

RUTGERS UNIVERSITY
COMPUTING SERVICES

ANNUAL REPORT

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RUTGERS UNIVERSITY COMPUTING SERVICES

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RUTGERS UNIVERSITY COMPUTING SERVICES

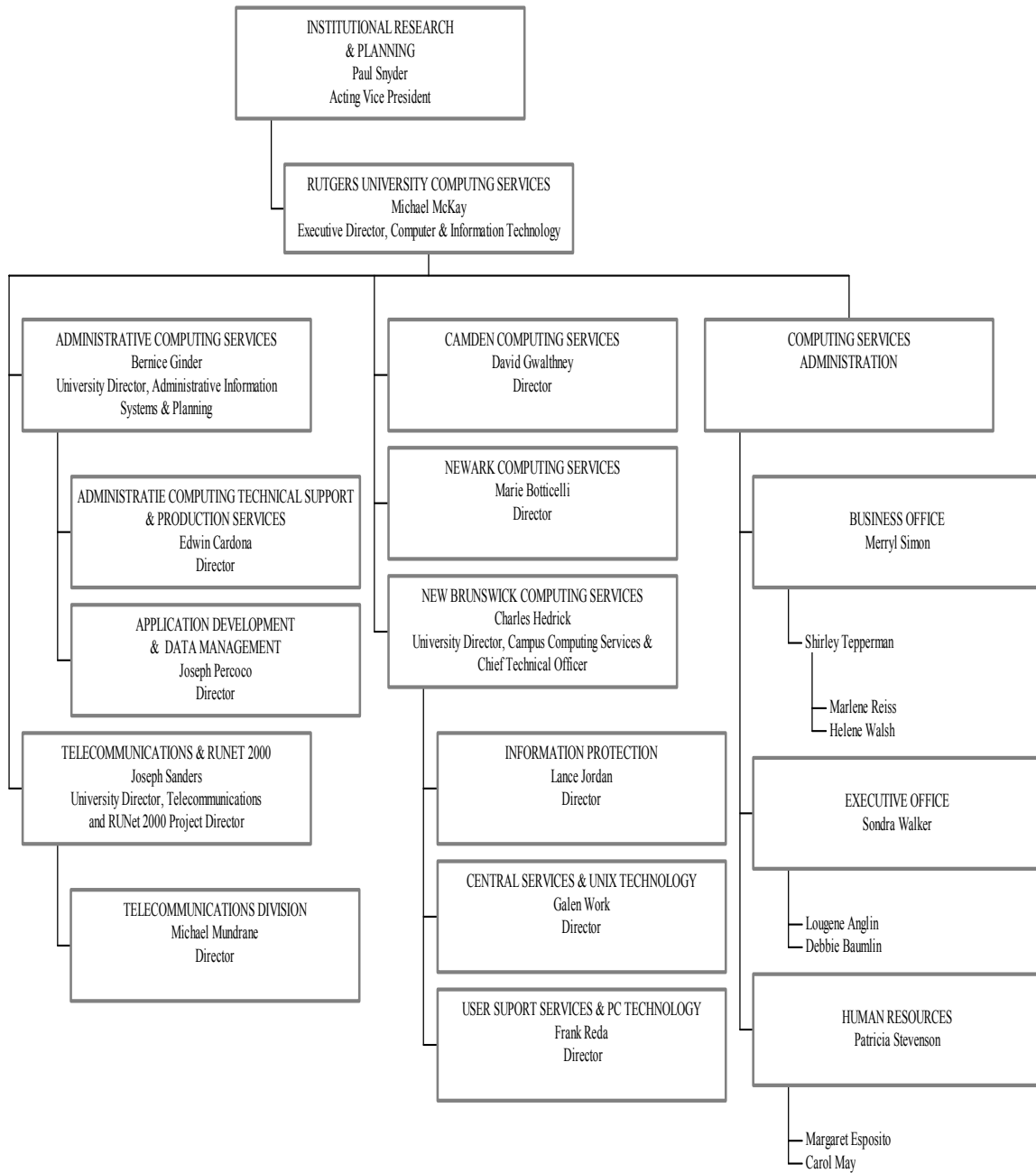
Rutgers University Computing Services (RUCS) is the university's centralized computing and telecommunications support organization. RUCS consists of three campus-based divisions – one at each of the university's regional campuses in Newark, Camden and New Brunswick – and three university-wide organizations supporting administrative computing, telecommunications, and computing services. RUCS staff members provide support for voice and data networking services, centralized batch and timesharing computing platforms, administrative applications software, and instructional computing resources, all of which support Rutgers' threefold mission of instruction, research, and public service.

Each campus-based computing services division maintains centralized data centers that provide general-purpose academic computing systems and software support on the Camden, Newark and New Brunswick campuses. These divisions also operate and maintain the student computer labs on their respective campuses. RUCS Administrative Computing Services division maintains a centralized mainframe data center that supports primary administrative applications for the core business functions of the university. The Telecommunications Division supports university-wide voice and data networking connections throughout Rutgers and is the primary facilitator for the RUNet 2000 construction project. The office of the University Director for Campus Computing Services coordinates regional computing support services and provides technical vision and focus for the development of the university's future computing environment. RUCS Information Protection and Security Division is responsible for the preservation of the continuity, integrity and confidentiality of academic and administrative information resources throughout the university.

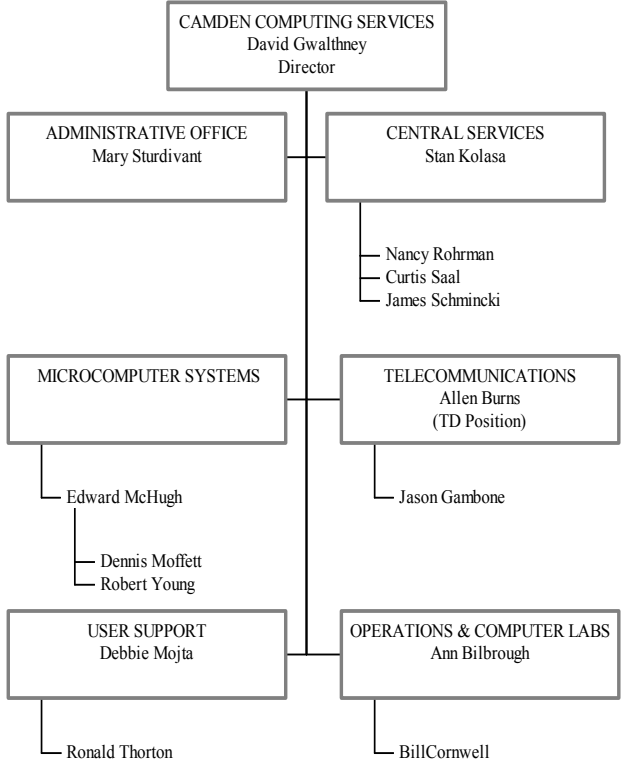
The Executive Director for Computing and Information Technology reports to the Vice President for Institutional Research and Planning, who is a member of the Rutgers University President's Cabinet. RUCS Executive Director provides oversight for all computing and information technology activities, including RUNet 2000 and Internet 2 participation, and serves as co-chair of Rutgers Integrated Administrative System implementation project. He is also a member of the Rutgers University Senate, the institution's senior Administrative Council, several university committees, and professional associations including EDUCAUSE and ACUTA.

An administrative staff provides support to the Executive Director and Division Directors in the areas of finance, human resources, internal operations and outreach, corporate and government relations, internal and external communications, and strategic planning.

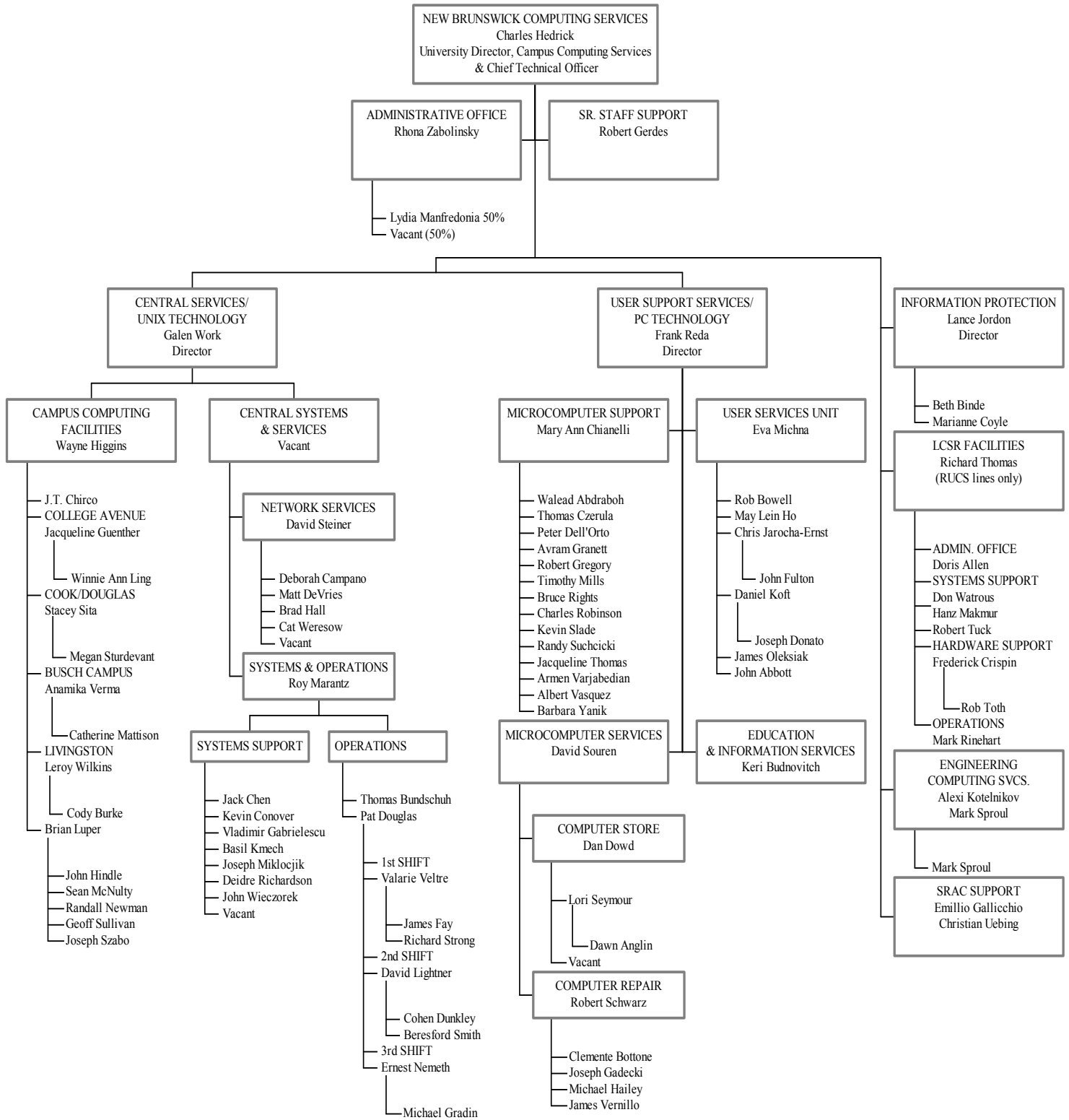
ORGANIZATIONAL CHARTS



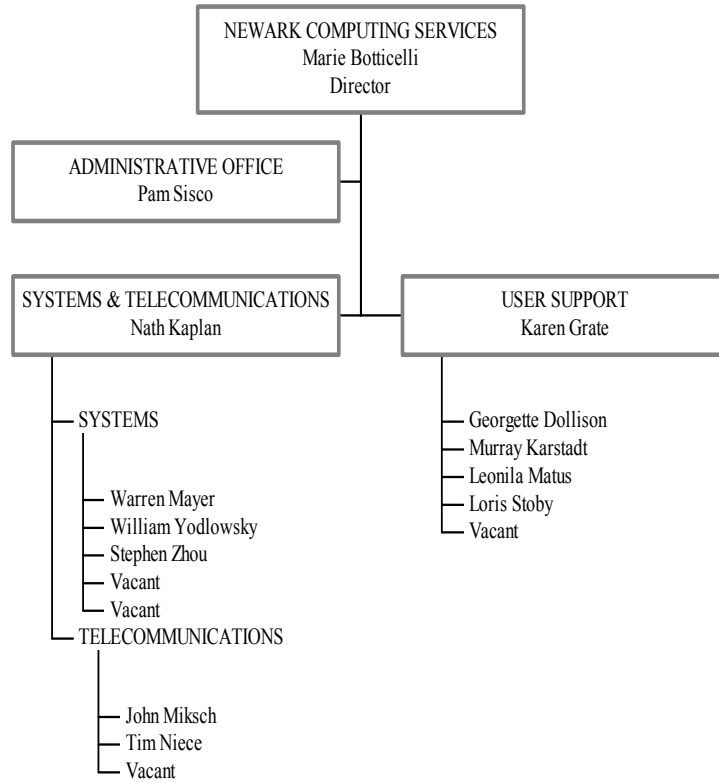
Camden Computing Services



New Brunswick Computing Services



Newark Computing Services



EXECUTIVE SUMMARY

Rutgers University Computing Services made significant strides during Fiscal Year 2000-2001 toward achieving its mission of ...

providing university-wide leadership in information technology and quality information technology services in support of the university's mission of instruction, research, and service.

