



The College of New Jersey

# **Information Technology White Paper**

*Annual Update April 2005*

Created on March 15, 2005



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# Introduction

Information Technology at The College of New Jersey is comprised of four separate but highly integrated operating units: Enterprise Applications, User Support Services, Network and Technical Services and an administrative layer called IT Administration. This document contains the strategic plans for each of these units, and various documents that support and explain the rationale behind those plans.

While each of these units is charged with handling a separate aspect of Information Technology at The College of New Jersey, Information Technology uses the method of integrated planning described below:

1. The director of each operating unit creates a white paper that outlines the strategic plans and goals for the upcoming year. These white papers are compiled, along with supporting documentation, into one overall IT white paper. This white paper is then reviewed by each of the directors and the CIO for accuracy and completeness.
2. A strategic planning meeting that includes each of the directors, the Provost, Treasurer, and the Vice President for Facilities Management, Construction and Safety of The College is held. In preparation for this meeting, the directors choose a few highlights from each area to discuss. The selected items are ones that the group anticipates having a major budgetary impact and/or have a major impact on the college's strategic initiatives and technology infrastructure. This meeting results in further clarification of the scope of the items in the strategic plan and their impact on The College community as a whole.
3. Taking into account the feedback from this meeting, the IT directors then develop a detailed project plan for the upcoming year (see "IT Project Plan '04 - '05" in the Appendix for last years plan). This detailed project plan is reviewed by the directors and CIO, and widely distributed within IT, as well as to any department that is included as a resource or impacted by these plans.

The allocation of the IT budget for the upcoming academic year is guided by this process, which allows for input from the various operating units and the leadership of The College.

As an overview of the interplay of the various operating units, a brief description of each follows:

## **IT Administration:**

This team of central staff works to develop the structure that guides the various IT departments as they develop short and long term goals. This group leads the

initiatives to replace our core administrative systems and provides the project management of these implementations. Included in this group are the CIO, the Data Resources Administrator, the Associate Director of Information Security, Policy and Web Development, and the Web Developer.

**Enterprise Applications:**

Includes all computer applications that are distributed campus wide and the College's central information systems. Enterprise Applications is the operating unit that develops and maintains these systems unless otherwise noted. Enterprise Applications maintains enterprise systems that are integrated and support the business of the College, develops and implements new systems, customizes packaged software, develops and supports departmental applications via the Departmental Application Development Team – DADT, and produces reports from the enterprise data for the campus community.

**Networking and Technical Services:**

Is responsible for The College's communications infrastructure including the cabling, electronic equipment and termination equipment needed to deliver voice, data and CATV.

NTS provides for the back office server needs of The College's faculty, staff, and students, including file and application sharing (Novell), email capabilities (UNIX), and other network driven applications. In addition NTS provides technical support for mainframe based enterprise applications.

**User Support Services:**

Provides microcomputer support to the entire campus. USS supports several client server systems and provides support to faculty and staff in incorporating technology into their curriculum and services. USS includes the following areas: Computer Support Services (Help Desk, Training, Repair and Distribution Facility), Instructional Technology Services, Computer Labs, RES.net, Information Technology Support Specialists, and Media & Technology Support Services.

# **Information Technology Administration**

## *Annual Update*

March 2005 Edition

CIO: Nadine Stern

The Division of Information Technology consists of several departments (Enterprise Applications, User Support Services, and Network and Technical Services) and staff that span both IT and Student Services: the CIO, the Data Resources Administrator, the Associate Director of Information Security, Policy and Web Development, and the Web Developer. This team of central staff works to develop the structure that guides the various IT departments as they develop short and long term goals. Many of these goals are continuous and ongoing, some are issue specific or project related. This year, the major categories and goals are:

### ***IT Governance***

#### **ITAC**

Work with ITAC as it evolves into a planning council to re-define its role, and to examine existing IT policies, procedures and guidelines, revise as appropriate, and determine additional ones are necessary. (See “Information Technology Advisory Council Membership and Charge” in the Appendix)

#### **Strategy Development**

In concert with the changes in the overall campus approach to planning, strategy and assessment, refine the IT strategic plan, and create a process to update and assess its effectiveness. (See IT Strategic Plan in the Appendix)

### ***ERP Implementation***

Coordinate and participate in the implementation of the Student Administration System, including Campus Community, Student Records, Advising and Admissions modules, and a student reporting data mart. (See the “ERP Implementation Timeline” in the appendix)

### ***Academic Computing***

#### **Academic Computing Consultant**

During the fall 2004 semester, Tom Hagerdorn served as the campus advisor for Academic Computing, studying the working relationship between Information Technology and the academic schools. Specifically, he was charged with understanding the current level of supports, its strengths and weaknesses, and to study the current system for aspects that could be improved.

For that purpose, he held meetings with many people at IT, notably Nadine Stern, Jeff Kerswill, Craig Blaha, Shawn Sivy, and Kevin Little, faculty representatives and deans from all seven academic schools, as well as the computer liaisons from several departments, including all those in the School of Science. The purpose of these conversations was to understand the different perspectives of the individuals involved and to gather input and information from them on this partnership.

A draft version of his report has been completed, and Tom and Nadine are working on developing a set of action items to turn Tom’s observations into tangible ways for the College to continue to grow in the area of Academic Computing.

## **E-Portfolio**

Determine the scope, strategy and technology involved in implementing an electronic portfolio at TCNJ.

## ***Security***

### **Identity Management**

Continue to refine the business processes and technical procedures related to authentication and authorization, including account creation, removal, change, and the limiting of SSN

### **Authentication and reduced sign-on strategies tied to system implementations**

Continue to pursue the goal of integrating Information Technology systems with a reduced sign on approach that balances security with ease of use for the end user.

## ***Web Development***

### **Web Pages**

Continued development of accessible, standards compliant, easy to update web sites for TCNJ schools, academic and administrative departments, and affiliated groups. Continue to support College and Community Relations in their web marketing goals.

### **Campus Wide Portal Development**

Continue to integrate the campus portal with existing systems and perform development work related to the SA implementation.

