

University and Community College System of Nevada  
Most Important Information Technology Problems  
Submitted by Campus Technology Officers  
May 29, 2003

The UCCSN relies on technology resources for all instructional, research, service and administrative activity. Providing the services and infrastructure to meet technology requirements is a serious challenge for every UCCSN institution because technology is seriously under funded and lacks many essential resources.

The Campus Technology Officers have prepared this report to increase awareness about the most serious problems UCCSN campuses currently face in providing essential technology services. The summary below is followed by more detailed information from each campus.

## Summary

### Comprehensive Problems

Some problems affect all areas of the UCCSN mission. The most serious of these are:

- The **Funding Process** for campus technology makes planning very difficult. Funding has always been scarce and seldom allocated directly for technology resources. Funding usually comes from one-time allocations with no provision for ongoing maintenance, depreciation, scheduled replacements or upgrades. There is **insufficient stable funding for staff positions**; so support at campuses is often inadequate. Because technology is not a line item those responsible for technology often have very little stable budget and must rely on requests to other campus administrators for funds to maintain the infrastructure.
- **Security** for academic and administrative networks, servers and processes is not only essential to protect data integrity, prevent abuses and provide disaster recovery, it is mandated by federal law. Staff, software, training and equipment are needed to manage network and processing security and to ensure required privacy. No funding has accompanied the HIPAA and Patriot Act mandates.
- **Network Development and Maintenance** affects all UCCSN processes and network use has outgrown the current infrastructure. Networks are increasingly complex, and outages are devastating to productivity and instruction. Aging campus networks need to be replaced and expanded. Network support staff and training is needed. Security, monitoring and traffic shaping tools are needed. Networks are usually built with construction funds and receive no ongoing funding.

## **Instruction**

Supporting instructional technology requires experienced trained staff, current software on capable workstations and servers, a secure robust campus network with connectivity to the Internet, and classroom technology including interactive video. Campuses face the following problems in instructional technology:

- Technology-assisted course delivery has grown tremendously with no new funding for the necessary software (such as WebCT), multimedia equipment, servers and staff. The same problem applies whether accommodating the web components used on campuses in urban areas or providing instruction to widely distributed students in rural areas. More “smart” technology-friendly classrooms are needed.
- Web portal development, enabling a single point of entry for all campus computing systems, is needed to streamline access and support.
- Additional staff is needed to support the infrastructure, to develop web-based tools, and to support students and faculty. Productivity and learning are hampered when staff and students wait days for assistance, when essential tools are missing and when the infrastructure fails.
- Training is needed for various populations. IT staff need more training in developing and supporting new technologies for instruction. Faculty and coordinators need training to integrate technology into instruction and student services. Training opportunities are often bypassed for lack of funds.
- There is no ongoing money for the periodic updating of classroom, lab and faculty workstations and servers to sustain current software. Old computers (six years on some campuses) are practically useless for academic or administrative use.
- The campus networks used for course delivery, student/faculty communication and student research are aging, inadequate, not sufficiently secured and sometimes unreliable. Equipment, software tools and staff are needed to bring networks up to date.

## **Administration**

Campuses provide essential administrative technology services for students, faculty and administrative offices such as Personnel, Student Services and Finance and Planning. Campus based services and software augment those provided at the System level. Campuses need experienced programmers, systems and database analysts and support personnel to provide the campus information systems. They also need current software on capable workstations and servers, and storage devices, a secure reliable campus network, and space to house the staff and equipment. Campuses face the following problems in providing information systems for administration:

- The need for timely access to institutional data has grown as students, faculty and administrators are expected to perform more administrative tasks themselves such as registration, address changes, contract printing, and financial account tracking. Funding for staff, software, workstations and servers has not kept pace with the need. It is often received as a one-time allocation without the required ongoing funding.
- The amount of relevant administrative data increases as student and staff populations increase and as state and federal requirements for tracking data increase. There has been no funding for these increases. Servers, storage devices and backup capabilities are inadequate. Staff trained in database development and management is lacking.
- Training is needed for various populations. IT staff need more training in developing and supporting new technologies for administrative support. Administrators need training to integrate technology into administrative functions and coordinate with instruction. Training opportunities are often bypassed for lack of funds.
- There is no ongoing money for the periodic updating of workstations, servers and support devices required to sustain current software.
- Campus networks used for critical administrative transmissions are aging, inadequate, not sufficiently secured and sometimes unreliable.
- Work, storage and office space is needed for administrative and academic technology support.