As part of its strategic planning process, the department identified four strategic growth areas and four operational growth areas in which to focus its efforts. These areas include:

Strategic Growth Areas

- Creating and maintaining a state-of-the-art telecommunications network
- Creating and maintaining sufficient and effective central computing and customer support services
- Developing standards that promote optimal integration and efficiency of IT systems and services throughout the university
- Improving IT security and information protection throughout the university

Operational Growth Areas

- Creating and maintaining clear and effective business practices and identifying new revenue opportunities
- Recruiting high quality IT professionals, enhancing the skill sets of employees, and creating and maintaining effective human resources operations
- Improving intradivisional and interdivisional communication and cooperation
- Improving awareness and understanding throughout the university about Computing Services

Highlights of fiscal year accomplishments in each area are described below. Additional details are included in the divisional reports, found in Section II of this report.

STRATEGIC GROWTH AREAS

Creating and maintaining a state-of-the-art telecommunications network

RUNet 2000 conduit construction was completed on the Newark, Camden, Cook/Douglas and College Avenue campuses by July 2001. In fact, all outside plant conduit construction was completed in just less than the 2 years that had been projected. By the start of the fall semester, RUNet 2000-class fiber optic cable will connect about 270 buildings on all campuses, providing video services to 21 academic buildings and 62 residence hall buildings. To accommodate these services, wiring was completed in 10 academic buildings and 12 residence halls on all campuses. By the start of the next academic year, wiring will be completed in an additional 12 academic and 38 residence halls.

After conduit installation was completed and fiber terminated on the Busch and Livingston campuses, the RU-TV distribution "head end" was completed in Davidson Hall and satellite dishes were installed at the Office of Print and Electronic Communications-Livingston Campus, thereby permitting RU-TV services to be deployed on the Busch and Livingston campuses. Four thousand (4,000) students on the Busch and Livingston campuses received the RU-TV Network during the fiscal year.

A formal process for transitioning departmental computing systems to the RUNet 2000 infrastructure was organized and implemented. Under the supervision of an interdivisional team, more than 50 buildings spread across the Camden, Newark and New Brunswick campuses are in some stage of the transition process at this time.

In January 2001, Governor Whitman announced the donation of two high-speed fibers from the state-owned, regional consortium's fiber-optic network. This acquisition allows Rutgers to create the Rutgers Regional Network, which will link the university's three campuses in New Brunswick, Newark and Camden, and research and educational outreach facilities in other parts of the state through connections to high-speed fibers along New Jersey's major highways in the EZPass system.

The use of wireless networking is in the planning or test stage on each of the university's regional campuses. During FY01, a wireless pilot was deployed in R-place, the Newark campus cyber-café; New Brunswick Computing Services (NBCS), Newark Computing Services (NCS) and Telecommunications (TD) tested various components and functions of wireless technology; and Computing Services on all three campuses planned for the installation of wireless pilots in libraries, student center lounges and other public spaces in fall 2001.

Creating and maintaining sufficient and effective central computing and customer support services

Administrative Computing Services (ACS) launched the following online administrative services during the fiscal year: web-based class rosters, New Brunswick web parking registration and ticket inquiry, financial aid award status and disbursements, and Calendar of Events. ACS also created a web-based system for managing the university's Pay for Performance process. In addition, ACS implemented links from the online schedule of classes to departmental web sites that contain course synopsis information, which can be updated easily by authorized department staff. Further, ACS completed all planning, analysis, architecture, design and specifications for the online payment application, which will be tested first on the undergraduate admissions application fee process.

The continued expansion of web services provides the university community with enhanced functionality in carrying-out university business. This translates into greater efficiencies for faculty, staff and students. It also provides more timely and organized information delivery for the RU community, and it ensures that Rutgers maintains a competitive edge with peer institutions. These benefits are further illustrated by the tremendous growth in the number of web transactions that occur online now (more than a 100% increase over the previous year – over 8 million for FY01 compared to 3.9 million in FY00), compared to other more labor-intensive methods.

In support of the university's outreach to New Jersey's higher education community, ACS continues to engage the state's community colleges in the ARTSYS initiative, a course selection and evaluation system for community college students who are transferring to Rutgers. This year, ACS partnered with Brookdale Community College to successfully process and articulate Brookdale transcripts. A framework for similar testing for all community colleges in New Jersey has been established.

A comprehensive analysis of ACS systems is underway to determine the potential impacts of the RIAS implementation. This analysis focuses on applications that use Chart of Account and/or employee information that will need to interface with RIAS. An analysis of all current legacy interfaces with the existing payroll, HR and financial systems is also underway, and strategies for interfaces and conversions have been drafted. ACS project teams have completed application impact documents, project plans to identify the changes required to the legacy applications, and changes to support RIAS conversions and interfaces. Project team members have been working with the RIAS development staff to reformat and supply them with files to test certain conversions/interfaces

ACS developed a Rutgers Portal, "MyRutgers," demonstration that leveraged existing content at Rutgers (student employment search, dining services menus, channel listing web

search engines), as well as links to external content providers of news, sports and entertainment. ACS and NBCS will jointly develop a portal as a pilot for targeted students in Rutgers College in the fall semester, with a second release for a larger audience of students, faculty and staff in the spring semester.

Both faculty/staff and student email servers were installed, tested and put online by Camden Computing Services (CCS), providing "name@camden.rutgers.edu" for the entire user community. NCS implemented a Help Desk that went into full operation in September 2001, and installed a new network disk storage unit that provides increased space as well as improved backup and restore features for users. To enable timely corrective action, NCS also designed a failure notification routine that automatically pages a system administrator if problems occur outside of regular business hours.

In New Brunswick, NBCS worked to improve the current email system's reliability and performance and started a project to design a next-generation email system. Also during this year, NBCS assumed responsibility for network support in the smart classrooms, and installed network devices to simplify the use of laptops in these classrooms and enable the remote testing of equipment prior to the start of a class.

Developing standards that promote optimal integration and efficiency of IT systems and services throughout the university

ACS staff conducted critical and comprehensive analyses on behalf of the Rutgers Integrated Administrative System (RIAS) project. Among its contributions in FY01, ACS sized and configured the technology infrastructure required to support RIAS and negotiated the purchase of a new Sun Microsystems E10K for the project.

NBCS partnered with the university's Teaching Excellence Center in support of WebCT, a course management product that facilitates the use of technology in the classroom. NBCS and ACS are working together to provide automatic data feeds to WebCT tools including class membership rosters, grade books, chat rooms, discussion areas, and facilities to build quizzes. This will eliminate the manual entry of information by faculty. NBCS is also developing a facility that will maintain mailing lists for these courses. WebCT currently facilitates about 400 courses, with 20,750 users.

TD researched and adopted the reference model H.323 to facilitate video conferencing over Rutgers' data network. The implementation of this solution will provide a new level of service to the university community and serve as an internal and external networking standard.

Improving IT security and information protection throughout the university

The Information Protection and Security Division (IPS) researched and acquired the equipment for a forensics lab to analyze instances of hacking, and NBCS staff were trained to record and track student computing incident abuses. Such tracking allows the university to identify trends in abuse and prepare for future response needs. Using problem-tracking software, operations staff are now assigned to handle initial reports of security or abuse problems from any system at Rutgers.

In response to network congestion and as a mechanism to enforce overall bandwidth policy, TD installed the university's first firewall in FY01. This device performed only modest filtering and enforcement during preliminary deployment, but it has proved to be a very effective tool. This infrastructure was upgraded to carrier-class equipment with better performance characteristics and much greater development potential. The upgraded firewall consists of a pair of high capacity devices that function as a primary and a hot standby. In the event of a primary failure, the standby assumes full responsibility. The devices maintain synchronization of all state information (e.g. messages and acknowledgements) to ensure that connections are not broken during the transition.

OPERATIONAL GROWTH AREAS

Creating and maintaining clear and effective business practices and identifying new revenue opportunities

A third year of federal funding from the U.S. Department of Education for FY02 RUNet 2000 construction, including the extension of RUNet 2000 connections to K-12 facilities in New Brunswick, was awarded to the university in May 2001. During FY01, connections were completed to the Newark Library and Newark Museum; fiber was installed to the University Heights Science Park Office, Science High School and NJPAC in Newark; and also to Lincoln School in New Brunswick.

The Computer Store sold about \$5 million of equipment this year, primarily to university departments. This represents an approximate doubling of sales from last year. Much of this occurred through the Computer Purchase Program, which leverages the buying power of the university to negotiate the best prices with vendors while also producing the added benefit of technology standardization.

The Network Installation Group completed more than 290 jobs for a total of \$700,000 billed for the year.

Newark's CS-Net repair and installation unit completed 163 jobs and billed a total of \$24,350 for labor and materials.

Recruiting high quality IT professionals, enhancing the skill sets of employees, and creating and maintaining effective human resources operations

A staff position was created to focus on recruitment issues, in response to the demands in this area. Seventy-three hires were made in FY01. When all positions are filled, RUCS staff total is 317.5 full- and part-time employees.

Enhanced student employee training programs were implemented this year to improve customer services on all of Rutgers campuses, and NBCS initiated a program to improve customer service skills for staff.

More than 90 ACS employees participated in technical, managerial or general education training programs during the fiscal year. Additional ACS staff participated in self-study initiatives, presentations, and internally sponsored seminars that focused learning on particular applications or technologies.

All NCS employees had an opportunity to participate in at least one professional development workshop or training session. Internally, the division focused on cross-training to continue the expansion of technical skills, and employees took advantage of internal workshops and seminars in technical, human relations, and organizational subject areas. In Camden, more than 75 percent of the staff participated in external professional development programs, and almost all attended customer satisfaction and leadership seminars offered on campus.

Two networking protocol-troubleshooting/Internetworking routers and switches courses were offered through TD for Rutgers IT staff. A total of 48 unit-computing specialists from different departments across Newark, New Brunswick, and Camden attended the two sessions.

RUCS contracted with the Rutgers Center for Management Development to develop and deliver an eight-session skills development program for 32 RUCS managers.

Improving intradivisional and interdivisional communication and cooperation

NBCS implemented its reorganization into two parts, each with its own director. One handles central services and UNIX technology, and the other handles user and departmental support and PC technology.

Planning for a combined NBCS/TD Help Desk was initiated during the fiscal year. Implementation is scheduled for September 2001.

A joint NBCS/ACS project to improve the online telephone/email directory and the re-design of account creation software moved forward resulting in a much smoother process for student account creation at the start of the academic year.

As an early step in the strategic planning process, RUCS directors identified a primary proponent division within the organization to lead special research and development projects and new technologies. In addition, cross-divisional teams are being established to work with the identified proponent divisions. The purpose of this initiative is to clarify roles within RUCS, while also establishing a mechanism that supports organization-wide communication and collaboration. Success in these areas is noted on divisional leadership evaluations.

Improving awareness and understanding throughout the university about Computing Services

Computing Services staff and student employees participated in the New Brunswick, Camden and Newark Campus Open House activities this spring. Campus computing facilities tours were also provided. Information about services was disseminated through brochures and conversations with prospective students and their families. All three divisions also participated in freshman and/or transfer student orientation programs on their respective campuses during the summer.

Throughout the year, Computing Services on each campus provided departmental IT support staff, system administrators, campus administrators and other campus account holders with email messages regarding planned network and computing changes, security threats, good computing practices and other relevant information technology news. In addition, CCS and NCS instituted periodic newsletters that are distributed in print and online to their respective constituents in Camden and Newark.

