

ACADEMIC COMPUTING AND INSTRUCTIONAL TECHNOLOGY SERVICES

VISION PLAN

2000-2001

1.0 Executive Summary

Academic Computing and Instructional Technology Services (ACITS) provides information technology services to University students, faculty, and staff. In keeping with the mission of The University, ACITS shares the responsibility of providing campus-wide information technology services with Administrative Computing Services and the General Libraries. ACITS' mission is to support The University's academic and research programs by providing an information-technology-based environment, technological capabilities, and able staff who can assist students, faculty, and staff in their learning, teaching, research, and outreach activities. ACITS has three major divisions: Academic Computing, Instructional Technologies, and Telecommunication and Network Services. This service model aligns services with the needs of students, faculty, and staff. The ACITS' vision plan described here includes projects from each of these three major divisions.

ACITS receives an annual recurring allocation that provides funding for a portion of the costs to operate the Student Microcomputer Facility and the Center for Instructional Technologies (CIT), and to provide some support for the Help Desk and Training Services. That allocation for 1999-2000 is \$1,496,274. Of this total, \$846,274 will be allocated to the operation of the SMF, supporting the Help Desk and Training Services, \$360,000 will be used to pay the last installment on the three-year loan from UT System to replace all the SMF computers (summer 1997), and \$290,000 for support of the CIT. For the 2000-2001 academic year, ACITS requests an increment to this recurring funding to accommodate increased minimum pay and fringe benefits for SMF proctors and professional staff (\$39,800), increased costs for salaries and fringe benefits for the CIT (\$30,000), expansion of Help Desk services by adding weekend hours (\$60,000), implementation of a student computer user survey (\$20,000), and implementation of an electronic thesis/dissertation project (\$42,460). The total additional recurrent funds requested are \$192,260.

For 1999-2000, ACITS also received a one-time allocation of \$652,070. If the new vision plan, ACITS has identified one-time projects totaling \$2,904,708 for implementation over the next three years. These special projects, if funded and implemented, will provide significant enhancements to the campus network, the campus cable system, and the University Mail Box Service and will provide seed money for some investigative efforts in ATM-based technology and Internet multicast technology. We need to begin a new three-year life cycle for the SMF (\$835,000) by 9/1/2000. Funding is also requested for other major projects: the Campus Web

infrastructure, directory and authentication services, integrated messaging and office services, database support, investigations involving e-commerce, enterprise backup and enterprise management, upgrading an upgrade of Web Central. CIT enhancements include: upgrading the CIT lab with new equipment and a new physical layout, a courseware production studio, and matching funds for the FAS-TEX program.

This report covers the following items:

- Vision, goals, and progress (Section 2.0)
- Facilities and services (Section 3.0)
- Project with recurrent costs (Section 4.0)
- Projects with one-time costs (Section 5.0)
- Technology funding of ACITS (Section 6.0)

In addition, three Appendices are included:

- Summary of ACITS funding (all accounts)
- IT Infrastructure at UT-Austin
- ACITS facilities, services, and staffing

2.0 Vision, Goals and Progress

Over the last year ACITS has made progress in improving and expanding its standard and most visible services:

- A campus-wide high-speed backbone network with interconnections to regional, state, national, and international network. The backbone network currently comprises 110 buildings and 36,074 computers;
- Computer laboratory facilities, many operated under management contracts;
- High performance parallel computing facilities using Cray J90 and T3E systems;
- A distributed, campus-wide printing system with 40 printers. Over five million pages were printed in academic year 1998-99;
- Access to 457 Web servers with 260,000 pages and operation of Web Central, mailing lists, and newsgroups;
- Universal e-mail service for students, faculty and staff.
- TELESYS dial-in service to the campus network, with over 28,953 subscribers;
- Central computing servers for general classroom instruction and research.
- Help Desk services- 97,000 consults during academic year 1998-99;
- Training services - 102 seminars and workshops attended by 1,000 customers (mostly students) for 1998;
- Software distribution program, including negotiating and implementation of the Microsoft contract (Microsoft products at deeply discounted prices). The Software Distribution program now includes 27 software products, offering significant savings to UT Austin students, faculty, and staff;
- The Center for Instructional Technology, which offers production of multimedia and Web-based materials, instructional design services, distance education support, and visualization research.
- Campus Computer Store offering faculty, students, and staff current hardware and software at greatly reduced prices.

Future Plans

To provide the academic information resources environment required for the next five years, ACITS will concentrate efforts in the following areas:

- continuing development of an infrastructure to support a state-of-the art information resource environment;
- designing computing and information environments based upon distributed computing and client/server technologies to support increased demand for information sharing, human communications, and collaboration;
- expanding and upgrading student information resource laboratories;
- expanding the services available locally to departments, colleges, and research units;
- coordinating customer services with other infrastructure providers and technical support staff within University departments and organized research units;
- training faculty, staff, and students.

3.0 Facilities and Services

ACITS offers many different services to the UT Austin computer user community. In this section we cover the Student Microcomputer Facility (SMF), CIT, Help Desk and training units because these are funded partially by the student information technology fee. Other ACITS' services and staffing are discussed in Appendix C.

Student Microcomputer Facility (SMF) (<http://www.utexas.edu/smf/>)

All UT Austin students may use the SMF, but its use does require an ACITS individually funded (IF) account. This 193-seat facility includes 81 Macs and 108 Dell PCs, plus specialized software. The lab is also equipped with scanners, laser printers, and color printers. SMF proctors are on-site to answer basic questions when the SMF is open, and a consultant is available 40 hours per week to give more in-depth assistance. A training room adjacent to the SMF offers hands-on courses at no charge to students.