## ***IT Communications***

The IT communication committee is a group of volunteers that are dedicated to improving the internal communication in Information Technology through a series of presentations and information sessions, web casts and team building exercises.

To date, this committee has organized the following presentations and events:

1. December, 2004 - general IT services presented by each director in IT
2. January 2005 - individual introductions of staff and a presentation about the Development and Application Team (DADT) projects focusing on the form genie
3. February - First half - presentation about Instructional Technology and the services provided and SOCS, TCNJ's course management package. Second half - team building exercise by playing Jeopardy with topics revolving around TCNJ and IT.
4. March - Raiser's edge presentation given by Tom Mankovich from Development and Alumni Affairs.

5. April - Printsense and R25 presented by access technology. Second half - team building exercise by playing pictictionary with topics revolving around TCNJ and IT.
6. Informal information sessions to view web casts.
7. We will begin offering quarterly campus wide tours of IT services for new staff starting in the first quarter of 2005.

### ***Green Hall Renovations Planning***

Plan and manage the Green Hall basement renovation project.

These goals taken in tandem allow the IT administration to move forward with planned improvements at The College of New Jersey in a measured, managed fashion as we continue to improve the focus, coordination and cooperation of all Information Technology operating units.

# Enterprise Applications

Revised March 2005

Director: Pamela Singh

### ***Project IMPACT (Improving Management Processes and Administrative Computing Technologies)***

Prior to 2002, The College of New Jersey was constrained by the limitations of the 'SCT Plus' suite of products which did not efficiently and effectively permit information integration, interfaces, easy access of management information by central administration and end-users, system change capability and improvements and a reduction of shadow system requirements. It did not readily lend itself to modifications to enable modern business processes. While we are continuing to use it for SIS (Student Information System) we have shifted our financial and human resource systems to PeopleSoft. This change to PeopleSoft has positioned us with new technologies, computing infrastructure, fully integrated sophisticated reporting tools, Web capability, and multi-year processing. Another significant advantage with PeopleSoft applications is that the users are totally involved and knowledgeable with their product. In addition, the ADS system has been replaced by Blackbaud's Raiser's Edge. The migration of each of these legacy systems to its contemporary replacement is called project IMPACT.

### ***Employee Information System - EIS***

The support for EIS (Employee Information System) is ongoing. We have completed the transition from manual processes to electronic format. We expect to convert the legacy historical data by the end of spring. We have begun the implementation of the self service applications ('ePAY, ePROFILE and eBENEFIT) which will enable employees to review in read only mode their paycheck information including earnings, taxes, deductions and net pay and personal information on the web. At a later date we plan to add workflow and provide update capability for these applications. We plan to hold off on new development and concentrate on upgrading EIS to version 8.9 because the support for the current version will expire by the end of October 2005.

### ***SA Implementation***

In October 2004 we began the implementation of SA 8.9., a phased in approach with Student Records, Admissions, Campus Community and Academic Advising which will go live in fall 2006. Student Accounts and Student Financial Services will go live in fall of 2007.

### ***Alumni and Development – Raiser's Edge***

The Office of Alumni and Development has selected Raiser's Edge as their alumni and development software to replace the legacy ADS system. Raiser's Edge is live as of March, 2005. Currently the plan is that the Alumni and Development office will maintain the system but Enterprise Applications will provide assistance when needed.

### ***The HUB***

Other continuing work in the Enterprise Application area is the creation of the HUB which will serve as an interim system to store biographical data, EIS and SIS primary identifiers, email addresses, ssns, and other necessary information until we move to the implementation of an integrated PS HR/SA 8.9. An integrated PS HR/SA 8.9 will enable the members of the campus community to have a single id and move away from the use of ssn as a primary identifier. Third party systems such as T2, AMS and OPTIM will have access to biographical and demographic information through a nightly feed. A web front end will be available shortly to provide access to this information by the administrative offices. This will enable the offices to indirectly locate ssns through the use of any identifier.

### ***Legacy Support***

The support to the existing mainframe system is ongoing until we replace all our existing mainframe systems. We continue to maintain and update the current SIS system. We upgrade the SIS system twice a year in January and July by applying fixes and upgrades delivered by the vendor. We have begun the implementation of the new PeopleSoft SA system and a moratorium has been imposed on all new development for the current system. However, regulatory requirements and necessary fixes will be applied to keep the system stable.

### ***PeopleSoft Financials***

The support for PeopleSoft Financials is ongoing. We are current with all fixes and upgrades as of January 2002. We have pushed forward our timetable for the upgrade of our financial system to version 8.8. to a date as yet to be determined. This upgrade will move the financial system from a client server to pure internet architecture.

### ***Departmental Applications Development Team***

DADT initiatives for this year included the development of an online faculty and staff directory and Form Genie. The Form Genie will greatly impact department websites all over campus as people will be able to easily and quickly build professional looking forms while being able to look up their data without having to download it. They will also have the option of downloading the data as a text file, excel, or CSV. The forms will all match the current college html template and will be section 508 compliant for people with disabilities.

### ***Portal***

Oracle has announced that they do not plan to continue development of the PeopleSoft portal after version 8.9. In conjunction with this uncertainty, much of the portal

functionality has been pushed back into each application, so that some of the advantages we had been counting on the portal for are now delivered as part of the PeopleSoft standard applications. Due to these changes, IT is re-assessing our portal strategy. We have put on hold the release of any applications into the portal. The portal team will upgrade to the latest version of the portal, 8.9, in order to perform a cost-benefit analysis of launching our ERP through this particular software.

### ***Training***

The technical team for the PeopleSoft SA implementation has received functional training for the PeopleSoft SA suite of products. This will provide a better understanding of the different systems. The enterprise development staff who maintains the mainframe systems will be trained in the PeopleSoft suite of development products closer to the time when migration of the systems occurs. This training will keep the staff up to date with current development skills.

