I.T. TIMES

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Banner GUI Goes Live

by Aviva Luria and Babette Schmitt

After nearly five years of service, "Old" Banner is preparing for retirement. On December 3rd, the campus will begin to use the new, graphical user interface (GUI) version.

Banner is a computerized database of UC Davis student information organized into several modules, including admissions, registration, billing/accounts receivable, financial aid, and graduate student data. Access to student information in the Banner system is available only to those with a legitimate educational need or institutional business purpose.

From Text-Based to GUI

SCT, the vendor that supplies the Banner software, no longer supports the version in use on campus. The upgrade, which is required to keep up with the vendor's latest releases, was made possible by collaborative work between the Registrar's Office, Student Aid Accounting, Undergraduate Admissions, Financial Aid, Graduate Studies and Information Technology. The team customized GUI Banner to take advantage of new features and to meet the needs of the UC Davis campus.

Currently, Banner uses a host-based system, which means that users telnet directly to Zeus, a remote machine where all the Banner system resides, including the database, the application and the various forms used to view student information. All commands and processes occur on Zeus.

The new client-server version distributes the workload between Zeus, several servers, and your computer. [See diagrams, page 3.] Zeus will continue to house the student database and the forms will be accessed from the application server. Instead of logging directly in to Zeus, you will log in to one of the Citrix servers that will communicate with Zeus on one side and display a graphical interface on the user side.

A sophisticated security architecture was built into the new Banner program, creating a more secure environment. Eventually, Banner will make use of the Kerberos security protocol and, starting in Winter 1998, the Enigma Logic Security Tokens will be re-introduced.

The new forms are in a GUI format, which makes Banner look like desktop applications familiar to many of us — icons and menus will allow you to simply point and click with your mouse instead of keying in commands or having to remember what F-Key to use to navigate between forms and menus. Unlike the older version, the new software works in a Windows environment.

Getting GUI

The Banner system will not be available from November 26th through December 2nd while the system is upgraded. The current version retires on November 25th, so be sure to have your software and hardware set up before then.

GUI Banner will require new-

See Banner on p. 2

ResNet Brings New Opportunities

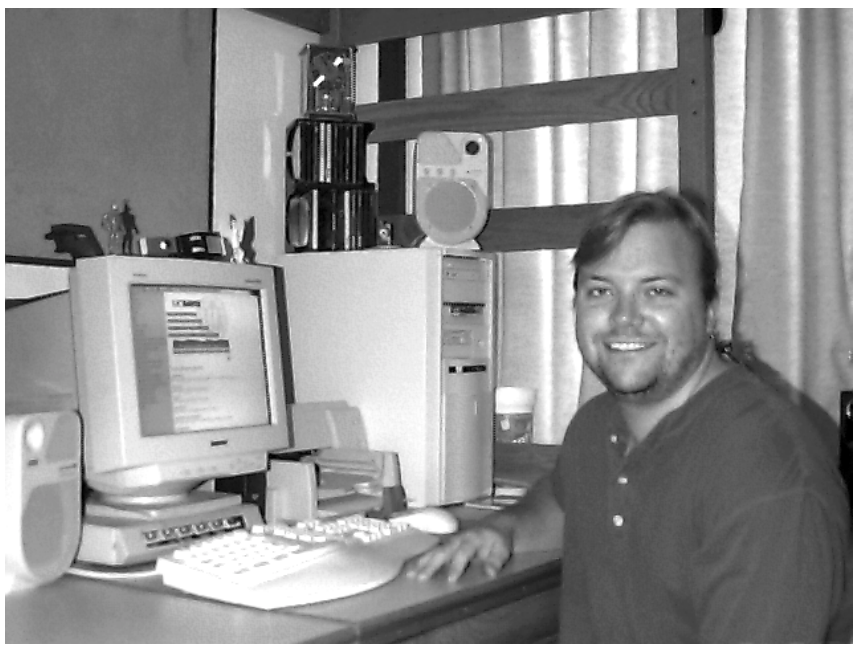
by Aviva Luria

Monica Fuller is a self-described "advocate for ResNet." A senior who has lived in the residence halls for three years, Fuller is pleased with the speed of her direct connection to the campus network. And happy to be rid of her modem.