Training Programs (<http://www.utexas.edu/dce/tcc/training/>)

Each semester, ACITS offers a series of noncredit, 1 - 8 hour short courses on introductions to the various computer systems, electronic mail, using Internet resources, editors and text formatting programs, and special packages such as mathematical and statistical libraries and database management systems. Regularly offered courses are described online at www.utexas.edu/cc/training/. Classrooms in the Thompson Conference Center are used for hands-on workshops on various Windows and Macintosh software products and topics, desktop publishing, and spreadsheets.

Center for Instructional Technologies (CIT) (<http://www.utexas.edu/cc/cit/>)

The CIT provides services and facilities that promote, support, and integrate digital-based technologies and instructional media in learning, teaching, and research, including: multimedia services; Web and information design; WebCT training,

technology support; and a visualization lab. CIT manages FAST-Text, a program that pairs students who have specialized instructional and computer skills with faculty members to develop innovative instructional technologies for the classroom. Additionally, the CIT offers a regular series of training activities in specialized multimedia software applications and hosts intensive 4-5 day summer workshops for faculty in developing instructional technology materials.

4.0 Projects with Annual Recurring Operational Costs

Three continuing projects and two new initiatives are reviewed below and summarized in Table 1.

4.1 Continuing Projects Estimated cost - \$1,658,229

4.1.1 Student Microcomputer Facility Operations \$437,800

In 1998-99, to recruit and retain student employees and classified staff, we increased the base pay of student proctors (from \$6.74/hr to \$7.32/hr) and student supervisors (from \$8.55/hr to \$9.13/hr). The prevailing wage in the information technology industry in Austin for student part-time help is as much as \$16.00 per hour. Salaries of our professional full-time classified staff have increased as well by an average of 6% per year.

4.1.2 Center for Instructional Technologies Operations \$330,000

The mission of the CIT must continue to address the needs expressed by the colleges and schools, as well as those of the UT Austin academic community as a whole, including multimedia, courseware development, technology classroom support and Web design. Use of the Center has grown significantly, and additional staff must be recruited and existing staff must be retained. Salary increases given in September 1999 have increased the expenses for operation of the Center. Additionally, the University administration is now focusing on "Technology Enhanced Learning" for the entire campus, and the support role of the CIT will see an increasing emphasis, particularly in the area of Web-based design and delivery of instruction. At a minimum, this will include hiring one additional FTE for the WebCT Group at an estimated cost of \$36,000. The WebCT group, given the current and anticipated instructor load, needs an additional staff person to support the rapidly growing number of courses using WebCT. This additional staff person will assist the WebCT group in providing assistance.

4.1.3 Help Desk and Training Services \$530,429

The goal of the ACITS' Help Desk is to answer questions and help solve problems of all computer users in The University community. The Help Desk is currently closed on weekends, but students and staff frequently work on weekends, and there is a demand for weekend Help Desk services. This need is indicated by the number of unanswered weekend calls to the Help Desk and by the demand every Monday from people who had questions over the weekend. To improve the service, we propose a pilot project: opening on Sunday and staffing the main Help Desk with two consultants, and the SMF with one consultant. To add these hours, we would begin

with three FTEs (at an average annual salary of \$18,990 each) for Sunday hours. To open on Saturday as well, another three FTEs would be required.

4.1.4 Life Cycle Funding of the Student Microcomputer Facility \$360,000

The Student Microcomputer Facility is on a three year replacement cycle. New equipment was purchased in the summer of 1997 with a three-year loan from the UT System, paid back at \$360,00 per year. In addition, ITAC will need to authorize the replacement of the SMF computers during 2000-2001 (see Section 5.2.1) at a cost of \$835,000.

4.2 New Initiatives Estimated cost - \$62,560

4.2.1 Student Computer Use Survey \$20,000

In the spring of 1997, the UT Office of Survey Research conducted a comprehensive survey of about 1,600 students from all colleges and levels. That survey revealed significant information about use and access to technology. A new survey of students to update the information should be conducted.

4.2.2 Electronic Thesis/Dissertation Project \$42,560

In 1996, the Graduate Assembly passed a resolution that dissertations could be submitted in digital form by 2004. ACITS' role will focus on the support for the preparation of the electronic theses/dissertations (ETD) and will assist with specifying a submission process and increased consulting.

Table 1

Summary of Estimated Costs of Projects with Annual Recurring Costs (2000-2001)

Continuing Operations

4.1.1 Student Microcomputer Facility Operations \$437,800 (\$39,800 increase)

4.1.2 Center for Instructional Technologies Operations \$330,000 (\$30,000 increase)

4.1.3 Help Desk and Training Services \$530,429 (\$60,000 increase)

4.1.4 Life Cycle Funding of the SMF \$360,000

Total Continuing Operations \$1,658,229

New Initiatives

4.2.1 Student Computer Use Survey \$20,000

4.2.2 Electronic thesis/dissertation project \$42,560

Total New Initiatives \$62,560

Total Request for Additional Funding for Annual Recurring Costs \$1,720,789

(Recurrent funds provided by ITAC for 1999-2000- \$1,496,274)

5.0. Proposed One-Time Capital Expense Projects for 2000-2001

We have identified \$2,904,708 of funding needed for one-time special projects (see Table 2). Based on past ITAC funding, about one-fourth of the capital projects will be funded. We will seek other funding for the remainder of the list, and unfunded projects will be shifted into later years. A brief description of each capital project is given below.

