University Computing Standards Committee Meeting
9:30 a.m. Wednesday, July 11, 2001
Room 216, Scott Hall

Steve Keto, Sam Averitt, co-chairs

Voting members present:
Carolyn Argentati, Arnold Bell, Bill Bayley, Joe Flowers, Mike Freeman, John Isenhour, Rick Liston, Harriet Mermes, Tom Miller, Scott Payne, Bill Scott, Dan Steen, Sam Snyder

Technical advisors present:
Everette Allen, Mardecia Bell, Gregory Buol, Debbie Carraway, Ken Crabtree, Jamie Dennis, Pete Evans, Alan Galloway, Gwen Hazlehurst, Janyne Kizes, Tim Lowman, Kathy Mayberry, Hal Meeks, Ron Melbourne, Bill Padgett, Greg Sparks, John Streck, Jennifer Van Horn

Welcome:
Sam Averitt called the meeting to order.

Approval of Minutes:
The Committee unanimously approved the minutes from the April 11th, 2001 meeting. John Isenhour's name was added as a voting member.

Presentations:

- **Wireless Infrastructure:**

Prior to Jennifer Van Horn's (ComTech) presentation on wireless, Sam Averitt said the Wireless Subcommittee would like the University Computing Standards Committee's support on the Acceptable Use and Planning Document for Wireless. Sam said the University is heading toward the age of wireless and there's going to be a lot of changes in wireless over the next five years. One of the interesting things about wireless is that the University is back into a shared media environment, Sam said. The University has basically two competing interests. One is the interest to build a production wireless infrastructure that is reliable, that is robust and that has good integrity and security. On the other hand, Sam said, while the University moves through the transitional period wherein it is trying to understand how it uses wireless, what it will do with it and trying to learn about competing technologies, it is going to be very important that the University empowers experimentation, innovation and the general academic process of discovery. According to Sam, a productive wireless infrastructure will require a lot of coordination and collaboration. Sam said ComTech is being proposed as the coordination point.

Jennifer presented an overview of John Streck's April 11th presentation on wireless computing at NC State. The presentation can be found at http://www.fis.ncsu.edu/standards_minutes. Jennifer stated that NC State Communication Technologies and the University Computing Standards Committee are developing a document to address best practices, rules and guidelines for the implementation of wireless (data network) technology on NC State's campus. The document also defines what ComTech's role is in the wireless implementation. Jennifer stated there are three components

of the document: the Acceptable Use Policy (AUP), Arbitration Procedures and ComTech Wireless Network Design, Installation and Maintenance Procedures. ComTech, as part of its Wireless Initiative project, will assist in the initial design and layout of wireless access points in campus buildings. The Wireless Initiative is part of the larger more global ComTech Nomadic Computing project. Nomadic computing, as it is being implemented at NC State, allows any member of the NC State community with an active university computing account to log onto the campus network from anywhere on campus. The nomadic computing architecture accommodates either wired or wireless connections.

Pete Evans asked what happened to specific languages about grandfathering in previous versions of wireless implementations.

John said grandfathering was removed from the previous documents because it was a hassle for ComTech to have uniformity. John said ComTech would look for access points in a building.

Pete asked if ComTech has a frequency plan for campus. John said ComTech does not have a frequency plan for campus, but for buildings. The span of the frequencies is a range wherein you have RF control, John said. The distance is about 150 to 200 feet. There are 12 frequencies. Explaining further, John said when you hit the open areas combined with the building, ComTech does have a plan of how to do mapping and how to detect the frequencies. According to John, ComTech imports the CAD scan of the building design and then does a theoretically mapping of the frequencies of the building. ComTech then replaces the points and actually measures them at that time. As it finds out that there is interference, ComTech tunes down a power of one so there isn't overlapping, John said.

Pete asked if the technical details were going to be presented in depth to LAN administrators. John said ComTech could give a presentation to the LAN administrators.

Tom Miller asked for an explanation of Item #4, which relates to Dynamic-Dynamic Host Configuration Protocol.