"I got frequently disconnected," she says of her former modem connection. "I think it was just a little bit slower and noisier. If you wanted to use it at 2 a.m. you'd be waking up your neighbors. It makes that connecting noise and sometimes can be a little distracting."

And now she can get all her phone calls. "I don't have to worry about my modem keeping my line busy," she says.

Fuller connects directly to the campus network via ResNet, a data and video network being made available to UC Davis Student Housing residents for the first time this Fall Quarter. Each student in the traditional residence halls (Segundo, Tercero, and Cuarto) has access to a direct connection to the campus fiber-optic infrastructure. (Emerson and Webster Halls, in the Cuarto area, will be undergoing seismic renovation and are not yet participating in ResNet.)



Student Tristan Dehlinger on ResNet: "It has made it a lot more convenient for students."

Student Housing conceived the residence hall network as a way to support students' academic needs. "Having speedy access to the Internet is almost mandatory [for students] at this point, and certainly will be within several years. We looked at it as a really good service, something that as time goes on will just be an expected service, almost like having a telephone is expected," said Lisa Papagni, Coordinator of Technology and Media Resource Centers for Student Housing.

To freshman Scott Wakeham, having a fast connection has made the transition to college life easier. "It's helped the whole freshman adjustment period for me. It's the first time I've been on my own for real. Adjusting to that, you get kind of homesick for everyone you knew at home. Having the ability to talk to them and ask them how it's going for

See ResNet on p. 4

SPOTLIGHT ON...

Project Management Center

The Project Management Center, which operates on a recharge basis, manages technical projects ranging from office moves to wide area network implementation. The team can assist you with any aspect of project planning, from budget development, scope refinement, resource estimation, requirements gathering and RFQ development, to project implementation. Members of the Project Management Center have contributed to a number of significant on-campus projects, such as the Banner software development project, the migration to GUI Banner, DaFIS technology assessment, DaFIS acceptance and stress tests, and Network 21.

The team's broad background in technology includes software design and development, desktop and LAN support, system administration, database administration, and backbone network technology. Experienced and resourceful, project managers will leverage the specialized technical expertise and resources, both within and outside IT, to ensure the successful completion of your project.

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WWW.it

ON OUR WEB SITE

View our "online exclusives" at *http://it.ucdavis.edu/it.times/* to learn more about:

- **This month's statistics**
- **Tech Humor**: The greatest cross-marketing effort ever
- **UC Online Enrollment**
- **Distributed Authentication**
- **Recommended Solutions**:
  - Off-Campus Connectivity Options
  - Wireless LAN Connectivity

Q: I've heard there will be a change in the way I log in to campus computer systems. What is the change, what is the reason for it, and how will it benefit me?

— Cindy Dufern, English Department

A: If you signed up for your campus computing account prior to 9/25/96, your LoginID (i.e., the username you use to access email, Banner or other central campus systems) was formatted as follows: a two-letter prefix ("ez" for students, "fz" for faculty, and "sz" for staff) followed by a sequence of numbers or characters. This is the old-style LoginID.

The new-style LoginID doesn't follow any predetermined format. This allows you to choose a name with more flexibility than "ez123456." For my new-style LoginID, I might choose a nickname, my last name, or even my old-style LoginID if I wanted to.

There are several reasons for the change. First, for a number of years, faculty, students, and staff have expressed the desire to select LoginIDs that are more comfortable, familiar, or easier to remember. Some already have usernames on departmental computer systems. Changing to the new format forges the way toward creating a "single sign-on" for systems around campus. Single sign-on means logging in only once and then using different, possibly unrelated systems. In order for single sign-in to work on the greatest number of systems, we need to use the most general naming scheme possible.

Computer security is another reason for the change. New campus systems, such as GUI (Graphic User Interface) Banner (the student information system) and DaFIS (the Financial Information System) will use the Kerberos security server, which requires new-style LoginIDs.