5.1 Telecommunications and Networking Individual Projects Estimated cost - \$770,000

The ten individual projects listed below indicate that the campus is requiring increasing levels of electronic access and bandwidth, a need that has doubled during the past fifteen months.

5.1.1 Upgrade of Campus Cable System \$70,000

To meet the growing demand for instructional and teleconferencing video programming across the campus, it is proposed that the cable system be upgraded from its existing equal-split configuration operating at 450 MHz of usable bandwidth to a sub-split configuration operating at 550 MHz. This upgrade would effectively triple the capacity of the system from 30 channels to 90 channels.

5.1.2 Internet Telephony Infrastructure \$150,000

Campus voice telecommunications are moving from a purely centralized circuit switched mode of operation to a hybrid system that also accommodates packet switched traffic, or *voice-over-IP* (VoIP). VoIP promotes the convergence of voice and computer networking infrastructures, applications, and services, thereby avoiding operating costs while enhancing function. In order to support this transition, interface equipment will be required between the public switched telephone network and UTnet. Additionally, equipment will need to be acquired to permit the exchange of digital mail messages between voice and electronic mail systems.

5.1.3 Core Router/Switch Upgrades \$250,000

The core routers and switches in the Network Operations Center will need to be upgraded to remain current with industry hardware/software standards. In addition, three additional access layer-switching hubs should be acquired to incrementally replace existing repeater-type concentrators. It is proposed that appropriate spares and memory upgrades be acquired for all equipment purchased.

5.1.4 Mail Server Upgrade \$50,000

In anticipation of additional use of the University Mail Box Service, and the increased user message store size in particular, it is proposed that the system be upgraded with additional processor and storage capacity.

5.1.5 ATM Investigation \$50,000

We will investigate how ATM-based technology can most effectively be integrated into UTNet by implementing a pilot project with an appropriate department or college.

5.1.6 Multicast Investigation \$0

We will evaluate how Internet multicast technology can be employed across UTNet in the delivery of multimedia services.

5.1.7 Network Authentication \$50,000

It is important to develop hardware/software to enable consistent *single sign-on* user authentication across UTNet. Ultimately, this will enable members of the campus community to employ their unique authentication credential with any information technology service on campus. This effort will also initiate the essential infrastructure for a University certificate authority.

5.1.8 Video Conferencing Equipment \$50,000

An important infrastructure concern of ACITS is the provision of quality video conferencing for students and faculty. At present, a central video conferencing facility, meeting minimum UT System standards and which is generally accessible to all members of the campus community, has yet to be established at UT Austin. The equipment being proposed could be employed in any of several conferencing locations on campus to provide the necessary functions.

5.1.9 Upgrade of the Switch for the Student Microcomputer Facility
\$70,000

The Student Microcomputer Facility network equipment has exceeded its projected lifespan and is overdue for replacement. The proposed network will bring the facility up to modern security standards and provide for an exponential increase in bandwidth.

5.1.10 Wireless Technology Evaluation \$30,000

Wireless technology has recently advanced as a viable production telecommunications infrastructure option with the introduction of the IEEE 802.11 standards. A small pilot project is proposed to evaluate IEEE 802.11 wireless technologies in typical local area network applications in classrooms and common areas.

5.2 Academic Computing Individual Projects Estimated cost - \$1,956,708

5.2.1 Student Microcomputer Facility Refit \$835,000

The SMF was refit in summer of 1996-97 with the hope that the equipment would hold up for three years. Microcomputer equipment, whether or not it is in a high usage lab like the SMF, cannot be expected to provide excellent services after this time. We propose to replace all of the student microcomputers. Breakdown of the costs is as follows: Summer 2000 Refit Computers- \$765,000, Replacement Chairs - \$46,000, Replacement File Servers - \$24,000

5.2.2 Help Desk Expansion and Enhancements \$150,000

- Computer Equipment Upgrade - \$20,000. The Help Desk has four different classes of systems in the life cycle. The training lab machines have the shortest life span of 1 to 2 years, the staff office systems have a life of about 3 years, the reference lab machines need to be replaced every 6 years on average, although some older machines should be upgraded to run the latest versions of the software that the Help Desk supports. For the year 2000-2001, we proposed purchasing five new systems to implement this plan.
- Help Desk Automatic Call Distributor (ACD) - \$90,000. The Help Desk needs to generate accurate, detailed management reporting, real-time data analyses, as well as flexible queue management in order to better manage the Priority, ACS, and Regular phone queues. The Help Desk needs the flexibility to handle voice over IP, unified messaging, and many other features of a full service ACD, such as skills-based routing and live notification to the customer of their position in the queue. A full-feature ACD would dovetail into our Help Desk Customer Support Application.
- Help Desk – Customer Support Application - \$10,000. The ACITS Help Desk has outgrown its current small home-grown customer support application. A new one should be written in house or purchased. To improve efficiency and management information.
- Help Desk – Knowledge Base - \$30,000. One of the Help Desk goals is to offer solutions out to the customer before they reach the Help Desk. This empowers customers to solve some of their own problems and alleviates the load on the Help Desk queues. Developing a knowledge base is a key component toward this goal.

5.2.3 Campus Web Services \$306,000

In just a few years, the World Wide Web has become essential technology for The University. Hundreds of thousands of Web pages are published here. These projects support the necessary infrastructure for the entire University, including student publishers, faculty, staff, and official publishing. Some are pilot or demonstration projects; others improve access speeds. Projects to upgrade the Web infrastructure and services include:

- Campus Web Publishing Systems - \$120,000. This project will allow students,

faculty, and staff central Web publishing independent of timesharing services. Each person would receive 1 MB of Web space at no cost.

