.

Certainly this problem is not unique to IT. Any Web surfer knows that most Web pages leave a lot to be desired. Most sites lack a coherent navigation scheme, and far too many emphasize snazzy graphics at the expense of clear and relevant content. But, like UC Davis' Public Communications Office who recently revamped the main campus site, IT has come to understand how crucial the Web is to its communication efforts. More and more, the public (and IT clients specifically) relies on the Web as the primary path to information.

Based on recommendations from the Five-Year Administrative Unit Review (AUR) (<http://it.ucdavis.edu/adminrev/re->

[port](http://it.ucdavis.edu/adminrev/re-)) and feedback from students, faculty, and staff, IT initiated Project Swordfish last February. "It was clear that the way we had organized our services and information on IT's Web pages was not meeting the needs of faculty and students," says John Bruno, Vice Provost-Information and Educational Technology. "Project Swordfish is a direct outcome of our efforts to be

see IT Site on page 4



The Division of Information Technology's new Web site features user-friendly content and navigation. One major change is a focus on IT services rather than departments.

"Distributed Learning": LEADING the Campus into the Future

By DONNA JUSTICE

Of all the challenges UC Davis faces in the next decade, first and foremost is the need to accommodate a diverse and ever-growing student population. How can the campus meet the physical and academic demands that lie ahead? More importantly, how can we help students and faculty to create a richer, more collaborative learning environment in the face of those challenges?

One solution that many leading universities are exploring is "distributed learning." Distributed learning is not merely a fancy new way of describing computer-assisted instruction. Rather, it is a new paradigm that holds the potential to revolutionize the way in which students and faculty interact on modern university campuses.

In a distributed learning environment, the need to create a physical space for instruction (classroom) at a specific time (10 a.m. every Tuesday and Thursday) is alleviated. In the new paradigm, a "class" could be held at any time, from any location, and include any number of instructors and students. For instance, a professor could conduct a class in real time with a group of students in various locations (e.g., study hall, dorm, or coffee shop) through the use of the latest distributed learning technologies (i.e., cutting-edge software and hardware that enable multiple users to work from virtually any location, using any kind of computer). Ultimately, distributed learning will augment traditional classroom learning to maximize the potential of the University and the students. Any network that supports this type of instruction must facilitate communication and efficient document-sharing across platforms using different operating systems (Windows, UNIX, Macs, etc.), software applications, and network connections.

Last fall, as a first step toward establishing a plan for distributed learning, the Division of Information Technology (IT) initiated the Learning Environment Architecture Development (LEAD) Project. Working with a cross-section of the campus community, LEAD is exploring the opportunities to make distributed learning a reality on this campus. LEAD is sponsored by the

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LEAD

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Academic Computing Coordinating Council (AC4) and is, in part, a response to the recommendations for improving UC Davis' academic infrastructure made in IT's Five-Year Administrative Unit Review (April 1999).

"To implement the necessary infrastructure of a distributed learning environment, we need to first have an understanding of the alternative technologies involved," says Vicki Suter, IT-Distributed Computing Analysis and Support and LEAD Project Manager. "Through close monitoring of what the market and comparable institutions are doing and have done (especially early adopters), we are beginning to identify what it would take to build a distributed learning network here."

An important part of LEAD's assessment process is to identify the unique needs and technical abilities of UC Davis staff, faculty, and students. "Before UC Davis can build a distributed learning network, we need to know where to invest," says Suter. "Infrastructure is expensive, so we don't want to invest in the wrong infrastructure or in an infrastructure that doesn't meet the critical needs of the campus."

But any infrastructure needs to be built in accordance to a set of standards. And the standards needed to govern a functional distributed learning network don't yet exist. In fact, this lack of common standards is one of the biggest challenges faced by any university interested in building its own distributed learning network. To address this challenge, UC Davis participates in national efforts led

by EDUCAUSE, an international nonprofit organization committed to facilitating the convergence of technology and instruction.

In 1997, EDUCAUSE initiated the Instructional Management Systems (IMS) Cooperative (made up of sponsoring organizations including UC Davis, other universities, hardware and software manufacturers, nonprofit and commercial institutions). The goal of the IMS project is to identify the standards needed to build a global system for distributed learning—an "Internet architecture for learning." To understand the importance of this work, we can compare it to the way an architect and a builder go about constructing a home. The architect creates a blueprint which the building contractor follows to build the house. Both experts rely upon a set of standards and codes governing the building of all homes within a given area. Eventually, the standards identified by IMS could be the "technical glue" applied to a global network of distributed learning.

So how do we get from here to there?

The first steps have already been taken. After one year, the LEAD team has met its goals for the first phase of the project:

- Assess new software applications, communications and networking technologies which should be considered for use at UC Davis.
- Inform the campus about these and related technologies. The LEAD team, along with the Teaching Resources Center and Arbor staff, have given monthly workshops aimed primarily at faculty on issues related to distributed learning (see <http://lead.ucdavis.edu/events.html> for details). In addition, the LEAD team has surveyed and in-

terviewed hundreds of staff, faculty, and students to assess current uses of technology for learning and teaching (see sidebar).

- Assist in the development of a campuswide distributed learning infrastructure and framework that can support diverse learning styles.

- Identify critical issues, such as security, privacy, and copyright considerations and recommend solutions that can be applied campuswide.

Sponsoring two "think tank" meetings is one of the most valuable activities the LEAD team has conducted, according to Suter. The first was held in May. Visitors from Arizona State University, UC Berkeley, and Buena Vista University consulted with LEAD team members and other campus representatives about some of the challenges of creating a technical infrastructure for distributed learning at UC Davis. The second, focusing on recommendations for implementing distributed learning at UC Davis, was held on November 17–19.

Through these discussions and careful monitoring of what other universities ("early adopters" of distributed learning, such as UC Berkeley, MIT, University of Michigan-Ann Arbor, Carnegie Mellon, and Indiana University) are doing, the LEAD team has learned a great deal about how UC Davis measures up.

"UC Davis is not, nor does it aspire to be, an early adopter in most areas of instructional technology infrastructure," says Suter. "We try to maintain a position with the 'early majority.' UC Davis is a little ahead of the rest of the early majority in terms of its directory infrastructure (which conforms best practices as they are currently being defined, even though its foundations were built several years ago), networking infrastructure, and authentication/security.

"UC Davis is trailing in the use of distributed file systems and interactive communication and collaboration tools, although individual faculty have actually done some early and substantive work in this last arena," says Suter.