How do you benefit? In just a few short years, we all will be connecting to a myriad of systems, databases, and tools in the course of each day. Thus, we would need a number of accounts and authorization procedures. Think of the complexity and annoyance of having to log in with different accounts on each and every system. We're laying the groundwork now to make the future as uncomplicated as possible by allowing you to log in only once in order to use a number of campus computing systems.

If you have not yet selected a new-style LoginID, you can do so easily at the UC Names Web site, where you'll also find frequently asked questions and further information about the change to new-style LoginIDs.

References:

UC Names Web site:
http://info2.ucdavis.edu/ucnames/

— Dan Dorough
Account Database Software Developer

Remote Access

Answers To Frequently Asked Questions

As the quarter draws to a close, UCDNet modem usage statistics continue to demonstrate a high demand for remote access to the Internet. In the last two issues of the *I.T. Times*, we outlined current connectivity options from on and off campus and presented preliminary computer classroom and modem usage trends. This article answers commonly asked questions about how the Division of Information Technology (I.T.) is addressing the growing demand for remote network access.

Q. Why isn't the campus adding more modems to the modem pool or at least replacing the slow modems with faster ones?

A. In February 1996, the Joint Campus Committee on Information Technology (JCCIT) recommended that I.T. keep the current free service running on an as-is basis and that dial-up service be provided by commercial providers for a nominal fee. To this day, the pool of 465 modems is available at no extra charge and at a maximum speed of 14.4K bps.

I.T. has negotiated non-exclusive agreements with commercial Internet Service Providers (CalWeb and MCI) and is evaluating innovative solutions for high-speed dial-up access technologies. For example, this month, the Remote Access Management Program (RAMP) team started testing a separate pool of ninety-six 33.6K bps modems capable of operating at speeds of 56.6K bps. The program will evaluate the cost, effectiveness and benefits of the service to determine if it should be offered for a fee to UC Davis students, faculty and staff.

Q. Like most UC Davis affiliates, I live off campus and often get busy signals when I dial in to UCDNet. How do you plan to improve dial-in access from my apartment to the campus?

A. If you dial in to UCDNet at the most popular times (i.e., between 3 p.m. and 1 a.m.), we recommend that you connect in the early morning hours (typically between 2 a.m. and 8 a.m.). Or consider subscribing for a nominal fee to an Internet Service Provider (ISP) that will provide better accessibility and higher connection speeds, particularly if you need access primarily to email and some Web capabilities. If you normally pay a toll or long-distance charge for dialing into the campus network, be sure to select an ISP with local access numbers in your calling area.

Through Wide Area Network Davis (WAND), one of I.T.'s Internet/Network Access Improvement Projects, the Greystone Apartment complex in Davis became the first off-campus location to offer high-speed network connections to the campus network from a complex computer lab and individual apartments. Negotiations are underway with local company owners about installing similar connections elsewhere. Off-but-near-campus computer labs with high-speed connections to campus are also under investigation.

Q. Some people seem to stay logged in for hours, often tying up the lines for non-legitimate purposes. Why not implement time limits?

A. Currently, users get disconnected after 15 minutes of idle time or 3 hours after logging in. I.T. is considering ways in which the current modem pool can be maximized further, which may include setting aside a bank of modems with lower time limits.

Q. I just subscribed to an Internet Service Provider. However, now I can't access my professors' Web pages and some UCD-based specialized databases when I use this service. Why is this?

A. I.T. is replacing the current IP-address-based authentication with a distributed authentication service. This service, which will be available in Winter Quarter, will allow users like you to access restricted types of information (such as Melvyl, specialized databases, some departmental services, some faculty Web pages, and the site-licensed software site) from off-campus locations without coming through the UCD modem pool.

In the meantime, use an ISP account to access services with no access restrictions, and connect to a central login server or visit the campus computer rooms when you need access to the UCD-only services. Frequently updated computer classroom usage data, with peak and quiet times, are available on the Web.

