Riding the Winds of Change

Jose Michel
Instructional Resources and Technology , CCCCO

Prior to 1996, the State lacked a funding base for the acquisition, maintenance, and upgrading of the technological infrastructure necessary for a distance learning system. During the 1996 legislative session, the Chancellor's Office convinced State legislators of the potential for distance learning to effectively respond to the needs of the private sector for a well trained work force. Recognizing the potential for distance learning for the State, the legislature agreed to provide an initial funding base in 1996 to the system.

The original base funding launched the design and implementation of the network infrastructure and the acquisition of video conference and satellite downlink equipment. Since 1996, funding for the Community Colleges Technology Infrastructure and Distance Learning initiative has grown 300%.

Below is a description of how the Chancellor's Office has used the potential for distance learning to greatly improve the quality of the community colleges educational environment.

4CNet

In 1996, the California Community Colleges (CCC) and the California State University (CSU) established a collaborative relationship to create the CCC and CSU network (4CNet). 4CNet is a dedicated data network linking 123 sites, including 106 college sites, 16 district offices not co-located on a campus, and the Chancellor's Office, with the 22 CSU college sites and the CSU Chancellor's Office in Long Beach.

CVU Vendor Fair and Exposition

Dr. Diane Vines
Vice President, Academic Development, CSU Institute
Chair, CVU Mission and Academic Policy Committee

The California Virtual University (CVU) Corporate Partners Exhibition attracted over 250 college and university administrators and faculty to the Los Angeles Marriott Hotel on February 18, 1998. Thirty-nine companies had vendor booths in which they demonstrated their mediated and distributed learning products and services. Company representatives were available to answer questions and solicit feedback from the campus representatives.

The day began with a kick-off general session moderated by Joe Rodota, Executive Director of the California Virtual University Design Team and Deputy Chief of Staff for Governor Peter Wilson. Roger Benjamin of the Rand Corporation discussed the implications of Rand's

4CNet Customer Support Services

Michael A. McLean

Manager, Customer Support Services, Telecommunications Infrastructure Support Services, CSU Office of the Chancellor

The 4CNet network is staffed by a highly qualified team of telecommunication specialists within the Telecommunications Infrastructure Support Services team, and is located in the CSU Chancellor's Office facility in Los Alamitos. The Customer Support Services Team is part of the Network Services group, which also includes Engineering & Configuration Management and Network Facilities & Services.

4CNet's Customer Service Center (CSC) is in operation 24 hours a day, 7 days a week and has full responsibility for managing all reported problems through to resolution. The CSC mission is to provide all 4CNet customers with a prompt, courteous, and timely response to all customer inquiries. All districts will receive a copy of the 4CNet Customer Support Services and Escalation Procedures.

While the escalation chain and time tables for all problems are clearly defined, the 4CNet CSC routinely escalates reported problems beyond the defined levels in order to resolve problems as quickly and as efficiently as possible.

Change Management procedures have also been implemented and are the responsibility of the CSC staff. Any modifications or changes to a customer's service needs to be reported as soon as possible. These typically include: requesting additional IP address space, requests for routing change(s), changes to primary or secondary DNS, requesting or modifying a Network News feed, and requesting additional bandwidth or circuits.

To insure that 4CNet campuses retain their inter-campus capabilities, the CSC's Network Management Center (NMC) monitors all network facilities and vendor services for the entire network. 4CNet's NMC is also staffed 24 hours a day, 7 days a week. 4CNet's infrastructure is presently being monitored utilizing Cisco Works, and involves, among other functions, insuring that the PacBell, GTE, Sprint, MCI, and AT&T communications lines between campuses are functioning properly, and that all hardware is operating in a stable manner. The NMC also insures that any new equipment deployed in the field is properly configured to insure interoperability with other equipment on the network.

The entire CSC staff strives to ensure the integrity and smooth operation of 4CNet for all of its customers. But as with 4CNet's forerunner, CSUnet, we are on the leading edge of technology. 4CNet staff are continually involved in reviewing and testing the latest versions of hardware and software provided to us by leading vendors. While such testing does not occur on the production network, the size and complexity of 4Cnet's infrastructure often taxes the capabilities of production hardware and software. Occasionally, problems do occur, and when they do, we are committed to their professional and timely resolution.