# **Networking and Technical Services**

## *Annual Update*

March 2005 Edition  
Director: Walt Lankford

## *Networking*

### **Internet Connectivity**

#### Internet Service Providers

**Present:** The College currently utilizes three ISPs for connectivity outside of the college. Our primary connection is a fractional-T3 running at 15Mbps supplied by Sprint. As backup, we also have two T1 (1.54Mbps) connections from MCI/UUNET. Finally, the NJEdge.Net consortium provides a T1 circuit to their network that interconnects a great many higher education institutions in New Jersey. The NJEdge.Net connection also gives TCNJ access to Internet2 as a SEGP (Sponsored Education Group Participant).

**Future:** When the Sprint ISP contract is up in the summer of 2005, the College will consolidate its current fractional-T3 and dual-T1 connections to a single 45Mbps T3 connection from NJEdge. Of the 45Mbps, 10Mbps will be dedicated to NJEdge member institution access which also includes a gateway to Internet2. The remaining 35Mbps will be for commodity Internet access and will be further divided among campus constituents (e.g. Resnet, non-Resnet).

#### Internet Security

**Present:** The College currently utilizes a standard firewall from a major network equipment provider to protect the campus from many **external** threats. However, because of the openness of the college environment, it is not a total solution. This firewall device also acts as a virtual private network (VPN) end-point for those special projects that need it. We also have a Linux server running Snort which is an intrusion detection (IDS) solution. Finally, a bandwidth management device is also used to “shape” the network traffic between the campus network and the Internet. It prioritizes network traffic based on its type and ultimate source and/or destination. An example would be to give lower priority to peer-to-peer (P2P) traffic or to guarantee a certain amount of bandwidth to faculty/staff traffic.

**Future:** Over the next year, NTS expects to upgrade its packet shaper device to a newer model that provides a more fine grained control of the Internet bandwidth. Also, several members of IT are involved in the evaluation of products which would be used in Resnet to enforce security policies to limit network problems due to machines not running virus protection and/or the latest OS patches. This type of product could also be used to enforce network bandwidth limits. Finally, the current Linux/Snort IDS setup may be re-evaluated and updated or replaced with a commercial solution.

The general theme for the next year or more is to get a better handle on what is happening on the network. NTS would do this by using intrusion detection

systems (IDS) and intrusion prevention systems (IPS) to detect and defend against hackers and viruses. Netflow and sFlow would gather network traffic statistics and trends. MRTG and RRDTool are software programs to create historical graphs using data gathered from various sources such as netflow and sFlow. Nagios and Netcrunch are being used and will be enhanced to monitor additional systems and system services (e.g. web, email, etc.) for availability. And finally, other log aggregation & correlation software will be used to collect server log information and alert the appropriate staff of problems. NTS is also looking into ways to monitor certain servers/services from off-campus so the appropriate staff is notified if the Internet connection fails.

## ***Campus Networks/Intranets***

The campus networks (a.k.a. intranets) consist of a few separate networks contained within the college that are interconnected at various points using routers, firewall or VPNs. These networks and the overall infrastructure that supports them are covered in the sections that follow.

### **Academic/Administrative Network**

**Present:** The academic and administrative networks encompass those buildings that primarily house faculty and staff offices. Most buildings contain newer Extreme Networks 24 or 48-port stackable Summit switches providing end-user desktops with 10/100 Ethernet connectivity. Those stackable switches are connected to the network core using gigabit fiber optic connections. Some buildings still contain the older 3Com 10/100 switches connecting back to the core at only 100Mbps.

**Future:** Each year, the older switches in buildings are evaluated to see if they need replacement and are prioritized based on available funding. Building renovations are also taken into account as good times to upgrade network switch equipment. The Music Building and Kendall Hall will need to have their in-building cabling evaluated to see if it still meets a minimum of Category 5 specification.

### **Residential Network (Res.Net)**

**Present:** The residential network consists of the dormitories and the off-campus Country Club apartments. Most of the network equipment in these buildings has been upgraded to Extreme Network switches over the past couple years. Those buildings where renovations or demolition are expected to occur in the near future may still contain older switches.

**Future:** For various reasons, some building renovation plans have changed. In these buildings network switches and network cabling may need to be upgraded. Buildings such as Travers and Wolfe, Eickhoff Hall and EAB fall into this category. There is a new remediation plan for Travers/Wolfe that involves relocating the data cabling into several different closets to provide more room and better ventilation for the network equipment. Other buildings such as Eickhoff Hall also have problems in that the data cabling originally installed is only Category 3. This means that it is only rated for 10Mbps Ethernet and would not benefit from an upgrade to Extreme switches. The cabling in this building should be evaluated and replacement should be discussed. Finally, EAB has cabling that is not always capable of 100Mbps connections. It should be evaluated to see if replacement is required.

## **CampusWide (Blackboard) Network**

**Present:** The CampusWide ID network currently runs over a mix of older 10Mbps fiber Ethernet (10BaseFL) and a newer 100Mbps fiber network installed in the past 1.5 years. The new network supports the BlackBoard IP converters which replace the older method running on unsupported hardware. This network also utilizes a VPN device to provide secure, encrypted access for users located on the main campus network to the HP system running the CampusWide software. This device is no longer under support from the vendor (Checkpoint).

**Future:** NTS will continue to work with Access Technologies to move from the older network to the newer one as time and funding permits. Also, NTS will be installing a new Linux based gateway to provide secure access to the Blackboard network and replace the unsupported VPN device.

## **Wireless Network (WLAN)**

**Present:** The College is currently rolling out wireless in various “hotspots” on campus identified by requests received from various campus members. The current wireless system utilized a centralized controller so that the management and security policies can be easily handled. The current system supports wireless protocols 802.11 a (5GHz 54Mbps), b (2.4GHz 11Mbps) & g (2.4GHz 54Mbps).

**Future:** The wireless network will continue to evolve and expand to meet the needs of the campus and follow the ever changing wireless standards. (see “Wireless Plan” in the appendix)

## **Network Core and Cabling Infrastructure**

**Present:** Today, the network core primarily consists of a few of the College’s Extreme Networks BlackDiamond chassis-based switches along with several Extreme Summit 7i & 5i gigabit switches and the campus dial-up systems. The BlackDiamonds (BDs) accept plug-in cards with various port configurations such as gigabit Ethernet over fiber, 10/100Mbps Ethernet over copper and 100Mbps Ethernet over fiber. The BDs contain the complex configuration of VLANs and routing information that makes the network function.