Articles about Computing Services, the RUNet 2000 project, and the Rutgers Regional Network appeared in 10 publications. President Lawrence spoke of the progress of the RUNet 2000 project in his September 1 letter to faculty and administrators of the university, his welcoming letter to students, and in his State of the University address to the University Senate.

Computing Services directors delivered presentations on the future of networking, the integration of information technology, and the status of information protection and security activities at Rutgers to the President's Cabinet. An Information Technology Forum, providing information to the Administrative Council about these areas, was also held. Additional computing and networking topics were presented to members of the computing advisory committees on the university's regional campuses. ACS also offered presentations on newly developed web-based user applications to the deans, faculty and staff members on the three regional campuses.

In addition to the above strategic and operational growth area activities, Rutgers University Computing Services has continued to provide outstanding support for the daily operational computing needs of the university community. For example, the five divisions of RUCS successfully maintained central systems, the computer labs, and microcomputer and desktop support; kept the university network fine-tuned and functional; delivered administrative systems and applications; and managed the security and operations of the central computing infrastructure. These efforts reflect some of RUCS' day-in, day-out routines that keep the university running, yet they often go unnoticed in contrast to higher profiled initiatives. The divisional reports that follow outline RUCS' numerous daily accomplishments, along with the highlights for FY 2001

I. ADMINISTRATION

A. MISSION, VISION AND VALUES

An organization's ability to keep its resources focused on meaningful objectives requires periodic reviews of its mission, vision and values, as well as frequent assessments of organizational strengths and weaknesses, internal practices, and external forces. During FY01, Rutgers University Computing Services (RUCS) launched a strategic planning process based on the following mission, vision and values statements. This process, which will continue into the spring of 2002, is propelled by the desire to provide sound guidance and leadership for institution-wide information technology (IT) decision-making. The planning process will also identify the shape of RUCS in its strategic future state — an organization that will supply the talent, infrastructure and central services required to advance and sustain the computing and IT needs of a major public research university.

MISSION STATEMENT

RUCS mission is to provide university-wide leadership in information technology and quality IT services in support of the university's mission of instruction, research, and service.

VISION STATEMENT

RUCS will be a role model within the higher education community for customer satisfaction and service excellence using innovative strategies and advanced technologies, through a unified multi-faceted approach.

VALUES STATEMENT

RUCS believes that the organization's greatest asset is its staff. We encourage and support professional development activities that meet the goals of the organization. We take personal responsibility, are accountable, and embrace a set of values that guide our daily actions.

Teamwork

We extend cooperation and support to colleagues and customers throughout the university community. We hold team goals paramount while encouraging and recognizing both individual and team achievements.

Innovation

We embrace creative solutions, different perspectives, and new opportunities. We provide leadership for the university in introducing and applying information technology.

Professionalism

We are knowledgeable in state-of-the-art IT and apply our knowledge in accordance with best professional practices. We empower each other and use good judgment in performing our duties and activities. We value the benefits of diversity and treat all individuals with respect.

Integrity

We are trustworthy and honest in all of our actions. We hold to a high standard of ethics in our professional relationships.

Initiative

We identify opportunities and promote appropriate uses of information technology. We proactively take steps to increase our customers' awareness of IT as a means to achieve their objectives.

B. HUMAN RESOURCES

Distribution of Staff

At the conclusion of Fiscal Year 2001, RUCS had 247.9 full-time state lines¹ and 68.6 auxiliary lines. Staff lines were distributed across divisions as follows:

Division	Occupied Lines		Vacant Lines	
	State	Non-State	State	Non-State
ACS	92	6	5	0
Admin.	12	0	0	0
Camden	9.4	4.6	0	0
Newark	10	3	3	1
NBCS	63	30	3.5	1
TD	49	20	2	3
Total	235.4	63.6	13.5	5

In addition to staff listed above, RUCS employed 142 type 4 (temporary) employees, and 582 type 5 (Rutgers student) employees.

¹Includes all new positions as of June 30, 2001, and positions funded by other Rutgers units.

New Hires

During FY01, 66 full-time staff were hired into job families as follows:

Job Family	ACS	Admin.	Camden	Newark	NBCS	TD	Total
Applications Development/Maintenance	10				2	1	13
Management	1			1	3	2	7
Network Engineering						6	6
Network Technicians						7	7
Operations/Production							0
Systems Programming/Administration	2		2	1	16	6	27
User Services & Support	1			2	6		9
Administration & Clerical	1	1			1	1	4
Division Totals	15	1	2	4	28	23	73

Vacancies

A total of 42 State and Auxiliary positions were vacated during the fiscal year. Of that number, 13 staff were selected for another RUCS vacancy, 6 retired, and the remaining 23 resigned. At the conclusion of the fiscal year, 18.5 positions were unfilled.

Recruitment

A full-time Technical Recruiter was hired in the RUCS HR Office this fiscal year. Active recruitment occurred through:

- Rutgers UHR Internal Job Postings (distributed via mail and on the UHR web site)
- Computing Services Human Resources Job Opportunity Web Site

- Posting on Job Web Sites: Professional (5), Higher Education (1), Outplacement (1)
- Posting on technical organization listservs
- National and local newspaper advertising
- Advertisement in computer and management publications
- Attendance at 9 Technical Job Fairs
- Student Training/Mentoring Program
- Referrals
- Search firms

Advancement

Reclassifications were granted for 19 employees, recognizing their increasing capabilities to serve the organization. As stated above, 13 staff were either promoted or accepted lateral transfers into vacant RUCS positions.

Performance Development Program

In preparation for the FY02 Performance Development Program, ten supervisors were provided training on the appraisal process and setting standards for Administrative/Professional/Supervisory (APS) staff. RUCS supervisors conducted appraisals for 235 (100%) APS staff members. As in past years, each division's Director presented their recommendations for employees designated as "Exceeding Performance" to the Director Team for consideration. The final breakdown of ratings included: 19% Exceeded Standards, 79% Met Standards, 2% Did Not Meet Standards.

IT Compensation

In August 1999, Computing Services retained the services of William M. Mercer, Inc. to conduct a comprehensive analysis of its IT positions compared to the market. Like many higher education institutions and corporations in central New Jersey, RUCS was having difficulty finding and retaining IT employees in an extremely competitive market. Almost 100 jobs were analyzed and market priced by Mercer.

Working closely with University Human Resources, the market data provided a broad framework in which RUCS positions and staff were mapped. In the course of the study new titles were developed for certain positions to better capture the actual skills and accountabilities of the position. In most cases title changes reflected a re-alignment with industry practices and not a change in job responsibility or value to the organization. In August 2000, UHR developed a new IT salary structure in which the RUCS IT positions were placed into. The effective date of the salary adjustments was made retroactive to March 1, 2000.

Compensation is only one component in attracting and retaining valuable IT professionals. RUCS continues to look at other factors, such as the type of environment that will motivate IT employees and the professional development and technical training needs that should be addressed.

RUCS Internal Personnel Review Committee

An internal RUCS committee made up of the University and Campus Directors, Executive Director and the Assistant Director, RUCS, HR, was established to review all recommendations for hires, reclassifications and promotions. The Director of the division for which the recommendation is being made provides clarification and justification for each action. The committee provides their feedback to the Executive Director, who in turn makes the final decision. This new process has helped to insure equity and consistency in personnel classifications across RUCS divisions.

New Staff Orientation Program

RUCS conducts a New Employee Orientation Program each quarter of the fiscal year. The program is designed to instill a sense of community to the new employees, allow for interpersonal networking between the new employees and RUCS management, and to give these employees the scope of their position within the University and RUCS. The program consists of a welcome by RUCS Executive Director Michael McKay and an overview presentation by the five RUCS Directors of their respective divisions.

Multi-Perspective Feedback Program

During the fall, with the assistance of the University Center for Organizational Development and Leadership and Tony Doody, Associate Director, Recreational Services and PDI Trainer, Computing Services conducted a Multi-Perspective Feedback Program pilot program. The instrument used, named Profilor, is a product of Personnel Decisions International. It provides feedback and recommendations to individuals about their management skill strengths and development needs.

All Assistant, Associate and Director level personnel participated in this program. Each Manager completed a self-assessment survey, and distributed the remaining surveys to five direct reports, five peers and to their boss. Surveys were sent to and analyzed by PDI, who then provided feedback reports to each participant. These reports provided input on development needs and suggestions that may be the basis for individual Development Plans. RUCS is planning follow-up sessions on Development Planning in the Fall 2001.

C. PUBLIC AWARENESS, INTERNAL AND EXTERNAL RELATIONS

Information about Rutgers University Computing Services (RUCS) is continually distributed to the university community in a variety of ways: the organization's web site, listservs and newsgroups, print materials and electronic notices. In addition, RUCS provided detailed information on networking, instructional technology, standardized IT integration, information protection and security to the President's Cabinet to heighten their awareness of IT choices and opportunities that lie ahead. As a follow-up to these presentations and in response to the recommendations of the university's High Speed Network Applications Committee, RUCS also assembled a day-long IT Forum for members of Rutgers' Administrative Council to share additional data networking, IT research and instruction, technology integration, and security activities with university deans and executive directors.

Similarly, information about RUNet 2000 was disseminated through the project website and in presentations made by the project director and senior university officers. A communication package including videotape, door tags, FAQ, and other documents continued to be provided to residence life personnel for use in introducing the project to students in affected residence halls.

Articles about Computing Services, the RUNet 2000 project, and the Rutgers Regional Network appeared in *Rutgers Focus*, *Daily Targum*, *Star Ledger*, *Home News Tribune*, *Rutgers Magazine*, *Cabling Business Magazine*, *GROK*, *Verizon Enterprise Solutions Group Newsletter*, *ACUTA Journal*, and *Green Print*. President Lawrence spoke of the progress of the RUNet 2000 project in his September 1 letter to faculty and administrators of the university, his welcoming letter to students, and in his State of the University address to the University Senate. In addition, the IT Forum, RUNet 2000 and the RU-TV Network were discussed at various Treasurers' Luncheons this year.

Computing Services staff and student employees participated in the New Brunswick, Camden and Newark Campus Open House activities this spring. Information about services was disseminated through brochures and conversations with prospective students and their families. Campus computing facilities tours were also provided.

A Rutgers faculty consultant who specializes in the mass media provided several hours of media and presentation training to new computing services directors and the Rutgers Integrated Administrative System (RIAS) project director and communications manager to better prepare them for addressing media questions.

A third year of federal funding from the U.S. Department of Education was awarded to the university in May 2001 for the extension of RUNet 2000 construction to selected educational facilities in Newark and New Brunswick.

Computing Services played an active role in university-wide IT development activities with both internal and external organizations. Staff members:

- Served on and advanced the work of university committees, including campus-based computing advisory committees and the university-wide High Speed Network Applications Committee.
- Notified other university units of external funding opportunities for IT projects related to research and/or instruction.
- Teamed with other university offices to monitor and assess IT-related legislation.
- Matched university technology resources and faculty outreach efforts with K-12 interests.
- Participated in and helped to expand the university's relationships and joint activities with government organizations and industry partners.

II. SUMMARY OF MAJOR GOALS AND ACCOMPLISHMENTS

A. University Directorates

1) ADMINISTRATIVE COMPUTING SERVICES

FISCAL YEAR 2001 GOALS

PUBLICLY VISIBLE GOALS

ARTSYS/ET

Implement the ARTSYS Electronic Transcript capabilities allowing New Jersey Community Colleges to send transcripts electronically and articulate through the ARTSYS database. Develop processes to automatically feed existing student systems to eliminate manual intensive re-keying of transfer course data.

Web Credit Card (Web On-line Payment)

Develop an architecture and framework for supporting web credit card processing at the university. Target the undergraduate admissions application fee for piloting the framework.

Financial Aid Reauthorization

Complete implementation of all federal financial aid reauthorization requirements for 2000/1 academic year.

Web Access to Financial Aid Award Status

Provide students with up-to-date information on financial aid award information via the web.

RIAS Interface Planning and Analysis

Initiate planning and analysis for the implementation of all necessary data conversions and interfaces in support of the RIAS project.

Undergraduate and Graduate Admissions Web Application Enhancements

Implement ability for partial application processing in the undergraduate web application. Implement administrative (back office) functionality in the graduate admissions web application. Also implement functionality to process graduate application personal statements and references. Provide enhancements to graduate and undergraduate web status page. Provide enhancements to generate "facsimile" of paper graduate application.