Q. I own a laptop. I have logged on to the network from the ports at the library and in Olson, but the current process is quite cumbersome. Is anything being done to simplify this process?

A. A service known as Dynamic Host Configuration Protocol (DHCP) will soon allow any computer registered with the university, including laptops, to operate from multiple locations on campus. By automatically assigning IP addresses to computers, DHCP servers will eliminate the "cumbersome" process currently in place.

Q. When can I expect to see some improvements to the remote access situation?

A. ResNet, the residential hall network made available this quarter, has already relieved some of the load on the campus modem pool. Further improvements will follow as pilot projects reach completion. To see a timeline and updates on the status of remote access pilot projects, visit the Internet/Network Access Improvement Projects Web site. And check the *I.T. Times*' Project Updates page for regular reports on these projects.

Resources

For more information on remote access and the Internet/Network Access Improvement Projects, visit *http://access.ucdavis.edu/*. Send comments, questions and suggestions to *net-access@ucdavis.edu*.

Banner

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style LoginIDs. If you have not yet changed to the new style, you should do so prior to the Thanksgiving holiday. Old-style LoginIDs will no longer be accepted after the third week of January. For more information on new-style LoginIDs, see "You Asked" on this page. You can change your LoginID easily at *http:// info2.ucdavis.edu/ucnames/*.

You or your Technology Support Coordinator (TSC) will need to install special software (WinFrame for Windows and NTRIGUE for Macintosh workstations) to connect with the Banner application servers. To download the software (available free of charge), read step-by-step instructions on how to install the software, or learn about hardware requirements, visit the Desktop Systems Group's Web page (see "Resources" at the end of this article).

Mac users should disable their QuickKeys program, as it may interfere with the new interface. If you are planning to run both DaFIS and GUI Banner on a Mac, special requirements may apply when configuring your system. See the recommendations at the Desktop Systems Group's Web site.

Using the New System

Just as all new applications require training, some adjustment and learning will be needed to transition to GUI Banner.

The Enigma Logic hard and soft tokens in use on the current Banner system will not be required by most users for the first several months of GUI Banner implementation. Instead, you will enter a self-assigned fixed password. However, beginning in Spring 1998, you *will* need to start using your hard or soft token again. So hold on to your token and PIN number.

Because the graphical interface is more memory intensive on the Banner application servers, you may notice a slower response time. Once forms are accessed, however, response time should be similar to that of the current version.

The new graphical interface will allow you to point and click with your mouse, which means that the extended key pad required for the old version will no longer be necessary. If you wish to learn how to use the new

see Banner on page 3

PROJECT UPDATES

Year 2000

Last month, Nancy Thompson, our fictional MSO in the Department of Foresight and Planning Ahead, started to familiarize herself with the Year 2000 compliance status of her desktop Power Macintosh workstation and software. This month's article focuses on PCs in her department.

Following the recommendations available on the UC Davis Year 2000 Web site on testing desktop computers, Nancy's Technology Support Coordinator (TSC) performed a full backup of two of her faculty's IBM PC compatible desktops. These backups may become essential if either PC fails the Year 2000 test and affects the software or corrupts the data on that PC. After reading the BIOS (Basic Input/Output System) articles posted on the Web, Nancy closes all applications and is careful not to run Windows' File Manager which is not compliant and might therefore corrupt some of her files. By using a BIOS check tool found on the UCD Web site, she was able to determine that while the newer PC passed the Year 2000 compliance test, the older failed. (Please carefully research this subject at the UC Davis Year 2000 Web site prior to actually performing these tests. Results will vary with each machine.)

When checking on the software's compliance, Nancy found out that:

- Both Microsoft Windows 3.1.x and Windows 95's File Managers present a Year 2000 problem;
- Bugs were found in Microsoft Word 6.0's Find File command;
- Microsoft Excel 5.x, 7.x, and 97 are compliant. However, the dates entered in spreadsheets will need to be verified. With Excel 5.x, any date entered as a two-digit ("short year") format between "00" and "19" will default to 2000 through 2019. With later versions (Microsoft Excel 7.x and 97), short year formats between "00" and "29" will translate into dates between 2000 and 2029.
- Eudora Pro and Eudora Light by Qualcomm, Meeting Maker XP by On Technology, and all versions of Netscape are Year 2000 compliant.