Next Steps

In late December, the LEAD team will submit a final report to the AC4 and John Bruno, Vice Provost for Information and Educational Technology. The report will outline the team's findings and recommendations. Once the next steps are agreed upon, an implementation plan will be drafted and



Photo credit: Jeff Van de Pol

Completing surveys pays: Dr. Linda Morris, Chair of the Department of English, displays the \$50 gift certificate for the UC Davis Bookstore she recently won in a drawing from the pool of completed LEAD surveys.

LEAD Faculty Survey Results

In September, as part of its ongoing effort to identify the computing abilities and needs of UC Davis faculty and staff, the Learning Environment Architecture Development (LEAD) team, in collaboration with the Teaching Resources Center, collected hundreds of surveys. The results of these surveys are helping to shape the LEAD team's recommendations for establishing a distributed learning network at UC Davis. Here, we highlight some of the main results.

Total number surveyed: 1,295 UC Davis faculty (sample size: 650)

- Faculty are generally using at least one computer for instruction-related tasks. Only 6% reported never using a computer for instruction.
- Faculty are very mobile workers. They conduct their work from multiple locations using different machines (50% use laptops, with 30% using them in the classroom).
- At least 90% do some of their instruction-related computing tasks off campus.
- Faculty use a wide variety of computers and operating systems (62% use Windows, 48% use Macs, 18% use both, and 15% use UNIX-based machines).
- 65% use a course Web page or plan to do so.
- Over half suggest their students use email, and 36% require students to use it as a regular part of their courses.
- Over half use Melvyl® as an instructional tool.
- Two-thirds rated technology as important to access information in their discipline.
- Almost half (46%) rated technology as important to improving pedagogy.

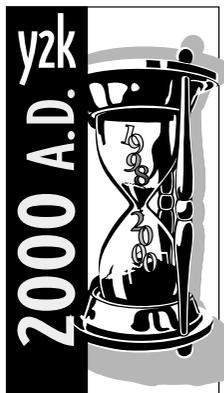
Full survey results are available on the Web at <http://lead.ucdavis.edu>.

grants will be sought to support the next two to three years of implementation.

"If we gain a good understanding of needs, and test, prototype, pilot and implement the necessary infrastructures in a timely way," says Suter, "they can support a pretty wide range of solutions—from offering online sessions to providing virtual labs (to supplement physical labs) and developing distance offerings for particular markets in which UC Davis has unique resources and strengths."

But, of course, even when the infrastructure and tools are in place to make distributed learning a reality at UC Davis, the campus will still face many challenges. Not the least of which are the issues of training and maintenance. Some distributed learning tools (e.g., special software, Web sites, and databases) come with a fairly high learning curve. The need for training and supporting professors in their efforts to use and maintain those tools will be assessed more carefully. The LEAD team's report will highlight some of those challenges and make some preliminary recommendations.

Distributed learning, though never intended to replace traditional classroom instruction, could increase the opportunities for all students at UC Davis (particularly returning or part-time students) to collaborate more fully in the creation of knowledge. At the same time, we could reach more of the vast and diverse number of the 60,000 full-time equivalent students predicted to enter the UC system in the next ten years.



Campus Wrapping Up Y2K Preparedness

We've all heard about it. Some of us have even worried about it. The dreaded Year 2000 (Y2K) Problem. Regardless of how well-versed we are in this subject, we should all be aware of UC Davis' Y2K preparedness, for—like it or not—Y2K glitches could affect each and every one of us.

The Y2K Problem occurs in both computers and computerized systems (e.g., heating and cooling systems) when a two-digit (99), rather than a four-digit (1999), date field is used to represent a year. When this two-digit field rolls from 99 to 00, faulty systems may mistakenly read the "00" in 2000 to mean the year 1900. Some systems may fail to recognize it, or they may stop functioning altogether.

Year 2000 flaws have been popping up for years in software—a report recently released said that 82 percent of large companies had already encountered them—but the first weeks of January are expected to bring the largest volume of malfunctions.

The only way to "fix" the problem is to reprogram systems to read four-digit date fields,

which takes time and resources.

Because computers are used to manage many aspects of campus life, system failures could prove very disruptive. It is easy to imagine how failure in one information system could corrupt or destroy data in another. The consequences of this could range from annoying to catastrophic.

To head off this problem, the campus has taken a number of measures. In July 1996, efforts began to expose and remediate flaws within centrally-managed applications. A year later, a Year 2000 awareness program was developed to more effectively organize campuswide Year 2000 research and information sharing. The campus Year 2000 Web site was developed shortly thereafter and a seven-part series of presentations was offered to various segments of the campus community.

In July 1997, following a directive from the University of California Office of the President (UCOP), Vice Provost and Executive Vice Chancellor Robert Grey requested that all "mission-critical" campus systems be made compliant. Major systems such as the Banner Student Information System, DaFIS, Student Housing, Storehouse, Purchasing, Payroll/Personnel, RSVP, Facilities, Tele-

communications and Networking were made a top priority.

With fewer than 40 days left until January 1, 2000, campus administrators and computer system specialists believe that thanks to repairs and replacements, mission-critical campus computer systems will probably avoid major breakdowns when they encounter a year that ends in "00."

Campus information systems, such as Banner, DaFIS and Payroll, are at 99 percent compliance. Water, electricity and sewage systems are in the final stages of remediation, with most systems having no Year 2000 problems or work-arounds already in place. However, many of these systems still rely on outside sources, so the possibility for temporary, isolated problems still exists.

Many of our embedded systems, such as heating, ventilation and air-conditioning, are also expected to work after the Year 2000, though some systems may have to revert back to manual control for some functions. The project managers and programmers involved with those systems continue to maintain communications with vendors to ensure that unexpected problems are

see Y2K Preparedness on page 8

Tiger Team Wants You!

UC Davis has done a good job of preparing for the Year 2000 Problem, but there is still much work to be done. To address any last minute Y2K remediation needs and to help those who experience Y2K-related problems, the Division of Information Technology is deploying a Y2K Tiger Team and encourages you to consider joining the effort.

The Tiger Team is a group of volunteers with a wide variety of skills—from communicators and administrative support staff to project managers, programmers, system administrators, desktop consultants, and database administrators—who will go into "alert" from December 15 to January 14.

The Tiger Team will respond to requests for help according to the following criteria: the system is considered critical to campus operations or pose a risk to life or life-supporting processes; constitutes a significant campus financial loss or potential financial loss; or constitutes a significant loss or potential loss in research data that cannot be recovered.