The BDs are located in the computer center and connect to the other buildings using the campus fiber optic cabling infrastructure that runs in conduits throughout the campus. Compass Consulting recently conducted a survey of the campus underground infrastructure and provided manhole diagrams, fill ratios and

routing information as part of their overall infrastructure report. This information is being used to decide on future expansion and remediation of the campus underground network.

**Future:** The network core is upgraded less frequently than the edge switch devices, primarily to maintain network stability. However, over the next few years, it may be necessary to upgrade most of the components in the core. The Extreme Blackdiamond switches that form the true core of our network will reach a point in the next few years where they will be technologically outdated.<sup>1</sup> A new core switch design is available from Extreme Networks, and it provides support for much higher bandwidth (many gigabit ports per card) and faster throughput overall. (see also “Construction Report” in the appendix for more information)

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<sup>1</sup> Network upgrade funding expected in FY07.

## *Servers*

### **Enterprise Server (a.k.a. Mainframe)**

**Present:** A few years ago, the enterprise server was upgraded to a smaller, yet more powerful system. This system is currently running our SIS application. It has been very stable and scalable especially during registration periods. Like the previous enterprise server, the new one also supports the concept of virtual machines, and is now able to run a version of Linux in a virtual machine.

**Future:** Once SIS is transitioned to another package, the use of the enterprise server will need to be re-evaluated. The ability to run Linux may allow The College to continue the use of this server; otherwise, there may still be some value for it on the used market.

### **Novell Netware Servers**

**Present:** The Novell Netware servers form the backbone of our file sharing, printing and desktop management system. File sharing provides access to a private H: drive for personal files, as well as access to applications, departmental shared data (S: drive) and lab data. Novell also handles the management of all print requests to network printers from desktop computers. Using NDPS, printer drivers can be automatically downloaded and installed on the client PC based on the type of printer being accessed. ZenWorks and NAL (Network Application Launcher) form the bulk of the SAL (Software from Any Location) initiative. They provide a means to lock down the desktop computers and require the user to provide a login before gaining access. Others desktop changes and applications can be automatically downloaded to the desktop or selected manually from a menu that appears on the Windows “Start” button menu. ZenWorks also allows the IT staff to create standard hard drive images and download them to computers over the network. Behind the scenes many of these configurations are kept in the NDS, which stores information about users, workstations and more.

**Future:** NDS, ZenWorks and Netware in general will continue to be upgraded to take advantage of enhancements in those products. Future Novell products will transition from running on the NetwareOS to a SUSE Linux core (SUSE was recently acquired by Novell); however, the change will most affect the NTS staff since the end-user functionality will remain the same.

Server hardware upgrades will continue on a regular cycle with no foreseeable mass server upgrades required over the next few years. NTS is looking into ways to consolidate Netware server storage using previously purchased EMC Storage Area Network (SAN) technologies.

## Microsoft Servers

**Present:** The main use of Windows servers on our campus is to run those applications that will not run on any other platform. Some of them are “turn-key” and fully supported by the software vendor. The Windows servers that NTS maintains are primarily used for infrastructure needs such as license servers and a few enterprise applications such as Peoplesoft and Raisers Edge. The Access Technology area of IT administers the remaining Windows servers, and NTS only provides hardware and networking support for those servers. These server run Windows applications that include the CampusCall system used by Alumni, Imaging used by Records & Registration and Graduate Studies, Equitrac used for the pay-for-print project, IT’s help desk system called Magic and Expedition used by Campus Planning.

**Future:** Other than hardware upgrades and a few new applications that may be installed, Windows server growth will be kept to a minimum. NTS is looking into ways to combine the small but proliferating number of Windows-based servers using VMware.

## Unix/Linux Servers

**Present:** The College uses Unix servers from Sun Microsystems to support many of the infrastructure (DNS, DHCP, Web servers, email, Unix/Linux application file sharing, etc.) needs, as well as an enterprise application platform for Peoplesoft, SAP, Voyager library system and other Oracle-based applications. Open source software is used extensively on the current Sun systems for many of the software infrastructure needs. Some of these applications include Cyrus IMAP from Carnegie Mellon University, Postfix (SMTP), Apache (web server) and ISC DHCP server. The Sun servers also support various commercial applications such as Steelbelted RADIUS, Sun Workshop compilers, Mathematica, Extreme Networks Epicenter network manager and Sun’s IDS LDAP-compliant directory server.

The enterprise backup system (e.g. robotic tape library) is currently hosted on a Sun Solaris server platform, but supports backing up clients of various types such as Microsoft Windows, Sun Solaris, Redhat Linux and Novell. The current tape library supports up to 180 LTO1 tapes (100-200GB capacity per tape) along with 4 LTO1 tape drives.

**Future:** Like the Novell Netware servers, regular hardware upgrades are performed to keep the servers technologically up-to-date. NTS is also investigating the use of Linux to replace or supplement Sun Solaris for infrastructure-type applications. NTS will be working on making software

currently available on Sun Solaris available on Linux to start either a full migration to Linux or maintain a Solaris and Linux mixed environment. NTS is current testing Linux workstation for use by the various faculty in the Sciences and Engineering. NTS is also working with Enterprise Applications to move their “Delphi” server from Solaris to servers running Linux. While IT may be moving to integrate Linux into the server infrastructure, Sun Solaris is not to be forgotten. As of this writing, Sun has release Solaris 10 with significant enhancements over its previous versions. NTS will be to evaluating both the SPARC and x86 versions of Solaris 10 for use in its server infrastructure.

Over the next year, NTS will be evaluating the College’s Enterprise backup strategy and decide on new backup hardware and possibly new backup software. Disk-to-disk and disk-to-disk-to-tape options will be evaluated from vendors such as Storagetek, ADIC and EMC.