> ***Wireless base stations may not enable Dynamic-DHCP (Dynamic-Dynamic Host Configuration Protocol) on the wired side of the device****. (Note: Dynamic-DHCP picks an IP address from a pool of addresses available, in contrast to static DHCP which assigns a fixed IP address to the requesting client station during registration.) Dynamic-DHCP with a wireless base station can be a significant security issue; therefore, violating devices will be banned from NC State's network if the devices continue to enable D-DHCP. These base stations may use NAT (Network Address Translation) and enable DHCP on the wireless side of the device, provided they serve IP numbers from a private network distinctly different from NC State's IP ranges. (Examples of acceptable IP ranges are 192.168.123.100-199 and 10.1.1.50-59.)*
>
> *Static-DHCP may be used where nomadic computing is not supported, although this will limit the support from the ComTech group.*

John said ComTech is not allowing anyone to hook Dynamic-DHCP up to a port that they have defined and that is an open port that's part of a regular V-LAN of the building. There will be Dynamic-DHCP on the wireless side, John said.

Tom asked if NAT *(Network Address Translation)* would be used on the wireless side. John said the problem is that people are using NAT right now and that's what the University has to back away from. The University is moving toward the registration of it, John said.

John Isenhour asked about the problems related to shadowing to put antennas in certain places. He sought an explanation of Item #3.

> ***Site placement and antenna design for wireless base stations must be approved by ComTech.*** *This Rule is being instituted to either confine or to prevent signal flooding into areas already covered by other wireless networks. ComTech will assist in the initial design and layout of wireless in campus buildings and will revisit a building if layout problems occur or additional wireless nodes are needed for broader coverage or higher client density.*

John said there are two ways ComTech is dealing with the situation. One is that ComTech can control and change the power range for the channel. There's another device that's in that RF range but it's not a wireless access point, John said. An authority in that building will then have to make a decision as to what will be used.

Carolyn Argentati asked if there was a schedule for building-by-building analysis.
John said priorities have been placed on building. John said that as ComTech goes through the wiring progress, it might have to rip out and redo wiring done by departments. John said where the impact is on the fixed wiring is where the access point has to go.

Everette Allen asked for an explanation of the network client card (Item #7).

> ***Network client cards from only two vendors will be supported by ComTech for connection to wireless networks.*** *No restrictions will be placed on the type of workstation wireless card used during the initial deployment. (The names of currently supported vendors will be listed on the ComTech web site, comtech.ncsu.edu). If a problem arises with the network and both ComTech-approved cards can attach without problems, then the wireless network will be deemed in proper operational condition, and problems will be attributed to the incompatibility of an unsupported card. If a department or unit has specific compelling needs that require different cards than those listed, ComTech will work with that department to try to ensure operation of the cards they require. (Note: The choice of the two vendors will be done so that at least three Operating Systems {Win2k, Linux and AppleOS} are supported. This is a goal but does not alleviate the possible need for users to customize drivers for particular OS versions. This will be the responsibility of the individual user if the workstation and OS combination is deemed non-standard.)*

John said the reason that ComTech included Item #7 is for "debug" purposes. If a

department uses its own cards and has problems with a driver, ComTech will inform the department if it can use the cards or not, but can not guarantee the debug time to do the department's cards.

Sam suggested that Everette submit some additional language for clarification of Item #7.

Using Wireless Devices to Enhance Teaching and Learning:
Hal Meeks of IDT gave a presentation on his study of the use of hand-held technology in the classrooms. Two years ago, he decided that hand-held computers would have a major impact on people's lives. He wanted to integrate technology into the classroom and into students' overall lives on and off campus. He partnered with Drs. Betty Black and Marianne Niedzlek-Feaver of the Department of Zoology on the project. Their work, Pilot Studies on the Potential for Wireless, Lightweight Computing in Lecture-based, Undergraduate Teaching, was presented at the University of Chicago. The presentation can be found at http://www2.ncsu.edu/misc/mobile.