So far, 58 people have joined the team. IT is actively searching for more volunteers. Those who do volunteer do so with the understanding that their home department is their first priority.

If you are interested in joining the Tiger Team or would like more information, contact Tecoy Porter at importer@ucdavis.edu.

Preparing for Y2K at Home

By JEFF VAN DE POL

Contrary to the surge of survivalist literature and media hype that forecasts the downfall of civilization, most Californians will wake up on Saturday, January 1, 2000, and likely will notice only minor glitches. Does this mean that you should do nothing to prepare? Well, no. There are a few relatively simple but important tasks you should complete to greatly limit the effect of the Y2K problem on your life.

First, let's take a look at the basic utilities. According to a recent Senate Special Committee Report on the Year 2000 Problem (<http://www.senate.gov/~y2k/>), nearly everyone in or

near American metropolitan areas should have continuous electric, gas, water, and wastewater service. However, it is recommended that you read the Y2K readiness disclosure statements you get in the mail from the companies with which you do business.

The phone companies are largely Y2K-compliant, and the main anticipated problem might be a glut of phone calls (similar to holiday usage) by people checking to see if their phone works.

The financial industry is also well prepared for the upcoming potential ballyhoo, and the federal reserve has strengthened cash reserves enough to handle any rush on the banks. While the bank should still be the safest place for your money come January 1, keeping a small cash reserve on hand (enough for 3-5 days) is still recommended.

Home appliances and electronics, especially those manufactured after 1988, are expected to work. To check the age and Y2K status of your appliances, contact the manufacturers or visit <http://www.y2kbase.com>. This site provides a consumer-focused independent database of Y2K compliance information, including a nifty search and browse feature.

Home computers are a slightly different story. Most computer hardware purchased after 1993 should be fine, but several applications may need to be checked for date-sensitive glitches. See the UC Davis Y2K site (<http://y2k.ucdavis.edu>) for information on how to per-

form diagnostic tests on your computer.

While the United States is largely prepared for Year 2000 computer problems, serious concerns remain, particularly in health care, small business, and local government. The truth is no one knows exactly what will happen, and invariably there will be a few glitches the first several days of January. The Senate Committee recommends that you "be in a position to handle inconvenient interruptions in basic services." If concerned, check out <http://www.consumer.gov/y2k/>. This page links to U.S. Government telephone hotlines for consumer and small business information.

When shopping for supplies, listen to the experts. What nearly everyone involved with the Y2K issue agrees upon is that people should treat this unique event like any other possible emergency (a severe winter storm seems to be the most common example). With this in mind, make sure you have flashlights, batteries, warm blankets, and enough nonperishable food for several days. For those of you who take medication, check with your physician if you are concerned about a Y2K-related disruption in supply.

A last bit of advice: start now. Right now. The New Year is fast approaching, and holiday shopping and planning will suck up most of December. The Web offers useful Y2K information, but it will become increasingly difficult to access as more and more people start their own preparations.

In a nutshell, don't believe the hype, but listen to and heed the warnings. Above all, be informed and be early. Happy New Year!



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IT Site

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responsive to the recommendations in the AUR Report.”

David Shelby, Chair of IT's Administrative Unit Review Committee and Assistant Dean, Biological Sciences concurs. “The reorganized Web site makes a significant contribution to addressing the spirit and the letter of the AUR recommendations and should help people unfamiliar with IT better navigate through the organization to access the services and resources they need,” says Shelby.

The primary goal has been to develop a site that is easy to navigate and provides information that users want in the way they want it. “An intelligent design can go a long way to decreasing the amount of ‘surfing’ people have to do and reducing the level of frustration our clients have with finding all sorts of useful information,” says Kent Kuo, Swordfish Project Sponsor and Associate Director of IT-Communications Resources.

The first step will be accomplished with the launching of division-level Web pages (<http://it.ucdavis.edu>). This winter all of the departmental Web pages will be redesigned as well. Eventually, every unit within IT will restructure its pages to ensure consistent navigation and accessibility on all IT Web pages.

“One of our biggest challenges was meeting the need to be many things to many people,” says Babette Schmitt, Swordfish Project Manager and IT-Information and Events Manager. “We wanted to create a site that could serve the needs of the novice and the knowledgeable ‘techie.’” To meet this challenge, the Swordfish team created new content pages and audience-specific menus and provided context and orientation cues on all pages.

Among the most important improvements to the site is an emphasis on a broad and shallow navigation scheme. “We felt it was important to set a ‘three-click’ standard,” says Ellen Guttadauro, member of the Swordfish Project Team and IT-Creative Communication Services. “Now when someone goes to the Division's home page, they have lots of choices from the beginning.”

The realization of the three-click standard is evident in the site's emphasis on IT services rather than departments. As the AUR report pointed out, IT's Web site has been perceived by many on campus as “difficult to understand and to navigate . . . and of little help to those seeking to identify and access IT services.” The site's new home page (see p. 1) includes a list of links to IT services as a primary gateway to the information users have identified as most important.

“In redesigning the divisional site, we made a concerted effort to put the user first,” says Schmitt. “Our redesign is based on consistency, predictability, thoughtful page design, and ease of navigation. We also wanted to provide fast access to accurate and relevant

Making the Web Accessible to All

Putting the user first was the foremost goal of Information Technology's initiative to revamp its Web sites to provide better service to all users, including those with cognitive or physical disabilities. In fact, Federal law requires that all government-funded Web sites (this applies to UC Davis) meet Web accessibility guidelines set by the World Wide Web Consortium (W3C) in May 1999 (see <http://www.w3.org/WAI>).



Bobby, the “Web accessibility cop.” Image from <http://www.cast.org/bobby>.

For instance, the absence of textual equivalents for non-textual information (images, video clips, sounds) present a major barrier for the blind, who often rely upon software that can convert text into sound. Similarly, for some people with cognitive and learning disabilities (including those with dyslexia and other reading difficulties), organizing pages consistently and providing clear navigation mechanisms can be very helpful. As

a result, many decisions about navigation, content, design, and the use of the latest technologies on IT's new site were based on W3C guidelines.

When applied consistently, the following guidelines can help any Web developer set the stage for a successful site. (This list represents a summary of the 19 guidelines created by W3C.)

- Use text whenever possible. For instance, use captions with sound files and provide text descriptions of video files.
- Create text that can be understood out of context (i.e., avoid “click here”).
- Always use “alt” tags to provide a description of a visual.

content.” The team's concern for meeting the needs of the user included considerations for disabled users (see “Making the Web Accessible to All,” above).