- Web Server Automatic Failover Using Layer 4 Switching - \$75,000. This project will replace current domain name service (DNS) methods with the network preferred solution of layer 4 switching. It requires a new router for the COM Building.
- Upgrade Web Central Nodes -\$36,000. This project will upgrade the current three nodes to support increased use of encrypted data streams (https). Private information and e-commerce are driving increased use of https, which is CPU-intensive.
- Increase Backup Web Central Filer Space - \$75,000. This project will increase the size of the current server to match the size and performance of Web central and increase its capacity to 500GB to provide adequate performance.

5.2.4 Directory and Authentication Services \$30,000

Windows 2000 Active Directory Services. Windows 2000 will be available shortly for faculty, student and staff use. ACITS needs to provide The University community with a uniform authentication service native to Win 2000. This will be an enterprise-wide and redundant Microsoft Active Directory Service.

5.2.5 Integrated Messaging and Office Services \$135,000

- Additional Thin-Client Services Using Windows Terminal Server - \$20,000. This project will increase the number of seats and provide redundancy (backup) for thin client servers.
- Storage Area Network Server for NT Services - \$75,000. SANS architecture provides the most efficient and effective long-term method to increase storage.
- Upgrade Campus Exchange Services - \$40,000. Expand Exchange platform to support up to 10,000 users.

5.2.6 Mailing Lists \$30,000

This project will add Web interface and archiving capability as well as providing a second machine for deliveries and improved disk performance.

5.2.7 USENET News \$90,000

Upgrade Capacity and features of USENET News. Articles are being expired up to three times per day. To improve retention, ACITS needs 5X disks and needs to allow non-utexas.edu ISP users access. This project will also increase the memory.

5.2.8 Database Support \$57,600

Reliable and available database serving has become critical as a basic underpinning of other services (e.g., claiming IF accounts on the Web, getting updates to Dr. Solomon's anti-virus software). ACITS supports Oracle, NT SQL Server, FileMaker Pro, and Access as the primary technologies, and this project replaces obsolete equipment with modern reliable configurations.

- Upgrade Cold Fusion Services - \$20,000. The project will add a second server to split instructional and production service and provide redundancy.
- Oracle Web Application Software - \$1,600. Purchasing this software will cut development time in half for Oracle/Web application by using higher level programming.
- Oracle Database File Server - \$36,000. This project will add a second server to increase reliability to 99.99%.

5.2.9 Investigations of New Tools \$60,000

- E-commerce - \$20,000. Investigate providing e-procurement and other e-business efforts.
- Enterprise Backup - \$20,000. The current enterprise backup method (ADSM) might not continue to be available and an alternative must be sought.
- Enterprise Management - \$20,000. The current methods available are not adequate for monitoring critical services. Alternatives need to be reviewed.

5.2.10 Publications \$6,065

This project provides valuable introductory information for new users of ACITS services, providing answers to common questions and saving consulting time at the Help Desk, at the Student Microcomputer Facility, and on the Help Desk phone line.

5.2.11 World Lecture Hall \$10,000

The World Lecture Hall (WLH) contains links to pages created by faculty worldwide who are using the Web to deliver university-level academic courses in any language. The World Lecture Hall is being enhanced by creating a Cold Fusion database presentation of the information. Additional enhancements would be involve acquiring additional database support software.

5.2.12 Training Services Upgrades \$51,000

- Life cycle replacement of 15 personal computers at the Thompson Conference Center MTF - \$25,500. This is a routine two-year turnover of equipment in order to maintain the high standards necessary for ACITS to remain a leader in technology training on campus.
- Replace 15 Macintosh machines in the SMF Training Facility with personal computers- \$25,500. Given that students using the SMF prefer PCs at 61%, over

Macintoshes, 39%, the training room should be equipped to provide hands-on training on PCs. Further, ACITS needs a PC lab for which there is no rental fee. The change would not mean discontinuing training on Macintoshes.

5.2.13 Microcomputer Testing Facility \$100,000

In order to meet our obligations for support of the new Campus Computer Store, future bulk purchases and faculty computer initiatives, departmental site tests, as well as being able to provide campus computer configuration recommendations, Departmental Services must enhance its computer testing capabilities. This project requires servers, workstations, testing equipment, and software to ensure that we can accurately quantify testing results for local publications and reports.

5.2.14 Upgrade Statistical/Mathematical Services \$31,043

- Survey Central. The use of surveys by ACITS and the UT community is expected to increase. This effort will use a Windows NT thin client model and will require the purchase of an additional NT server along with specialized software to provide survey capabilities. This project will also support the development of a Knowledge Base with the acquisition of the Oracle Database software and could also provide enhancements to the World Lecture Hall. The key additional features include: NT Server: - \$21,153; Allaire Cold Fusion -\$4,890; and Survey Software - \$5000
- UT Virtual Statistical Community. To address the need for organized, effective, top-quality statistical support at UT Austin ACITS proposes the creation of a virtual statistical community comprised of UT faculty and staff possessing specialized methodological and statistical expertise. ACITS would provide staff and technical resources to maintain the UTVSC's Internet presence. In addition, ACITS would fund UTVSC workshops

5.2.15 Web Central Services \$65,000

- Campus SSH Pilot – \$10,000. As a pilot project to ready the campus for widespread use of SSH, the UT Connect Team recommends that ACITS invest in SSH client software for use on staff machines and in ACITS-run labs. We have been advocating SSH technology for several years, but we have yet to deploy it widely ourselves. This will be a first step in securing the campus network and timesharing systems.
- Upgrade Cold Fusion Service -\$20,000. The existing Cold Fusion server is not sufficient to meet the current demands placed on it, let alone growing demands that it could receive from the World Lecture Hall and several portal initiatives for faculty and K 2 educators.
- Live Webcasting Infrastructure - \$15,000. The demands for Webcasting live events is increasing. In order to address this demand, we need to increase the number of licenses that we can support on the ACITS RealAudio Server, negotiate an agreement with a third-party vendor for broadcasting of large events, and create a portable recording and encoding solution.