Factors the team based the need for the study on included the following:
- The standard lecture method of teaching does not work well with today's students, especially in large classes.
- Placing course materials on the Internet has provided students the flexibility to access class content and "notes" at any time, but results in low attendance for lectures.
- A desire to improve the learning environment by use of technology and to provide a better use of faculty time in the classroom.
- Small, wireless computers have been used to introduce active, collaborative learning into the lecture environment and to facilitate "mobile" learning outside of class.
- The cost of handheld devices and wireless networking had dropped significantly.

Their specific objectives for 2000-2001 were to:
- Use immediate student feedback via "instant polling" to guide lecture direction and pace during class.
- Initiate a problem solving approach to encourage student interactions and critical thinking during class.
- Compare the capabilities, ease of use and student response to handheld (PDA) vs. mini-laptop computers.

According to Hal, handspring visors were used in "Developmental Anatomy and Histology of the Vertebrates I (45 students) during the fall semester. Twenty-two students were assigned a visor for personal use during the semester; they were expected to bring the visors to class for potential use in note taking and/or class exercises. Visors contained all course outlines, links to images and study guides plus a number of high-quality gray-scale images. Problem solving was limited to a few exercises in which tables were filled in or images were labeled during class. Quizzing and "instant polling" could not be used due to delay in shipping the Ethernet modules required for wireless Internet access.

Hal said Jornada 820 computers were used in "Principles of Evolution" (24 students) during the fall semester and in "Developmental Anatomy and Histology of the Vertebrates II" (15

students) during the spring semester. In the Evolution course, students worked in pairs and were allowed to take the Jornadas home (one Jornada per pair). Student pairs were required to prepare presentations outside of class; they "surfed the web" wirelessly using the Jornadas, but used desk top computers to work on their presentations. Students were required to critique articles during class and they downloaded the articles wirelessly from the course website and prepared discussion notes using the Jornadas.

In Developmental Anatomy, students also worked in pairs, but the Jornadas were only used in class. In weekly class exercises, student pairs were required to write short essays and submit them wirelessly or to utilize images on Flash cards for brief class presentations. Jornadas were also used for quizzing during class, with feedback guiding the course of subsequent lecture or class discussion.

According to Hal, students did not use the visors as much as expected partly due to few in-class exercises utilizing visors (only 3) and no homework assignments requiring their use. Comparison of final averages for those students with verse without visors gave values of 78.4% ± 2.4 and 69.9% ± 3.8, respectively. (Significant difference via the F test, $P < 0.05$.) Students gave mixed reviews of visor usefulness in a focus group held at the end of the fall semester.

Hal said student evaluations of handheld computer use in the fall at the beginning verses the end of the semester reveals that students spent more time interacting with one another then usual in a science course, but found the Jornadas less useful than expected. The Jornadas were difficult to maintain and malfunctioned often. Student expectations were too high. They assumed that the mini-laptop had all capabilities of a desktop computer. Wireless access outside of class was very limited and sharing the Jornadas outside of class did not work well.

Hal said students gave more positive reviews of Jornada's usefulness in a focus group held at the end of the spring semester. Students enjoyed the collaborative class exercises, the immediate feedback resulting from instant quizzing and the variety of classroom activities facilitated by the Jornadas. A major deficiency of the Jornadas was an inability to edit html documents (annotate downloaded web pages). Students expressed a desire for wider wireless access (more access points on campus and ability to download e-reserve materials wirelessly).

In summary, Hal said the Jornada was less difficult to integrate, due to a better browser and wireless access. However, there is now an 802.11b wireless solution for the Handsprings as well. The Compaq iPaq, Handspring Prism with a wireless module, and the NEC Mobilon (Windows CE device similar to Jornada) are currently being evaluated. There are now three different quizzing systems either in development or ready on NC State campus that can support handheld computers. The Nomadic computing wireless environment has been demonstrated to work well on all their handhelds, including the Handspring with the wireless module. He also stated that the College of Veterinary Medicine would be deploying 85 Handspring Prisms and wireless modules this fall to upper classmen.