Please note the following important numbers and addresses:

•4CNet Customer Service Center and Help Desk: **562-985-9533**
•4CNet Customer Service Center FAX number: **562-985-9443**
•To request any modification or change in service: **help@4c.net**
•To report changes to Network News feeds: **news@4c.net**

Cooperative Purchase Initiatives

Larry Toy, Ph.D.

Director of System Advancement and Resource Development, CCCCO

The System Advancement and Resource Development Unit has been very busy securing some agreements, and the following is a status report regarding the cooperative purchases that have been negotiated by the Chancellor's Office. Currently, the California Community Colleges Chancellor's Office has completed two of three cooperative purchase initiatives, with one in progress. All initiatives are voluntary, but provide extremely good value for the colleges.

NETg Computer Based Training Software

First, we are very proud to announce an arrangement with NETg Computer Based Training Software. This initiative provides a one year license for approximately 450 computer based training courses in such topics as Microsoft Windows 95, Microsoft Word 97, etc, including many technical courses. All faculty and staff are included for the price of 27 cents per Full Time Equivalent Student (FTES) (approximately $3.50 per full and part time staff member). This represents a savings of 90% over the normal commercial price and 80% over the educational price. This means that a district with 10,000 FTES can provide this package of training to all staff for $2700 per year. This fully qualifies for expenditure under our new staff development for technology funds which were recently released.

> *We estimate that there will be approximately $50 million to $100 million in computers that will be purchased through this initiative.*

NETg was chosen as the best combination of quality and value by a committee of 7, including 2 MIS directors, 2 Staff Development Officers, 1 Business Educator from the community colleges and 2 members of the Chancelor's Office staff. The one year license allows unlimited duplication rights for CD-ROM distribution and installation on the college or district Local Area Network (LAN). The software will be updated on a regular basis during the year and will be installed on the CCC 4CNet for distribution also.

We want to thank Eleanor Gajewski of the California Community Colleges Council for Staff Development and Golden West College, Dale Pittman of Chief Information Systems Officers Association (CISOA) and Pasadena City College, and Joyce Arntson of the Business Education Vocational Education Advisory Committee and Irvine Valley College for their assistance.

For further information call Dan Estrada at 916-324-8901 or email at destrada@cc1.cccco.edu.

Sun Microsystems

Second, an agreement with Sun Microsystems will provide a 40% discount on equipment. Through an arrangement with California State University (CSU), we have obtained a 40% discount on Sun Microsystems computers. This is greater than our previous 30% educational discount from Sun. Contact Rose Avila of Sun/Hi-Soft, the educational representatives at 619-222-5615.

PC Desktop and Laptop Computers

And finally, we are currently in the bid stage of an initiative for the cooperative purchase of PC desktop and laptop computers, which is being coordinated through Yuba College. A detailed specification package is being sent to all purchasing directors in the state. A full range of options will be available for the winning bidder. The bidders are limited to the top tier vendors of PC's (including Dell, Compac, Gateway, IBM, HP, NEC, AST, etc) who qualify as Gartner Group Tier 1/Tier 2 vendors.

We have included both desktops and laptops and have also included optional on-site service contracts and extended warranties for as long as five years. We have also included optional financing including both straight lease and lease purchase. In addition we have included a provision to allow faculty, staff, and students to purchase on this offer using a credit card (with a possible small surcharge) for drop shipment directly to their residences for their personal use.

Bid packages were sent during the week of February 23, with bids due on March 18. A review period will take place, including technical inspection of sample computers coordinated at Cerritos College, with final approval scheduled for April 22. Purchase can then be made from the "piggyback" clause in the bid specifications.

Ventura College

Gary VanMeter
Resource Development Coordinator, Ventura College

Ventura College will develop a comprehensive telecommunications infrastructure plan using the input of all campus constituencies and external stakeholders to interface with the educational and facilities plan. In addition, the Chancellor's Office documents, "Baseline for Planning and Implementing an Internal Campus Telecommunications Infrastructure Systems for the California Community Colleges" and "Telecommunications Infrastructure Planning," will be used as tools to develop the plan.