- Web Software Tools and Server Software -\$20,000. Purchase of commercial applications for use on the University's Web site including chat, content management, shopping cart, discussion, and other common portal and e-commerce applications.

5.3 Instructional Technologies Individual Projects Estimated cost - \$178,000

5.3.1 Purchase an MPEG Encoder \$20,000

The CIT should have the ability to do real-time video conversion, from either a Beta or VHS source. Network video is increasingly the instructional content-of-choice but the vast majority of extant production equipment generates a baseband analog representation. Increasing requests for this service is anticipated, and the CIT will be the logical campus-wide organization to respond to these requests.

5.3.2 Upgrade Visualization Lab with 100baseT Networking \$4,000

Data-intensive and remote visualization projects in the Visualization Lab are limited by networking speeds. Upgrades to the local network scheduled for December 1999 will make 100baseT networking available; this upgrade will make the Visualization Lab machine 100baseT capable.

5.3.3 Funds for FAST Tex \$50,000

Funds are requested to support students involved with the "Faculty and Student Teams for Technology" (FAST Tex) program initiated in 1997. The funds are to be used solely for wages for the students working with faculty projects geared toward incorporating technology into courses.

5.3.4 TA Support Funds for Web Page Development \$25,000

The CIT proposes to prototype a program where Teaching Assistants are paid \$500 to put up their course Website over the summer. Other peer institutions have established similar successful programs. The CIT can organize and train the students. This program can be a collaboration with the CIT WebCT group, and can include incentives such as a contest for best site. Funds for a prototype program of 50 TA's/courses are requested.

5.3.5 Improving the Facilities in the CIT Lab \$79,000

Improving the physical environment will improve the quality of experience for both the instructor and students who use the facility, improve the quality of seminars and classes streamed from or recorded at the CIT, and increase its general usability. The lab facilities should be updated to keep the CIT equipped with of current technologies and allow more extensive teaching by replicating several tools on each of the teaching stations.

- New video projector - \$7000.

- MacOS X Server - \$5000.
- 10 CD-RW - \$4000.
- 3D graphics software - \$12,000.
- Life cycle funding - \$24,000.
- Digital Video Decks - \$8,000.
- Large format postscript plotter - \$12,000.
- High quality color printer - \$1500.
- SmartBoard- \$5,000.

Table 2
Estimated Costs of Proposed One Time Capital Expense
Projects for 2000-2001

5.1 Telecommunications and Networking

5.1.1 Upgrade of Campus Cable Systems	\$70,000
5.1.2 Internet Telephony Infrastructure	\$150,000
5.1.3 Core Router/Switch Upgrades	\$250,000
5.1.4 Mail Server Upgrade	\$50,000
5.1.5 ATM Investigation	\$50,000
5.1.6 Multicast Investigation	
5.1.7 Network Authentication	\$50,000
5.1.8 Video Conferencing Equipment	\$50,000
5.1.9 Upgrade Switch in Student Microcomputer Facility	\$70,000
5.1.9 Wireless Technology Evaluation	\$30,000

**Total for Telecommunications and
Networking**

\$770,000

5.2 Academic Computing

5.2.1 SMF Refit	\$835,000
5.2.2. Help Desk Services	\$150,000
5.2.3 Campus Web Services	\$306,000
5.2.4 Directory and Authentication Services	\$30,000
5.2.5 Integrated Messaging and Offices Services	\$135,000
5.2.6 Mailing Lists	\$30,000
5.2.7 USENET News	\$90,000
5.2.8 Database Support	\$57,600
5.2.9 Investigations	\$60,000
5.2.10 Continuing Publication	\$6,065
5.2.11 World Lecture Hall	\$10,000
5.2.12 Training Services Upgrades	\$51,000
5.2.13 Microcomputer Testing Facility	\$100,000
5.2.14 Statistical/Mathematical Services	\$31,043
5.2.15 Web Central Services	\$65,000
Total for Academic Computing	\$1,956,708

5.3 Instructional Technologies

5.3.1 Purchase an MPEG Encoder	\$20,000
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5.3.2	Upgrade Visualization Lab with 100baseT Networking	\$4,000
5.3.3	Funds for FAST Tex	\$50,000
5.3.4	TA Support Funds for Web Page Development	\$25,000
5.3.5	Improving the Facilities in the CIT Lab	\$79,000
	Total for Center for Instructional Technologies	\$178,000

Total Funding Request for One-time Capital Expense Projects **\$2,904,708**

6.0 Technology Funding Overview and Life Cycle Methodology

Technology Funding Overview

Inasmuch as the purpose, mission, and vision of ACITS is the provision of information technology services, all expenses incurred in the operation of Academic Computing and Instructional Technology Services are categorized as information technology expenses. There are three major sources of funding for the organization: State funds - AUF; ITAC funds; and income generated from services and sales. In addition, ACITS receives reimbursement from the NSF NPACI grant funds for expenses incurred in the provision of high performance computing services

Life Cycle Methodology

ACITS has informally established a life cycle for computer equipment and software of three to four years. Replacement of hardware and upgrading software is funded from earned income.