To improve the site's accessibility, the Swordfish team decided to refrain from using flashy graphics, such as animation and pop-up windows, that increase download time and prevent many users from gaining access to the site. “We were concerned that developing a technology-laden site would affect download times and set the wrong example for other Web developers to follow,” says Schmitt.

Instead, the site employs technologies that enhance the site's functionality. For example, mouse-overs (short pieces of text that appear when a mouse is dragged over a link) on the home page provide a preview of the information available before clicking on a particular link. Try placing the mouse over

the “instructional support” link on the home page, and the following text will appear: “faculty consulting, computer labs for instruction, media support.”

The site also makes judicious use of several industry-standard navigation tools: an internal search engine, frequently asked questions, index, site map, glossary, links to related sites, and feedback mechanisms such as online surveys.

Setting design, navigation, and content management standards for all IT Web pages is another important achievement for the Swordfish team. A common set of standards will enable all IT Webmasters to work from the same assumptions and templates.

The Swordfish team hopes the site will serve as an example for others. “We are developing standards and templates for use by our Webmasters, but much of that information will also be made public in an effort to help

- Keep page layout and design simple and consistent on every page.
- Use the clearest and simplest language appropriate for the site's content.
- If the site must require plug-ins (such as Flash and Real Audio), provide the same information in a text-only format to accommodate special software or outdated browsers.
- Don't rely on color alone; some users cannot access information in color.
- If the site is based on frames, use meaningful titles and provide an alternative NO-FRAMES code.
- Divide large blocks of text into small, manageable units for easier scanning, in general, and to facilitate communication with disabled users, specifically.
- Avoid using animated text, redirects or strobe effects; these can sometimes cause serious health problems for people with cognitive disabilities, such as epilepsy.
- Don't make access to content dependent on the use of a particular device, such as a mouse or keyboard.
- Provide clear navigation mechanisms: identify the target of every link (i.e., mouse-overs); provide information about the general layout of the site; and describe accessibility features.
- Clean up spelling and grammar. Some special screen reader software cannot decipher misspelled words and incomprehensible sentences.
- Provide a text-only version of the site.

If you are interested in testing the Americans with Disabilities Act compliance of your favorite Web site, check out the utility available at <http://www.cast.org/bobby>.

other campus units,” says Schmitt.

Once all of the IT Web pages have been redesigned, many challenges remain: keeping the content fresh and informative, meeting the changing needs and knowledge base of users, and tracking the rapidly evolving technology of the Web.

“This will be a ‘work in progress’ but I believe it's off to a very good start. I hope those who felt particularly strongly about the need to improve the IT Division's home page will take a look at these revisions and continue to provide comments for ongoing refinements,” says Shelby.

The focus over the next two months will continue to be on gathering and analyzing feedback from users. Preliminary reactions have been positive. IT encourages all of its site visitors to provide feedback via email to itweb@ucdavis.edu. “We really want to know what our visitors think,” says Schmitt. “Without feedback, it will be very difficult to know if the site is truly meeting the needs of the campus.”

“We still face some challenges, but this site is a major improvement over the old one,” says Swordfish team member Lora Delwiche, IT-Advanced Network and Scientific Applications. “In fact, I rarely used the old site. I will certainly use the new one.”

Degree Navigator

Registrar and IT Create Powerful New Tool for Students

By DONNA JUSTICE

Automation can be a beautiful thing, particularly when the ability to make qualitative decisions depends upon the accuracy and availability of quantitative data. In the race to complete a degree, students would love the ability to spend more time thinking about the quality of their courses rather than counting the number of units needed to graduate. This is certainly a quality v. quantity fight, and quantity wins out every time.

In an effort to help students take more control over their quest for a degree, UC Davis will soon offer a new automated degree auditing tool. Working together, the Division of Information Technology (IT), representatives from every college, and the Registrar's Office have married the collection of data and the freedom to explore possibilities in a powerful new program that helps students better track their progress toward completion of a degree.

The tool is called Degree Navigator, and it will be available in the next quarter. Viewed via the Web, Degree Navigator provides a visual representation of the UC Davis course catalog. Students will be able to log in to the program and compare their own coursework to any degree requirements on campus.

Today, this process occurs on paper only. Banner, the computerized database of UC Davis student information, stores the coursework data, but students and advisors must work together to manually compare that data to the course catalog requirements for any particular degree. Much time is spent

creating and recreating checklists, and still course requirements can be easily overlooked.

"Degree Navigator makes it easier for students to answer two basic questions more easily: 'What do you need to take and how far have you gone?'" says Keitha Hunter, Degree Navigator Project Coordinator.

With 24-hour access to Degree Navigator, students won't need to haul around a course catalog, check and cross-check courses taken against requirements, or face the horrifying realization in Year 4 that required courses were overlooked and graduation is not on the immediate horizon.

But getting a computer program capable of organizing the complexity of degree auditing has not been easy. The working group evaluated several programs before deciding on Degree Navigator.

"Writing a program to access and analyze degree requirements is extremely difficult," says David Johnston, Senior Associate Registrar. "But Degree Navigator is one of the best of the few that are available. Its visual, highly accessible interface is its greatest strength, but, it can't do everything. In degree auditing there is always some ambiguity, so students will need to continue working closely with their academic advisors."

How does it work?

Working with the Registrar's Office, the IT team, made up of Computer Resource Manager Sandra Stewart and Applications Developer Brian Alexander, built a customized

link between two databases: the existing Banner database where student transcripts are stored and the new Degree Navigator database containing the course requirements for every major and minor degree at UC Davis. Through this link, Degree Navigator functions as a front-end to the data stored in Banner.

"I got involved in this project about a year ago. It has really been a partnership," says Alexander. "That's what has made it a success." IT contributed at three

main stages of the project: data conversion, security, and "transfer articulation." This final stage refers to the incorporation of transfer students' data from other colleges and universities into the Banner database.

To this point, transfer course information has been tracked on paper only. Now any UC Davis student who fulfilled degree requirements on another campus will be able to view that data in Degree Navigator.

"One of our main concerns was security," said Alexander. "We needed to make sure that the way the two systems interact complies with UC Davis's strict security requirements. So we had to create a system where the information in Banner was not duplicated in Degree Navigator, but rather accessed in a very secure way."

To use Degree Navigator, students will be required to enter their LoginID, Kerberos password, student ID, and PAC (personal access code, which they use for Web and phone registration already). The core database (degree program requirements) is maintained by the Registrar's office. At the department level, advisors can customize course substitutions for particular students through the program's Visual Editor, but the core data in Banner never changes.