Student Information Management Systems (SIMS) Co-requisite Processing

Implement co-requisite checking to eliminate the need for departments to register students for co-requisites after registration period.

Student Data Warehouse (SDW) Expansion

Provide enhancements to SDW to satisfy requirements of clients including selection criteria (multiple semesters), historical data, new data elements and more frequent updating. Roll out Oracle's Web Discoverer query tool to support improved access and delivery of administrative information.

Student Records Database (SRDB) Expansion

Expand the SRDB to accommodate additional space for data element needs of administrative clients.

Rutgers Portal

Build a portal that encapsulates all the types of information and services students need in a single, easy-to-navigate web site. The portal may include on-line registration, schedule of classes, transcript requests, statements of accounts, address update, financial aid documents and grades – all in an integrated site customizable to the end-user with single sign-on capability.

Graduate & Professional School Reporting

Implement a web interface for Graduate & Professional School reporting that provides clients with convenient browser access and menu selection of reports.

Re-engineer Client Server Applications for Delivery over the Web

Improve the ease of access, support, and roll out of the current client server (c/s) applications by delivering them over the web. Reengineer existing c/s applications to the web including HRinfo, FASIP, First-year Sectioning and Pay-for-Performance.

INTERNAL INFRASTRUCTURE GOALS

Upgrade Mainframe Operating System to OS/390 v2.8

Upgrade the IBM mainframe operating system to OS/390 v2.8.

IMS Maintenance

Apply maintenance patches to the Information Management System (IMS).

Upgrade Oracle to version 8i

Install Oracle upgrade on the mainframe in order to improve reliability and availability of the university's centrally supported administrative Oracle applications and Web pages on the administrative mainframe. Oracle 8i will also provide new functionality and improve security.

ACS Network Enhancements

Upgrade the current infrastructure from 10BaseT to 100Mbps Networks

Upgrade UNIX Production Infrastructure

Upgrade the legacy UNIX infrastructure providing enhanced performance and reliability.

Upgrade NT Production Infrastructure

The upgrade of this infrastructure will improve performance, reliability, and security for the applications, and replace systems at the end of life cycle/warranty.

Internal Audit: Administering Windows NT Server

Work to complete outstanding audit recommendations for the Windows NT infrastructure.

Data Entry

Continue the process of reducing centralized data entry through the implementation of electronic feeds and re-engineering on-line applications.

Data Entry Falcon 32 Upgrade

Upgrade the existing DOS based Falcon Data Entry System.

Desktop Support Virus Protection

Standardize our Anti-Virus software implementation procedures to safeguard workstations.

ACS Desktops Asset Management

Begin tracking and compiling an accurate hardware list of serial numbers and licensed software.

Automated Tape Libraries and Backup Software

Implement a backup methodology for the heterogeneous environment (NT and UNIX), taking advantage of the current tape technology and storage management.

Output Management

Improve the timely delivery of client reports while reducing the user's dependency on centralized printing.

Disaster Recovery Testing of Oracle/UNIX and NT Web Server Production Platforms

Include as part of the overall Disaster Recovery Plan the successful recovery of the UNIX and Windows NT Production Web Servers.

Disaster Recovery Internal Audit

Respond to Internal Audit recommendation for Disaster Recovery.

ORGANIZATIONAL GOALS

Professional Development and Performance Management

Provide continual professional development for the ACS staff through formal and informal training and cross training in concert with business needs. Provide ongoing performance feedback and annual formal appraisal to manage individual performance and development.

Customer Satisfaction

Provide mechanisms for customer input and feedback in order to effectively respond to customer needs.

Quality: System Development Methods and Procedures

Establish additional methods and procedures to govern software implementation in order to ensure quality and efficiency of operation.

Quality: Operational Methods and Procedures

Establish additional methods and procedures to govern operations and production control in order to ensure quality and efficiency of operation. Evaluate the existing change management process to ensure adequate controls are in place across all platforms and data center operations. Implement new changes and provide training and documentation for support staff.

Quality: Project Management Methods and Procedures

Establish additional project management methods and procedures to govern project implementation in order to ensure quality and efficiency of operation.

Communication

Establish additional mechanisms to enhance organizational communication

FISCAL YEAR 2001 ACCOMPLISHMENTS

ARTSYS/ET

Goal: Implement the ARTSYS Electronic Transcript capabilities allowing New Jersey Community Colleges to send transcripts electronically and articulate through the ARTSYS database. Develop processes to automatically feed existing student systems to eliminate manual intensive re-keying of transfer course data.

Status: Good progress was made this past year in the implementation of ARTSYS e-transcript functionality. ACS is currently partnering with Brookdale Community College as the pilot for e-transcript processing and has successfully processed and articulated Brookdale transcripts. A planning framework for similar testing for all community colleges has also been developed and will be refined as other school file transmissions are scheduled.

ACS has also completed planning and analysis with Enrollment Management and the University Registrar regarding downstream processing of articulated transcripts. Design and specification for processing to the SRDB, NJAS database and Undergraduate Imaging System was completed.

ACS and the Office of Enrollment Management, have met with Technical and Academic representatives from the New Jersey Community Colleges to continue to proactively engage the community colleges in order to further integrate these schools into the statewide ARTSYS initiative.

Web Credit Card (Web On-line Payment)

Goal: Develop an architecture and framework for supporting web credit card processing at the university. Target the undergraduate admissions application fee for piloting the framework in the future.

Status: ACS completed all planning, analysis, architecture, design and specification for the web on-line payment application. ACS led discussions with University Accounting, Treasury and Internal Audit personnel to discuss the business process flow associated with online payment processing and to ensure that the solution meets university financial accounting and control requirements. After investigating vendor offerings for online payment solutions, and performing an evaluation of select e-payment services, a choice was made to contract with Verisign for their Payflow Pro service.

A roll-out plan has been developed targeting the undergraduate admissions application fee as the initial implementation. Subsequent planned implementations include parking fee and term bill payment.

The application has been designed as a "common module" that can be invoked from a variety of web applications. This generic "plug and play" design provides a flexible solution that can be deployed fairly quickly as new business needs arise. Design and specification have been reviewed with Office of Enrollment Management, Parking & Transportation, Student Financial Services, Controller's Office, Internal Audit and the RUCS Information Protection Team. Coding and testing is underway with targeted completion by June 2001 when a User Acceptance Test (UAT) will get underway.

A new E420R Web Server was purchased in January for the Online Credit Card Application. The server was purchased to reduce web access hits against our main production server and to provide better throughput and balancing. In addition, a 128-bit Verisign certificate was purchased for Secure Socket Layer (SSL) support. ACS is reviewing firewall options for external network security. The Online Credit Card application is installed on the new server and support's the Oracle 'Internet Application Server' (IAS). IAS is Oracle's

replacement product for the Oracle Application Server; it is Oracle's flavor of an Apache Http Server. ACS expects to have the server running in test mode by June 2001.

Rutgers Portal

Goal: Build a portal on the web, encapsulating all the types of information and services students need, in a single, easily navigable web site. Examples include on-line registration, schedule of classes, transcript requests, statements of accounts, address update, financial aid documents and grades – all in an integrated site customizable to the end-user with single sign-on capability.

Status: ACS developed a Rutgers Portal demonstration that leveraged existing content here at Rutgers (student employment search, dining services menus, channel listing web search engines), as well as links to external content providers of news, sports and entertainment. ACS and NBCS will jointly develop a portal as a pilot for targeted students in Rutgers College in the fall semester, with a second release for a larger audience of students, faculty and staff in the spring semester. The "My Rutgers" portal will be built with "uPortal", which is an open source university portal framework, developed by the Java in Administration Special Interest Group (JA-SIG).

Financial Aid Reauthorization for the 2000/1 academic year

Goal: Complete implementation of all federal financial aid reauthorization requirements for the 2000/1 academic year.

Status: ACS completed all enhancements to the FAMS system supporting federal financial aid regulation changes for the 2000/1 "reauthorization" year. This effort, which spanned the course of approximately one year, included the following highlights:

- System changes to Direct Loan
- Major changes to Pell Grant processing to comply with the Department of Education's new Recipient Financial Management System (RFMS)
- Enhancements to the Outside Application Resource (OAR) secondary confirmation to provide identification of any problems with matches between the Institutional Student Information Records (ISIR) and national databases
- Enhancements to PARS in order to package two new merit scholarships

Web Access to Financial Aid Award Status

Goal: Provide students with up-to-date information on financial aid award information via the web.

Status: Web access to student financial aid award information was implemented in August 2000. This secured web page displays an individual student's financial aid award offers and disbursed aid. Links are provided to the financial aid application and document status page and the student statement of accounts web page.

RIAS Interface Planning and Analysis

Goal: Initiate planning and analysis for the implementation of all necessary data conversions and interfaces in support of the IAS project.

Status: A comprehensive analysis of ACS systems for potential impacts due to RIAS implementation is underway. The focus of this analysis is on those applications that utilize COA (Chart of Account) information and/or employee information that will need to interface with RIAS. Good progress was made on data gathering and analysis for the RIAS interfaces and data conversions. An analysis of all current legacy interfaces from/to the existing payroll, HR and financial systems is underway. Data file layouts and other relevant information has been collected. Oracle AIM documents outlining strategy for interfaces and conversions have been drafted. ACS project teams have completed application impact documents

and project plans to identify the changes required to the legacy applications and changes to support RIAS conversions and interfaces. The project teams have been working with the RIAS development staff by reformatting and supplying them with various files to test certain conversions/interfaces.

Undergraduate and Graduate Admissions Web Application Enhancements

Goal: Implement ability for partial application processing in the undergraduate web application. Implement administrative (back office) functionality in the graduate admissions web application. Also implement functionality to process graduate application personal statements and references. Provide enhancements to graduate and undergraduate web status page. Provide enhancements to generate “facsimile” of paper graduate application.

Status: ACS completed enhancements for partial undergraduate application processing that provides prospective students with the ability to enter a partial application, save the application, and complete it at a later time. Prior to this enhancement, it was necessary for applicants to complete the entire application in one logon session.

Due to shifting priorities, the other items were deferred while more pressing needs were addressed (see next section: Additional Publicly Visible Accomplishments).

SIMS Co-requisite Processing

Goal: Implement co-requisite checking to eliminate the need for departments to register students for co-requisites after registration period.

Status: This project was completed in June 2001. Co-requisite checking eliminates the need for departments to register students for co-requisites after the registration period (currently many students will register for a course that requires a co-requisite and fail to register for that co-requisite). This new process will automatically identify any course that requires a co-requisite and add it to a student’s schedule.

Student Data Warehouse (SDW) Expansion

Goal: Provide enhancements to SDW to satisfy requirements of clients including selection criteria (multiple semesters), historical data, new data elements and more frequent updating. Rollout Oracle’s Web Discoverer query tool to support improved access and delivery of administrative information.

Status: ACS has expanded the selection criteria for the SDW to include not only currently registered students but also students pre-registered for two future semesters, students registered in the prior semester and students who have graduated in the current graduating cycle. The SDW was also expanded to include additional data elements and the frequency for updating was changed from bi-weekly to daily. A historical SDW that has student data dating back to 1990 was also implemented. (See next section: on Additional Publicly Visible Accomplishments for progress on Oracle Discoverer rollout.)

Student Records Database (SRDB) Expansion

Goal: Expand the SRDB to accommodate additional space for data element needs of administrative clients.

Status: ACS implemented a major expansion of the Student Records Data Base in December 2000. The driving force of this project was the increasing demand for additional elements on the Student Records Database. Requests have been received from the Graduate Admissions Office and the Registrar, among other clients, to add additional elements for a variety of SRDB segments. In addition to adding new elements, certain SRDB segments were expanded to allow for future growth.

This expansion called for enhancements to software across all ACS systems that interface with the SRDB including, but not limited to, NJAS, Graduate Admissions, Registration/

Scheduling, Student Financial Services, Financial Aid and University Services. This effort also called for extensive testing to ensure all SRDB program interfaces were accounted for.

Graduate & Professional School Reporting

Goal: Implement a web interface for Graduate & Professional School reporting that provides clients with convenient browser access and menu selection of reports.

Status: ACS initially produced reports for the Graduate School – New Brunswick Dean’s office. Reports included Student Enrollments for all and first time students, GRE/GPA for all and first time students, Payroll Support, Degrees Awarded and Program Data. It was decided to utilize the Institutional Research Data Mart for this type of reporting going forward. Since that decision was made, ACS has been working with Institutional Research personnel to help populate the datamart.

