NEWS TICKER
Coming soon: Tech & Teaching Summer Institute, Security Symposium . . . Encrypt, please . . . Vista test results . . . Fresh email upgrade . . .

GET UPDATES on **PAGE 2**

SURPRISED?
Most campus notices for illegal file-sharing aren't for songs. Or for games.

PAGE 3

IT TIMES
Information Technology News for the UC Davis Community
Spring 2007

How *much* do we *need*?

The campus has begun a major effort to calculate how much power, cooling, storage, and network speed its high-level research requires. Got room for 500 million virtual trees?

Advanced research often requires sophisticated displays of data, a skill these days that calls for more—much more—than a hearty dose of PowerPoint.

It can require software and equipment sturdy enough to support virtual "caves," or high-definition display walls taller than a basketball player, or digital recreations of ancient cultural sites in three dimensions.

Researchers and faculty increasingly use almost magical images to understand and explore huge sets of data, in areas ranging from physics to sociology. With the right power and networks, they can send the images to distant colleagues or supercomputers, for analysis or to work together.

But to do all that, researchers need computing power, cooling, and data storage—plus a network big enough to move enormous files quickly—in quantities that would have seemed impossibly huge a decade ago. Which has raised a key question: How much high-tech firepower does UC Davis need, to do the work its researchers want to do? How much will it need in a few years?

The campus has begun to find out, through discussions, a cyber-infrastructure conference on campus this spring, a survey, and other focused efforts. Getting answers isn't easy, but it is important.

At stake, said Information and Educational Technology (IET) Vice Provost Pete Siegel, is the future of the campus as a top research university. Without the right framework, the really advanced research can't happen here.

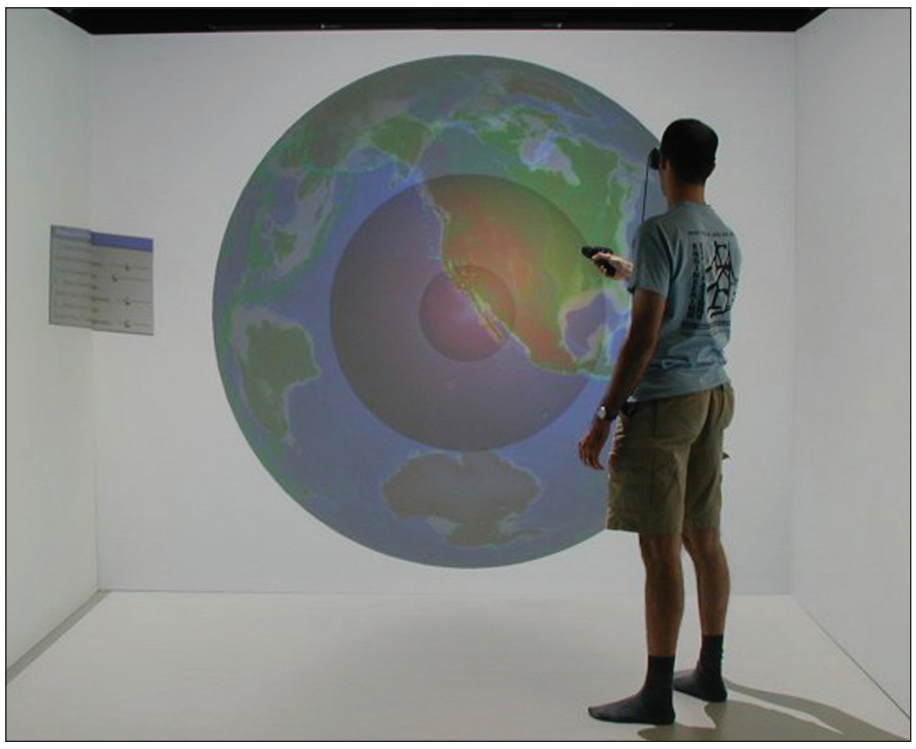


Photo: UC Davis W.M. Keck Center for Active Visualization in the Earth Sciences (KeckCAVES)

A project scientist uses the KeckCAVES virtual display "cave," located in the Physics-Geology Building, to analyze a global catalog of earthquakes with a magnitude of at least 5.0 over the previous 65 years. The four-sided structure measures 10 feet by 10 feet by 8 feet.

Like printing half a billion trees

An assessment of faculty by IET in late 2005 helps define the need for more capacity, although the figures are so large they're hard to comprehend.

Take just one component among many: hosted data storage (data stored off campus, in this case). The requirement at UC Davis in late 2005 was estimated at 51 terabytes. One terabyte equals 1,000 gigabytes, or 50,000 trees made into paper and printed. So 51 terabytes equals about 2.5 million trees turned into printed pages. (The comparison comes from information posted at UC Berkeley and credited to scientist Roy Williams of the California Institute of Technology.)

In 2010, the assessment estimated, the demand for hosted data storage from UC Davis will swell to a nearly unimaginable 10 petabytes. Each petabyte is 1,000 terabytes. Added up, that's equal to 500 million trees turned to print.

The report, though, only goes so far. The response rate was 59 percent, and it didn't reach everyone it should. That became clear when Doug Hartline, the director of technology, planning and development for IET who ran the survey, started getting responses from people on campus neither he, nor the people he consulted, had known to ask. The unexpected responses came from researchers who learned about the study from their peers.