Tom commented that Hal blew pass the most exciting and important thing and that was the significant grade difference.

Hal apologized and returned to the slide with the grade information. He said the grade validated what the team expected. In the presentation, the comparison of final averages for those students with verse without visors gave values of 78.4% ± 2.4 and 69.9% ± 3.8, respectively. (Significant difference via the F test, $P < 0.05$.)

Carolyn asked if the visor could convert documents into portable document files (pdf) files. Hal said the visor could convert documents to pdf.

With regards to wireless access points and hand-held technology, Bill Padgett asked if ComTech has started to think about what is going to happen when the classroom environments change.

John said wireless is being designed in a way to have optimal coverage for 40 to 60 students. It's designed around the limitations of technology.

John Isenhour asked if the wireless architecture that ComTech is designing would support multicast. John Streck said it would.

Discussion:
Wireless Acceptable Use and ComTech Wireless Network Design, Installation and Maintenance Procedures: Sam Averitt reiterated the role of the Committee. Sam said the Committee does not set or establish University policy but votes on recommendations that are forwarded to George Worsley, Vice Chancellor of Finance and Business, and Provost Stewart Cooper. Sam said the document was a good one that sets an initial plan forward as to how the University addresses this emerging critical area that is also very sensitive. Sam ask if the Committee was comfortable enough with the document to vote to send it forward as an appropriate use planning statement for the campus, understanding that it will be changed over time, or if the Committee needs to "wordsmith" it some more.

Tom said he understood John's answer to his question about Item #4 but when he reads the words, they are confusing as to when Dynamic-DHCP is allowed and when it is not.

Sam said he sensed from the questions asked that the Committee needed to spend more time on the document. There are some opportunities to misinterpret what has been stated, he said. Sam recommended that the Committee read through the document and make suggestions as to how to change some of the language. He proposed that the document be passed through several electronic reiterations before the next meeting. The Committee will vote on the document at its next meeting.

Pete wanted an explanation of how first priority might vary according to input or how does one make changes to applications.

Jennifer said she would establish a subcommittee to look at what ComTech is proposing and adjust that schedule based on applications.

Steve Keto said what is being done now for wiring buildings on campus is that Jennifer and her staff in concert with Sam produce a list and it moves up through the process. The changes that Jennifer and John are referring to usually happens because someone at the top decided that an early change wasn't what they wanted and it comes back down. It doesn't happen very often, he said.

John said a web page has been designed to show what requests ComTech has in, what the buildings' priorities are, and what the status of the project is as ComTech is wiring buildings. The website will be released when all bugs are worked out.

Sam said with he would try to incorporate the Committee's suggestions into the document and send another revision out within with the next several days.

Security and Disaster Recovery:
Mardecia Bell stated that the effective July 1, the OUC's have been removed from the Financial Accounting System (FAS) screen. This policy change will allow the same inquiry security access that exists within the Financials System. If users have queries or SQL that retrieve information specific to their OUC range(s), they must change their selection criteria to include the OUC range(s) of the data that they need. Otherwise, transactions from all OUCs will be given. Mardecia also reported that security reports for Human Resources and Financials were distributed April 1. The next reports will be distributed in October via the web. It will contain Mainframe and Sybase access.

Mardecia reported that Charles Moreland and George Worsley have decided on a permanent second site for disaster recovery on Sullivan Drive. The second Administrative Services Building is targeted for completion by 2004. In the meantime, the Team is working on an interim solution for the client server environment and is meeting with vendors to gather information for a permanent site so that the University can have full redundancy and recovery for its academic and administrative environments. Mardecia reported that the group should have recommendations within the next month or so. In addition, the mainframe environment is scheduled for testing in September and the Disaster Recovery Team is also finalizing business continuity plans for critical business units. Once this task is completed, the Team will work on business continuity plans for the academic units.

Communications and Networking:
Jennifer asked for five to six volunteers from the Committee to serve on a subcommittee that will review the schedule for campus wiring and network switch upgrades. Those who volunteered included Pete Evans, Joe Flowers, Bill Scott, Scott Payne, Jamie Dennis, Harriet Mermes and Ken Crabtree.