Appendix A Summary of Information Technology Expenditures 1998-1999

Expense Category	18- Accounts	19- Accounts	20- Accounts	Total
Administrative and Professional Salaries	\$921,958	\$23,869		\$945,827
Classified Staff Salaries	\$1,806,840	\$148,988	\$4,437,727	\$6,393,555
Fringe Benefits	\$626,208	\$42,377		\$668,585
Wages	\$653,857			\$653,857
MO&E	\$3,056,639	\$7,151		\$3,063,790
Travel	\$68,463			\$68,463
Special Equip		\$652,650		\$652,650
Total Expenses	\$7,133,965	\$875,035	\$4,437,727	\$12,446,726

Itemization of IT Expenditures

University Object Code/Description

1401 Consumable Office & Computer Supplies	\$155,649		\$155,649
1481 Maintenance & Repair - Computer Hardware	\$32,792		\$32,792
1487 Maintenance & Repair - Computer Software	\$421,485		\$421,485
1830 Furnishings and Equipment - (Capitalized - ³ \$1,000)	\$12,895	\$47,227	\$60,122
1836 Furnishings & Equipment - (Not Capitalized £ \$1,000)	\$5,697	\$9,542	\$15,239
1840 Purchase of Computer Equipment (Capitalized - ³ \$1,000)	\$241,411	\$416,810	\$658,221
1841 Purchase of Computer Software (Capitalized - ³ \$1,000)	\$85,905	\$25,658	\$111,563
1842 Computer Software & Manuals (Non Capitalized \$0.00 - \$999)	\$295,912	\$98,864	\$394,776
1846 Purchase of Computer Parts, Furnishings, Equipment (Not Inventoried or Capitalized - \$0.00 - \$499)	\$163,140	\$30,446	\$193,587
1847 Purchase of Computer Parts, Furnishings, Equipment (Inventoried, not Capitalized - \$500 - \$999)	\$2,403	\$12,271	\$14,674
1860 Telecommunications Equipment - \$1,000	\$15,797	\$1,454	\$17,251
1781 Telecommunications (VBNS, MCI, SWB/ATT, GSC)	\$147,337		\$147,337
1786 Telecommunications (SWB, Time Warner, MCI)	\$718,131		\$718,131
1788 Telecommunications (Parts and Supplies)	\$7,144	\$605	\$7,749
Total Hardware, Software, Equipment	\$2,305,699	\$642,877	\$2,948,576

Appendix B Summary of Information Technology Infrastructure 1998-99

1.0 Network Status

Established in 1987, the Networking Services group of U.T. Austin's Academic Computing and Instructional Technology Services (ACITS) organization maintains Utnet. Utnet is a campus-wide high speed digital data network available to all

computer users on the UT Austin Campus. UTNet also comprises a core set of network-based services, which are made available to all of its users. Some additional services are supplied by the UT System Office of Telecommunication Services.

UTNet has grown over the last 12 years to become what it is today: an information resource that is essential to the academic, research, and business operations of the university. Recently, the UTNet backbone network has been re-engineered, which has resulted in a large increase in network performance. The new Ethernet switching core is the current backbone system to which all new and renovated building networks are attached. The complete UTNet system is actually several systems linked together. While some technologies have been replaced, much of the equipment that has been installed over the years is still in use. As such, the UTNet system includes several generations of equipment reflecting the rapid evolution of networking technology.

UT Austin is the largest university in the United States, and consequently the campus network serves a community of approximately 70,000 people (48,000 students and another 20,000 or so faculty and staff) in over 100 buildings on the main campus and at several other locations in Austin. Ten years ago, UTNet served a mere 400 computer located at about 20 sites. By 1992 the number of connected computers had increased to 4,000. From 1994 on, the combination of the World Wide Web and the widespread adoption of low cost, high performance desktop computers led to an explosion in network access and utilization. Currently there are approximately 35,000 computers on UTNet, a number that is roughly twice as large as the number of telephones on campus. The current population includes some 3,000 computers on the ResNet system, a 6,500 port dormitory network for students who live on campus. More than 30,000 dial-in user accounts are supported by the 3,200 lines of the Telesys dial-in system, and over 65,000 users have e-mail accounts on the mail.utexas.edu system.

There are nearly 500 Web servers on campus, with approximately 300,000 pages of information being indexed on a regular basis. Currently, 75 percent of UTNet traffic is Web-related, with hundreds of Web traffic flows per second (each flow is the result of a "Web-click") being delivered by the backbone routers during the busy part of the day. There has been an 8,663 percent increase in the number of assigned IP addresses ("hosts") from November, 1988 to May, 1998. Traffic moved across the UTNet backbone by routers was measured at 68 billion bits per busiest weekday in April, 1993. That level of traffic has increased by 3,429 percent to 2.4 trillion bits per day in May, 1998.

While everyone depends upon the UTNet system to get their work done, few people ever think about the network and fewer still know how the network functions. Instead, everyone simply assumes that the network will be there when they need it. This level of confidence is an appropriate response, since no one using e-mail or the Web should have to know how the underlying network system operates. This level of confidence is also a powerful indicator of how successful the UTNet system has been in delivering reliable, production quality services 24 hours a day, seven days a week. From the outside, the network appears to most users as something so reliable that they can take it from granted. However, a look "under the hood" at UTNet reveals a

complex and dynamic system in a constant state of change.