In a decentralized campus, the existence of research largely unknown outside the host department is not surprising. But it creates another hurdle tech planners must overcome: Identifying and extracting requirements from researchers who mostly work on their own.

Mark Redican, director of the campus Network Operations Center (NOC), hears about some needs indirectly. A faculty question or requirement might reach Siegel's office, who then asks NOC about it.

"So part of our challenge is to get out there and beat the bushes," he said. "We've got to go to them."

Conferences this spring

On April 5 and 6, the campus scheduled a cyber-infrastructure workshop in the Genome and Biomedical Sciences Facility. The goal: Consult numerous campus faculty to assess what researchers require, and to analyze where the resources available to the campus fall short. The results, plus an initial map for developing cyber-infrastructure at UC Davis, will be shared with the campus this spring.

Siegel and Barry M. Klein, vice chancellor for the Office of Research, sponsored the event.

"Cyber-infrastructure is an increasingly important issue for the campus, and for higher education generally," said Babette Schmitt, director for strategic planning and communications in IET. "We're bringing together campus researchers, campus technical specialists, and representatives from national and regional cyber-infrastructure organizations so they can exchange ideas, discuss challenges, and explore opportunities for future collaboration."

The dialogue will help IET and the Office of Research understand the key campus challenges in cyber-infrastructure, as well as how to address them.

Based on these talks, Schmitt said, "we will start strategizing about ways in which we can improve support for the demands of current and future research computing."

See Research, page 2

Witnesses to the REVOLUTION

When Tom Arons and Gabe Unda ***signed on, campus tech was what we'd now call primitive. the new retirees are two of the many people who helped to change all that.***

To fully understand the spread, use and influence of computing technology at UC Davis, you could hardly do better than to talk with people like Gabriel Unda and Tom Arons. They have seen most of the changes since the mid-1970s, and helped shape more than a few.

Unda is a photographer. He started as a medical photographer for the UC Davis Medical Center in 1973, has fielded assignments for the campus in diverse areas since then, was an early proponent of using computers to improve photography, and has become expert in digital imaging. Arons is a programmer and tech supervisor who started working for the Electrical Engineering Department in 1978, using a computer with a tiny 64K address space. He departs this year as campus infrastructure architect.

They have worked for various campus units along the way. Unda's area has been restructured several times, sometimes over his objection—high-end campus photography will suffer, he says, if the campus lacks a strong photo unit led by a photographer who keeps pace with the state of the art.

Now each is winding down his campus career as they retire from Information and Educational Technology: Unda from the Mediaworks unit, Arons from the vice provost's office. Unda will return as a part-timer, but Arons is headed for Texas, where he has family.

IET senior writer Bill Buchanan interviewed them together in IET's Chiles Road offices in February.

Tom, how did you come to work for what became IET?

In 1994, a unit on campus called Distributive Computing Analysis and Support was formed, and they were looking for someone to do security. Joan Gargano, the director, asked me if I wanted to work there. I said, well, I'll do part there. But I like working for the department. Departments can move a whole lot quicker than central units.

See Tom and Gabe, page 4

Photo: Sam Woo

Steve Faith and Leslie Madsen-Brooks, whose jobs combine technology and teaching.

New version, new trainers set stage for SmartSite's big expansion this fall

An important software update and new support staff have kept UC Davis' emerging course management system on track to replace the similar, less extendable tools in MyUCDavis.

SmartSite is scheduled to reach a milestone this September, when it will become the preferred course-management system for the campus. Plans call for the tools in MyUCDavis to be shut down in 2008-09, but run alongside SmartSite until then. SmartSite began as a pilot project last spring.

Meanwhile, programmers continue to upgrade the system.

After midnight on Feb. 23, programmers updated SmartSite from Sakai version 2.1 to 2.3 (Sakai is the open source, university-oriented course management system known as SmartSite to most of UC Davis). The upgrade adds features to existing tools and fixes more than 450 known issues. The changes include increased stability, new features like commenting and RSS notifications to the wiki, as well as an improved text editor that enhances many existing tools.

The work in February also keeps UC

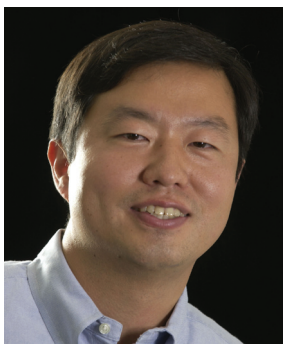
See SmartSite, page 4

Research (from page 1)

While many faculty can get what they need from the campus information technology infrastructure, timely upgrades and expansions are necessary, said Bernd Hamann, a professor in computer science and associate vice chancellor for research.

The campus has untapped potential for interdisciplinary work, he said, such as engaging in major next-generation complex computational simulations.

Most of what researchers and graduate students need lies in the areas of computing power, space for computers, data archives and networking, Hamann said. The vast digital archives used by astrophysicists, cosmologists and high-energy physicists, for instance, require the ability to store, mine and explore these data sets in a distributed computing environment, where scientists work together all over the world. That requires advanced networking capacity.