"With Visual Editor, advisors can record in one place accessible to them and the student any waivers or course substitutions," says Johnston. "The ability to store this information centrally eliminates the need for the advisor to record it in a hard copy file or to keep track of it on a sticky note. More importantly, the record remains in the student's profile, so students needn't worry about the record getting lost or forgotten."

What does the user see?

Degree Navigator will be available to three distinct groups: UC Davis students, academic advisors, and the public. All will have access to a user-friendly Web interface representing the various colleges and degrees as islands in the UC Davis ocean of possibilities.

Once the user clicks on the name of a college, she or he will see more islands with the college's specific departments and sub-



Photo credit: Jeff Van de Pol

IT Information Resources Applications Developer, Brian Alexander, helped make Degree Navigator a reality for UC Davis students.

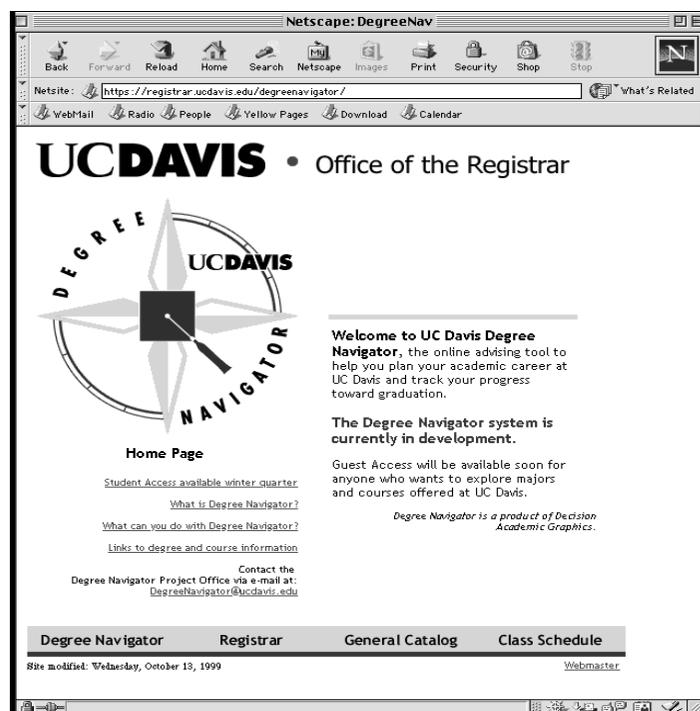
degrees. Students looking at the degrees in the context of their unique information will be able to run different scenarios instantly.

"This makes exploring a change of major much easier and much less stressful," says Hunter. "Students can find out in a matter of minutes what additional courses they would have to take, and they could estimate how much longer they would need in order to complete a degree and how much it might cost."

Once students have run a scenario they want to keep, Degree Navigator can generate a printed report. Advisors will also be able to run scenarios and review any reports a particular student has chosen to generate. The Guest view will be available to the public via the Web to enable any prospective student to explore the course catalog and try out different degree scenarios.

"It is the campus's hope that Degree Navigator will facilitate work between students and advisors," says Hunter. "Instead of spending a lot of time tracking progress, students and advisors should have more time for productive conversations about the student's focus, what they can take for breadth, and if they are fulfilling their needs and interests, in addition to catching omitted or overlooked things more easily."

Not many campuses offer an automated degree auditing service to their students. "UC Davis has made this investment for a couple of very important reasons," says Johnston. "First, we feel it is our responsibility to provide students with the best access to this information. Right now, they have limited access and are forced to keep track of their progress in a piecemeal way. Second, UC Davis is committed to helping students move as efficiently as possible toward their degrees. Degree Navigator's ability to generate degree scenarios at the click of the button helps both students and parents make more informed choices."



Degree Navigator will be available in Winter Quarter. For more information, see <http://registrar.ucdavis.edu/degreenavigator>.

Evaluating the Deployment of New Technology

- 1) Survey the current environment:
 - a) What are the current organizational rules and processes?
 - b) What technology is currently used in the organization?
 - c) What needs are not being met by the current set of rules, processes, or technologies?
 - d) What are the current technology support structures and training levels?
- 2) Evaluate the new technology:
 - a) Does it require the organization to change its rules or processes?
 - b) Does it require a different set of support structures, changes in the infrastructure, or training levels?
 - c) Will it be able to meet the needs specified in 1c?
 - d) Is it a brand new technology, a major upgrade, or a minor upgrade?
- 3) Make the decision:
 - a) If the technology doesn't require a change in the rules, processes, infrastructure, or support required and is a minor upgrade – test and then release wide scale.
 - b) If the technology doesn't require a change in the rules, processes, infrastructure, or support required and is a major upgrade – test, release in limited production, and then release wide scale.
 - c) If the technology doesn't require a change in the rules, processes, infrastructure, or support required and is a new release – test, pilot, release in limited production, wait for the first revision or patch kit to be released, and then release wide scale.
 - d) If the technology requires a change in the rules, processes, infrastructure or support required – make the changes in those areas first and then proceed with a, b, or c based on whether it is a minor or major upgrade or brand new release.

For assistance or more information, contact the Center for Advanced Information Technology at (530) 752-5711 or advancedit@ucdavis.edu.

Windows 2000: A Review

By FAUST GORHAM

After several false starts, Microsoft has set the release date of Windows 2000 to February 17. Windows 2000 is the latest release of Microsoft's Windows NT operating system, aimed at servers and desktop machines in a business environment. It is not a replacement for Windows 95 or 98 machines in the home market. In fact, Microsoft is developing a new release of the operating system for those machines. Called "Millennium," it will be released next year.

This article will present an overview of the main features available in the Windows 2000 product line and what Information Technology is doing to prepare.

What are the different products in the family line?

There are four products available in the family line: Windows 2000 Professional, Windows 2000 Server, Advanced Server, and DataCenter Server. Professional is aimed at client machines and is targeted to replace Windows NT Workstation. Windows 2000 Server, Advanced Server, and DataCenter Server will replace Windows NT 4.0 Server and Enterprise Server.

- Windows 2000 Professional comes with a new GUI (Graphical User Interface), File System, Network settings, and power management features. The GUI has gone through an upgrade; the icons are sharper in detail and have been reorganized. Professional also provides support for Plug and Play and laptop power management, which makes it a better laptop operating system than Windows NT workstation ever was. Microsoft has increased the availability of their enterprise operating system, reducing the number of cases requiring reboots from 75 to 7. The changes at the disk management level allow for volume extensions, fault tolerance, disk mirroring and striping. Professional offers disk quotas so administrators can be notified when users use too much disk space. These are Professional's main features.