2.0 Technology Classroom Inventory

Academic Computing and Instructional Technology Services has one technology classroom. This classroom is located in the Computation Center building, Room 8.

Appendix C Summary of Facilities, Services and Staffing 1998-99

UT Microcomputer Teaching Facility (<http://www.utexas.edu/dce/tcc/computer.html>)

The Microcomputer Teaching Facility (MTF) in the Thompson Conference Center has both PC and Macintosh classrooms. The computers in these classrooms are connected with a local-area network, and each has access to the campus timesharing computers. In each lab, an instructor's workstation is connected to a projector, which displays output from the instructor's computer on a wide screen on the front wall of the room. The projector can also display a video signal from an ordinary VCR player. The MTF is used primarily for Academic Computing and Instructional Technology Services workshops, but is also available to Continuing Education programs, regular academic classes, and other special meetings and seminars.

Output Services (<http://www.utexas.edu/cc/printing/>)

ACITS provides access to medium quality color printing and 600 dpi black and white printing either through a timesharing system or from desktop systems via the Print Relay Services (PRS). Printers are located in several labs on campus including the Student Microcomputer Facility (SMF), the College of Communications microcomputer facility, the College of Engineering, the College of Fine Arts, the Nursing School, the College of Business, the department of Physics and the University residence halls. Any student, faculty or staff member with an ACITS individually funded (IF) user number, validated for a timesharing system or PRS, may have access to the print service.

Consulting (<http://www.utexas.edu/cc/help/>)

ACITS offers several kinds of consulting. While the Help Desk tries to answer most questions, expert consulting is available for more difficult questions related to Web, UNIX, VMS, NT, graphics, desktop systems and statistical/mathematical and database applications. Consultants provide guidance for faculty, staff, and students getting started with and using complex applications. Contract consulting for more in-depth tasks requiring extended periods of effort (e.g., programming) can also be arranged, provided staff members are available.

Desktop Computing and LAN Support (<http://www.utexas.edu/cc/ds/>)

In addition to consulting on microcomputer topics, the departmental services group assists with system and network configurations and manages the Student Microcomputer Facility in FAC 212. The Departmental Services division also provides

an "on call" and "carry-in service" at reasonable fees to help campus users fix or make better use of their equipment. Contracts with campus units can also be established to run student labs and to offer continuous on-site support. Departmental Services also does in-depth evaluations of computer systems for eventual recommendations as campus standards.

Software Distribution Services (<http://www.utexas.edu/cc/sds/>)

Software Distribution Services (SDS) at ACITS actively pursues quantity licensing agreements with computer software vendors so UT students, faculty, staff, and departments may purchase software for personal computers, workstations, and servers at greatly reduced prices. Since 1988, SDS has negotiated software licenses for UT Austin and for other UT System components. The number of license programs has grown from a few at that time to twenty-seven programs today. Most recently, UT Austin negotiated a comprehensive four year license with Microsoft on behalf of the UT system that provides all faculty, staff and students low-cost access to their standard software.

In addition to providing software packages, SDS performs a variety of administrative tasks to maintain the license programs. Each program is unique, and SDS must carry out the terms and conditions of each of the vendor's license agreement. SDS keeps complete records for every software product purchased by an individual or department, for UT Austin and for other component institutions in the UT System. Depending upon the license agreement and the software restrictions, distribution is made available for departments, faculty, staff, or students. SDS is working to provide better software discounts and programs, and we are working with other campus units to improve one-stop shopping.

Consulting for SDS software is provided by ACITS' Help Desk staff and expert consulting groups. SDS works with consulting staff to provide informational documents, such as installation instructions, and to review the software before distribution.

Publications (<http://www.utexas.edu/cc/pubs/>)

ACITS publications staff publish documents, Web pages, newsletters and other materials that describe the services and software offered by ACITS for use by students, faculty, and staff of The University of Texas. ACITS' newsletter, *Current ACITS*, is published monthly and contains up-to-date information about information technologies. See <http://www.utexas.edu/cc/newsletter/>. ACITS also publishes, jointly with other campus IT organizations, "IT-Quicknotes", a biweekly mailing of timely information about IT events and activities. See <http://www.utexas.edu/computer/quicknotes/>. In addition, publications staff collaborate to produce online help, self-paced tutorials, internal staff documentation, and Web pages. In 1998-99, ACITS publications staff produced 38 new or revised documents, 12 issues of *Current ACITS*, 21 issues of IT-Quicknotes, and numerous other Web pages. They also developed and maintained the University Computing Web (www.utexas.edu/computer/) and the World Lecture Hall (www.utexas.edu/world/lecture/).

Team Web (<http://www.utexas.edu/teamweb/>)

In cooperation with General Libraries, Administrative Computing Services, and the Ex-Students Association, ACITS participates in TeamWeb, which supports and promotes Web publishing and Web use at The University. TeamWeb coordinates Web publishing activities on campus, provides design services to current publishers, train Web publishers and users, provide consulting to Web users, and maintain the Web central server. All pages signed TeamWeb are maintained by the Team.

Facilities Management for UNIX, VMS and WNT Systems

ACITS assists departments in managing their own computer systems. The service is offered on a cost recovery basis and involves an agreement or appointments between a department/agency and ACITS to manage and or operate their facility. ACITS provides direct management support and capacity planning expertise.