Re-engineer Client Server Applications for Delivery over the Web

Goal: Improve the ease of access, support, and rollout of the current client server (c/s) applications by delivering them over the web. Reengineer existing c/s applications to the web including HRInfo, FASIP, First-year Sectioning and Pay-for-Performance (P4P).

Status: The HRInfo client/server forms application was converted to run via the web using Oracle Developer Server. The web version of HRInfo merged the 3 basic forms showing Employee Address, Benefits, and Personal Data into one tabbed form. The HR Report now runs on Oracle Reports Server and is also viewable through the web. P4P was also deployed to the web (see next section for P4P). Due to shifting priorities and the small end-user base for FASIP and First-year Sectioning, conversions for these applications were deferred.

PUBLICLY VISIBLE ACCOMPLISHMENTS

Pay for Performance (P4P)

ACS staff led discussions with University HR regarding application enhancements necessary to support university-wide administration of salary and bonus awards. ACS finalized all functional and technical requirements and completed all necessary implementation activities. Major enhancements from last year include conversion from a dual year to a single year process, addition of departmental level drop down screens, enhancements to prior year award display and conversion from a client/server architecture to web deployment (upgrading from Oracle Forms/Reports 5.0 to Oracle Developer Server 2.3). ACS also created a detailed and comprehensive end-user guide and assisted Human Resources in end-user training sessions. The ACTS/PSF staff devised a temporary help desk to respond to user issues during the P4P period. The staff was trained and tested in proper help desk protocol. Operations staff were trained in how to triage in-coming calls, re-direct them as required, and follow through for proper closure.

Financial Aid Management System (FAMS) Regulatory Maintenance for FY02 academic year

ACS staff have modified the FAMS system in accordance with federal and state requirements for processing of 2001/2 academic year financial aid applications. The revised Free Federal Application for Student Aid (FFASA) and data record required mapping and incorporating the new aid record fields to the database. Online programs and batch processes were modified for federal, state and department requirements. The 2001/2 Institutional Needs Analysis System (INAS) was installed to provide the ability to compute federal and state estimated family contribution. Enhancements were made to the Verification and Secondary Confirmation processes, Resource Audit, Packaging Aid Resource System (PARS), Institutional Student Information Record (ISIR) print, and Electronic Data Exchange (EDE) Correction processing. In March 2001, over 24,000 financial aid applications were loaded

enabling the Financial Aid Office to begin processing the new academic year. Some of the highlights of this year's maintenance included:

- New federal compress software was installed for all the transmissions jobs in January. This was needed to prepare for migration from the Title IV WAN to Student Aid Internet Gateway (SAIG) in the fall of 2001.
- Captured the state calculated New Jersey Estimated Index (NJEI) to enable the Financial Aid Office the ability to compare the INAS calculated NJEI with the state's NJEI. This will improve awarding and reconciling the Tuition Aid Grant (TAG).
- Provided the Financial Aid Office with the ability to print ISIR's by transaction. In the past only the most current ISIR could be printed.
- Refined existing selection criteria and added several new selections to the verification process.
- Modified the secondary confirmation process for new and revised comment codes and installed two additional selection criteria.
- Modified the housing logic and messages printed on the Award Letter program.
- Several enhancements were made to PARS for this processing cycle. Increased scholarship award amounts, installed TAG and Pell tables, provided edits to prevent packaging students who have not completed and returned required documents. Modified the program to use reported housing and reported NJEI, when present.
- The Award Status Web page was enhanced to enable students to select and view current or prior year award data.

Web Schedule of Classes and Course Synopsis

For the spring 2001 registration period ACS implemented links from the online schedule of classes web application to various departmental web sites which house course synopsis information. These links allow students to "click" on specific course/sections presented on the course schedule screen and link directly to a departmental page that displays synopsis information for that course/section. ACS has also implemented an administrative screen that allows authorized departmental staff to input URL's where synopsis information resides for specific course/sections. This functionality empowers the academic departments with an automated method to maintain synopsis links. ACS led a pilot of this functionality with select personnel from Cook College, the Faculty of Arts and Sciences, and the School of Information, Communication and Library Studies. Going forward this application will be rolled out to additional departments in New Brunswick, Newark and Camden. For fall 2001 registration, student access to online synopsis information continued to grow. During this registration cycle, there were approximately 5000 hits by students to various departmental web pages for synopsis access. Currently, approximately 20 percent of undergraduate course sections have a synopsis link, which is up from 10 percent for the spring 2001 registration period.

Web Class Rosters

On-line web based class rosters were implemented university wide for fall 2000 after a successful pilot for faculty in Newark and NB Math department. Functionality includes on-line roster generation, creation of class email lists and administrative functions for granting user privileges. The application allows hierarchical management and administration from the University Registrar through college deans, department heads and faculty.

A follow up release of the class roster application was implemented for the spring 2001 semester. Added functionality included granting 10-month faculty the ability to view rosters during the summer months, granting access to "guests", display of special permission numbers and academic warnings and usability enhancements for easier viewing and navigation.

ACS has been working with the RUconnections Office to potentially integrate online photos into the Rosters Application. A prototype was completed to retrieve photos from the RUconnection FoxPro database, transmit them to an ACS server, load them to an Oracle database and integrate them with the Rosters application. ACS presented a demo of this prototype to the University Registrar, Associate Dean of FAS-NB, and the Director of Compliance and Student Policy Concerns. Additional discussions will be held in the upcoming year regarding use of potential photos in the rosters application.

Web Online Statement of Accounts (for administrators)

Web access to student financial information for university administrators was implemented this past year. This service compliments last year's delivery of online financial account information to students. The original implementation gave the student the ability to view a current snapshot of their financial statement of account including tuition, fees, payments, refunds and remission information through a secure web based process. Prior to this students could get this information only in person at the cashier's office or through periodic mailings. The follow up release of this application for administrators was implemented to provide less cumbersome access to student account information.

Calendar of Events

A new web-based Calendar of Events System was implemented this past year. This application was designed to collect information about events of interest to the Rutgers community in one central location. The application allows posting of events by registered users and public viewing of event information. Any registered Rutgers organization, department, affiliate or alumni group can post events. Public searching of events can be done by specific date, date range, event category, key word or location. A link to online campus maps is in place to provide exact building location and directions. An email link to event organizer is also provided. This application provides up-to-date event information combined with a user-friendly search capability.

Web Parking Registration and Ticket Inquiry

ACS implemented Phase 1 of the New Brunswick Web Parking Registration and Ticket Inquiry System. This application provides New Brunswick students with a Web based parking registration form that displays parking permit fees, outstanding ticket fines and parking lot assignment information. Students can print the form and mail it with their payment to the Parking Office. This application provides enhanced service to students with more accurate and up-to-date parking registration and ticket information. It also obviates the need for students to travel to the Parking Office and wait in line to get an application. The system provides financial savings for the Parking and Transportation Department since they will no longer have to purchase and mail pre-printed forms. Future releases include integration of online payment and online submission of registration form. (See ACS' Goals for Fiscal Year 2002 on page 83.)

Web Housing & Parking Lot Assignment

In support of Housing Administration and the rollout of the Web Parking Registration and Ticket Inquiry Application, ACS needed to create a new application that would provide online maintenance of resident student building and room information and corresponding lot assignments, as well as commuter student lot assignments. A new web application was built that allows the Housing Administration Office to input dormitory information and the Parking Office to update parking lot assignment data. This process is not only more timely and efficient, it is more accurate since it eliminates the transcribing of handwritten data into a COBOL program.

Web Camden Post Office

The new web based Camden Post Office application, which was implemented in August 2000, replaces the Camden Post Office Assignment and Maintenance System. Students are now able to view their post office box combination, post office mailing address and the names of students who share their box. The application provides facilities personnel with the ability to display, add, modify or delete student post office box assignments and to update box combinations and reserve codes. This application will allow the elimination of keypunching and data entry and will provide a more accurate means for post office box assignment.

NB Parking and Transportation Automated Diploma Holds

A process to automate the generation of letters for graduating students with outstanding New Brunswick parking tickets was implemented in April 2001. The new service, which eliminates weeks of manual processing, satisfies a request by the New Brunswick Parking and Transportation Office. This application also creates a number of reports, which will enable the Parking and Transportation Office to analyze the data in order to determine a cut-off dollar amount for the holds.

Reengineered IMS Telephone Screens

In an attempt to make the online process more efficient, ACS took on the effort of merging four telephone screens and programs into one new screen. This application enables the staff at the Telephone Office to display and update telephone data faster and more efficiently. It also makes it easier and quicker for the Administrative Computing Services team to modify the screens and programs, as well as get the authorization for user access.

Faculty Arts and Sciences Increment Program (FASIP)

ACS staff completed an upgrade of the FASIP application for the fall 2000 FASIP cycle. Enhancements included a technical upgrade from Oracle Forms/Reports 4.5 to 5.0 and a functional enhancement to allow award initiation at the University President level. Test installations of FASIP software were performed and recommendations for hardware requirements were made based on these tests. Desktop Support staff began contacting end-users late in September to schedule the rollout, which took place the last two weeks of October. Desktop staff installed the software on twenty-eight desktop PCs across three campuses.

Trustee Survey

ACS created a web-based assessment survey for the Council for Advancement and Support of Education (CASE) Board of Trustees, at the request of the Executive Director of University Relations. The survey assessed their knowledge of the responsibilities as a Trustee, the evaluation of the Board and specific governance policies and practices, and their knowledge of CASE. This survey was available for Trustees to complete online for approximately two weeks. Summary data was compiled and made available at the CASE Board leadership workshop on November 12, 2000.

College Assessment Research System (CARS)

The College Assessment Research System (CARS) has been upgraded to support the in-house testing instruments that are being developed by the Math and English departments at FAS. These testing instruments are replacing the New Jersey Basic Skills Tests previously used by Rutgers. This is a five-year process. In this fourth year of the process modifications were made to ensure that the tests are valid predictors of performance in Math and English courses. In addition, enhancements were made to the foreign languages testing to assist various language departments in testing and placing students in correct language level courses.

Facilities Interfaces to New System

ACS developed automated interfaces to have data from Facilities transmitted electronically to the ACS mainframe via FTP (File Transfer Protocol) in order to eliminate keypunch redundancy. In the past, the department needed to send a list of charges to keypunch to be manually entered.

Cellular One Invoice Processing

In order to facilitate monthly bill processing, ACS designed and implemented an automatic, one-invoice billing system much like the telephone system that is currently used at the university. Previously, Cellular One had multiple invoice processing and manual entries generated to the ledger. Now, Cellular One provides us with a monthly tape, which is processed to generate a single invoice, and also provide detailed data to the mobile phone user department. Entries to the general ledger are generated from the system and are posted directly to the ledger rather than being keypunched. By participating in the single invoice plan with Cellular One, the university is receiving substantial discounting on their phone service plans.

Course Analysis System (CAS)

The new web based Course Analysis System was rolled out to academic departments, Office of Institutional Research and other university administrative offices for the fall, 2000 cycle. The enhanced system provides state-of-the-art technology, enhanced data collection and data validation. Processes were put in place to verify collected data against official university HR data. This has significantly decreased the need for error correction and data entry. Institutional Research and other university academic and administrative offices use data collected through CAS for the production of faculty workload reports.

Off-Campus Reporting System

Office of Budget and Resource Studies requested additional statistical analysis for students who took both on and off campus courses. As the university increases its use of off campus facilities and course offerings the reports and statistical analysis provided by this system will become more valuable to university offices.

Student Health Online Tracking System (SHOTS)

Enhancements were made to the immunization letters sent to students each semester to increase the compliance and return rate.

Student Unit Record Enrollment (SURE)

Requests from the Commission on Higher Education to increase the data supplied for the Enrollment and Degree files sent each semester was completed. The timeliness and accuracy of these files is crucial due to Commission on Higher Education's (CHE) reporting of this data to other agencies which determine funding for Rutgers.

