Internet 2: the next generation

by Sally Hritz

Internet 2 is coming, and it's so new that only the planners and diehard techies know about it. But The Ohio State University is one of the trailblazers, being among the 34 charter members of Big Ten and Ivy League schools and other leading research institutions who signed on last October to create the next generation network. Membership is expected to reach 100 institutions, and the federal government and major industrial players like IBM and AT&T will also be involved. President Clinton has announced that he will push for up to $500 million over the next few years to aid the project.

"Internet 2 goes deeper than a new, faster national network," says James F. Davis, associate provost and director of University Technology Services. "I view Internet 2 the same as I do the Internet at its inception; it represents a quantum jump in terms of capabilities. We need it because the ability to share information among research institutions has grown exponentially. Universities have to be able to keep network capabilities progressing in a coordinated fashion nationwide. We can already identify projects where connectivity requirements are saturated in current conditions. Internet 2 will support a new level of applications and open doors for sharing research and other materials."

Why an Internet 2? Because its technology promises to accelerate network communications to astounding speeds, with data propelled anywhere from 100 to 1,000 times faster than currently possible. Internet 2 will also introduce enhanced network services and multimedia applications. It will not be a replacement for the original Internet, but a higher capacity portion available to member institutions who install the faster lines and equipment for their campuses.

Bob Kalal, director of UTS Affairs, says that Internet 2 will enable University Technology Services to provide a whole new array of capabilities and services for the university that will involve a parallel upgrading of campus facilities. However, Internet 2 will continue to be part of the Internet and it will look the same. He notes that Internet 2 will remedy one of the Internet's biggest problems, which is that no one ever knows when the data they send will arrive at a destination. The new technologies of Internet 2 will ensure that the simultaneous transfer of huge amounts of audio, video and data can take place in real-time for events like teleconferencing and distance education, among other things.

Robert Dixon, a member of UTS's emerging technologies group, offers more perspective. "The Internet is the greatest cooperative effort humankind has ever engaged in," he says. "It started out being egalitarian, with everybody cooperating and sharing the problems. Now the commercial providers have taken it over because they can make money. To them it's a utility, but utilities don't innovate, and that level of service is not good enough for leading universities who have to be able to push the edge of

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technology. The Internet is a wonderful place for adventurers, entrepreneurs, and inventors, and we need to preserve that capability for universities. If we don't go to Internet 2, we might find that we can't do even what we do today because the network is getting slower and bogged down."

Clifford Collins of the UTS Networking and Communications group, assures that there will be no disruption of existing Internet services on campus while new technologies are added. But users will notice the perceptible increases in the capabilities and transmission speeds that are critical to the next wave of bandwidth-intensive applications such as audio and video transmissions.

Kalal says the speed and new technologies of Internet 2 will be advantageous for researchers, faculty involved with interactive video and multimedia delivery, and also the students, who will reap the benefits of improved technologies in classrooms as well as the high quality faculty who will be attracted to such institutions.

Professor Raj Jain, of the Department of Computer and Information Science is involved in research on high speed networking and ATM networks, on which he says a large part of Internet 2

will be based. Because ATM networks are suitable for integrated multi-media traffic, that is, applications that contain data, voice, and video at the same time, he feels that "Internet 2 is very important" to providing the bandwidth and services required for distance learning, tele-medicine, video conferencing, and video on demand applications.

Everyone is excited about Internet 2's prospects, including Steve Acker, UTS associate director of Instructional Technologies. However, he urges that Internet use policy be carefully deliberated. "As in so many cases, technology is way ahead of policy," he says. "Internet 2 could become the transforming mechanism of this supposed information age because in concept it's close to unlimited bandwidth, but if the use and access policies are wrong, they can choke off that collaboration and further separate the have and have-nots."