## **Research**

Research contributes much to UCCSN and the state, but receives very little state funding. Competitiveness in obtaining grants and participating in cooperative ventures requires up to date equipment and software, skilled staff, capable facilities and a secure robust network.

- Additional positions for highly skilled staff are needed to support the technology infrastructure and the specialized needs posed by computer intensive research.
- Equipment needs to be replaced on a regular schedule and enhanced to accommodate the demand for increasingly high speed and capacity computing. Collaboration with other research entities requires adequate tools.
- Space for equipment and IT staff is lacking.

- Dependable funding is needed. Building the technology infrastructure from grant funds places an excessive burden on research projects and activities.

There is widespread understanding that critical campus missions rely on technology, yet funding is inadequate and unreliable. Instructional, research, service and administration programs suffer for lack of technology resources such as personnel, reliable networks, current software and hardware, training and equipment ranging from desktop computers to information technology servers. Technology resources are a modern utility, and a stable reliable technology funding strategy is needed to insure that institutions are able to perform their missions and meet the objectives set by the Board of Regents of the UCCSN.

## UCCSN CAMPUS REPORTS

**CCSN:** (Based on a survey conducted by the CCSN Technology Committee.)

1. **Funding for technology equipment upgrades.** Most respondents indicated that a top priority was the need to update the existing equipment available. This need was indicated for in the classroom, in the offices of faculty and staff members, and in the student services area (assessment centers). In addition, some respondents indicated that an inventory of equipment (software and hardware) in supply would allow the technology department to better serve the students, faculty, and staff at the college.
2. **Funding for infrastructure / network upgrades.** Most respondents indicated that a top priority was the need to update the network and to provide increased ease of access through use of wireless net access. Improve network at Henderson campus, reliable network support, and increase bandwidth were also mentioned.
3. **Technology Training.** Training on all levels including: training on use of technology in the classroom; instructional development support training (for example, training on the design of web page access for disabled students); training of faculty and technicians to keep up with the pace with software and hardware technology improvements.
4. **Technology Support.** Increase and coordinated support provided for technology used in the classroom and academic labs. Repair or replacement of broken faculty computers.
5. **Technology use in the classroom.** Expand the institution's ability to utilize technology in the classroom. More computerized classrooms, more access to the Internet in the classroom, server space to allow each class to have a website and chat room capabilities are all needed to enhance the use of technology in the classroom.
6. **Information Technology Staff.** Funding is needed to increase IT staffing to meet the technical support needs of the CCSN staff. Currently, we have approximately 20-25 technicians who are responsible for maintaining over 3000 computers, which is equivalent to 1 technician per 150 computers.

## **DRI:**

- 1. Information Technology Staff.** The number of staff and the available skill sets are insufficient. Existing staff is overwhelmed working in a continuous crisis mode. There is no opportunity to address basic problems such as security. Basic computing capabilities cannot be advanced. Computer-intensive research projects are affected, impeding future competitiveness and the ability to attract good staff and students.
- 2. Equipment Maintenance and Replacement.** Very few existing servers, computers and network equipment are under maintenance contracts because of money concerns. There is an increasing risk of disruptions in service, as equipment gets older. New software and capabilities are unavailable on aging equipment.
- 3. Equipment Enhancements and Growth.** We are not able to accommodate the demand for high-speed network ports or for large capacity data storage and backups. This means we cannot accommodate computer-intensive research projects, which affects current research projects and the ability to pursue many funding opportunities. We not have adequate tools and capabilities for electronic collaboration with other research groups
- 4. Facilities.** There is no room for growth in computer-friendly space or IT office space. Some staff is currently housed in labs and server rooms, affecting their productivity and morale. There is no quality space for current and planned projects, particularly those involving Beowulf clusters, data visualization, and other high-end equipment
- 5. Funding.** DRI needs dependable funding for all of the above, without excessive burden on research projects and activities. Technology needs to be recognized for the utility that it is and funded accordingly. DRI does not benefit from student tech fees even though a sizeable number of graduate students work and pursue research at DRI facilities.