People Database Data Integrity and Processing Improvements

After a review of the current interface process from the SRDB and Payroll to the People Database System, it was decided to update this process to improve the reliability and integrity processing of data to PDB. Additionally, new matching processes and error checking processes were incorporated. Additional enhancements include:

- Review of assignment of IDs at ACS and NBCS and change to algorithm to eliminate conflicts
- Creation of unique Database Access Descriptor (DAD) for Privilege View and Guest processing to eliminate application down time

- Refresh of PDB for spring semester 2001
- Conversion of all email accounts on Camden campus to @camden.rutgers.edu

People Database "Guest" Processing

The People Database Online Directory was enhanced with the "Add a Person" application, a web-based vehicle that allows authorized individuals to add a person to the people database in order to be able to create a computer account for that person. This application is used mainly to enter new faculty and staff that have yet to be processed through payroll. It will also be used to enter guests of the university who need computer accounts.

Institutional Research Data Mart

Course and term files extracted from the Student Records Database (SRDB) for the period fall 1992 through fall 2000 were prepared for upload to the Institutional Research data mart. Institutional Research uses this data mart in the production of reports and statistical analysis for internal and external reporting.

Undergraduate Admissions (NJAS) Cycle Start-up for Spring/Fall 2001

ACS completed the implementation for the undergraduate admissions cycle startup for spring/fall 2001. This effort, which spanned over eight months, included enhancements to NJAS (mainframe undergraduate admissions system) and the online Undergraduate Web Application. Highlights include:

- Extensive enhancements to student notification letters and associated forms and documents to provide greater personalization in our communication to prospective and admitted students.
- New Financial Aid and Student Notification Letter text entry screens added to allow data entry of award information and free form "customized" text input into notification letters
- Back-end processing enhancements to automatically convert the electronic web application into an imaged version and transmit it to Enrollment Management's ImageNow system (eliminating the need to manually scan these applications).
- Updates to NJAS IMS Admission screens to provide more user-friendly screen navigation.
- Enhancements to the Undergraduate Web On-line Application to provide greater flexibility for students and additional efficiencies for application processing. The online application now gives the applicant the ability to fill out a partial application, save it and complete it at a later date.

Undergraduate Admissions (NJAS) Startup for Spring/Fall 2002

NJAS system upgrade requirements for the undergraduate admissions cycle (spring 2002 through fall 2002) are being gathered. Items currently being discussed that may call for system changes include upgrades to the undergraduate admissions online web application and online status page and enhancements to allow prospective students to acknowledge their acceptance to a specific Rutgers College over the web. Additionally, optical scanning of paper applications is being looked at in an effort to reduce data entry of paper student applications. Also being discussed is implementation of an algorithm to convert a student's high school grade point average to a scaled value based on the high school's GPA scale. Upgrades to the letter notification process are also expected.

Undergraduate Admissions Application Imaging

Using Crystal Reports, ACS implemented a process to image the web undergraduate student application from ACS Oracle database to the Enrollment Management ImageNow

system. This implementation helped to streamline the undergraduate admissions decision-making process.

Undergraduate Admissions Datamax

ACS has implemented modifications to NJAS in order to interface with the new Datamax application run out of the office of Enrollment Management. Datamax is a new application that allows data entry of undergraduate admission applications. Datamax replaces the Summit Bank lockbox transmission of undergraduate applications. ACS provided subject matter expertise and documentation to assist Enrollment Management personnel in the Datamax implementation.

NJAS Summit Bank Transmissions

ACS worked with Summit Bank in the upgrade of the lockbox file transmission of undergraduate application and tuition deposit fees. This project was a technical upgrade from the Remote Job Entry (RJE) file transmission mechanism to the File Transmission Protocol (FTP). In addition, PGP encryption software was implemented to provide secure data transmission.

Graduate Admissions Test Score Reporting

ACS completed enhancements to the Graduate Admissions system to capture student self-reported GMAT, TOEFL and LSAT test scores. Enhancements also provided for the capture of information regarding minority eligibility for special programs and foreign address information.

Graduate Admissions Standard and Ad-hoc Reporting

ACS initiated work to deliver various Graduate Admissions reports over the web. Program Status and Student Statistical reports have been designed and made available over the web. ACS also upgraded the delivery method and usability of the "Graduate Request" data file that is used by the Graduate Admissions Office to query current admissions cycle student and program data. Discussions regarding the use of Oracle Discoverer for additional ad hoc reporting needs are also underway.

Winter Session Registration

The Student Information Management Systems (SIMS) winter session process for winter 2000/1 was completed. ACS created a registration process to allow students to register for a new winter term. This began with the rollover of winter "transfer" courses to legitimate winter terms and courses on a new Winter Session Database. ACS successfully retrieved and processed a registration file from eCollege (external vendor of student administration and course management software) and updated registration data for approximately 1000 students on the new Winter Session Database. In order to fully integrate winter term courses, this project required enhancements in the calculation of student cumulative degree credits, grade point averages and transcripts. Modifications were also made to the transcripts/grades web application to include winter session courses. Modifications were also made to reports and online screens to enable the Registrar to request transcripts and reports and to view winter session information for a given student.

Course Scheduling Construction Sheets

ACS modified the Schedule of Classes printer's copy and construction sheets to display cross-listed courses. This permits the Scheduling Office to review the cross-listed courses and to publish to the students the identity of cross-listed courses. These are usually courses that have interdisciplinary content and so are listed with different course identifiers under several different academic disciplines.

Web Registration Personal Access Code (PAC) change

Fall 2000 featured a new enhancement for web registration – the ability for a student to change their Personal Access Code (PAC) online. This feature was implemented in response to student concerns over the security of PAC number as authentication for online web registration. The concern centered on the fact that the PAC assigned by the university defaulted to the students' birth month/day. Previously, students could change their PAC numbers only by visiting the Registrar's office. In the past, the rate of PAC change requests through the Registrar's office has been on the order of five per month. During the fall 2000 demand registration period, students changed PAC numbers at a rate of twenty-five per day.

Commencement Processing

The Student Information Management Systems (SIMS) commencement process was modified to automatically import degree posting information (for a given student) from the registration process to the commencement process. These enhancements to the degree posting process were a great benefit to the students. This is the first time that degrees were posted as early as one week after graduation. Prior to this, the posting of degrees was not completed for over a month after graduation. Students now do not have to wait to request a copy of their transcript that includes degree information. This enhancement also eliminates the need for dual data entry by the registrar's office.

National Student Loan Data System (NSLDS) Process Conversion to Clearinghouse

After contracting with the National Student Clearinghouse to provide student status confirmation reporting to the Federal Student Loans Program on behalf of Rutgers, ACS converted the in-house reporting process to create a data extract of all registered students and to transmit a file to the Clearinghouse.

New Grade Values

In support of a University Senate resolution, ACS implemented grade value changes for fall 2000 grade processing. The request, from the Senate Educational Policy and Planning Committee, called for a redefinition of the existing "TZ" grade and a new "NG" grade. The TZ grade is now only to be assigned when a student is unable to finish course work due to a verifiable emergency. The NG grade is assigned by the Registrar in the case where no grade is assigned on the final grade roster. ACS implemented and tested all necessary changes to the grading, student term update and GPA recalculation modules of SIMS in order to support this request.

Add/Drop Schedule Change

In support of a University Senate resolution, ACS implemented necessary changes to the online web registration system and online touch-tone registration system to allow for a change in the spring 2001 add/drop schedule. The new schedule allowed for a 9-day add period and a 7-day drop period. This schedule change provided a window of opportunity for students to add classes where space may free up due to another student's drop.

Support for Online Course Management

ACS continues to partner with the Office of Continuing Education in support of the implementation of the eCompanion course management product offered by eCollege. Discussions are in progress regarding data feeds necessary from ACS systems that need to be loaded to eCompanion.

ACS and NBCS continue to partner with the Rutgers Teaching Excellence Center in support of the use of the WebCT course management product. Initial discussions regarding data extracts from ACS systems have taken place. Technical specifications are being

developed. The WebCT product facilitates the use of technology in the classroom by providing a pre-populated course framework.

Purchasing Card (PCARD)

ACS, partnering with the Rutgers University Purchasing Department, continues to support implementation of the Rutgers Pcard program. ACS has developed a departmental reconciliation process to be run prior to posting transactions to the general ledger. ACS has also developed a mechanism to track purchase details for historical reporting purposes. Paymentech (the Pcard vendor) has completed a custom-mapping program for Rutgers.

Payroll Mass Transit Benefit

ACS has completed enhancements to the Payroll System to support the new Mass Transit Commutation Reimbursement Program (MTCRP). This program is meant to assist employees with commuting expense. Employees can set aside money from their paycheck on a pre-tax basis to pay for eligible mass transit expenses. The amount set aside is placed in their MTCRP account. An employee can then request reimbursement for commuting expenses incurred during the calendar year, up to monthly limits specified by law. University Human Resources will administer the program.

Student Account Receivable (SAR) Tuition Remission Rewrite

The tuition remission process was upgraded to accommodate updated TA/GA salary structures and to provide the Student Financial Services office with update capability over the web. The new process eliminates manual updates and has resulted in a more efficient, maintainable process.

SAR Real-time Tuition Calculation

In anticipation of providing students with the ability to pay tuition and fees over the web, ACS implemented a process to perform real time calculation of tuition and fees. Tuition and fees for fall, spring, summer and third term are now calculated in real time and displayed online when students request their Web Statement of Accounts.

SAR Tuition Payment Plan

ACS has completed enhancements to the Student Account Receivables (SAR) system in order to migrate from AMS to ECSI as the vendor for partial payment processing. This effort, initiated by the Office of Student Financial Services, will be more cost effective for the university, as well as provide a simpler and more efficient payment program for the students.

SAR Summer Session Billing Revisions

Additional summer session processing codes were implemented in order to make the summer session processing more accurate and have less manual intervention for reconciliation. Also, a process was implemented to allow for journal entries to be divided into pending entries and actual entries. This allows for more flexibility and efficiency in the system. The process was also modified to create supplemental bills and unpaid balance notices, in addition to term bills. This eliminated redundant processing where summer session students were receiving multiple term bills, including those with zero balances.

SAR 1098 Processing Revisions

The changes to the Tax Relief Act (TRA) processing were needed in order to make the 1098-T processing more efficient and more accurate. One of the major changes was to modify the winter session file from eCollege to include refunds, financial aid, third party payments, remission, journal entries, and external scholarships. Other changes to TRA processing included the processing of zero-tuition students, re-printing prior year 1098-T

on the original form, journal entry descriptors and processing, and creating a 1098-T pull file.

Updateable Course Fee Table

ACS created a simplified course fee table that could reference all of the course sections with their corresponding fees. This made the table easier to manage by providing end-user update capability. This eliminated the need for the user to look up the course number and index when applying fees to the student's bill.

CORE Cash Register

ACS continued work with the Student Financial Services personnel for the implementation of the CORE Cash Register project. Implementation will allow direct transmittals to the General Ledger and Subsidiary Ledger, eliminate keypunching, allow for quicker reconciliation and provide more timely updating of the student's bill payment indicator.

Real SSN

Modifications were made to the ACS core administrative systems in order to capture a student's "real SSN" which is required for financial aid award recipients and for those individuals who desire to take advantage of the IRS 1098 tax credit. Previously, a student could specify a pseudo SSN for his/her student ID. While that option continues to exist, any student who wants to be considered for financial aid and/or the tax credit must provide a real SSN, which will be carried as a separate data element in the core administrative systems and the SRDB.

Support for Student Government Elections

In response to a request from the Camden Campus Student Organization, ACS extracted and transmitted a file of student data to an external vendor (iballot.com) in support of the student government elections held from April 16 to April 20. Prior to providing this feed, discussions were held with the University Registrar and University Council regarding necessary compliance with the Family Educational Rights and Privacy Act (FERPA) disclosure requirements.

Decision Support using Oracle Discoverer

ACS is currently working with various client offices (Human Resources, University Registrar, Institutional Research, Graduate Admissions, College Deans) in the rollout of the Oracle Discoverer reporting tool. This project was initiated as a result of the ongoing need for administrative and academic offices to have flexible and timely access to university data currently housed in ACS systems and databases. The near term goal of this endeavor is to put the Oracle Discoverer tool in the hands of those clients who need access to information about students, courses, programs, employees and other related information. A longer-term goal is to expand data warehouse capabilities to meet the information needs of the university community.

ACS has held discussions with clients regarding their general information needs and specific data requirements. ACS has provided overview and demonstration of Discoverer to clients and facilitated discussions as to how the tool can best suit client needs.