"The prospects for realizing a world-class UC Davis cyber-infrastructure are extremely bright."
—Professor S.J. Ben Yoo

In engineering, researchers looking into next-generation, simulation-based material design need space for clusters of computers, plus access to the clusters. In social sciences and the humanities, researchers increasingly rely on major digital archives in areas including history, economics, and cultural heritage. Their work often calls for remote access to digital data, too.

Building an advanced infrastructure, Hamann added, will allow the campus to attract the next generation of faculty and researchers who rely on this infrastructure in their work.

Some of the added IT capacity can arrive in a few years. Some must arrive by summer.

Too much heat ahead

Expanding demand has given Morna Mellor, director of the Data Center and Client Services in IET, an urgent task this year—either juice up the cooling power of the campus Data Center, or send some of its computing load off campus.

The center added more electrical power and air conditioning in 2006, blocking in windows and adding high-volume cooling ducts. But the center's capacity is still too small for the heat its machines now produce, so the building cannot continue as is through another scorching Davis summer.

Short term, the campus might outsource some of its data-storage needs if it can't augment the Data Center in time. Longer term, it's looking at building a new data center, perhaps in four to six years.

Another key question is how to organize the infrastructure. Broadly speaking, the usual choice is between centralizing resources and distributing them throughout the campus, to allow researchers and faculty easy access to servers near their labs and offices (often called co-location).

Each option has its arguments.

There's a logical hierarchy for structuring the work, Hartline said: department, campus, regional and national levels. Some tasks should be done at each level. But by working together on common IT needs, researchers could devote more of their grants to their work, not to buying equipment to support the work.

The probable result, Schmitt said, is better research.

Making room for virtual orchestras

Here's a hypothetical example. Under the decentralized system the campus has generally followed, researchers in various fields, working separately, might acquire six servers for their projects. But centralizing and coordinating new infrastructure might let them meet their needs with four.

A more centralized structure would also help the "have-nots" by giving them access when the researchers aren't using the servers. Transmission demand for research varies. It might spike for 20 minutes at 700 megabytes per second, Redican said, then go away for a couple of weeks. "With research," he said, "you have to build the network to handle your peaks."

The have-nots include faculty in the arts who want access to high-capacity networks and storage. Artists have used high-performance computing to conduct virtual orchestras, choreograph dancers working simultaneously on stages thousands of miles apart, or compare paintings against images stored in archives around the globe.

Centralization also maximizes the efficiency of cooling systems and other support equipment.

The IET survey lists more than 40 high-performance computer applications that are driving the demand for cluster computing. They range from protein folding and modeling functional brain activation images to simulating optical networks and simulating human exposure to contaminants through groundwater. As a group, it's very advanced work.

S.J. Ben Yoo, a professor in Electrical and Computer Engineering and UC Davis director of the Center for Information Technology Research in the Interest of Society (CITRIS), conducts applied research in ultrahigh-performance networking and computing involving healthcare, the environment, and other areas.

His work on peta-scale optical routers and realizing a "data-center-on-a chip" could produce tremendously useful changes—such as allowing the immediate transmission and routing of very high-density 3-D images between data centers, medical facilities, and patients, perhaps even from ambulances and desktops. That way patient care, even in remote locations, could start within minutes.

"The prospects for realizing a world-class UC Davis cyber-infrastructure are extremely bright," he said, crediting "strong collaborations between the faculty and IET under the new leadership and initiatives."

Yoo prefers cyber-infrastructure resources to be co-located and distributed on "a seamlessly networked platform," but sees value in centralizing core services. "Either can work," he said. "The key is the reachability of support."

The cost of a major building

Siegel, who joined UC Davis last August, doesn't see just one plan emerging from this year's discussions. The campus needs to get a handle on some core pieces of infrastructure and services, and that will lead to specific initiatives, he said. But cyber-infrastructure is important enough that planning must continue all the time.

The consensus of outstanding faculty, Siegel said, will be a major influence in shaping campus priorities. Some of the work at UC Davis might be done by IET, and some might be done by other parts of the campus with support from IET.

Speaking generally, Siegel added, major research campuses consider it likely that they will spend as much on their cyber-infrastructure upgrades as they would on a major new building.

Interdisciplinary and multi-institutional partnerships are likely to grow as an area of federal research. That's good news for the campus financially. "Effective and agile institutions," Siegel said, "are likely to be the most successful at getting stable or increasing federal funds."

The campus, he said, "has a well-deserved national reputation for collaboration and interdisciplinary projects that actually work. Cyber-infrastructure can play an enormous role in amplifying that work."

"Research excellence is a priority," Siegel said. "This is crucial."

CAMPUS TECH *Wrapup*

NEXT TECH AND TEACHING INSTITUTE TO MEET JULY 16-20

Faculty interested in learning more about the smart use of technology in teaching at UC Davis might want to jot down these dates: July 16-20. That's when the Teaching Resources Center (TRC) will host its next Summer Institute on Teaching and Technology, or SITT.

More details will be announced on the TRC Web site (trc.ucdavis.edu) as summer approaches.

SITT has met on campus most summers for 15 years. Topics last July ranged from podcasting and the use of technology in large lecture classes to ideas on student writing and an introduction to SmartSite, which will become the main campus course-management system starting this autumn.

University Writing Program lecturer Andy Jones, who organizes SITT for the TRC, is eager to schedule sessions this year on these and other subjects that address innovative teaching and technology applications at UC Davis. Send ideas, expressions of interest, other comments or questions to him at trc@ucdavis.edu.