## **GBC:**

- 1. GBC needs increased staffing for IT technicians and a college-wide help desk.**  
Our current staffing is a director and three techs to maintain the network and over 600 desktops on four campuses. We need at least two more techs and a help desk person. Not getting these positions means GBC IT support falls farther behind each day, students and staff must wait days for support.
- 2. Security and network management.** GBC needs new tools and staff training to manage our network and to secure it from attacks. GBC doesn't currently have the ability to control bandwidth or adequately manage the network. Network security becomes more of a problem daily with the increasing number and sophistication of attacks. We must soon make a major investment in security or risk our whole network being crashed by an invader in the near future.
- 3. Increased budget for maintenance and expansion of the network infrastructure to replace aging equipment and expand to new buildings.** Without increased budget we won't be able to replace the older cables in buildings with cat 5 wiring, or be able to expand the network to the new dorms.
- 4. Budget for maintenance and replacement of desktop workstations.** Most computers should be replaced in three to four years as the technology changes and machines begin to break down. At GBC, some computers being used are six years old, but GBC doesn't have a budget to able to replace them.
- 5. Budget for the maintenance, replacement and expansion of interactive video equipment.** GBC runs more IAV courses than any other institution in Nevada. The nature of our service area makes IAV an essential function to provide access to our courses. A few years ago we were in dire straits but were saved by a generous donation from a local company. Now, that equipment has reached the age where it is beginning to fail, but we don't have budget to replace it. Many of our IAV rooms are lacking the accessories that enhance student's learning experiences such as multiple microphones, dual cameras, and computers because we just don't have the budget to pay for them.

**NSC:** (Based on discussions with the NSC Technology Committee.)

1. **Distance Education.** To meet enrollment projections, student access to WebCT is imperative. Because of limited classroom space, NSC will need to increase online course offerings utilizing WebCT. The money requested will be used for faculty training and computer hardware and software needed to create online courses. The current annual charge for WebCT alone is \$6,000. As we increase the number of courses and number of students the cost for WebCT will increase. Two-way interactive classrooms are also part of distance education and require funding for equipment and course development. Additional telecommunications expenses are also expected as students access campus servers and compressed video classes.
2. **Multimedia Equipment, Software & Training.** Multimedia studio equipment will be used to create instructional material for online, real-time, and labs classes. CDs and VCRs would be created in addition to online materials for students to use in labs, libraries or at home. Production of course materials requires investment in equipment and training.
3. **“Smart” Classrooms.** Six classrooms currently require computers, projectors and installation to allow faculty to present class materials from CD, DVD or the Internet.
4. **Web Portal Development.** A single point of entry into all campus computing systems (Home Page, WebCT, library, registration, printing, etc.) is possible using Web Portal systems. A Web Portal creates a single “view” into all college systems. The benefit is that students need only a single access login for all services and the college should be able to streamline support staffing and improve response to problems. Web Portals should also improve security. Web Portals require an investment in planning, design, and implementation.
5. **Upgrading faculty & staff computing services.** Upgrading and adding computing requires an investment in hardware and software as well as support staff.