He points out that Internet 2 comes with a built-in pricing mechanism that may or may not be activated. "The design parameters of Internet 2 make it possible to meter, charge for, or prioritize individual messages or exchanges. For example, Internet services could be priced based on the urgency of communication—higher costs for immediate delivery and lower or no costs for delivery within 24 hours. The pricing gets complicated for activities like conferencing that have to be done in real time. Electronic meetings would have to pay for priority use. Even though the bandwidth promised by Internet 2 is needed for high quality video and audio conferencing, that kind of pricing/allocation system could work against collaborative, full-service activities."

Who will pay for the physical components of Internet 2? The Clinton Administration recently announced that it will allocate $100 million in FY98 to the project, with the expectation that it will spur additional investments by universities and the private sector. But member institutions, for the most part, will pay for the lines and equipment for their own campus networks. Davis says that UTS will participate in the conceptualizing, design, development, construction, and implementation of Internet 2 for Ohio State, then install and maintain it.

"OSU must participate in this project to position itself for research collaborations that will be coming," Davis states. "OSU's presence at the beginning of Internet 2 sends a clear message that it is one of the country's leading research institutions and innovators."

For more information, visit the Internet 2 web site at *http://www.internet2.edu*. Technical information on Internet 2 is available at *http://www.ucop.edu/irc/projects/Internet-II_Arch.html*. Information on the future of the OSU campus network is available at *http://www.net.ohio-state.edu/futures/index.html*.

Support Center Adds Services

Last Fall, University Technology Services introduced the Technology Support Center, which was started in response to a need identified by a universitywide project team composed of members from A.R.M.S., the Research Foundation, the Office of the Controller, UNITS, the University Medical Center, and UTS. In the university's move to a more distributed environment for technical and computing activities, UTS is assuming a more centralized role for information sharing and consultation.

Associate Provost and UTS Director James F. Davis considers the Technical Support Center a cornerstone of our new organization and says, "it will play a key role in our future and continued success as a service organization. Not only will the center make it possible to provide an increased level of consultation services to a far greater number of users, but it will also allow us to stay in better contact with the user community so we can continuously review the quality of our services."

The Technical Support Center is open 7 am to 10 pm, Monday through Friday. To request a service or ask a question, call 688-HELP or send e-mail to *8help@osu.edu*. When calling, please be prepared to give your network username, for example *smythe.123*.

You can call the Support Center for immediate answers, for referrals on complex situations, or whenever you're not sure whom to call regarding a UTS service. If your request requires the in-depth knowledge of a specialist, it will be referred to the appropriate person. In those instances, additional time for research may be required before you receive a response.

The Technology Support Center is still a work in progress. Last quarter, staff fielded phone and e-mail service requests related to HomeNet, OfficeNet, ResNet, e-mail, password resets, and Whois updates. This quarter they have begun accepting requests related to mainframe, statistical, UNIX and workstation computing, and are also responding to electronic mail messages forwarded from familiar consultation addresses such as *consult@magnus* and *consult@ohstmvsa*. In addition, the staff is investigating a new notification method for system outages that will reach more people in less time. Eventually, the Technology Support Center will be the first contact for nearly all UTS services.

Best Practices Update

Best Practices, The UTS program to help disseminate and develop technology enhanced learning and research (TELR) activities at OSU, is happy to announce that the Best Practices server is now open for business. The server (*http://www-best.uts.ohio-state.edu/*) is collecting information from faculty members who are working on, completing, and testing instructional and research applications using information technologies and want to publicize them. Best Practices also is developing resources to support these activities in the form of grant competitions, templates and tutorials, student co-op and technical support, and featured activities to help give faculty long-needed recognition for their design and development activities. By contributing to Best Practices, faculty can improve their own work and at the same time help others avoid reinventing old wheels.

Steve Acker, associate director of instructional technology for UTS, sees another clear faculty benefit for those submitting to Best Practices—no more gnashing of teeth when asked count-

less times for identical information. He urges faculty to submit their material to Best Practices, and then point their department chair, dean, or interested colleague to the server. "Let's let information technologies make our lives easier and better at the same time," he suggests.