Over the past year, NTS has purchased EMC SAN storage that supports Novell, Linux, Solaris and Windows servers. In the coming year, NTS hopes to begin the consolidation of its Solaris/Linux storage needs from direct attached storage arrays to the EMC SAN.

Finally, the Library servers and SAP servers should be evaluated for replacement with newer, faster and more reliable models. The cost of maintenance on the existing machines may make it advantageous for the College to upgrade those systems.

## *Telecommunications*

### **Phone Switch (PBX)**

**Present:** The current phone system at The College consists of three Siemens/Rolm phone switches. Two of the switches act as nodes to each other giving the appearance of a single PBX system. The third switch is a self-contained PBX, but has communication ties to the main systems to share call-routing, outbound lines, etc. These systems are aging, but still have value in them. The vendor still supports the equipment and will repair and reconfigure as needed. Any direct expansion of the switches needs to be weighed against the expected lifespan of the system as a whole.

**Future:** As the College moves forward with its phone technology, NTS will continue to evaluate newer technologies such as Voice over IP (VoIP) as a possible replacement to the existing system.<sup>2</sup> VoIP is said to require extensive planning and 2 - 3 years to fully implement. A phased-in approach would be best for The College to reduce service disruption. There are still outstanding issues with VoIP technology including security, staffing and the need for a more reliable data infrastructure. The College is also evaluating its phone strategies for student residence halls due to dropping revenue as a result of increasing cell phone use. (see “VOIP Strategy” in the appendix)

### **Service Offerings**

**Present:** Over the past few years, NTS and Telecommunications has implemented sending the phone bill via email, allowing students to look up their call history via the web and look up their long distance authorization code via the web. Telecommunications has also implemented a cell-phone like calling plan that features purchasing bulk minutes per month instead of paying per minute charges.

**Future:** NTS and the Telecommunications office will continue to improve their electronic self-service offerings. In the near future, there will be new student apartments constructed on-campus, and NTS will need to decide very soon on the best method of providing phone service to those buildings whether it be traditional phone services, voice over IP or cell phone service.

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<sup>2</sup> NTS continues to monitor and evaluate VOIP technology for future deployment. See the VOIP whitepaper located as an addendum to this document.

## ***Research and Development***

### **Overview**

Research and Development has always been an important component of NTS. Before new technologies can be deployed, they need to be evaluated to see if they work as advertised and fit the needs of the College. Sometimes new technologies may seem flashy and cool, but they don't help advance the mission of the College. Some technologies are not mature enough, are too expensive or put a large management burden on the NTS staff.

Due to budget constraints and increasing support needs, NTS has limited time and funds for R&D. Most of the NTS staff time is being spent running the current production systems.

### **Security**

Security has always been an important topic, but has been brought to the forefront because of recent world issues and information/identity security concerns. NTS continues to look at ways to enhance system and network security using new technologies. It is a future goal that all communications that traverse the network will be encrypted from end-to-end. Further out, encryption of the files on the server itself may become more common using technologies such as encrypted file systems. Encrypted file systems encrypt the actual files stored on the server so that only the owner and other authorized users can read them. Even the system administrator (e.g. "root" user) wouldn't have access to the files unless the owner authorized them.

### **Network Management**

Network Management includes such things as Internet bandwidth management, on-campus bandwidth management, intrusion detection/prevention, virus & spyware mitigation and network security. NTS, in conjunction with the IT security coordinator, are working to evaluate and implement products that allow NTS to see what is happening on the network by actively and passively collecting data from the traffic moving throughout the network. Protocols such as netflow, sFlow, SNMP and RMON allow software programs to gather statistics from network equipment. These statistics can be used to model trends in network traffic as well as alert IT staff when exceptions to those trends occur. Devices such as IDS and IPS can report and possibly mitigate hacker activity and virus activities before they impact the network and the systems on it. Finally, products like QualysGuard allow IT to scan servers either from the Internet or from within the campus network to see if they have any known vulnerabilities exposed. Network management is often overlooked because of its cost until there is a problem with the network that one of these systems could help identify or prevent.

## **Identity Management**

Identity Management is the buzzword for identifying and managing user accounts across various systems and applications. A single datastore such as LDAP is used to store the account information, and each system or application stores attributes as to whether the user has access to that particular system. This way there is only one account to manage throughout the enterprise. Identity Management platforms today also include plug-ins to allow them to manage accounts that can't be consolidated into a single LDAP-compliant directory. Beside the security benefits, identity management could also better leverage staff time managing user accounts.

## **Open Source**

Open source software (OSS) has had a long history at the College. Because of recent funding issues, it has become even more important to consider OSS for new projects. OSS is not used simply because it free, although that is a big draw, but because updates and fixes tend to appear more quickly, it can be customized to the College's needs and the OSS currently used at the College tends to be better than most of the commercial alternatives. Sometimes an OSS product isn't as good as a commercial product, but it provides a no cost way of evaluating new technologies.

## **SANs**

Storage Area Networks (SAN) allow for the creation of a shared pool of disk space. The idea is to separate the disk storage from the server and connect the two using a special high-speed network called Fibre Channel (FC). Intelligence in the disk subsystems or in the FC switches allows the storage administrator to partition disk space from the disk pool to many different servers. This provides the utmost flexibility in disk storage use since unused disk capacity doesn't need to be tied up on a single server. The College currently has a SAN storage arrays from Sun/Hitachi and EMC.

## **Blade Servers**

Blade servers allow for the consolidation of server hardware into rack-mounted, space efficient enclosures. A common chassis is used to provide power and management to several blade servers. The server consists of CPUs, memory and one or two disks on a single plug-in card that goes into the chassis. Blade servers currently handle only low-end workloads such as web servers and other infrastructure-type applications. The disadvantage of blade servers is that the servers will not work without the supporting chassis. A change in chassis technology could render all the blade servers outdated and require upgrades. However, blade server technology may yet find a place here at the College.