- **Network support for Novell IPX and AppleTalk protocols: -** Jennifer Van Horn

Jennifer apologized for the June 26th letter to 3D's explaining that support for IPX and AppleTalk would end. The letter was sent out in advance of ComTech's planning. Subsequently, staff members met to discussed their plans. Support will not end until December 31, 2002. According to Jennifer, Novell and Apple have stated that they are going

to IPA in all their new generation products and the vendors have a clear migration path that is working now to move from Legacy systems to the IP environment. Jennifer said, right now, it's difficult for ComTech to troubleshoot IPX and AppleTalk and there are no real good tools that will help ComTech with troubleshooting. She said IPX and AppleTalk protocols generate a lot of overhead traffic that have to be propagated throughout the network switches and the client, which is not an efficient use of the bandwidth. By going to IP, she hopes performance will be better.

John commented that ComTech does not have and will not have the increased staff to support networking as it expands. It is trying to focus its expertise so that it can efficiently get network management in place and be able to provide the five nines of reliability. John said the two protocols are not bad, but ComTech just does not have the 30 to 40 people to support all of these things.

Rick Liston asked about the "nature of grief" associated with the change.

John and Jennifer said there would be applications that will not work in addition to servers and devices that will need to be upgraded.

Bill Padget stated that the project would be handled internally as a team effort. He said ITD could do a lot of things internally that colleges don't have the resources or staff to do. Bill said what ITD wants to do is document where the problems are, where colleges are going to need hardware and where they will get their software and in the process of doing so, communicate that information to the colleges.

Sam said an individual has been identified to be the change management czar for this initiative so that it is highly coordinated.

Sam said the most compelling reason for this move is that when one looks at the network equipping manufacturers and where they are taking their products, they are moving to IP optimized environments and will eventually not just run these other protocols as secondary but stop supporting them in the latest version of the products and software releases. The University needs to get a stake in the ground far enough ahead of time and make this transition into a thoughtful and managed fashion, he said.

Everette commented that there are four general areas that ITD has identified and colleges should be looking at. They are file systems and servers, printers, backup software and database access software.

Joe Flowers stated that an earlier comment that routing may work fine in the buildings is vague. You may or may not be able to route within a building, he said.

John said as long as you're within the same subnet, you shouldn't have any problems. Problem occurs when one tries to route out.

Sam said he agreed with Joe because when one looks at the trends in networking architecture, what is happening is that routing is migrating toward the building level so once

a routing engine is inside the building itself, then it will no longer be all of the building but some section of the building or a set of outlets out of a particular closet. The University is heading in a direction where it's safe to assume that at some point this will no be longer supported or won't work in a reasonable fashion. It will always work if you plug your printer directly into your desktop machine. If it has to go over the network, there are no guarantees because the topology won't be under your control. But we're trying to put this out far enough so we can make this transition, Sam said.

Electronic Mail, Directory Services, Calendaring:
Greg Sparks reported that David Drooz of the Office of Legal Affairs attended the last subcommittee meeting. The group is looking at an LDAP directory, which will allow access to email from any email system. Greg said there are a lot of privacy issues as well as legal issues associated with sharing directory information. There are a ton of rights that students have that we don't necessarily have on the administrative side, he said. Greg said David elaborated on those issues as they related to the Buckley Amendment and what the University can and cannot publish. Greg said the technical committee has been charged with finding out how many of those laws can be practically implemented and for those that cannot be implemented, the technical committee has to determine how much leeway the University has in interpreting the law. It will be a few months before the subcommittee has an answer.

Another matter the subcommittee is looking at is the Responsibilities and Guideline Policy for email administrators. The policy is being distributed to email administrators and they have been asked to submit comments. Greg said he would submit the policy to the Committee at the September University Computing Standards Committee meeting.