Material from last year's institute is available through links at the 2006 site, trc.ucdavis.edu/trc/sitt/SITT06.

MOVE TO CYRUS IS LATEST EMAIL UPGRADE

If later this spring you notice that your campus email account suddenly seems to work a little better than it was—but that's all you notice about the change—then the planners, programmers and others in Data Center and Client Services who work on the campus email system will be delighted. Your response would show that Cyrus is working behind the scenes as planned.

Cyrus is a new email architecture system that the campus will begin moving to in April, following months of tests and review. Adopting Cyrus should boost email performance and user response time, allow faster access to mailboxes by Web-based email programs, increase mail quotas, and improve the system's storage of archived messages.

UC Davis offers email services to more than 50,000 users, and delivers more than 2.5 million email messages daily. The existing architecture is aging, and needs improvements to meet the growing demand on campus.

As with most transitions to new programs, there will be side effects. One is a one-time double-download of stored emails for campus clients with a POP email setup (POP refers to a configuration that an email program can use to access your account; a newer and better configuration is IMAP). Look for more information as the quarter advances, and read more about Cyrus at vpiet.ucdavis.edu/email.storage.cfm.

The move to Cyrus is one of several improvements the campus is making to its email system this academic year. Other changes include replacing the mail list processing service (listproc), replacing Geckomail, and increasing mailbox quotas.

Carnegie-Mellon University developed the Cyrus email system. Subsequent users include UC Berkeley, University of Michigan, Stanford, and other leading universities.

REGISTRATION OPENS FOR IT SECURITY SYMPOSIUM

Registration for the third biennial UC Davis IT Security Symposium has opened. The $2^1/_2$-day conference, held on campus June 20-22, offers UC technical professionals practical information for enhancing computer and network security levels in a university environment.

The schedule includes more than 40 seminars, panel discussions and hands-on lab sessions. Topics include writing secure code, forensics, encryption, Mac OSX security, e-voting and more.

The audience can also enjoy a keynote speech by proxy firewall inventor Marcus Ranum, a networking lunch on day one, and a full breakfast on day two. A free T-shirt, conference publications and refreshments are included.

Thanks to the sponsors, registration costs just $85.

To register or read more about the event, visit itsecuritysymposium.ucdavis.edu.

VISTA COMPATIBILITY TESTS: MOSTLY GOOD NEWS SO FAR

The campus continues to test Vista, Microsoft's new operating system, to see how well it works with various applications. As of early March, many common uses have been found compatible, including SmartSite, MyUCDavis, Geckomail, and Moobilnet, as well as popular commercial products such as Adobe Dreamweaver MX, InDesign CS2, and Photoshop CS2. The word is still out on others.

Volunteers from 15 departments began testing Vista in December to make sure important campus applications would work for early adopters who wanted to upgrade to the new operating system, or for campus users buying new machines with Vista already installed.

The test results—which also include compatibility testing of the new Office 2007 and Internet Explorer 7—have been compiled into an alphabetical listing that features the results, notes, and links (if available) to vendor support.

For results, and for information about Microsoft licensing specific to campus, visit vista.ucdavis.edu.

With tests continuing, the campus is reluctant to recommend the upgrade yet. "There's no compelling reason for the upgrade now," said programmer Pete Peterson, from the Data Center and Client Services, in early March. "Most technical departments will wait until the release of Service Pack 1," an upgrade with patches and enhancements.

Users should be cautious, and might encounter integration problems. "While the applications work with Vista, the peripheral items like scanner or printers might not," Peterson said.

Older computers (ones with less than 1 gigabyte RAM or less than 128 megabyte video RAM) will encounter problems with Aero Glass, the new feature of Vista, because Aero Glass runs more efficiently on a Vista Premium Ready computer.

A Premium Ready computer meets the requirements set by Microsoft, allowing users to take full advantage of Vista, especially the new Aero technologies.

TEAMSPOT HELPS LAPTOP USERS WORK AS A GROUP

The campus has added TeamSpot, a product that creates a public space—typically in front of a public computer with a large screen—where people can easily work together when using digital resources.

Part of the Meyer Media Lab in 1154 Meyer Hall is being slightly remodeled to create a specific TeamSpot collaboration zone, available to students, faculty and staff. The service is free, said Meyer Media Lab manager Joe Castillo, but clients will need to reserve the TeamSpot area through the lab (meyermedialab.ucdavis.edu), and bring their own laptops.

Clients don't use TeamSpot by logging in to the big-screened public computer—instead, using their laptops, they join a space managed by the computer. Then they can work together on the public computer screen from their laptops, and handily exchange files and other information with other members in the group.

A campus TeamSpot Web site, which is expected to go live by mid-April at teamspot.ucdavis.edu, will have more information.

TeamSpot is made by Tidebreak, Inc., an interactive workplace technology company based in Palo Alto. A company representative demonstrated the product on campus last August.

Please scan, then store or zfhs4rergjfg

Asdfiisuf spdc kj$#%$521j mcsngkuj ejdwih^d flcb.

Gibberish? You bet. And its sheer illegibility is exactly why the campus is making a major push into encryption this spring—to install one more layer of protection against identity theft. Thieves who try to steal lucrative personal data from UC Davis computers or files won't get far if encryption software has scrambled the data into claptrap.