Many of these features bring about new complications. Most of the advantages found in Professional cannot be leveraged without a flavor of the server. To take advantage of the disk management features, you must have a machine that runs only Professional. No dual booting. In addition many new security holes have been created which will require patching.

- Windows 2000 Server has made the same base level changes to Windows 4.0 Server as Professional did to Windows NT Workstation. The most dramatic changes can be seen in the administrative functions. Windows 2000 comes with Active Directory, a directory service for keeping infor-

mation about users, servers, desktops, network resources, and disk volumes. A brand new release of Internet Information Server has also been included. Microsoft has made significant changes in how application and services are run making the whole server more reliable. Adding support for Kerberos, the ability to use Certificate Authorities, support for Public Key Certificate Servers, and an Encrypted File System has bolstered Windows 2000 security. Server also offers support for up to 4 CPUs to be running at the same time (Symmetric Multi Processing) and up to 4 GB of physical RAM.

All of this comes at a cost. Without Active Directory, Windows 2000 is a null product. This means that organizations have to update their skill sets and start the process of creating an organizational directory structure. This will take time and require continuous refinement. No one department or area should adopt this product without first considering how they will deploy Active Directory. (See sidebar on evaluating the deployment of a new technology.) In addition, the stability of Windows 2000 for mission-critical applications has not been fully tested.

- Windows 2000 Advanced Server adds to the features in Windows 2000 Server by adding clustering and load balancing (which was provided in NT 4.0 Server through the Wolfpack extension) and support for up to 8 CPUs per box and 8 GB of physical RAM.

- Windows 2000 DataCenter Server expands the processor support to 16 CPUs per box and support for 64 GB or RAM.

Note: If you currently have the maximum number of processors in your systems, when you upgrade you can actually double the number of processors listed above. Windows NT 4.0 Enterprise users currently running 16 processors could upgrade to 32 processors by transitioning to Windows 2000 DataCenter.

What is Information Technology doing to prepare?

Information Technology is sponsoring a group to evaluate Windows 2000 and develop sets of recommended solutions for use of the new operating system at UC Davis. We look forward to working with representatives from the campus technical leads group and other departmental technology support personnel.

If you are interested in evaluating Windows 2000, joining the workgroup, or discussing these issues, contact Faust Gorham at (530) 752-6387 or fgorham@ucdavis.edu.

Measuring the Effectiveness of IT's Communications Survey Soon to be Released

By ROGER ASHTON

In 1995, the Communication and Outreach Implementation Committee for the Information Technology Outreach Program (ITOP) was charged with developing a communication plan to inform the campus about services and programs provided by the Division of Information Technology (IT). Last April, IT's Five-Year Administrative Unit Review (AUR) report reinforced the need to continue implementation of that plan. A month later, IT took the plan a few steps further with Project Mercury, a ten-month endeavor to develop a strategic IT-wide communications plan.

Project Mercury is in the primary research phase, trying to

objectively determine the effectiveness of current IT organizational communications and to identify the information needs of various campus constituencies. For this research phase to succeed, the project leaders need to marshal support, input, and understanding from all on campus who touch IT — that includes just about everyone.

In the next few weeks, students, staff, and faculty will be asked to reflect on the effectiveness of the Division's communication efforts. Some of the input will be solicited from key groups and individuals. Others will be asked to provide their thoughts through the completion of an anonymous survey.

The Project Mercury team will take the information gathered during this most important research phase to formulate a strategic IT communications plan in the spring.

Similar to Project Swordfish (see story, p. 1), Project Mercury is designed to provide the best communication possible with various segments of the campus community. Your participation in this project is essential.

For more information on this project, contact Roger Ashton, Project Coordinator at mercury@ucdavis.edu.

Tapping Internet 2's Potential

By BETHANY FAITH DANIELS

Do you regularly exchange large amounts of data with colleagues? Do you wish you could do lab work from a remote location? Would you like to tell Fed Ex and your travel agent, "thanks, but no thanks"? Well, if you are connected to UC Davis, you can because you no longer have to rely on the Internet as we know it. UC Davis is part of Internet 2, a parallel network created for the sole use of universities and colleges nationwide. Internet 2 provides a much less congested, much more reliable way to conduct electronic communications.

In October, 1996, right around the time that the White House announced the Next Generation Internet initiative, 34 research universities (including UC Davis) met to kick off a new Internet vision: Internet 2. Internet 2 was launched to provide more reliable connections to

pleted more recently on October 1. One more Southern California link between CALREN-2 and Abilene is slated for the near future.

How does one take advantage of Internet 2?

The good news is all UC Davis users are already connected to Internet 2. The capacity of Internet 2 serves average users well in that it can easily handle the aggregation of users that are connected via 10Base-T or 10 Megabit per second speeds.

But Internet 2 can handle much more traffic and it has been designed to handle specialized high-speed research projects. In order for faculty to take advantage of this, it will be necessary for them to have customized higher-speed connections to their desktops. IT-Communications Resources (CR) is available to assist in engineering these customized connections. Additionally, Russ Hobby, Director of IT-Advanced Networking and Scientific Applications, provides consulting services to faculty on their high-speed networking requirements and can assist researchers in formulating their service requests to CR.

What the future holds

Future Internet 2 objectives are to implement Quality of Service (connection guarantees) and to expand regional Internet connectivity. Additional exploration is underway with Information Technology, the College of Engineering, the UC Davis Medical Center and CENIC (Corporation for Education Network Initiatives in California) to determine the viability of a Sacramento Wide Area network (SWAN). According to Doug Hartline, Director of IT-Communications Resources, "SWAN could provide opportunities for very high-speed network research, connections to other high-performance networks, high-end applications such as those found in genomics and telemedicine."