Under the direction of the Student Development Dean, the Tele-

communications Plan project will utilize a Project Coordinator and a Telecommunications Consultant to assess current systems and telecommunications infrastructure. They will look at the direction of educational planning efforts currently underway, and at the resulting infrastructure needs, in order to determine gaps in capability and systems.

This plan will build on ongoing efforts to establish a county-wide shared distance educa-

tion infrastructure network that all educational systems can access. It will improve library learning resources through the use of electronic media, existing projects to improve instructional delivery and learning through computer assisted educa-

The project will improve instructional resources in the Ventura community.

Napa Valley College

Judie Walter-Burke
Director, Planning and Resource Development

Napa Valley College is aggressively engaging technology to enhance instructional delivery systems, as well as administrative and student services. Several developments both on and off campus dictate that the college needs to coordinate activities related to technology to give our campus community direction and information.

Some developments on campus include building a backbone for our own infrastructure, an automated library services network, development of an electronic classroom, the ad-

dition of distance education in our curriculum, and a general move toward electronic communication among faculty and staff. At the same time, the college is moving ahead to connect with 4CNet, the community college telecommunications infrastructure. The college also has an application with the Federal Communications Commission for the acquisition of 4 ITFS channels.

This project will give the college the opportunity to do an internal needs assessment and develop a plan in coordination with the Chancellor's

Office Telecommunications Plan and the Chancellor's Office document titled "Baseline for Planning and Implementing an Internal-Campus Telecommunications Infrastructure Systems for the California Community Colleges." This process and plan will become a model for other community colleges throughout the state. The college proposes to accomplish this goal at the local level by identifying a consulting firm that can assist the project team with an internal needs assessment leading to a comprehensive strategic technology

tion, existing Telecommuter/video Teleconferencing Center and Distance Education capabilities, and through the planning and grant development efforts already underway.

This is joint effort with Ventura County businesses, local government, California State University (CSU), University of California (UC), K-l2 schools, County Superintendent of Schools, and Ventura College, with the intent of establishing a virtual university in Ventura County. This virtual university would also share instructional services in a true effort to provide distance education and other services.

plan. Elements of this plan will include: description of the current situation, an ideal plan, the finance and architecture, final preparation, implementation, recurring activities and evaluation. On a state wide level, the college proposes to accomplish this goal by communicating with other community college districts that receive planning grants to learn from and share information with them. After the plan is complete the college will make it available both in hard copy and electronically.

CVU Vendor Fair

recent report on California higher education. He was followed by a futuristic look at mediated and distributed learning by Bernie Luskin, a consultant and member of the California Postsecondary Education Commission.

Following the general session, CVU Design Team members hosted breakout sessions for the four segments of higher education in California. The University of California session was hosted by Carol Tomlinson-Keasey. The California Community Colleges

session was hosted by Larry Toy, and the session for the independent colleges and universities was hosted by Jonathan Brown. In these sessions, attendees learned more about the CVU and the involvement of campuses in that segment in the CVU. Also, Ric Matthews of the California Community Colleges discussed the upcoming articulation meeting sponsored by the Intersegmental Committee of the Academic Senates. Professor Matthews chairs the ICAS planning committee for the meeting.

Winds of Change

The State legislature approved funding in the 1996-97 fiscal year for the connection of the 123 community college sites with the CSU network and for upgrading the new network's data capacity. The upgrades for the 4CNet backbone are associated with providing video conference and satellite services. The first complement of community college sites were installed on April 1, 1997. On December 15, 1997 the last of the community college sites were connected. The entire community college system was connected within nine months, three and half months ahead of schedule. The expanse of the 4CNet data backbone stretches from the College of the Siskiyous in Northern California to Southwestern College in Chula Vista, a few miles from the California-Mexico border.

> *Since 1996, funding for the Community Colleges Technology Infrastructure and Distance Learning initiative has grown 300%*

Video Conference Network

In February 1997, the Community College Chancellor's Office entered into an agreement with the Pacific Telesis Group and PictureTel Corp. to equip and install the 123 community college sites with state-of-the-art video conferencing equipment. The $3.1 million initiative created what is destined to become the largest video conferencing network in higher education in the US. The first compliment of community college sites were installed on July 1, 1997 with all sites expected to be installed by March 31, 1998.