Alan Galloway said over the next few months, ITD would be implementing a few changes to the email system. He distributed a handout to Committee members to carry back to their technical staffs. He also requested 15 minutes at the next meeting to discuss details and answer questions about the email changes.

Sam said Greg and Alan could give a full presentation at the next University Computing Standards Committee meeting.

Major Administrative Systems:

- **Financial and Human Resources:**
  Gwen Halzehurst reported that this is the first year that the University has processed its submissions to the Office of the State Controllers and the State Auditors via the Financials System instead of the Financial Accounting System (FAS) and it is closing the year out of the new Financials System. A large part of yearend closing has been reconciling Financials to FAS, Gwen said. Gwen said the University is in the processing of completing yearend closing and all the offices that support the Financials System have been very focused on that task. Once that is done, not only will the University be ready to close out to those state-reporting agencies, but it also will be ready to roll out the remaining nVision reports. Gwen also reported that fall bills were generated this past weekend, and they will be sent to the printer today.

Steve mentioned that the General Assembly has not decided on a final appropriation for this current year. Steve said the University is running on a continuing resolution, which allows it to keep spending money and to stay open, but there is no budget right now for the current year. The budget bill includes the tuition for the 16 institutions in the University systems. That also has not been determined yet. There are two versions of tuition in front of the General Assembly right now. Steve said the University has chosen to bill on the Senate version, which is more rational. The Senate version has a $300 increase that the University's Board of Trustees approved, a 4% inflationary increase that the Board of Governors approved and a 5% increase that the Senate believes the University needs. The House version taxes the nonresident students by $1,600. According to Steve, no one in the University System likes the House version. Steve said nonresident students are already paying the full cost of education, at least at NC State University. Steve said if the House version passes or if something else happens with tuition, the University would be doing a second billing. He also stated that if the House version passes, the University would be processing major refunds because the House version only affects nonresident students. The University is sending bills along with an insert on bright paper that cautions students that this is a tentative bill, he said. UNC-Chapel Hill sent its tuition bills out based on the Board of Governors approved increase only, he said.

- Gwen also reported that the Human Resources Team is ready to run the SPA raise. The team is working on budget incumbent of salaries. Also within the next month, colleges should be able to see if graduate students are in good standing. The Team also has a project to track information on nonresident aliens. They have finished the coding and data reconciliation on that project and have released it back to the OSSI office to work through the business process issue. The Team is working with the Performance Team in the Human Resources Reporting environment to release denormalized tables. They are also in the process of finalizing upgrade plans for the Human Resources and Financials environment.

Rick asked what has been decided about the database platform.

Gwen said the University doesn't have to decide right now because Version 8 of Financials will be supported by Sybase and the University had decided to move to HRSA 7.6. Both moves buy the University a good amount of time, she said.

- **Student Administration:**

Mardecia reported that the Team has removed restrictions from courses designated as labs. The labs will no longer be required to have L or course numbers. The Team is working on a project to receive and send transcripts to EDI. It can now receive and print transcripts to EDI. NC State University will also be a test intuition this summer to work with high schools to receive transcripts via EDI. In addition, the Team is working with Distance Education to incorporate its courses into TRACS and is working with the Graduate School to make enhancements to its inquiry screen via the web. Mardecia also reported that donations for the Annual fund could now be made via the web.

Open Discussion
Pete asked if there is going to be an Office 2000 czar appointed to coordinate the licensing issues across all of the colleges.

Sam said the University does have individual, Jack Bridges, in a relatively new position that is handling site licenses. Sam said the coordination of site licenses has become a full-time job and he hopes to get it under control enough to greatly assist the campus in doing that as well. Sam suggested that Pete meet with Jack to discuss specific issues and questions. At some point, Sam said he would ask Jack to come before the Standards Committee.

Campus Presentations

- John Isenshour, The NCSU Libraries
- Alan Galloway, Information Technology Division; and Greg Sparks, Network and Client Services

Next Meeting
The next University Computing Standards Committee meeting will be held at 9:30 a.m. on September 12, 2001. Sam will forward the meeting location to members at a future date.