## **Disaster Recovery**

NTS is working with the Facilities department in the construction of an alternate computer room on-campus to house backup servers in the event of a disaster at the Green Hall computer room. Besides the alternate physical location, NTS is researching software and techniques to provide maximum uptime for the applications and servers that are supported. Some techniques simply involve mirroring all boot-up hard disks or having alternate/secondary services available for those applications that support such a configuration (e.g. NDS, DNS, LDAP, RADIUS). Replication software is also being used so that changes to the data on one server are automatically copied to another server at a schedule time (or in real-time). The second server will be relocated to the alternate computer room when it has been completed.

# User Support Services

## *Annual Update*

March 2005 Edition  
Director: Jeff Kerswill

## ***What is User Support Services?***

User Support Services provides microcomputer support to the entire campus. The support is broad and encompasses many areas. User Support Services has embraced a mission of developing a quality program for customer support that encompasses both the technological needs and also recognizes the individual user's personal needs.

Our Service Theme:

*User Support Services is committed to providing quality service through implementing technology focused solutions for the entire campus community*

User Support Services is broken down into several areas that focus on specific technical needs.

## ***Computer Support Services***

### **Help Desk**

The Help Desk is each customer's first contact for all technical requests. It is an integral part of User Support Services because it offers first and second level computer support to the campus community. This support encompasses a large number of applications and technical areas.

The Help Desk is the foundation for all support processes in User Support Services and Information Technology. It is the Help Desk's responsibility to ensure that service requests are resolved at the initial call or are routed to the appropriate support staff to ensure efficient response to the requests.

### Future plans

1. Continue to develop training videos for Help Desk website
2. Increase use of Remote Assist procedure via Zenworks

### Training

Training is available several times during the academic year for both faculty and staff. Standard training includes *Microsoft Professional XP (Word, Access, Excel and PowerPoint)*, *Mozilla Thunderbird*, *Meeting Maker*, and *Web Page Development*. Other types of training include:

- Training for students in the classroom on the above standard applications.
- Department specific training on the above applications.
- One-on-one faculty training on the developmental tools.

Training classes organized through User Support Services are instructed by Help Desk staff, ITS staff, and Support Specialists. USS is currently assessing the demand for training to ensure there is still sufficient demand to continue to provide this service in its current form.

### **Computer Support Center**

The Computer Support Center is responsible for maintaining and distributing all computing equipment on campus. We have approximately 2300 computers and 1600 network and stand alone printers on campus. Some of the additional responsibilities include: equipment purchasing, vendor contacts, asset management, installation and relocation of equipment, and a laptop-loan program. The Computer Support Center is also responsible for the development of software images and installation/maintenance of campus standard software such as: *MS Windows OS, MS Office, virus applications, internet tools* and many other applications.

### ***Instructional Technology Services ITS***

Instructional Technology Services (ITS) supports instructional technology use on campus. The Instructional Technology Staff supports faculty and students in their technology endeavors. The dedicated staff, teamed with a multi-purpose multimedia facility in Forcina 111 merge to support classroom instruction. The facility in Forcina is equipped with advanced equipment to assist in providing services that include digital photography, scanning photographs, a 42" poster size printer and laminator, vhs to dvd transfer system, dvd hand held recorder and OCR scanning to name a few. In addition, staff and students are available to assist with the specialized equipment and software programs.

From the Instructional Technology area, many development tools have been created for faculty members who allow them to easily use technology in their curriculum. One of the best examples of these tools is SOCS (Simple On-Line Courseware System) which includes a form generator, message board, the OFDS (On-line File Distribution System), an expanded grade book including the ability to download your gradebook to Excel and use gradebooks from previous semester in future classes, an assessment module and photo rosters. This program allows faculty members and students one point of access to resources for a particular class.

#### Future plans

SOCS is undergoing a face lift this year, on both the front end and back end. Transparent to the user will be a redesign to increase response and page load time on the back end. On the front end, SOCS 4.0, which will be introduced at the Instructional Technology workshop in May 2005, will have a new look and feel with expanded help capabilities including movies and guided tutorials and new features including the ability for the professor to:

- combine sections or create subgroups or "teams" within a class
- include tutors or librarians as needed in class discussions or research projects

- move easily from section to section including a “quick jump” feature
- and much more

The ITS staff and services will also move to the new library upon building completion to fulfill a vital role in higher end and assistive technology on campus.

### **Computer Labs**

Computer labs at TCNJ have a standard configuration with *MS Windows 2000*, *MS Office* and Internet connectivity. Additionally, some computing lab facilities are setup and configured with specialized applications to support the needs of academic areas. Many of the specialized software programs are available through S.A.L. (Software from Any Location). SAL also allows students with RES.net to access some specialized applications from the comfort of their dorm rooms.

The need for open computing facilities is in transition currently. More classes are being taught in the classroom with computing capabilities. As new buildings are being built and each classroom is being designed with multimedia as a standard, the need for open labs has decreased. Another factor for the decreased need for open labs is our RES.net program.

### Future plans

Upon completion of the new library, we will be closing the Student Center and Wolfe computer labs. We will also be instituting the PrintSense printing program for printing in the computer labs. See Access Technology for more information on PrintSense.

### **RES.net**

RESidential NETWORKing Services has been in existence at The College of New Jersey since 1995 and today serves over 4800 connections in every college residence hall. The objective of RES.net is to provide student residents with reliable access to various network capabilities offered here at the college such as the Internet, email and library access. The Residential Computer Consultants (RCC's) are students employed by the college and are responsible for providing and maintaining network connectivity throughout the residence halls.

RES.net has become a very important factor in the growth of technology on campus. Since a large percentage of students are coming to college with computers, the need for appropriate network and support systems has become more apparent.

RES.net student staff provides a combination of telephone and office support. The RES.net office is currently located in the Library Court, Trailer A. Students who need assistance can make an appointment with the staff to help troubleshoot

computer problems. The RES.net staff is also available by phone for approximately 10 hours per day, Monday through Friday.

The RES.net staff provides an instructional video for students who may need visual training on how to setup their computers when they come on campus. RES.net has also been instrumental in distributing virus protection to students through the college's student license through McAfee.

#### Future plans

RES.net will undergo an evaluation and a revitalization or transformation this year. Early in the planning stages, we are looking at our current support structure for RES.net and are evaluating options. The student workers are currently providing support for virus and spyware cleaning which is well beyond our original support structure of making sure that the student can get connected.