With the results of their preliminary research, Nancy and her TSC drew the following list of action steps:

Older PC: Upgrade the BIOS; plan to upgrade from Windows 3.1 to Windows 98 when the new version is released in late Summer 1998, or consider the viability of replacing the older PC with a new Year 2000 compliant system that can also run Windows 98 (Pentium class PC with a minimum 32MB of memory); upgrade the suite of tools (Word, Excel, Powerpoint) to at least Office 97.

Newer PC: Schedule upgrade from Windows 95 to Windows 98 in late Summer 1998.

Both PCs: To avoid default conversions of short year formats with recent versions of Excel, dates will need to be entered, or re-entered, as 4-digit numbers (19XX or 20XX).

Although still preliminary, Nancy's research and planning have already helped her define a project plan, including what needs to be done and when the changes might take effect. When the changes are complete, Nancy's TSC will perform a final test of each of the computers for Year 2000 compliance, which will complete the five-stage plan recommended by the Gartner Group.

References

All Web sites and vendors referenced in this article as well as a description of the Gartner Group's five-stage plan can be accessed from the UC Davis Year 2000 Web site at *http://y2k.ucdavis.edu*.

Correction: Last month's Network 21 Update mistakenly listed the rate for departments not eligible for Instruction and Research (I&R) funds as $11.87 per connection per month. The correct amount is $16.36 per connection per month.

Banner

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function keys, consider attending a class offered by the Office of the Registrar. Classes are available for a limited time only and are listed on the Web.

Any instability or problems with GUI Banner should be reported to the Banner help desk. If you receive an error message that is puzzling to you, please report it, whether or not the message goes away.

Sneak Preview

To view the new Banner forms and read about new navigation methods, visit the Registrar's Web site.

Resources

Send your questions and comments to the Banner help desk team at *bannerhelpdesk@ucdavis.edu* or 757-8996.

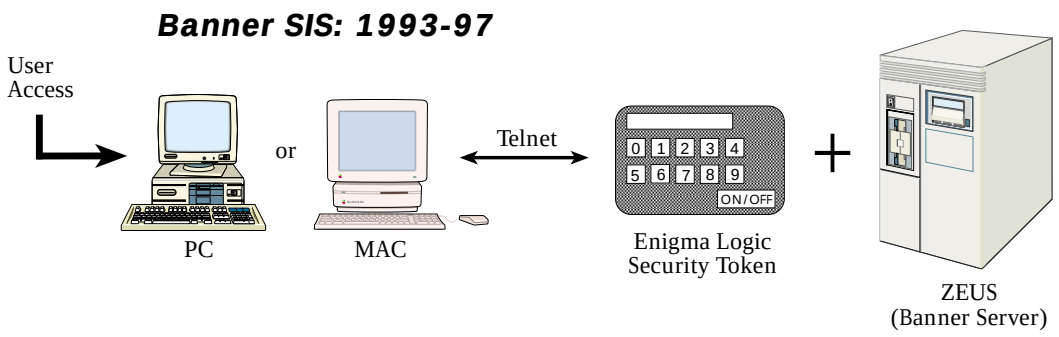
To receive updates and other informative messages about the new Banner implementation, subscribe to *banner-issues@ucdavis.edu*.