The community colleges have purchased over 130 video conferencing units to date. As colleges are connected, they have begun to utilize video conferencing technology for numerous activities such as faculty and staff development, administrative meetings, as well as for distance learning.

The Chancellor's Office has established a web site to support the California Community College Video Transport Network. The web site will include a video directory of the current 123 community college video sites, listserves and chat rooms for technical support as well as end user support, and links to PictureTel in San Francisco for scheduling use of the California Community College Video Transport Network Video Bridge.

Satellite Network

The community colleges and the CSU have established coordinated satellite standards for both analog and digital capabilities for 4CNet. This will allow 4CNet to provide bandwidth over the backbone for satellite services for the community college sites. Community colleges will be able to receive analog satellite signals in KU and or C bands and digital satellite signals in the MPEG-2 signal.

Currently 4CNet is coordinating the development of a digital satellite uplink site which will allow the 123 community college sites to offer turnkey satellite services to distribute educational video programming from community college campuses to anywhere in the continental United States. The 4CNet digital satellite uplink will function on a MPEG-2 digital video platform.

California Community Colleges Online Network for Education (4C@O.N.E.)

This $1.0 million project, funded by the Chancellor's Office, is a coordinated statewide response to the tremendous challenge of integrating technology into instruction and of improving community college student outcomes by expanding access and reducing per student cost. The 4C@O.N.E., housed at De Anza College, establishes a virtual organization in which faculty take a leadership role in the Califoria Community College technology effort. This new structure will facilitate the integration of resources and expertise from community college districts, business, and other segments of education.

Technology Model Applications Pilot Projects (TMAPP)

The Chancellor's Office invested $1.0 million in 1996-97 and $2.2 million in 1997-98 in the development of model applications for the California Community Colleges through TMAPP. The projects funded were designed to address a number of critical areas of development including Statewide Delivery of Distance Education, Online Curriculum and Instructional Resource Center, Faculty Access to Computers and Technology, Online Tutorial Support, Online Counseling and Advisement, Electronic Transcript Exchange, Universal Internet Access, and College Telecommunications Planning Grants.

As distance education becomes more prominent on the college campus, more and more instructors and students are becoming involved in both the technical and educational aspects of distance education. It is important to understand distance education related terminology if the instruction and delivery is to be understood by all persons involved.

A

Analog: A signal that is received in the same form in which it is transmitted, while the amplitude and frequency may vary.

Amplitude: The amount of variety in a signal. Commonly thought of as the height of a wave. American Standard Code for Information Interexchange (ASCII): A computer language used to convert letters, numbers, and control codes into a digital code understood by most computers.

Asynchronous: Communication in which interaction between parties does not take place simultaneously.

Asynchronous Transmission Mode (ATM): A method of sending data in irregular time intervals using a code such as ASCII. ATM allows most modern computers to communicate with one another easily.

Audio Bridge: A device used in audioconferencing that connects multiple telephone lines. Audioconferencing: Voice only connection of more than two sites using standard telephone lines.

B

Backbone: A primary communication path connecting multiple users.

Band: A range of frequencies between defined upper and lower limits.

Bandwidth: Information carrying capacity of a communication channel.

Binary: A computer language developed with only two letters in its alphabet.

Bit: Abbreviation for a single binary digit.

Browser: Software that allows you to find and see information on the Internet.

Byte: A single computer word, generally eight bits.

C

Central Processing Unit (CPU): The component of a computer in which data processing takes place.

Channel: The smallest subdivision of a circuit, usually with a path in only one direction.

Codec (COder/DECoder): Device used to convert analog signals to digital signals for transmission and reconvert signals upon reception at the remote site while allowing for the signal to be compressed for less expensive transmission.

Compressed Video: When video signals are downsized to allow travel along a smaller carrier.

Compression: Reducing the amount of visual information sent in a signal by only transmitting changes in action.

Computer Assisted Instruction (CAI): Teaching process in which a computer is utilized to enhance the learning environment by assisting students in gaining mastery over a specific skill.