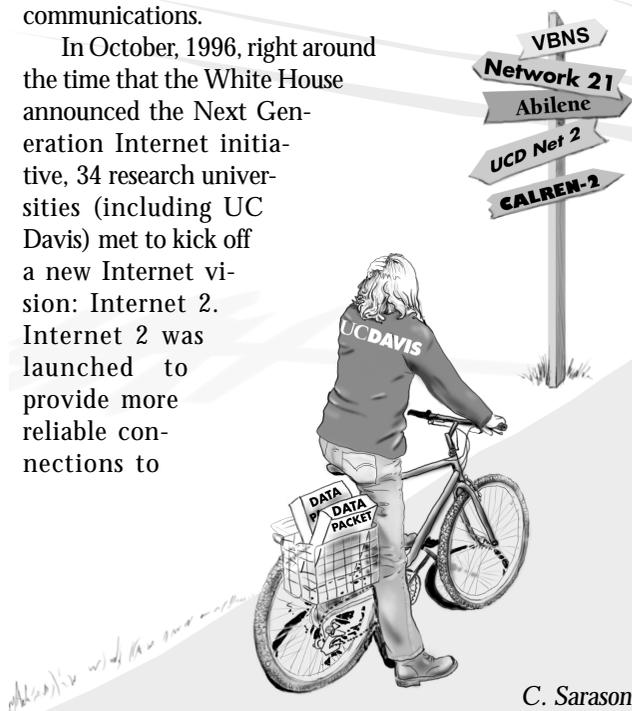
It will be some time before more campus users see the full benefits of the advanced features currently under development for Internet 2, but many can take advantage of the rich bandwidth already afforded by UC Davis' connection to Internet 2. Fed Ex won't mind—too much.

Today, Internet 2 has over 160 member universities and relies on two network backbones (vBNS and Abilene) to facilitate connections among members. Through these Internet 2 backbones, researchers can send large files faster than ever before. Scientists can access labs and supercomputers remotely and receive data transmissions in real-time, and professors can simultaneously send video clips to student desktops using multicast technology.

The Internet 2 backbone Abilene established coast-to-coast connectivity in January 1999. Regional network connections to Abilene have been developed and implemented over the course of the Internet 2 project.

One of these regional networks, CALREN-2 (California's network), connects all of the University of California campuses, California State Universities (including all community colleges), Stanford University, USC and Cal Tech to the Abilene and vBNS networks. UC Davis is connected to CALREN-2 through UC Berkeley and has a back-up link through University of California Office of the President (UCOP) in Oakland.

For the past year, CALREN-2 has connected to Abilene and other transit networks in northern California through a distributed set of interconnected routers called gigaPOPs. The southern California connection to Abilene was com-



C. Sarason

the "information superhighway" for higher education and set out three main goals:

- Develop new research and education applications that cannot be implemented on the commercial Internet.
- Create a communications infrastructure capable of guaranteed and uninterrupted connections.
- Partner with government and private industry to eventually pass on new technologies to the commercial Internet.

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Main Computer Networks Accessible to UC Davis Users

• UC Davis Networks

Network 21: Project to build an internal network capable of supporting high-speed connections. Concluded in 1998. The objective was met to build a highly stable, standardized Asynchronous Transfer Mode (ATM) fiber-optic network infrastructure. (ARCHIVED: <http://net21.ucdavis.edu/>)

UCDNet2: A new project continuing the UC Davis internal infrastructure enhancements started with the Network 21 project. UCDNet2 will employ traditional copper wire, the fiber-optic infrastructure used in Network21 and wireless technologies. (Web site in development. For ongoing information, subscribe to listserv: ucdnet2-info@ucdavis.edu)

• Regional Networks

CALREN-2: Operates at 622 (or greater) Megabits per second. California's research and education network. Developed by the Consortium for Education Network Initiatives (CENIC). CENIC partnered with Pacific Bell and Cisco Systems, Inc. to design and deploy an advanced electronic superhighway linking California's Institutions of higher education to each other and to the Internet 2 backbone networks. CALREN-2 connects to Abilene at two points in California. (<http://www.ucop.edu/irc/projects/CCI2/>)

• National Networks

Abilene: Operates at 2.4 Gigabits per second. High-performance Internet Protocol (IP) network developed by the University Corporation for Advanced Internet Development (UCAID) in partnership with Quest Communications, Nortel Networks, Cisco Systems and Indiana University. A primary goal of Abilene is to provide a backbone network for the Internet 2 project. (<http://www.internet2.edu/abilene/>)

Next Generation Internet (NGI): A multi-agency Federal research and development program that is exploring advanced networking technologies, developing revolutionary applications that require advanced networking and demonstrating these capabilities on test beds that are 100 to 1,000 times faster than today's Internet. (<http://www.ngi.gov/>)

vBNS: Operates at 644 Megabits per second. This is a very high-speed backbone network system developed by the National Science Foundation (NSF) and MCI/WorldCom. vBNS is intended as a platform to develop new Internet applications to facilitate collaborative research efforts. (<http://www.vbns.net/>)



Long Distance Rates Reduced

On September 24, long distance telephone rates for campus subscribers were reduced from 15.5 to 13 cents per minute.

The new rates were reflected on the October billing statement delivered in early November.

It is unusual to implement a rate change that is not a direct result of the campus's bi-annual rate review process. However, in collaboration with other administrative units, IT-Communications Resources was able to pass on operational savings to the campus community in the form of lower long distance rates. If you have questions regarding the new rates, please call CR at (530) 752-4603. For specific billing inquiries, call (530) 752-8971.

IT on the Move

Information Technology's Distributed Computing and Applica-

tions Support Unit (DCAS) will be moving to 3820 Chiles Road on December 1. DCAS is the last IT unit scheduled to relocate off campus. As part of this move, in December and January, some servers will be moved to Chiles Road. Any interruptions in service will be announced via email and on the IT Web site (<http://it.ucdavis.edu>) prior to the move. For the latest information on server availability, see http://clientservices.ucdavis.edu/service_outages.html.

Connecting You to the World

UC Davis processed 14 million email messages in October. In an effort to accommodate the ever-growing number of students, staff, and faculty who rely on the Internet, during the last quarter, IT staff added a new email server (purple), replaced 2 login servers, transitioned the campus Web connection to a new system, upgraded the campus search engine, transitioned all DNS servers to new hardware, and transitioned the Mothra (campus computing accounts) server to a new system.



December

- 1 □ **Using the Library, Part 1:** 3:10-4 p.m., Microcomputer Room, 163 Shields Library.
- 8 ⚙ **Finding Jobs on the Web:** 1 p.m., 1 Olson Hall.
- ◆ **Outlook 98: Introduction:** 8:30-4:30 p.m., TB 134.
- 9 ◆ **Excel 97: Advanced:** 8:30-Noon, TB 134.
- ◆ **Power Point 97: Enhancing Presentations:** 1:30-5 p.m., TB 134.
- 13 ◆ **Photoshop 5.0: Introduction:** 8:30-4:30 p.m., TB 134.
- 14 ◆ **Access 97: Advanced Topics:** 8:30-4:30 p.m., TB 134.
- 15 ◆ **Access 97: Forms and Reports:** 8:30-4:30 p.m., TB 134.
- ⚙ **Voice Mail Training:** 10:30-Noon., CR Network Service Center Trailer.
- 2 ◆ **Database Design Concepts:** 1:30-4:30 p.m., Cabernet Room, Silo.
- ◆ **Web Publishing: Intermediate:** 8:30-4:30 p.m., TB 134.
- 3 ◆ **Web Publishing Introduction:** 8:30-4:30 p.m., TB 134.
- 6 ◆ **Eudora: Introduction:** 1:30-5 p.m., TB 134.
- 7 ◆ **Excel 97: Introduction:** 8:30-4:30 p.m., TB 134.