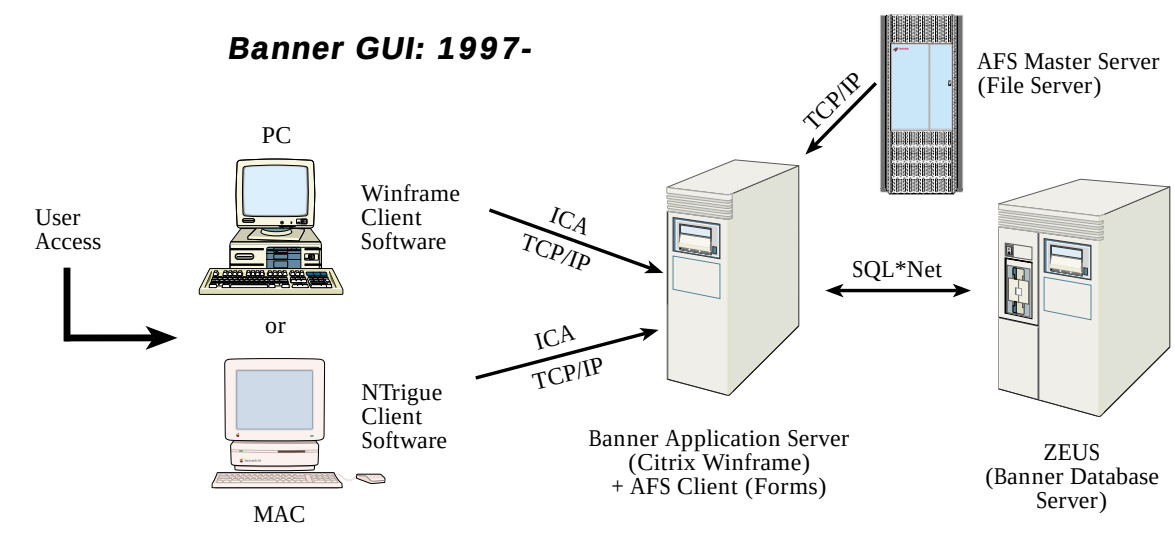
Web Sites:

Office of the Registrar:
http://registrar.ucdavis.edu/training/

Desktop Systems Group:
http://desktop.ucdavis.edu

Sandra Stewart and Karen Munoz from Information Resources contributed to this article.





UCDAVIS AT HOME ON THE WEB

Submissions are welcome; please send them by email to itpubs@ucdavis.edu.

Center for Spatial Technologies & Remote Sensing

http://cstars.ucdavis.edu/

This interdisciplinary research unit has a broad range of interests; these include remote sensing imagery, applications of geographic information systems (GIS), and landscape modeling of vegetation, hydrology, and climatology. Find out about the people involved in these research areas and explore their impressive array of projects.

The Inquiry Zone

http://cbshome.ucdavis.edu/IqZ/

The Inquiry Zone is envisioned as an outreach venture, with the aim of informing both the campus and the broader regional community (with emphasis on K-12 education) about the "frontiers of knowledge." The site hosts an extensive listing of regional "informal science education resources"—parks, museums, zoos, centers, and more.

Public Service Research Program

http://ovcr.ucdavis.edu/oru/psrp/default.htm

The Public Service Research Program (PSRP) "promotes and supports research and education on issues of public concern" (from the program's mission statement). Among its many activities, the PSRP collaborates with state and federal agencies on resource management, participates in such initiatives as the Sustainable Communities Consortium, and hosts conferences, seminars, and guest speakers. (A schedule is available.)

UC IT Organizations and Planning Groups

http://www.ucop.edu/irc/itorgs.html

Interested in finding out more about information technology projects and planning at the UC Office of the President (UCOP) and other campuses? From this page, presented by UCOP's Information Resources and Communications, you have easy access not only to the IT organizations on all UC campuses, but also to University-wide policies and planning documents.

Architects & Engineers

http://www.ae.ucdavis.edu/index.htm

With primary responsibility for designing campus infrastructure, Architects & Engineers have the greatest influence on the look of our campus. Here you can find all about their current and planned projects, and view the extensive Campus Standards and Design Guide.

— Richard Darsie

I.T. CALENDAR

NOVEMBER / DECEMBER 1997

S	M	T	W	T	F	S
November	24		26	27	28	29
		Web Frames	Thanksgiving			
December					5	6
	FileMaker Layouts	Melvyl Web Commands	SGI WebFORCE	Web Tables		
7					12	13
	Web Image Maps	Flyers With Word	FileMaker 4 Demo	PageMaker Large Docs		
14				18	19	20
	Web Doc Converting	Web Analyzers	Mailing List Administration			
21	22	23	24	25	26	27
SEASON'S GREETINGS						

November

25 ◆ Fundamentals of Eudora: 8:30 - Noon, TB 134.