Cyberspace: The nebulous "place" where humans interact over computer networks. Coined by William Gibson in Neuromancer.

D

Desktop Videoconferencing: Videoconferencing on a personal computer.

Dial-Up Teleconference: Using public telephone lines for communications links among various locations.

Digital: An electrical signal that varies in discrete steps in voltage, frequency, amplitude, locations, etc. Digital signals can be transmitted faster and more accurately than analog signals.

Digital Video Interactive (DVI): A format for recording digital video onto compact disc allowing for compression and full motion video.

Distance Education: The process of providing instruction when students and instructors are separated by physical distance and technology, often in tandem with face-to-face communication, is used to bridge the gap.

Distance Learning: The desired outcome of distance education.

Download: Using the network to transfer files from one computer to another.

E

Echo Cancellation: The process of eliminating the acoustic echo in a videoconferencing room.

Electronic Mail (E-mail): Sending messages from one computer user to another.

F

Facsimile (FAX): System used to transmit textual or graphical images over standard telephone lines.

Fiber Optic Cable: Glass fiber that is used for laser transmission of video, audio, and/or data.

File Transfer Protocol (FTP): A protocol that allows you to move files from a distant computer to a local computer using a network like the Internet.

Frequency: The space between waves in a signal. The amount of time between waves passing a stationary point.

Frequently Asked Questions (FAQ): A collection of information on the basics of any given subject, often used on the WWW.

Full Motion Video: Signal which allows transmission of complete action taking place at the origination site.

Fully Interactive Video: (Two way interactive video) Two sites interact with audio and video as if they were co-located.

H

Host: A network computer that can receive information from other computers.

Hyper Text Markup Language (HTML): The code used to create a home page and is used to access documents over the WWW.

Hypertext Transfer Protocol (HTTP): The protocol used to signify an Internet site is a WWW site, i.e. HTTP is a WWW address.

Hypertext: A document which has been marked up to allow a user to select words or pictures within the document, click on them, and connect to further information.

•Glossary: http://152.30.11.86/DEER/Houghton/ Committees/distancelearn GlossaryDistEd.html

•Glossary of Terms. http://www.ctcnet.com tips/ glossary.htm

•Reed, J. (1996) Videoconferencing for learning glossary. http://www.kn.pacbell.com/ wired/vidconf/glossary.html

•The EdWeb Dictionary. http:// k12.cnidr.org:90/ dic.html

•Willis, B. (Ed.) (1994). Distance education: Strategies and tools. Educational Technology Publications, Inc.: Englewood Cliffs, N. J.

This guide was developed by Allison J.L. Touchstone Engineering Outreach, University of Idaho

(Part Two (I to Z) will appear in next months issue)

Winds of Change

These projects are testing the feasibility of varying applications utilizing technology specially designed to prepare students for college-level work and enhance the system's commitment in meeting the educational needs in the community colleges.

Library Initiatives and Electronic Resources

The role of the library in the distance learning experience is critical. The deployment of library resources beyond its physical structure is needed to support the distance learner. The 1997-98 budget for library initiatives and electronic resources was $3,360,000. This will begin to provide the system with access to its information resources from multiple locations. The acquisition of standard software/

hardware and electronic databases will reduce cost through volume purchases and cooperative purchase agreements with vendors.

A coordinated leveraging of the system's size has been an important factor in achieving the best prices and producing the savings in all of the above initiatives.

Cooperative Purchases

Currently we estimate that the winning bid should provide a discount of 15 to 25% from the price that districts pay buying quantities of 200 or more computers. This is equivalent to the price that the largest distributors in the country pay for their computers for resale to computer retailers. We have included penalty clauses for late delivery (including installation) and

price protection for the life of the offer - until June 30, 1999. We estimate that there will be approximately $50 million to $100 million in computers that will be purchased through this initiative.

A committee of 3 college purchasing directors and 2 MIS directors helped draft the specifications and determine the terms and conditions in the bid package. We want to especially thank Carol Thompson of Yuba College and Donna Jones of Cerritos College who have worked to make this possible.

For further information please contact Dan Estrada at the number and email listed above.

We are looking for further ideas for cooperative purchases and want to provide as much value-added to your colleges through these and similar initiatives.