## TMCC:

- 1. Life Cycle Replacement of Faculty and Administrative desktop computers.**  
Currently faculty workstation replacement occurs only when TMCC gets one-shot funds to deal with equipment expenditures. Often these expenditures are shifted towards other equipment needs in the Science department and the technical trades. Occasionally we are able to leverage funding (savings from other projects) towards limited faculty and administrative workstation replacement. Note: Classroom technology and lifecycle replacement is presently funded via the student Technology Fee.
- 2. Information Technology Network Infrastructure.** Presently TMCC receives no stable source of funding for network infrastructure upgrades and lifecycle replacement of equipment. Departments are assessed a portion of the cost of our telephony while data network infrastructure is funded by leveraging funds college wide. This source of funding is unstable and cannot be counted upon in the planning process for technology.
- 3. Application and Data Base Server Farms.** Presently TMCC receives no stable source of funding for server farm upgrades and lifecycle replacement of equipment as well as software licensing costs. TMCC has used the Estate Tax funds to put together an initial configuration. It is our hope that we will continue to be funded at this same level in the years to come.
- 4. Distance Education.** Web based DE costs to the college are increasing rapidly. WebCT provides for our current web based software and has restructured it's pricing so that it is no longer easy or cost effective to provide for this resource. Presently we pay \$22,000 yearly with expectations in excess of \$50,000 in years forthcoming.
- 5. Information Technology Staffing & Training.** Currently we are understaffed in IT operations support, applications development, teaching technologies and media services. TMCC has experienced rapid growth and expansion in facilities, student population and instructional staff. IT staff need to be continually brought up to speed in the latest technology. Training opportunities are often expensive and thus frequently skipped.

## UNLV:

- 1. Base Funding with Growth Factors and Depreciation Considerations.** Technology funds vary from year to year, lag expenses by at least 2 years, do not account for growth in both number and types of services needed, do not include depreciation, are far below current needs, and do not take into consideration future plans.
- 2. Classroom Technology Infrastructure and Support.** No new state funds have been dedicated to classroom technology since 1997. In 2002 some of the Student Technology Fee funds have been diverted from computer facility support to classroom support.
- 3. Distance Education Infrastructure and Support.** Only one new position has been added to the Distance Education program since the last legislative funding earmarked for distance education was received by the campus in 1999. Since then enrollments have grown from 751 students annually to over 6,000. The number of courses has grown from 45 to over 200 annually. With no new classroom buildings in site, distance education options are being developed to help manage increased enrollments both on and off campus.
- 4. Information Technology Staffing.** Staff support ratios continue to decline in all areas of information technology. Modest gains in student technology support staff were offset by decreases in faculty/staff support. New technical and administrative staff is needed in all areas of information technology to meet current service requirements. Even more staff will be needed as deadlines for new federal mandates for security approach; new classroom technologies become enterprise-wide (e.g., WebCT), distance education enrollment increases remain exponential, and demands for mobility increase (e.g., wireless, PDAs).
- 5. Large and Small Server Replacement.** Many routine administrative and academic tasks are completed with the assistance of large and small software applications (both purchased and developed) that reside on campus servers. Server life, depending on size, number of applications served, and number of users, varies from 3 to 7 years. No systematic server replacement program is currently in place. Funds are secured following a failure or just in time to prevent a major disruption to service.
- 6. Network Development and Replacement.** Network development on the UNLV campus has been done primarily through new construction. No ongoing funds or consistent one time source or funds are available for fiber plant maintenance, repair, or enhancement. There are no funds for the replacement of network equipment. No funds exist to purchase network management and security tools (e.g., packet shapers, monitoring software, port management). Finally, even funding for service maintenance agreements on the existing electronics lags by at least one fiscal year.

7. **Research Infrastructure and Support.** With the exception of support for the Supercomputer Center (minimal) and Internet2 (one time network development) very few technology funds are available for support of research endeavors on the campus.
8. **Security of Information Technology Systems.** The campus currently does not have a single position dedicated to the security of the campus network, the web presence, any of the information systems, or the growing number of facilities that house the technology infrastructure. Nor does the campus have a current, publicized unified disaster recovery plan for its major information technology systems and infrastructure. Authentication systems, physical security systems, and other security measures are implemented, where possible, with existing staff whose primary responsibilities lie elsewhere. Emerging governmental requirements for both the protection and provision of information (e.g., Patriot Act, SEVIS, HIPAA, and FERPA) as well as other legislation and organizations (e.g., Digital Millennium Act, Motion Picture Association of America, MediaForce) are requiring the deployment of increased security measures in all areas of information technology. Where disaster recovery plans exist they are inadequate, out-of-date, are not coordinated with other recovery plans, and are not tested on a regular basis.
9. **Space for Information Technology Resources.** Space needs for offices, classrooms, laboratories, and studios remain at critical levels on the UNLV campus. Specialized spaces for technology related activities, by necessity, take a lower priority than instructional spaces but the needs will soon join the critical list if some type of relief is not forthcoming. Additional space is needed for classroom technology equipment storage, specialized server rooms, technical staff workrooms and technical staff offices, computer delivery set up rooms, research, development, and testing labs.
10. **Workstation Replacement.** The campus does not have a systematic computer replacement program for faculty and staff computers. Of the 4,477 computers on campus for faculty and staff 997 are 3 years old or more.