⌘ Web Publishing: Working with Frames: 8:30 - 11:30 a.m., TB 135.

◆ Fundamentals of Excel: 1 - 5 p.m., TB 134.

❑ Finding Resources on the World-Wide Web: 11 - 11:50 a.m., Shields Microcomputer Room (Rm. 163).

December

1 ◆ Windows 95: Beyond the Fundamentals: 8:30-11:30 a.m., TB 135.

◆ Creating Layouts and Reports Using FileMaker Pro: 1:30 - 4:30 p.m., TB 134.

❑ Web Interface to Melvyl - Basic Commands and Features: 3:10 - 4 p.m., Carlson Health Sciences Library.

2 ❑ Web Interface to Melvyl - Basic Commands and Features: 11 - 11:50 a.m., Shields Microcomputer Room (Rm. 163).

◆ Fundamentals of Photoshop (two-day course offered December 2 & 4): 1:30 - 4:30 p.m., TB 134.

3 ◆ Fundamentals of Netscape: 8:30 - 11:30 a.m., TB 134.

◆ Creating Forms and Reports Using Access: 1:30 - 4:30 p.m., TB 135.

✣ Presentation by Silicon Graphics Incorporated (SGI): WebFORCE MediaBase, 10 a.m. - noon

4 ⌘ Web Publishing: Working with Tables: 8:30 - 11:30 a.m., TB 134.

8 ⌘ Web Publishing: Creating Image Maps: 1:30 - 4:30 p.m., TB 134.

9 ◆ Creating Newsletters and Flyers Using Word: 8:30 - 11:30 a.m., TB 134.

Key to Classes & Seminars

✣ Center for Advanced Information Technology, 165 Shields Library.

⌘ Information Provider Series: Staff Development & Professional Services. Faculty and student registration: *learnit@ucdavis.edu* or 754-8091.

❑ Library Instruction Programs: *LibraryClass@ucdavis.edu* or 752-4381.

◆ Staff Development & Professional Services (SDPS): Enroll online at *http://sdps.ucdavis.edu*. Call 752-1766 for an application or catalog.

☆ Student/Faculty Series: Information Technology; call 754-8091 or e-mail *learnit@ucdavis.edu*.

⌘ Fundamentals of Web Publishing (two-day course offered Dec. 9 & 11): 5:00 - 8:00 p.m., TB 134.

10 ◆ Creating Scripts, Menus, and Buttons in FileMaker Pro: 1:30 - 3:30 p.m., TB 134.

✣ FileMaker Pro 4.0 Demonstration: 11 a.m. - noon.

11 ◆ Creating and Managing Large Documents Using PageMaker: 8:30 - 11:30 a.m., TB 134.

◆ Creating Macros, Menus, and Buttons in Access Databases: 1:30 - 3:30 p.m., TB 135.

15 ⌘ Web Publishing: Converting & Repurposing Documents: 8:30 - 11:30 a.m., TB 135.

16 ⌘ Web Publishing: Working with Frames: 8:30 - 11:30 a.m., TB 134.

⌘ Web Publishing: Creating Custom Web Graphics: 1:30 - 4:30 p.m., TB 134.

✣ Web Analyzers Presentation: 11 a.m. - noon.

17 ⌘ Interactive Electronic Mailing List Administration: 9:30 - 11:30 a.m., TB 135.

ResNet

from page 1

them makes me realize that everyone's going through the same thing, and that makes it easier." A direct connection makes communication more convenient and helps save on phone bills, he said.

As more and more classes rely on the Internet for communication between instructors and students — whether by means of the World-Wide Web, email, or newsgroups — having access to a fast and reliable connection becomes a greater necessity.