November

- 29 □ **Formatting Bibliographies:** 3:10-4 p.m., Microcomputer Room, 163 Shields Library.
- 30 ◆ **Excel 97: Intermediate:** 8:30-4:30 p.m., TB 134.
- ◆ **PageMaker 6.5: Intermediate:** 8:30-4:30 p.m., TB 135.

Key to Classes & Seminars

- ⚙ **Communications Resources Voice Mail Training Sessions:** Every first and third Wednesday of the month. Call 752-4603.
- **Library Instruction Programs:** LibraryClass@ucdavis.edu or 752-4381.
- ◆ **Staff Development & Professional Services (SD&PS):** Enroll online at <http://sdps.ucdavis.edu>. Call 752-1766 for an application or catalog.
- ☆ **Center for Advanced Information Technology Presentations:** call 752-5711 or email cait@ucdavis.edu.
- ⚙ **Internship and Career Center Workshops:** <http://icc.ucdavis.edu> or email jmscuderi@ucdavis.edu.

Y2K Preparedness

continued from page 3

dealt with swiftly.

At the academic and research level, nearly all departments have produced Year 2000 compliance reports at Provost Grey's request. Provost Grey's directive focused on the readiness of academic systems and the assessment of possible risks to instruction and research. Most departments claim a 90% or higher compliance level and have plans in place to achieve full compliance before the Year 2000.

"We do not expect any major disruptions to teaching at UC Davis due to the Year 2000 Problem," said Faust Gorham, UC Davis Year 2000 Coordinator. Gorham emphasizes that he does not foresee catastrophic problems. "I think there are going to be some systems that have some problems when the new year rolls around, just as some businesses and households will," said Gorham. "But I don't think it will be catastrophic."

The areas on campus most likely to incur Year 2000 problems are desktop systems, data and embedded chips. A large number of Year 2000 departmental coordinators are working hard to ensure that their desktop systems and servers are prepared. Patches are available for most operating systems and applications currently in widespread use on campus. Data contained in spreadsheets or databases are affected only if the data utilized a two-digit date or if the system received date information from a source that is not Year 2000 compliant. For advice and help, contact the person who designed the database or the software manufacturer. Finally, electronics with embedded chips, such as cell phones and fax machines, are expected to work normally, with only some limitations to their functionality.

For assistance or more information, contact the Year 2000 Program Office, the central UC Davis Y2K communications hub. This office provides consultation services and helps coordinate a team of programmers and desktop consultants in solving any problems which may occur shortly before, during and after the rollover on December 31, 1999. (See "Tiger Team Wants You" on p. 3.) The Web site (<http://y2k.ucdavis.edu>) provides a number of resources, including a database of software compliance information, step-by-step guides for fixing Year 2000 problems, patches for download, and work-arounds for applications and operating systems. You may contact the office Monday through Friday from 9 a.m. to 4 p.m., by phone at (530) 752-7039, or by email at y2kstaff@ucdavis.edu.

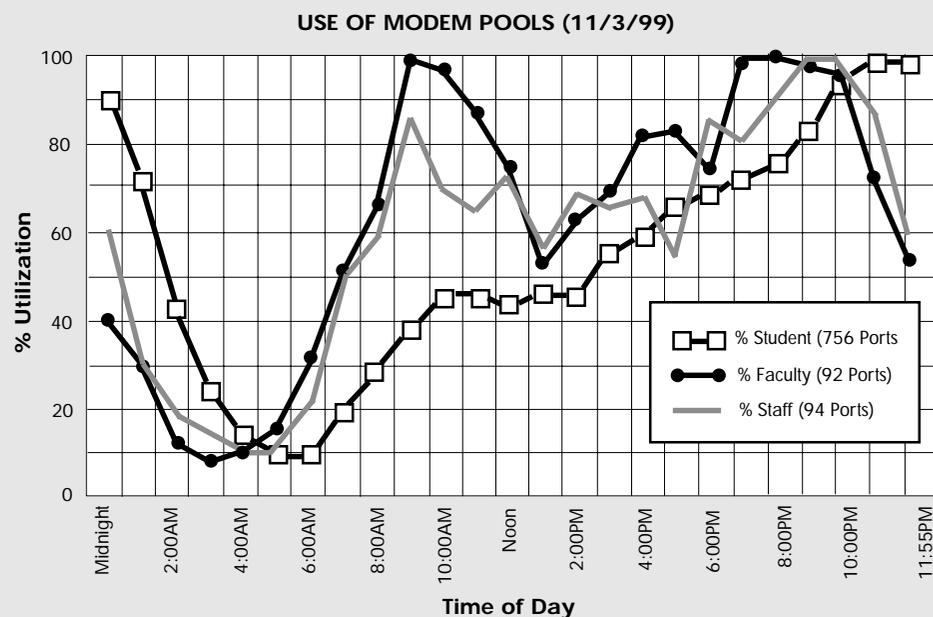
Mark Siegenfeld, Y2K Program Office, contributed to this article.

Modem Pool Users Getting Busy Signals

Since new permits were enforced on October 15, users have been experiencing busy signals when dialing in to the campus modem pools during peak times. To increase your chances of connecting to the modem pool, try to dial-in during non-peak times. Based on the single-day sample below; current peak usage time on the campus modem pool is as follows:

- Student Modem Pool: 10 p.m. - 1 a.m.
- Staff Modem Pool: 8 p.m. - 10 p.m.
- Faculty Modem Pool: 8 a.m. - 11 a.m. and 7 p.m. - 9 p.m.

If you use the campus modem pools, please be considerate of other users and limit your idle connection time.



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Editor: Babette Schmitt (530) 752-5965

Senior Writer: Donna Justice (530) 754-9832

Writer: Jeff Van de Pol

Webmaster/Desktop Publisher: Richard Darsie

Designer: Chris Sarason



Email: itpubs@ucdavis.edu Web: <http://it.ucdavis.edu/it.times/>