**UNR:** (Source: University Planning Committee—Information Technology Strategic Plan <http://www.unr.edu/planning/0203-cycle/it.0212.plan.pdf>)

1. **Fund existing vacant positions, including positions funded by Estate Tax.** We are woefully understaffed with systems administrators, other technical support personnel, and academic IT support personnel for a campus of our size. Continued funding for Estate Tax positions and filling existing vacancies is critical to maintaining the barest minimum of IT services.
2. **Maintain campus network infrastructure (basically status quo).** Requires new network analyst and life cycle replacement for core electronics. The University simply cannot operate without a stable campus network. There are more than 7,500 devices connected to the network. Yet there is no dedicated funding currently identified to maintain the network at current levels, let alone continue to expand and upgrade the network. In August 2002, the entire campus network crashed due to a lack of maintenance dollars.
3. **Improve network security to protect data integrity, prevent abuse of UCCSN computing resources, and comply with federal regulations.** Requires new network security officer. A Chief Security Officer position is suggested by recent federal government guidelines and is quickly becoming a necessity due to the rapid rise of virulent computer attacks from a wide variety of sources. The position must draft high-level policy, address security vulnerabilities, and implement and monitor policies to ensure compliance, as well as study the need for and address changes in policies across the organization.
4. **Maintain basic IT core services (existing level of service, add redundancy).** Requires new Windows systems analyst; shared storage device (SAN) essential for multiple IT projects; UNIX email server; MS Exchange server; and domain controller. The University has accumulated considerable expenses in basic infrastructure as a result of years of neglect and lack of appropriate funding mechanisms for IT. There is insufficient staff to manage even existing core services. Network-based storage (SAN) is essential to provide rapid recovery from failed disks and large amounts of disk space for central file storage, and for increasing quotas on email and web accounts.
5. **Maintain existing institutional data applications and instructional applications (WebCT).** Requires two new programmer analysts and life cycle funding for administrative applications servers. Access to accurate and timely institutional information is essential. A minimum of two new positions is required to maintain existing data warehousing projects and core instructional services (WebCT).
6. **Improve support for technology-assisted learning environment.** Requires life cycle funding for equipment in “smart” classrooms; new classroom support technician; and new instructional design faculty position. Strengthening support for a technology-assisted learning environment is crucial to faculty instruction and student success.

## WNCC:

1. **Budget.** Current computing services funding is dependent on Estate Tax sourcing. It is essential that this funding continue. Currently, Computing Services has a modest budget that is used only for its own operating expenses and for “break/fix” issues involving every aspect of the system.
2. **System Upgrades.** As indicated in number one above, any funding for Computing Services is already earmarked for basic expenses. Upgrades needed to improve system performance, increase capacity, or reduce labor costs, rely entirely on Tech Fees and any other available source (this last option is disappearing rapidly). Without the upgrades in place, the organization will soon reach the limits of its resource and will have to deny some services needed for administration or student support. In some cases this has already begun to happen.
3. **Training (personnel).** Again, budget plays a big role in this area, or more appropriately stated the lack of a budget. Training for technical personnel have reached a standstill with one exception . . . training that is offered via the college system. Levels of expertise for the system will remain stagnant while the technology gradually moves forward. An example would be the upgrade of the server operating system required to bring the system up to date (prompted by the vendors elimination of support for the current version), however, the support staff will be learning the new version while installing it.
4. **Resources.** The ability to assume new projects or support for student services has been limited due to storage space on existing servers, lack of machine capability in some student labs and in some cases the quality of the hardware (workstations . . . this is particularly true within the prison education system).
5. **Financial Structure.** Funding for IT services should be recognized as a line item when planning operating budgets. Currently, any funding received by Computing Services is used to barely maintain the current system.