"Right now is when I really need the speed because I'm starting to do more on the World-Wide Web," Fuller said. "I'm doing grad school searches, research on the Web, surfing the Web for free stuff. ResNet helps me speed up that work."

Senior Tristan Dehlinger, who has a double-major in sociology and psychology, also has increased the amount of research he does over the Internet. And he credits ResNet. "It's made it a lot more convenient for students," he said.

Electronic mail is becoming a primary communication tool for Dehlinger. In one of his classes, he has submitted all his homework and writing assignments by email, and his professor emails back his grades. As a Resident Assistant in Ryerson Hall, Dehlinger communicates with many campus resources, almost entirely by email. "I prefer email [to the phone]. I know they got a message. I know they'll get back to me when it's convenient for them. I'm not put on hold. It's a lot more reliable than trying to get hold of someone by phone," he said.

According to Student Housing records, approximately 55% of students residing in halls with ResNet ready connections arrived on campus with their own computers. Of that number, roughly 84% (or 1,382 students) are using ResNet. Students like Fuller and Dehlinger configured their own systems using the self-help instructions provided by Student Housing by mail and via the ResNet Web site. The "ResNet Connect" support program was available to residents at the start of Fall Quarter, providing free assistance ("Tier 1") to those with recommended and network-ready computers. Residents needing additional help were referred by Tier 1 consultants to the fee-for-service Tier 2 support team.

"More students than we anticipated did come prepared for ResNet with a network-ready system," Papagni said. "That meant that within three days we were able to connect a huge percentage of the students. We actually shut down the Tier 1 support system for a period of time because they were walking around with nothing to do. It was that effective."

Dehlinger estimates that 75% of the students living on his floor have computers and are using ResNet. But Fuller, who worked as a Tier 1 consultant, said there were some students who chose not to connect directly. "They couldn't upgrade, didn't want to upgrade," she said. "I think some of them couldn't afford to. Others were going to get a new computer the following year and didn't see investing the money."

About 16% of residents with computers had equipment incompatible with ResNet or chose not to use it, according to Student Housing. Older operating systems, pieced-together equipment, and incompatible ethernet cards were some reasons for difficulties. There are alternatives to ResNet: students can connect via modem, or can use the Learning Resource Centers (computer labs open only to Student Housing residents) or the campus computer classrooms.

Construction continues, and sometime during the Winter Quarter students will have access to a closed circuit television system and cable service. A broadcasting studio will allow students to create their own programming, and the Housing Office will collaborate with other campus departments to produce educational programs.

For More Information:

ResNet Web site:
http://resnet.ucdavis.edu

CommuniCAIT

The Gartner Group, a leading provider of IT research, advisory, and market research services, uses the phrase "the four I's" to refer to benchmarks and indicators that predict advances in technology. Taken individually, each of the four I's helps analyze advances in a specific technology-related area. When combined, they can predict new products and trends. Much as advances in laser technology lead to innovations in surgery techniques, advances in one I can lead to advances in other I's. The four I's are Interface (the ways in which users interact with applications), Intel (the company that sets standards for processing power and advances in components), Infrastructure (basic cabling and other physical components of a network), and Internet (existing and emerging tools and their standards).

Many of the technologies we will be using in the near future fall into one or more of these categories. Medipoint Systems, for example, has created a voice-enabled system capable of hearing and transcribing 110 words per minute with an accuracy rate of 98%. Here we see an advancement in the Interface area.

Biometrics (retinal, voice, or thumbprint authentication), used for enhanced security, is an advancement in both Interface (relating to how the user verifies his or her identity) and Internet (standards will need to be developed to authenticate and transmit secure information).

Full streaming audio and video technologies will become increasingly available as chips with the power to support video (Intel), backbones robust enough to handle increased traffic (Infrastructure) and browser plug-ins capable of displaying video (Internet) are developed.

As advances are made in each of these areas, technologies such as desktop video conferencing, distributed desktops, avatars, and intelligent agents will enable us to do things we can only dream about now.

The CAIT can be contacted at *advancedit@ucdavis.edu* or 752-5711.

I.T. TIMES

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