The call for encryption is part of a campus drive for better safeguarding of personal data that also includes a new policy, encryption software subsidies for qualified users, and instructions to all faculty and staff on where to search for personal information on their computers.

The basic goal: to have faculty and staff scan their machines and files for personal information, delete or offload it if possible, and encrypt it if the records must be kept on the computer. So that if someone does try to steal personal data, all they get is osdydv;lgd0b0grrg/fv.

A preference for Pointsec

The Whole Disk Encryption Policy, expected to be adopted this quarter, will require faculty and staff to encrypt computer systems which store restricted information if other protections are limited, and to encrypt the information if necessary to keep it from being stolen or misused. The data include Social Security numbers, California driver ID numbers, financial and medical records, and other information which, if accessed, modified or deleted, could harm UC Davis.

To help, the campus has made Pointsec software available campuswide. Pointsec scrambles information on a user's hard drive and prevents anyone without the right password from accessing the files.

Pointsec is one of two licensed encryption software programs on campus. The other one, Credant, is primarily used by the UC Davis Medical Center.

The campus prefers Pointsec, said IT Security Coordinator Bob Ono. "Unlike Credant, which encrypts a specific file or folder, Pointsec encrypts everything on the hard drive," Ono said. "We can't assume that everyone will consistently store data in one area."

Check your digital attics

Personal data can be found anywhere on a computer. Important places to check are email archives, letters of recommendation or resumes, class materials, and databases of job applicants. Personal data can also hide in old computer files, student rosters, grant applications, and personnel files that used Social Security numbers as IDs.

> **"With 30,000 computers currently used on campus, we expect to see at least 50 percent of staff and faculty perform these scans."**
> **—Bob Ono, IT Security Coordinator**

Computers inherited from retired faculty or staffers might contain data the current user doesn't even know about.

Staff and faculty can scan for certain types of personal information on their own, or ask their departmental technical support coordinators for Cornell Spider or Power Grep—two software programs available to staff and faculty.

Cornell Spider (available for free) and Power Grep (minimal cost) let users program searches for a specific type of data, such as Social Security numbers, by searching for data arranged in a pattern, i.e. xxx-xx-xxxx.

"With 30,000 computers currently used on campus, we expect to see at least 50 percent of staff and faculty perform these scans," Ono said. "Cost should not be a hurdle."

What to do if you find some

Once a user finds restricted personal data, the first option is to delete or move it. "If the information is not frequently used, we encourage faculty and staff to move the files to a portable media device, like a CD," Ono said. But people who need to keep restricted information on their computer can use Pointsec to protect it. IET will pay for the Pointsec for PC license.

The Whole Disk Encryption Policy embodies the university's ongoing effort to protect personal information and prevent security breaches. Victims of identity theft can spend thousands of dollars and hours of time recovering from losses.

Also, employees whose negligence allowed the theft can lose their jobs. As stated in a directive signed last October by campus leaders, "individuals who could have prevented security breaches but did not are held responsible . . . up to and including dismissal."

The stepped-up diligence sounds good to Matt Bishop, a professor in the Computer Science Department. "I believe protecting students' personal information is critical," he said. "Whatever we can do to protect that information is good."

READ MORE:

For more information, go to security.ucdavis.edu/encryption.cfm.

UC Davis misses top 25; that's good

Universities usually want to be on top when it comes to rank, but in a new list from the Recording Industry Association of America (RIAA), UC Davis isn't among the top 25.

Good thing, considering the list ranks universities that have received the most notices from RIAA regarding the illegal file-sharing of music, video and games.

Ohio University tops the list with 1,287. But UC Davis' numbers are rising. The campus has received 459 notices so far this academic year, said Jan Carmikle, an attorney and UC Davis' designated agent for notifications of illegal file-sharing, up from 310 for all of 2005-06. (UC San Francisco had the lowest in the system last year, with 22 notices.)

The rise signifies a new crackdown by the industry, not necessarily a jump in illegal file swaps. Copyright holders are focusing on colleges, where fast networks and high bandwidth make illegal downloads more convenient.

To combat illegal file-sharing, the campus runs education campaigns and responds to every notice, to make sure the violator removes the illegal files and the software used to share them. And the campus is investigating ways to make it more difficult for illegal files to occur on the network, plus looking for more opportunities to educate users.

For most violators, one notice is enough. A second brings permanent consequences. No violator on campus has received a third.

The campus also promoted an alternative to illegal sharing by buying students free subscriptions this year to Ctrax, a digital music-buying service. Other universities have done the same. But Ctrax owner Cdigix is dropping the service as of April 30; the shutdown affects about 1,300 students at UC Davis. (For a list of continuing legal music sites, visit musicunited.org/6_legalsites.html.)

It's mostly movies and TV shows

Song piracy gets most of the publicity, but only 17 percent of the UC Davis notices for 2005-06 were for music. Of the rest, 14 percent were for software and games—such as The Sims, Diablo, and Super Mario Bros.—and 68 percent were for movies and TV shows including "Heroes," "The Office," and "Battlestar Galactica."

The campus does not monitor its network for illegal file-sharing, but as a service provider, it must act on every notice. It also gets notices from companies and trade groups.

"People think they are only vulnerable to getting caught when they are downloading a file," Carmikle said, a task that can take just seconds.