ACS personnel have been trained in the administrative and end-user capabilities of the tool. An in-house pilot project using the ACS Task Management system was completed to assess practical use of the tool. ACS is currently working with Human Resource personnel in an informal "sandbox" assessment of the tool. Initial discussions with the Director of Graduate Admissions regarding the potential use of Discoverer for graduate admissions reporting have been held. Planning is underway to bring together a small team of users of student data (e.g. registrars and deans) to discuss potential use of Discoverer. ACS will also be

discussing Oracle Discoverer with the Office of Institutional Research. ACS will utilize knowledge gained in these pilot initiatives for future reporting needs for the RIAs initiative.

Report to University Senate: Replacement of SSN as Student Identification Number

At its regular meeting on October 27, 2000, the Rutgers University Senate approved recommendations presented by the Senate Student Affairs Committee regarding the use of social security numbers as student identification numbers. One specific recommendation resulted in a "charge" to RUCS to perform an assessment of the impact to administrative computer systems to accommodate the replacement of student social security number with a new unique student identifier. In response, ACS personnel conducted a detailed analysis and prepared a formal report. The key findings in the report were presented to the University Senate Executive Committee.

The report showed that the replacement of social security number as the student identification number in RUCS administrative computer systems would be a large and costly undertaking. The report suggested an alternative, potentially more cost effective option that could resolve some "public" use of social security number.

A decision was made to forego this type of work since a student systems reengineering effort is being planned for the future. In the interim, the Senate decided to form a committee of select university personnel to review the "public" use of SSN.

Student Internal Transfer Process

ACS and the Office of Enrollment Management have met with various college deans to discuss the implementation of an online system to support internal transfers for intracampus (dean to dean) and intrauniversity transfers. It is viewed that a web-based system comprising an online application for internal transfer students and administrative features for the various Dean's offices will streamline the internal transfer process by eliminating paper, expediting application review and promoting electronic communication. A prototype application has been built and demonstrated.

Degree Audit Analysis

ACS is presently initiating discussions with the University Registrar for the potential implementation of a university wide degree audit application. Degree audit capability is a long-standing desire of students, deans and the University Registrar. The implementation of a degree audit system would streamline and automate the current manual process potentially leading to time and cost savings. Automated degree audit could also potentially be used as a conduit for an enhanced student advising function at the university.

Preliminary discussions will center on business need, method and criteria for product evaluation and determination of which university constituents need to be involved in the analysis and decision making process. If it is decided to move forward beyond these preliminary discussions, it is anticipated that a team comprised of ACS, the Registrar's Office and select college deans would be formed for a more detailed feasibility assessment. The feasibility assessment would need to include a detailed requirements analysis and determination of source of funding for this project.

College of Applied and Professional Studies (CAPS)

ACS has had initial discussions with Dr. Ray Caprio, Vice President for Continuous Education & Outreach, regarding the creation of the new College of Applied and Professional Studies (CAPS). Pending University Senate approval, CAPS is being established as a new academic unit, with a focus on upper division and post-graduate applied and professional education for off-campus program delivery. CAPS will offer new graduate certificate and master's degree programs and upper division baccalaureate programs in emerging technical and professional areas.

The need to integrate CAPS into existing administrative processes (i.e. admissions, registration, student billing, course scheduling) will call for significant enhancements to ACS student systems. Planning sessions with ACS and university administration personnel will be scheduled in the near future.

University Cyclical Business Process Support and Other Support

ACS continues to provide ongoing support for day-to-day business needs and the "cyclical" business processes of the university. This includes software enhancements, maintenance and production control for recurring processes that support students, faculty and administration. This also includes on-demand information delivery (reports, data queries, data files) to support internal decision making and external requirements.

KEY CYCLICAL ACTIVITIES

- Student Demand Registration
- Student Add/Drop
- Student Grade and Transcript Processing
- Student Account Creation (supported by People Database)
- Course and Room Scheduling
- Undergraduate Admissions (NJAS) cycle start-up
- Graduate Admissions cycle start-up
- Financial Aid award packaging (e.g. PARS, Direct Loan, INAS, EDE Correction Processing, Verifications, Secondary Confirmation, Comprehensive Management Reporting, summer aid disbursements, transmission enhancements, ISIR print, purges and start-up or new academic year)
- Student Term Bill Processing
- SAR 1098 Processing (Hope Tax and Life Time Learning Credit)
- First Year Sectioning
- Financial Accounting (GL, AP, Budget Preparation)
- Payroll Processing (paychecks, w2's, 1099s, 1042s, benefit statements, contracts)
- Faculty Survey
- Faculty Staff Directory
- Student Health (SHOTS)
- College Assessment Research System (CARS)
- Course Analysis System (CAS)
- Student Unit Record Enrollment (SURE)
- Longitudinal Database
- Institutional Research Reports
- Off-campus reporting
- Data Dictionary Updates (new data elements and new values)

CYCLICAL ACCOMPLISHMENTS

Fall 2001 Registration

For the fall 2001 registration period between 30 March and 20 April, 25,963 students completed registration for 213,991 course/sections. Approximately 62 percent of the students registered via the web and 38 percent registered via touchtone telephone registration. There were approximately 210,000 total database hits for web registration and 340,000 database hits for the online schedule of classes during this timeframe.

Summer 2001 Registration

Summer 2001 registration began in late February 2001. As of the end of May 2001, approximately 20,000 students have pre-registered (13,000 registered and paid).

Spring 2001 Add/Drop

During the add/drop period, peak-processing demand was at an all time high and was successfully accommodated. For the period between January 14 and January 24, over 200,000 hits were made to web registration and over 400,000 hits were made to the online schedule of classes. Over 25,000 adds were processed and over 23,000 drops were processed.

Spring 2001 Registration

For the registration period between October 30 and November 18, approximately 35,000 students completed registration for the upcoming spring semester 2001. This included approximately 3800 first year students who utilized online web registration and touchtone registration for the first time. System load was heaviest during a twelve-hour period between midnight and noon on November 16th reserved exclusively for first year students. During this period approximately 3400 freshmen accessed web and touchtone registration resulting in a total of over 54,000 successful data base transactions.

Fall 2000 Add/Drop

The newly upgraded ACS technical infrastructure successfully supported a record number of users during the fall 2000 add/drop period. During the add/drop period, peak-processing demand was at an all time high. For the period between 28 August and 11 September, 116,873 hits were made to web registration, 199,661 hits were made to web schedule of classes and 68,994 hits were made to the Rutgers Online Directory. All time daily highs were reached for web registration (16,933 on 9/11) and schedule of classes (23,438 on 9/6).

Spring 2001 Grades & Transcripts Processing

The posting of grades for the spring 2001 term was completed in May 2001. The cumulative and term grade point averages and degree credits were calculated for over 46,000 students. Approximately 176,000 grades (over 7000 grade rosters) were processed and over 46,000 transcripts were produced.

Fall 2000 Grades & Transcripts Processing

The posting of grades for the fall 2000 term was completed in January 2001. The cumulative and term grade point averages and degree credits were calculated for over 48,000 students. Nearly 190,000 grades were processed and over 48,000 transcripts were produced.

Spring 2001 Term Bill Cycle

The spring 2001 term bill cycle was kicked off in mid-November 2000 and continued through February 2001. The first and largest term bill cycle in November produced over 21,000 term bills. A total of over 45,000 term bills were generated.

Fall 2000 Term Bill Cycle

The fall 2000 term bill cycle was kicked off in mid-July 2000 and continued through September 2000. The first and largest term bill cycle in July produced 37,978 term bills. A total of over 49,000 term bills were generated.

Financial Aid Award Packaging

The Financial Aid Management System began processing applications for the 2001-02 academic year in March 2001. As of June 2001, 43,000 federal applications for aid were received and 22,934 students have been packaged.

Fiscal Year Close/Startup (2000/1)

All processing was completed for the fiscal year close/startup process. Positive payroll accruals were run and posted. The A/P year-end job cycle was completed successfully. The new year database was created and account balance transfers were completed and final trial balance reports were created and approved.

Faculty/Staff Directory

Address Directory Update documents were sent to all faculty and staff (12,161) in the fall 2000 for verification of data to be printed in the next directory. Updates were made through the web application or by return of the paper form for data entry. The updated composite file of faculty/staff directory information was transmitted to Data Management Inc. (the vendor that prepares the directory) for use in production of the 2001 Faculty/ Staff Directory. This file was also provided to Rutgers Foundation for use in their annual Giving Program. The directory was published and distributed to the university community in March 2001.

End of Calendar Year Processing (2000/1)

ACS successfully executed all required end-of-year processing. Highlights included the generation and printing of over seventy thousand 1098s, over thirty thousand W2s and over three thousand 1099s.

Payroll/HR Support

ACS staff provides ongoing maintenance and support for many cyclical and mandated processes in the Payroll/HR arena (PBP system). Examples include producing annual benefit statements, implementing various contract settlements, making open enrollment changes for health and dental plans, setting up the flexible spending account for medical and dependent care for the FSIA (Family Security Insurance Agency) and creation of wage tapes and reports for the state of New Jersey.

Data Dictionary Updates

Throughout the year, ACS has made all necessary changes to ACS Data Dictionaries, which are used to edit and validate online and batch transactions, and provided for end-user viewing. Dictionary updates were made to Student Records, Scheduling, Course History, Admissions, SHOTS, College Assessment Research and Financial Aid. Requests for updates came from a variety of sources including the Board of Governors (for approval for new curriculums, degrees, program name changes), university administrative and department offices (add new hold codes, location/option codes for curriculums) and data custodians (add/change fields to upgrade applications).

Institutional Research Reports and Information Requests

ACS processed a number of requests for reports and statistical data from the Office of Institutional Research. Examples include:

- Teacher Education Report Card
- Doctoral Degree Survey
- Basic Skills Effectiveness Report
- Graduate School of Education Study

- Advanced Degree Program Survey
- Football Athlete Academic Progress Report
- NCAA Athletes Report
- Graduate Rate Survey
- Seneca Athletes on Aid Study
- Graduate School of Social Work Study
- Age Analysis Study

INTERNAL INFRASTRUCTURE GOALS – STATUS UPDATE

Upgrade Mainframe Operating System to OS/390 v2.8

Goal: Upgrade IBM mainframe operating system to IBM's Operating System/390 (OS/390) v2.8.

Status: A successful upgrade of the IBM model 3000 H050 mainframe was completed on schedule in November 2001. This upgrade was highly anticipated by the mainframe user community. The latest version of OS/390 (R 2.8) enhances the capability of our Web Services that run on the mainframe system, while improving Transfer Control Protocol/Internet Protocol (TCP/IP) support.

IMS Maintenance

Goal: Apply maintenance software updates to the Information Management System (IMS).

Status: Updated versions (R 6.1) of maintenance software were applied to the Information Management System (IMS) in January 2001. The Administrative Computing Services Application Development and Data Management (ADDM) developers tested both the system and the applications. Software updates were then applied to the production system by the Administrative Computing Technical Support (ACTS) staff. The ACTS staff will monitor the system and apply maintenance routinely as needed.

Upgrade Oracle to version 8i

Goal: Install an Oracle upgrade on the mainframe in order to improve reliability and availability of the university's centrally supported administrative Oracle applications and Web pages on the administrative mainframe. Oracle 8 will also provide new functionality and improve security.

Status: The Administrative Computing Services Data Base Administration (DBA) team and ACTS mainframe system administrator, continue to work toward upgrading Oracle on the mainframe to version 8, which will keep it in sync with the version of Oracle on the UNIX servers. The upgrade to this version, which was needed due to several Oracle Technical Assistance Requests (TAR) that were initiated during the testing phase, has required a great deal of interaction with Oracle support.

Administrative Computing Services (ACS) Network Enhancements

Goal: Upgrade the current infrastructure from 10-Megabit Per Second (Mbps) to 100Mbps Networks

Status: The Mainframe and UNIX infrastructures were converted from 10BaseT, which is a 10 Mbps media to 100 Mbps connections by the ACTS staff over the summer. The Windows NT production infrastructure will also be converted from 10BaseT to 100Mbps. The enhanced infrastructure will improve response time on the ACS Web Server with subsequent upgrades to follow for the remaining branches of the network still using the slower media.

Upgrade UNIX Production Infrastructure

Goal: Upgrade the legacy UNIX infrastructure providing enhanced performance and reliability.