In addition to Acker, The Best Practices project team includes UTS staff Bryce Bate, Alan Clark, Beth Daye, Cindy Gray, and Bill Miller. Stefan Langer and Cheryl Sexton, two paid student interns earning university credit, offer html and graphic support. As an experiment, UTS is looking for five to ten faculty projects to further support with student expertise similar to that provided by Stefan and Cheryl. For more on Best Practices, please visit the web site at the URL shown above.

More Grants Available

This past fall, in keeping with the OSU Information Technologies Strategic Plan, UTS sought proposals for projects under the Instructional Technologies Facilities Enhancement Program (ITFE) that would further integrate technology into the instructional experiences of undergraduate students and, in the process, inform the university in systematic ways about technology-based practices that are instructionally effective and economically efficient. Recipients of program funds will be announced in February over a variety of electronic newsgroups, on UTS's Best Practices web page at *http://www-best.uts.ohio-state.edu*, and in the spring issue of *Update*. As of the December 20 deadline, UTS had received a number of proposals for ITFE Program funds, and for the first time, a world wide web page application form was available for proposal submission. The Information Technologies Strategic Plan is available for review on the web at *http://www.acs.ohio-state.edu/units/uts/strategic_plan/*.

UTS Small Grants Call for Proposals

UTS is distributing $25,000 this year in small grants for technology-based learning and research. Faculty are invited to submit proposals for up to $1,000 each to create instructional technologies that enhance OSU credit-bearing courses. UTS small grants recipients are also asked to participate in the Best Practices program, which inventories uses of instructional technology on campus and promotes sharing and collaboration. Small grant proposal guidelines and the electronic submittal form for applying are available on the Best Practices home page at *http://www-best.uts.ohio-state.edu/*. If you need assistance, please call 292-9689. The Winter Quarter small grants deadline is January 20. Deadlines for the rest of the academic year are April 16 for Spring Quarter and July 3 for Summer Quarter. Award decisions are made by the Instructional Technologies Advisory Committee. UTS is pleased to announce the following recipients for Autumn 1996. Further information and descriptions of these projects is available on the Best Practices home page.

Paul Berkman, Byrd Polar Research Center; web-based, interactive multimedia courseware.

Craig Davis, Natural Resources; memory card for digital camera.

Roberto Garcia, Management and Human Resources; web-based cooperative learning project.

Teresa Mensing, Geological Sciences; computer-based exercises.

Jane Murphy, Architecture; digitized PowerPoint presentations.

Ardine Nelson, Art; AV drive to capture full motion video.

Mohamad Parnianpour, Industrial Welding and Systems Engineering; Authorware project.

Peter Pappas, Zoology; update and expand a web-based resource.

Terry Pettijohn, Psychology; website development.

Alan Saalfeld, Civil and Environmental Engineering and Geodetic Science; Java project.

Marjorie Ward and Peter Paul, Teaching and Learning; distance education project.

ResNet Gives OSU Students Best Internet Connection

Although commercial Internet service providers and local cable companies continue to promise faster and better Internet connections, some OSU students in six campus residence halls today can transmit over the Internet at speeds more than 100 times faster than popular 28.8-bits-per-second modems. Students residing in Jones Tower, Taylor Tower, Baker Hall, Paterson Hall, Lincoln Tower, and Bradley Hall who have chosen ResNet service have 10-megabytes-per-second Ethernet connections in their rooms. Houck House is currently being wired for the service and students will be able to participate beginning late winter or early spring quarter. There is a competitive monthly charge for ResNet service.

The 10-megabyte ResNet service in OSU residence halls is also many times faster than Ameritech's ISDN at 128 kilobytes per second as well as the cable companies' promised Internet connection at two to four megabytes per second.

ResNet's Internet service to students' rooms is part of UTS's commitment to the Ohio State Information Technologies Strategic Plan in support of the distributed environment. Guidance for this project comes from UTS, UNITS, Residence and Dining Halls, and University Repair Services.