The notices, though, are based on users providing an unauthorized copy for other people to download, also known as uploading. Companies and organizations use peer-to-peer software to search for copies of their products—the same software pirates use. When they locate a copy, they download it, note the time, IP address, and title. If the address is from UC Davis, Carmikle gets a notice. Then it's her job to tell the student, faculty, or staff member who provided the illegal uploading that their access to the network will be blocked.

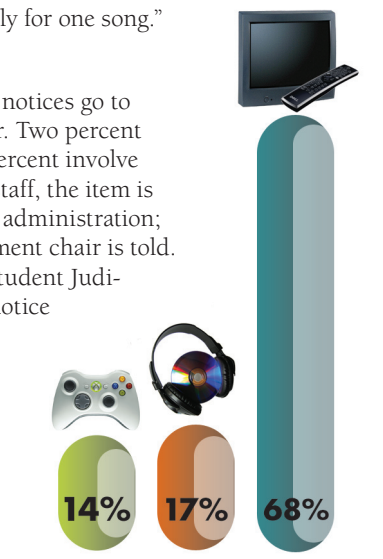
The copyright searches and subsequent notices to universities are automated. And because many computers are online all the time—and their peer-to-peer software is, by default, potentially making illegal files available all the time—it's increasingly likely they will be caught.

Another common misperception: only big violators are targeted. "The music notifications I get now," she said, "are generally for one song."

Two strikes and you're off

Most illegal file-swapping notices go to students—94 percent this year. Two percent go to staff and faculty, and 4 percent involve departmental computers. For staff, the item is turned over to the department administration; for faculty, the dean or department chair is told.

Students are referred to Student Judicial Affairs. After receiving a notice from dmca@ucdavis.edu (it stands for Digital Millennium Copyright Act), the violator's network access privileges for that computer are turned off. (The student can still use the computer labs.) After a first violation, students learn the potential consequences of illegal file-sharing, go through an educational program and sign an agreement. Then they get their network access back. Some are off the network for at least a week—longer if they don't go to Student Judicial Affairs promptly.



Just 17 percent of the UC Davis notifications in 2005-06 were for music; 68 percent were for movies and TV shows; 14 percent for software and games.

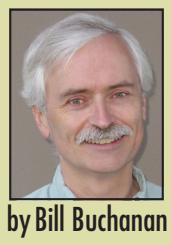
That usually fixes the problem. The peer-to-peer software is yanked and copyrighted material is no longer made available. Repeat offenders are rare. There were only 12 in 2005-06 and just eight so far this year.

For a third infringement, the university is liable for fines of at least $15,000 per illegal copy, up to $150,000 per copy if the infraction was known. Carmikle knows of no universities sued for a third violation. But UC policy is to not take a chance.

READ MORE:

For more about copyright infringement, visit getlegal.ucdavis.edu or email dmca@ucdavis.edu.

Tech's a car, plus the place the car goes. Get in and drive.



by Bill Buchanan

One afternoon last June, several of us in Information and Educational Technology were sitting around a table, struggling to find the best way to describe SmartSite in 10 seconds or less. Then Chris Sarason said something that went to the heart of what the new system is trying to achieve.

People used to call tech a tool, she said (Sarason manages the ET Partners program, which helps faculty use educational technology). But it's not just a tool anymore. Tech has become a place.

In other words, SmartSite is more than a thing that instructors can use to manage classwork or that students can use for a chat room; it includes the room itself. A space. A place where interactive tech makes certain things possible… things not possible in the unwired world.

Sure, that's only a partial description for something as sweeping as technology. Plus, calling tech a place is old news to anyone who already "gets" technology—and kind of woo-woo if you think of tech as just a different way to make a phone call or reheat last night's dinner.

So here's another way to illustrate how tech has morphed: compare it to engines. The kind that probably brought you to work today.

We don't call it the drive-o-sphere—thankfully—but that's what it is

Community used to mean "where you live." Now it includes "where you go." Both phrases used to mean the same thing, because unless you were rich, nomadic or prone to wander, you mostly worked and lived near home.

Cars, jets and a growing economy changed all that. They made it easy for more people to travel. Your world grew, not just by adding square miles to your turf, but by adding all the new things contained in those extra square miles.

And you met people, developed routines and found favorite places in those far-away locations. You gained variety. Your definition of community grew to take all that in. You lived in a larger sphere, defined by where you went.

What cars and jets did for travel, high tech is doing for 1) our ability to communicate, and 2) our ability to project and connect our images, beliefs and work, all over the globe. Tech is creating a place—an electronic village, a virtual market, a dark corner, where our projections can talk to each other.

Tech is an online coupe, plus sometimes wherever the coupe takes us. A little weird, but true.

We never named the larger world that Fords and Toyotas created. "Car culture" is as close as we've come. In most of the U.S., carland is a place we understand instinctively. It needs a separate name as much as your left hand needs its own Social Security number.

Virtual isn't physical, but it's real

Anyway, the name isn't the point; the point is the arrival of tech as a place.

When SmartSite creates an online chat room where classmates scattered throughout Davis can meet to discuss a test, it's adding a virtual conference room to their lives. SmartSite and similar systems can add lots of places like that.