### **Information Technology Support Specialists**

Responsibilities of the IT Support Specialists span both academic and administrative departments. The support specialists are assigned to support specific departments. Departmental responsibilities include ensuring all computers are operating properly, have the proper operating system and software installed, and each faculty or staff member can accomplish their daily tasks effectively and efficiently.

Each of the IT support specialists is responsible for providing an in-depth analysis of their areas of responsibility along with recommendations for moving from manual solutions to automated solutions. During this analysis, the support specialists meet with their departments to analyze existing systems. This analysis also results in training recommendations, as required.

Recently, moving to a "team" oriented support system, this group has been able to automate time-consuming tasks including scanning and verifying inventory via palm visor and automatically backing up and restoring data during machine replacement cycle.

#### Future plans

Over the next year, the support specialist will be responsible for continuing to expand services to the areas they support, especially in the area of analysis and recommendations for improving technology use within the department.

### **Media & Technology Support Services**

MTSS is responsible for the following services:

- Media equipped room design, installation and support – currently supporting 120 media equipped rooms
- Video recording (events, courses, training, etc...)
- Video tape duplication
- Media equipment scheduling, distribution and support – Online service request system is located at <http://www.tcnj.edu/~it/edc.html>
- Video conferences – Kendall Hall and mobile conferencing units
- Satellite services – Forcina Hall
- Campus cable television (Ch. 20 and 23)
- Technical training

#### Future plans

Implement streaming video services for campus events (athletics, Commencement, guest speakers, etc...)

Continue developing video technologies to include video over IP (conferencing, ITV, etc.) and Internet2.

### **Student Staff**

There are approximately 100 students who work for User Support Service. USS relies heavily on student worker in all areas. This concept of student staff benefits both the student and USS. The student gains valuable hands-on experience and USS gains much needed assistance with campus support.

USS has revamped the concept of student staffing in an effort to utilize this resource more efficiently and effectively. Our current model was outdated and didn't offer the students an opportunity to gain a higher level of technical experience. As indicated throughout this document, there have been changes to student staff to assist in a variety of roles.

Part of this year's initiative was the implementation of guideline documents called a "Student worker guide to success".

#### Future plans

USS will continue to refine and expand the use of students in both entry level and higher level technical positions.

### **Access Technology**

Responsibilities for Access Technology are to support and provide campus wide expansion of every day services with today's technologies. This dedicated team provides the campus with back end services for many specialized client server database applications. Some of the better known systems are the following.

- The campus wide ID card system which integrates with hall, parking access, meal plans, debit programs and future expansion of a single card system for simplifying campus life.
- The migration of hard copy documents to electronic form such as PDF, TIFF, and JPEG file formats. Applications supported like Teleforms for survey correspondence and Content Management for digital storage of transcripts and other import documents.
- Providing high end copier equipment and printing solutions campus wide including the PrintSense Environmental program.
- Streamlining the tasks of academic and special event scheduling using the R25 application.
- Enhancing the parking management on campus creating online registration, decal purchasing, and appeal procession and citation payments.

#### Future Plans

We will focus on increasing building security campus wide using a high end reliable security network and assist in the development of integrating newer technologies. We will continue to grow the many uses of a one card system while protecting an individual's privacy. This year will be focused on replacing Social Security Number as a key identifier and for financial transactions.

#### ***Department Wide Future Plans***

USS is in the third year of implementing a computer replacement hardware cycle which will dramatically reduce the need to "trickle down" equipment throughout campus. This will result in a time savings of USS staff hours and also a savings in repair and maintenance costs. Over a four year period, computers designated for faculty, staff and computer labs will be replaced with new equipment.

# Appendix

## ***IT Strategic Plan – DRAFT***

The IT strategic plan is a draft document that is currently under development. The goal for this document is to establish a process to tie the College's Strategic Aspirations, Enduring Goals, and Key Performance Indicators to the local IT goals, strategies and plans.

### **Strategic aspirations:**

1. Support the learning, scholarly, and administrative needs of the College
2. Optimize computing resources

### **Enduring Goals**

1. Advanced management systems to facilitate decision-making
2. Provide electronic tools to enhance communications and expand The College's pool of stakeholders, advocates and supporters.
3. Redundancy and disaster planning to ensure a robust, secure, and reliable network; protect the College's networks, servers, workstations, and data elements.
4. Promote effective communication and collaboration with academic units in support of talented *teacher-scholars* and Extend teaching and learning opportunities outside the classroom walls using technology.
5. Manage financial resources and predict long-term needs to ensure appropriate levels of funding

### **Enduring Goals and Related IT Strategies (draft)**

#### **1 Advanced management systems to facilitate decision-making**

- a) To make sound management decisions based on evidence, to limit redundancy, and to seek to improve efficiency while still providing excellent service, tools and support for the administration of The College. To provide seamless, state of the art tools in support of the administrative processes of The College.
- b) Strategies:
  - i) Early follower,
  - ii) Limit data redundancy
    - (1) No info entered more than once
    - (2) One data source, eliminating shadow
- c) Identity
  - i) One card strategy
  - ii) ID management – integrate with primary source, propagate single id, maintain data integrity
  - iii) Portal/Web – gateway integration whenever possible
- d) Software
  - i) Single tool where possible

- ii) IT involved in all hardware and software purchases where possible
- iii) Vendor approach – attempt to use vendors before home grown, watch leader s and follow when prime time.
- iv) eCommerce – use off campus vendors whenever possible
- v) Technical Standards – system development methodology, web development approach
- e) ERP – Peoplesoft vanilla, buy vs. build, leading not bleeding edge
  - i) Applying fixes/updates
  - ii) Upgrade strategy
  - iii) Technical Tools
  - iv) just in time purchasing
- f) Services
  - i) Have end user do reporting whenever possible
  - ii) Paperless
  - iii) Prioritization process – select projects for implementation based on priorities
  - iv) Self service – web enabled systems whenever possible

**2 Redundancy and disaster planning to ensure a robust, secure, and reliable network; protect the College’s networks, servers, workstations, and data elements.**