Computer Equipment Maintenance and Development Services
(<http://www.utexas.edu/cc/maint/general.html>)

ACITS maintenance staff performs, both preventive and emergency maintenance for most types of computer equipment, including minicomputers, microcomputers, and their peripheral components, some communications devices, and display terminals. Computer equipment purchasers often seek advice about equipment specifications and configurations currently available. The maintenance shop can help install hardware and software for desktop systems.

Data Import/Export and Media Duplication
Services(<http://www.utexas.edu/cc/operations/>)

ACITS provides a data import and export service for users who need to move data from off-line media, such as 4 and 8 mm cartridges and CD ROM, to file servers for access.

Telecommunications Infrastructure

ACITS maintains extensive communications networks for user access to The University's computers from desktop computers and workstations and for data communications between computers and with the Internet.

Campus Computer Network (<http://www.ots.utexas.edu/UTNet/>)

The campus computer network, UTNet, is not a single entity, but a system of networks, equipment, and software that enable information to be sent between campus computers and computer sites all over the world. The network employs both broadband coaxial cable and optical fiber media for inter-building computer communication.

UT Austin is a member of the Greater Austin Area Telecommunication Network (GAATN), which has completed installation of 250 miles of optical fiber to connect educational and government facilities. The Pickle Research Campus and the main

campus are connected by optical fiber. UT Austin is connected to the Internet through a common carrier by a 45 Mbps circuit. GAATN is currently chaired by Bill Bard of ACITS.

Within individual buildings, local-area networks (LANs) connect to Utnet by means of routers. These routers perform address filtering to reduce message traffic on the backbone and the individual LANs. The result of this network configuration is that a workstation connected to an Ethernet, Token Ring, or LocalTalk LAN in a particular building has access to the campus-wide network and thence to regional, national, and world-wide networks.

TELESYS Dialup System (<http://www.ots.utexas.edu:8080/telesys/>)

ACITS provides telephone dial-in services on a monthly fee basis (\$9 per month) to faculty, staff and students who have a desktop computer and a modem. TELESYS supports multiple communications protocols and includes features for data compression and error detection. Over 3,000 modems are currently in use serving 33,000 subscribers. Most services require a user id and password for authentication..

Access to National Academic Networks

UT Austin participates in several national networks (vBNS, or very high speed Backbone Network Service) through which its users can exchange mail and files with colleagues at other sites, get access to databases and servers, and remotely log in to other machines. UT Austin is also a member of the University Corporation for Advanced Internet Development (a.k.a.UCAID or Internet 2).

Most of UT Austin's systems are connected to the Internet. Access to the Internet is provided through the Texas Higher Education Network (THEnet).THEnet connects the UT System component institutions, as well as approximately 300 other educational, governmental, and industrial research organizations, to the Energy Sciences Network (ESnet) and to all major Internet backbones operated by commercial Internet providers such as Sprint, ANS, UUNet Technologies, and Performance Systems International.

The University of Texas System Network (UTSN)

The UTSN is an inter-institutional network for carriage, coordination, and integration of voice, video, and computer communications managed and administered from the network operation center (NOC) located in the Service Building at UT Austin. The UTSN is managed by OTS on behalf of UT System Office of Telecommunications and Information Technology. Management and operational policies for UTSN are established by the OTIT. Policy development is done in collaboration with the UT Clients via the UT System Strategic Leadership Council (SLC) and the UT System Information Technology Management Council(ITMC). Consultation concerning operational procedures, service levels and technical issues is provided to OTS by the UT System Telecommunications Advisory Council (TAC).

Staffing

Retaining and recruiting highly skilled information technology personnel is problematic. In conjunction with the UT administration's efforts to increase staff pay as a result of the Compensation Committee study, ACITS gave many classified IT staff members salary increases. In an effort to keep the student employees who can make as much as \$16.00 per hour (DELL) with no experience, ACITS increased minimum pay across the board for the student employee titles effective 1 September 1998. Currently, ACITS employs 177 (head count) classified staff, 163.23 FTE and 100 (head count) 44.63 FTE hourly employees. There are also 7 Administrative and Professional staff members (1-Associate Vice President, 1-Deputy Director, 4-Associate Directors, 1-Assistant Director).

Summary of Classified and Hourly Staff Titles

Classified Staff	FTE
Accounting Technician	1.00
Administrative Assistant	4.00
Administrative Associate	5.00
Computer Operations Specialist	4.00
Computer Programmer	31.25
Computer Programmer/Services Assistant	2.95
Computer Systems Development Specialist	1.00
Data Communications Specialist	3.00
Documentation Specialist	2.00
Executive Assistant	2.00
Manager, Computer Services	15.00
Microcomputer Applications Specialist	2.50
Network Analyst	1.70
Operating Systems Specialist	3.00
Research Scientist Associate V	1.00
Senior Administrative Associate	5.50
Senior Computer Equipment Maintenance Technician	2.00
Senior Computer Operations Specialist	4.60
Senior Graphics Designer	1.00
Senior Operating Systems Specialist	12.50
Senior Procurement Officer	1.00
Senior Systems Analyst	20.73
Social Sciences/Humanities Research Associate III	1.00
Supervisor, Electronic Data Processing	3.00
Systems Analyst	30.50
Technical Staff Assistant V	1.00
Training Coordinator	1.00
Total Classified Staff	163.23

Hourly Staff (students)	FTE
Graduate Research Assistant	1.50

Non-Affiliated Student Worker	2.75
Senior Student Associate	7.60
Student Associate	29.45
Student Tech	2.85
Technical Staff Assistant I	0.48
Total Hourly Staff	44.63