Again, old news to the in crowd. But I write this column partly for high tech's new, skeptical or indifferent users—a group I'd guess is rather big on campus, and includes me. People willing to see how tech can help us, but who flinch at the jargon and can't stand technobabble.

Tech is like cars. We don't care about idler arms or struts. But understanding where it can take us? That subject is rich.

Bill Buchanan, a senior writer in IET, edits the IT Times. *The views here are his own. Contact: wrbuchanan@ucdavis.edu.*

Tom and Gabe (from page 1)

That's still true. Trying to deploy something on an enterprise scale is a whole lot harder, a whole lot slower. In the Electrical and Computer Engineering department at that time, we had on the order of 100, 150 work stations that were sort of centrally managed. And the IT department didn't.

So I started working for Joan half-time. It's only 2003 that I went to IET 90 percent time. I wanted to maintain my departmental roots. Because that has really served to keep me honest.

Keep you honest?

Yeah, it helps you know what's going on. And I think people working for a central organization think everything ought to be centralized. It's funny, it's sort of like the first rule of bureaucracy is that people want everything centralized below them, distributed above them.

Gabriel Unda, today and during his early years on campus.

But now you're infrastructure architect. A fairly central job.

I see the role of the central organization, and the role of infrastructure in particular, is to build enabling technology that allows people in departments to go explore and do what they want to do, and not be dictated to that 'this is the way it's going to be.'

What do you do, as infrastructure architect?

I design and help deploy underlying technologies, specifically things like authentication, so that not every application on campus has to have a separate user-name password, and so there can be central service for doing things like account maintenance.

The point is to build a basic foundation the rest of the campus can use.

To build tools the rest of the campus can use. There's a crossover, because we build some applications too. There's middleware; basically, middleware is any program that talks to another program.

Digitizing the view from a roving truck

Gabe, please talk a little about photo assignments you've had, one or two that were really special.

The one that stands out in my mind is the Eastman Collection [donated to the University Library in 1994]. It was the first time anyone tried to digitize a large collection and put it on the Web. I did the approval concept on that and trained the people at the library who essentially made that happen.

Jervie Eastman, no relation to George [of Kodak fame], was a postcard photographer up in Susanville. He'd take his little truck and tour California and photograph basically everything that might work as a postcard. He also bought other studios as they went out of business, so accumulated a collection of something like 12,000 glass plates and negatives that are this incredible record of California [from about 1890 to 1960].

One of the best examples of photography and technology working together is the Eastman. The library is very good at metadata, and with the Eastman Collection, once they had the digital images, they built a metadata structure behind those images that makes it possible to find almost anything very quickly.

Did you digitize that collection?

The first 100 images, and created the structure for doing it, which is essentially what I'll be doing next.

I've done so many assignments that it's a blur. I really enjoy the medical work, the surgeries at the Med Center, the day-to-day stuff here on campus.

Probably the thing I'm proudest of, though, is bringing digital photography onto campus. It's been a passion of mine from the beginning. I worked very hard at creating a structure at Illustration Services [a predecessor to Mediaworks] that was digital, including the color management, trying to train people how to use color management, creating structures where what you saw in the computer is basically what you get out of the printer. That's a fairly major accomplishment.

You only have one window into our data, and that's our monitors. If they aren't giving us accurate visualization of what that data represents, then it's hopeless from the beginning.

Present for the first campus network

Tom, what's your best or most interesting accomplishment at UCD?

Probably something to do with networking. Building the first Ethernet on campus… The first Unix system that I know of on campus was in Electrical Engineering in 1978. Unix version 6.

And you had a hand in that.

Yeah. Also, I'm proud of a unified name space. The fact that you have a Kerberos ID that's used all over campus in different departments. That was a big deal, and enabled a lot of other stuff.

And the other thing, in terms of networking, was working with a bunch of emerging technologies. Working in the ECE department, we had a relatively understanding group of users who would tolerate down time, which we couldn't do on the campus. So there were technologies we were able to experiment with, switching technologies, which are now used all over the place. We worked with the first company to do Ethernet switching.

What's the biggest change you've seen in campus technology?

Probably the advent of networking, and moving from mainframe to distributed computing, in general. And the Internet too, both on campus and interconnected to the outside world.

Our first [Web] connection to the outside world was through Berkeley, through UUCP, which was basically a phone-line connection, 1200-baud connection to Berkeley. And with UUCP, you had to give an explicit path, so one computer would phone another computer … you'd have a 'bang' [exclamation mark] in between and you'd see the entire path, so if you wanted to get to Stanford, the address would be 'UCBvax,' bang, 'Stanford,' bang, some computer at Stanford ...

UUCP probably went away in the mid-'80s. In the early to mid-'80s we joined CSNet, a 4800-baud connection to Berkeley. It would pick up the mail several times a day.

Don't let excellent photography slip away

Gabe, someone 30 years from now will be doing some version of your job. What will the job be like?

I'm a little worried. There are probably five photographers who have retired in the last three or four years, some of them world-class, people like Jack Clark, just remarkable. None of them has been replaced. And the perception is, well, we really don't need them anymore, we can do our own. There are places like public affairs that have replaced photographers.

Tom Arons, 2007 and 1982.

Will there be photographers on campus 30 years from now?