- a) To continually assess and improve the technology, practices and capacity employed to secure and deliver data over The College’s networks, servers, and individual workstations. To provide a robust, secure and reliable network.
- b) Strategies:
  - i) Collaboration/Cooperation
  - ii) Network Capacity Planning
  - iii) Identity and access management (AuthN and AuthZ)

**3 Promote effective communication and collaboration with academic units in support of talented *teacher-scholars* and Extend teaching and learning opportunities outside the classroom walls using technology.**

- a) To provide and support exceptional IT infrastructure, tools and services that facilitates effective use of technology by faculty and students in support of teaching, learning and research.
- b) Strategies:
  - i) To remain current with technological advances in order to adopt technology that is to the best long term advantage of The College community.
  - ii) Develop, maintain and support “virtual” learning spaces.
  - iii) Wireless Plan (link)
  - iv) Use smart classroom committee to analyze needs annually to create it funding
  - v) Implementation, support of smart classrooms and other learning support infrastructure

- vi) To look for and create opportunities for the campus community to articulate the need for new products, support, and services.
- vii) Service and Support Strategy
  - To provide the highest quality support for the academic enterprise that both targets TCNJ's needs and balances those needs with available resources
  - (1) Provide, within reason, equipment, access and resources to support academic research and the recruitment of academic faculty.
  - (2) collaborate with academic area on pilot programs,
  - (3) Collaborate with departmental liaisons and the designated an academic technology analyst to improve services and support of research and the academic enterprise.
  - (4) Provide user support to the academic areas in terms of responding to service calls, collaboration on software choice and training
  - (5) Home grown course management vs. vendor
  - (6) Assist faculty members in the development of curriculum and making sound pedagogical choices influenced by IT.
  - (7) Provide advanced instructional technology equipment.

#### **4 Manage financial resources and predict long-term needs to ensure appropriate levels of funding**

- a) To secure and effectively manage the financial resources necessary to enact the Information Technology guiding principles.
- b) Strategies:
  - i) Planning Strategy
    - yearly reviews and updates, use project as planning tool (include overview of planning process)
    - (1) Budget – 4 year replacement cycle, multi-year budget including building IT resources for maintenance and replacement
    - (2) Institutional Planning
    - (3) Budgetary Planning
      - (a) Annualized replacement cycles and “right-sizing” of inventory. )
  - ii) Staff development Strategy
    - (1) Support the ongoing training and development of IT staff.
    - (2) Recruitment and retention and professional development of IT staff
  - iii) Awareness Strategy
    - Raising campus awareness of choices, concepts, resources, standards, procedures in order to leverage existing processes, improve service and minimize redundancy
    - (1) Liaison – CIO as cabinet member
  - iv) IT Governance strategy
    - (1) Use ITAC to provide input, include mission of ITAC
  - v) Leadership Strategy:
    - To enhance The College's reputation by becoming a national leader in IT, focusing on presenting at conferences and sharing our experience and

expertise with the higher education community in formal and informal settings.

- vi) Customer Service Strategy: (does this belong under Financial Resources Enduring Goal???)

Provide quality customer service that is timely, responsive, and flexible.

- (1) Operate in a transparent, accountable and flexible manner by providing opportunities for feedback and participation in important information technology decisions.
- (2) To look for and create opportunities for the campus community to articulate the need for new products, support, and services.

## **5 Provide electronic tools to enhance communications and expand The College's pool of stakeholders, advocates and supporters.**

- a) To provide state of the art technology to enable and support electronic communication and to leverage electronic communication to enhance interactions with external constituents and expand The College's pool of stakeholders, advocates and supporters.
- b) Strategies:
  - i) Communications Data
  - ii) Centralized Directory, middleware
  - iii) Tools
  - iv) Web based communication (portal)
    - (1) Email
    - (2) Phone
      - (a) VOIP
    - (3) Other
      - (a) Cable communications, satellite, video

## ***Information Technology Advisory Council Membership and Charge***

### **Membership**

ITAC will have the following members, each:

- 2 undergraduate students (1 graduate student if available appointed by SGA, serving a 1 year term)
- 1 staff from areas not in the Information Technology Division (appointed by Staff Senate, serving a 3 year term)
- 1 Academic Dean (appointed by Academic Affairs, serving a 3 year term)
- 1 Academic Assistant Dean (appointed by Academic Affairs, serving a 3 year term)
- 5 faculty (appointed by Faculty Senate, serving a 3 year term)
- Dean of the Library (ex officio)
- Chief Information Officer (ex officio)
- Associate Director for Information Policy, Security and Web Development (ex officio)
- Director of Network and Technical Services in Information Technology (ex officio)
- Director of User Support Services in Information Technology (ex officio)

Other members of IT or other departments may be invited to join meetings according to their potential contribution to particular topics.

The chair will be elected by the membership. Only the appointed members may stand for election.

### **Purpose**

The Information Technology Advisory Committee (ITAC) serves in an advisory role to the Chief Information Officer. As requested by the CIO, ITAC may be asked to provide input on issues such as:

#### **Technology Selection and Management**

1. Advise the CIO on standards, policies, and practices related to the selection, funding, deployment, management, and assessment of information technology used in support of system-wide and campus-based academic and administrative programs;
2. Explore specific issues (e.g. moving to a new e-mail system, developing web standards, implementing authentication and authorization), make recommendations, and support the implementation of such systems.
3. Discuss the impact of new technologies or methodologies and make appropriate recommendations;
4. Advise the CIO on other IT issues, acquisitions, and product selections as requested.

### Communication

5. Provide a forum for departments and Colleges to share information about issues for and opportunities relating to technology.
6. Assist in disseminating information to the campus community to raise awareness of existing IT policies and procedures, resources, and training opportunities;

### Planning and Operations

7. Review and provide input on Information Technology Strategic Plans and Policies including both long range strategy and yearly plans; provide “big ideas” for further consideration.
8. Provide input on mechanisms that exist for resolving IT operational issues.
9. Consider any other technology related issues as requested by the Steering Committee.