I don't know. I'm hoping it's a cycle. Because I think they need them. I've seen a publication on this campus that was just an atrocious piece of rag, because they all tried to do their own stuff and had no concept of photography or page layout or anything else. Now you've got professionals doing that, and the quality is much higher. Why? It's not being done by amateurs.

You'll continue to see photographers in places like publications. But the scientific community needs them too. That's what Illustration Services did. They were really research photographers and scientific photographers.

If the photographers on this campus are viewed as part of the infrastructure, you're going to have a very, very high level of photography. Otherwise you're going to lose that over the next couple of years.

Only the hair would change

What's campus educational technology going to be like in 30 years?

Tom: Thirty years? I have no idea. I mean, direct neural contact with computer, a better interface, you wear a little headband that controls something that has a speaker in your ear, you look something like the Borg guy [a computer/humanoid hybrid in the 'Star Trek' TV/movie series].

My first job, I worked with … the world's first desktop calculator, and a desktop is about what it took. It weighed about 100 pounds, cost about $4,000 to $5,000. You could spend millions of dollars back then and couldn't get what you can have now. Thirty years from now? I don't know. If we continue on the same path with miniaturization and computational speed, then it'd be bigger.

Gabe: It strikes me, how much difference there is between our two areas. Because if you were to take a picture of photographers at a sporting event 30 years ago, and you took a picture today, you wouldn't see any difference. The technology would be light years apart. But the lenses, the equipment would be the same. The photographers would look exactly the same.

Their hair would be different.

Today's visualization technology lets people walk into a 3-D image, in 'caves.' Is tech going to continue to develop in these strange and wonderful ways?

Tom: I'm sure. The underlying technology will advance to be able to support new and different things.

It used to depress me, but I've learned several sets of skills that are totally obsolete. I spent two or three years learning how to fit programs into 16-bit address space, and how to do image processing efficiently when you could only fit this much of the image into memory at one time, so you had to address it in ways that were clever. I wrote lots of clever things for bringing images from disk into memory in the most efficient way. Now you just suck the whole thing into memory, do whatever you want to do on it, and put it out. There's a whole set of skills like that which have become meaningless. I don't know what I'm doing today that will become meaningless in the future.

One path to Texas, one path back here

Tom, you're moving to Austin. What's next for you? Are you going to keep up with new technology?

I will probably keep up with new technology. But I don't even know what I'm doing as far as this place goes, in terms of when I retire officially. It'll be this year, unless they want me to telecommute from Texas. At some point, it'll end here, and I'd like to do consulting, you know, take the generous retirement package from the university, and then augment that with something else.

Consulting in educational technology?

I don't know. Probably not. They don't have as much money as other people *[laughs]*. … in infrastructure, in large-scale infrastructure deployments, wireless infrastructure. I could see doing that for other organizations.

That, and repairing my house.

Gabe, what about you?

I'm actually coming back [part-time], in March or April, depends on the whole retirement process. There's 40 years of negative files that Illustration Services/Creative Communications/Mediaworks has accumulated . . . I'll help digitize that.

READ MORE:

Read their thoughts on trends in educational technology in a longer version of this talk at ittimes.ucdavis.edu

SmartSite (from page 1)

Davis on track to update to version 2.4, the edition targeted for general campus use, this summer. Two highlights of the fall rollout version of SmartSite are more flexible course management features and additional tools.

Use of SmartSite keeps growing. As of Feb. 22, it had:

- 6,028 unique users, up about 100 percent from November.
- 308 course sites, up 35 percent.
- 628 project sites, up 7 percent.

Tech and teach; teach and tech

Helping faculty learn how to use SmartSite will be two new faculty training coordinators, who have been hired by IET-Mediaworks to help instructors discover and apply a broad range of educational technology.

Trainers Steve Faith and Leslie Madsen-Brooks have strong connections to the campus. Their backgrounds as an engineer (Faith) and teacher (Madsen-Brooks) provide complementary skills to support SmartSite, and give them differing perspectives on how to help users.

Their business cards display their different approaches. Faith's card—emphasizing his programming skills, experience with campus IT, and time at Apple Inc.—states "Technology and Pedagogy." Madsen-Brooks' card flips the order, listing "Pedagogy and Technology."

Putting teaching first reflects her background—specifically, her experience as a teacher of science and technology from a cultural perspective. She has taught in the American Studies department, and did research on women in science and technology in Cultural Studies.

Their backgrounds help strengthen SmartSite's training program, and exemplify the project's general sense of collaboration. For training schedules and other information about SmartSite, go to smartsite.ucdavis.edu.

Undergraduate chatter

SmartSite, nearly a year old as a pilot project, has been used by hundreds of UC Davis students. Undergraduates seem to like its chat room—a lot. It's useful for evening study sessions and cramming.

"I would say their favorite tool is the virtual discussion section we created using the chat tool," says Kristina De Korsak, a graduate student instructor in Linguistics. "The students actively participate, seem to enjoy the conversations, and appreciate the fact that they do not have to return to campus late in the evening."

"The lower division students are fond of the chat room," agreed physics professor Joe Kiskis, "the night before problem sets are due."

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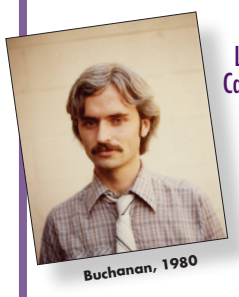

Buchanan, 1980

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