Status: Due to increased student, user, and ACS staff member demands, the legacy UNIX infrastructure was revamped to provide improved reliability and performance. A three-tier approach was incorporated into our infrastructure. Additional Sun Microsystems servers were purchased. All applications and databases have been distributed across the three-tiers as part of the architectural design. All the web servers use Verisign certification for security and encryption. The systems are currently running Solaris 8 and the Oracle databases are at release 8i. The three tiers will provide support for the developers, quality testing, and production.

Upgrade NT Production Infrastructure

Goal: The upgrade of this infrastructure will improve performance, reliability, and security for the applications, and replace systems at the end of life cycle/warranty.

Status: Five new servers were purchased to replace the servers that facilitate Data Entry, Print and File Services, File Transfer, and Online Web Access (Remote E-mail). All are currently running Microsoft NT. The servers were replaced as part of our server replacement program. The program necessitates that servers are kept under warranty and up-to-date with current technology. The new servers should provide improved performance, reliability, and security.

Internal Audit: Administering Windows NT Server

Goal: Work to complete outstanding audit recommendations for the Windows NT infrastructure.

Status: The Internal Audit Department reviewed procedures and interviewed staff as part of the ACS Windows NT infrastructure audit. Additionally, the audit team reviewed ACS standards and security. The auditors provided a Control Concepts & Applications methodology work session for ACS Directors at the Administrative Services Building.

The internal audit was intensive and comprehensive. The overall review was favorable, with minor recommendations for improved controls. ACTS staff is currently working on implementing these recommendations and has set June as the completion target date. In addition, steps have been taken to ensure overall password security is enforced. Password cracking software was purchased to test password vulnerabilities for brute force attacks. Password filters were enabled to restrict users to a three-character set very similar to the UNIX environment. Other security improvements include new password restrictions that require a 40-day cycle, while workstation lockouts are enabled after three failed attempts.

Data Entry

Goal: Continue the process of reducing centralized data entry through the implementation of electronic feeds and re-engineering on-line applications.

Status: Strides continue to be taken to reduce the amount of data that is passed into our current data entry system. The Time Report Forms were automated with a Visual Basic program that utilizes an Access database and direct PC to Mainframe data transfer. In February 2001, after extensive testing, the application was put into production. Parallel production cycles were run to mitigate potential problems. The application development group will continue to embellish the Time Report Form screens before they are rolled out to other units. The Student Financial Services Department is also looking at a new Cash Register System that will result in the reduction of 6 million data entry input keystrokes per year, which would make staff reassignments possible.

Data Entry Falcon 32 Upgrade

Goal: Upgrade the existing Disk Operating System (DOS) based Falcon Data Entry System.

Status: The DOS based Falcon system was replaced by a Graphical User Interface (GUI) based version running on Windows NT. The DOS version provided limited functionality and had become unstable. The new version supports a GUI based system with full support for Windows NT. All Data Entry Operators were fully trained on the system by in-house staff before it was implemented.

Desktop Support Virus Protection

Goal: Standardize our Anti-Virus software implementation procedures to safeguard workstations.

Status: Steps were taken at both the desktop and server level to safeguard all ACS desktops from viral infection. At the desktop level, PCs were upgraded to the most current version of the university site licensed anti-viral software, McAfee VirusScan. Desktop systems have been setup to automatically retrieve the most current virus definition tables, commonly referred to as "DAT" files (short for Data) from an internal server. At the server level, filters were setup on the MS Exchange server that block certain types of files most likely to be Trojans, such as Visual Basic Scrap files or other software that appears benign but is actually dangerous.

ACS Desktops Asset Management

Goal: Begin tracking and compiling an accurate hardware list of serial numbers and licensed software.

Status: Desktop Support Staff have performed physical inventories on all of the ACS desktops and have obtained extensive information to update our current records. For the first time, information such as IP address, machine name, serial number, RU number, installed software and warranty expiration dates have been logged and stored for easy referencing.

Automated Tape Libraries and Backup Software

Goal: Implement a backup methodology for the heterogeneous environment (NT and UNIX), taking advantage of current tape technology and storage management.

Status: Two Advanced Digital Information Corporation (ADIC) brand tape libraries (Scalar 220 and Scalar 1000) and Veritas Software for Netbackup was purchased as a replacement product for IBM's ADSTAR Distributed Storage Manager (ADSM) at Administrative Computing Services. Veritas is considered by the Gartner Research Group to be an industry leader in backup and recovery software. In addition, the product suite supports Oracle, MS-Exchange, UNIX, and the Windows NT platforms.

ACS has purchased software licenses for the Windows NT platforms and has contracted Computer Design Integration (CDI) to assist with the implementation and roll out of the product into production. The Windows NT infrastructure will be converted from ADSM to Advanced Intelligent Tape-2nd generation (AIT-2) technology, and housed in the ADIC Scalar 1000 Automated Tape Library reducing manual Operator intervention.

Output Management

Goal: Improve the timely delivery of client reports while reducing the user's dependency on centralized printing.

Status: The Faculty of Arts and Science (FAS) department was the first group to accept the Monthly Account Detail Report (BL/3) distributed electronically using mainframe tools. They will continue to implement the system and once approved, will eliminate several paper copies of the Monthly Account Detail Report currently being printed at ACS. Upon

completion of this phase, (FAS department) work on deploying the Output Management capability for the Monthly Account Detail Report to other departments will begin.

FAS Training: In the past year over fifty users representing approximately forty departments in the Faculty of Arts and Science have been given access to their portion of the Monthly Account Detail (BL/3) report on the CA-VIEW/DELIVER system. CA-VIEW/DELIVER allows viewing and printing of reports from the mainframe. In addition to access and training, each department has been assigned a printer for output distribution.

Virtual Printing System (VPS) Printers: The demand for VPS printers has grown exponentially due to this pilot, growing from less than ten to fifty within a year.

Disaster Recovery Testing of Oracle/UNIX and NT Web Server Production Platforms

Goal: Included as part of the overall Disaster Recovery Plan, the successful recovery of the UNIX and Windows NT Production Web Servers.

Status: For the first time ACS was able to test their disaster recovery plan for the UNIX, Windows NT, and Mainframe platforms simultaneously. The test was held in October of this year at Sungard Disaster Recovery Services, and was successful. A complete test plan handbook was created, outlining procedures and steps required for restoring each individual server.

In addition, the team was restructured for continuity, and additional staff were added to reduce work overload. Restructuring allowed the staff to concentration on specific platform goals. Five separate groups were deployed throughout the building at Sungard. Web servers were recovered on the three major platforms, and Rutgers data was retrieved successfully. This year's test included participation from the Internal Audit Department. Internal auditors actively participated in the disaster recovery meetings, were present at the test site, and have since provided an audit report for Disaster Recovery.

Disaster Recovery Internal Audit

Goal: Respond to Internal Audit recommendation for Disaster Recovery.

Status: Rutgers Internal Audit Department was very pleased with the results of the October Disaster Recovery Test, which for the first time included platforms for the UNIX and Windows NT environments.

As active members of the Disaster Recovery Team, Internal Audit has made recommendations for improvement. ACS, in compliance with the Auditors recommendations, is currently evaluating responses to these action items. The action items focus on user awareness, training and prioritizing critical applications.

INTERNAL INFRASTRUCTURE ACCOMPLISHMENTS

ACS Infrastructure Vulnerability Analysis

The vulnerabilities that were identified as part of a study by an outside consulting vendor in fiscal year 1999/0 were reviewed, and those that were applicable have been included as part of the Windows NT audit review. ACS is currently reviewing and testing intrusion detection software to strengthen support and to monitor the existing network infrastructure. The staff will review logs; run internal scans for Transfer Control Protocol/Internet Protocol (TCP/IP) port vulnerabilities, and review incident report procedures. In addition, the staff attends monthly Rutgers University Computing Services (RUCS) Team for Information Protection and Security (TIPS) committee meetings. Security seminars have been included, as part of employee development.

Operations Planning and Control (OPC) Scheduler Upgrade

The ACTS GROUP installed the new release of OPC Scheduler on a test system. It has been tested thoroughly by the Production Control area and is ready to be moved into

production. The staff is assessing scheduling events to mitigate any potential disruption in work schedules. The UNIX and NT OPC agents will be tested as we move into the next phase of the project.

Imaging Infrastructure

The Undergraduate Admissions Department, Financial Aid Department, and Administrative Computing continue to hold monthly meetings to discuss support, service, and functionality of the Imaging system. After a long and arduous year, the results of those meetings have improved the overall relationship between the three departments. ACS has dedicated resources to monitor and provide system support for the Imaging system. The Undergraduate Admissions and the Financial Aid Departments support the applications locally.

The main system support functions are monitoring disk space, reviewing logs, and providing status reports to users each month. Disk space requirements were exceeded on various occasions during the first six months of the year. In November 2001 ACS, Undergraduate Admissions, and Financial Aid agreed to replace the existing server with a new Compaq server which will provide increased processor power, increased memory to enhance performance and provide substantial disk space to mitigate interruptions in business workflow.

During the December 2000 holiday break, ACS worked jointly with the application vendor (Perceptive Vision Inc.) and a Systems Integrator to install a new Compaq Server. The server provided additional memory, storage, and increased processor speed. The application vendor and the systems integrator transferred the data from the existing server to the new server and applied maintenance where needed. In addition, the backup and recovery process was reviewed and has been enhanced to insure data recoverability. Phase 2 of this project will require the segregation of user data onto two separate servers. Staff are currently reviewing these measures.

Shadow Web Server and the Crypto-Processor

The crypto-processor was installed this year on the Rutadmin server to provide the crunching power necessary to support a secure 'Online Student Registration System'. In addition, a Verisign certificate was purchased for Secure Socket Layer (SSL) support and 128-bit encryption.

The application was turned over to the ACS development staff for further testing. However, the staff has encountered numerous problems stemming from a variety of sources such as IBM incompatibility with Neon, Neon source code, and application coding. These problems have recently been resolved and additional testing by the development group is currently underway.

Rutgers' Integrated Administrative System (RIAS) Test Infrastructure

As a prelude to what would be the RIAS infrastructure, Sun Microsystems provided ACS with an E4000 server to kickoff the RIAS project. ACS was able to install the Oracle applications on this system while putting together hardware configuration requirements for a permanent server.

In the weeks that followed, ACS purchased an E6500 server and disk storage as the replacement server for the E4000. Currently, the E6500 is running multiple Oracles instances and is used heavily by the RIAS team. The Conference Room Pilot was tested on the E6500 server. In addition the test database running on this server will provide crucial information for the production environment.

Setup of Temporary/Permanent RIAS Project Team Location

As additional resources were added to the RIAS project, the demand for temporary space increased. Therefore, additional space was acquired within building 4087 to allow for expansion. RUCS units from ACS, Telecommunications, and New Brunswick Computing Services (NBCS) worked together to provide voice, data, and desktop services, and re-wiring the original space.

Much of the same planning and combined resources were done for the permanent area, however, additional resources were contracted to help with the desktop moves. The move to the permanent area was successfully completed without event.

Desktop Support of Client/Server Applications

Desktop Support staff continue to assist with Oracle client server applications throughout the university and across three campuses. The following depicts some of the work requests:

- A thirty-five user rollout of the Faculty of Arts and Sciences Increment Program (FASIP) client server application, to implement the Forms50 version
- Thirty-five requests for Human Resources Information (HRInfo) installations
- Thirty-eight support calls resolved for the web version of Pay for Performance, including a field call in Newark and one in New Brunswick
- Thirty-one installations of SQLPlus/Microsoft ODBC driver, allowing Graduate Admissions users to use MS Access to link to our Oracle tables
- Twenty Freshman Sectioning installations
- Two Tuition Remissions installations
- Upgrade of all ACS developers to the latest version of SQLPlus

In addition to the above installations, Desktop Support provided second and third level application support for the web version of Pay for Performance. Support for this application included phone and field visits.

RIAS Desktop Support

Desktop Support took on additional work requests and responsibility for the RIAS Team. In addition to supporting the 120 plus workstations in ACS, Desktop Support provides support for the existing 60 workstations at the RIAS location. The total amount of time ACS staff spent supporting RIAS at the desktop level is 150 hours and growing. Desktop Support was a key element in the successful move of computer hardware from the temporary to the permanent location. In addition, ACS standards for Virus detection were implemented for added security. Part time resources have been added to augment the group.

Desktop End of Life Replacement

During the course of the past year, over fifty desktop PCs have been rolled out to ACS staff, replacing end-of-life PCs. This has replaced the minimum hardware configuration standards for ACS. The minimum hardware configuration for ACS Desktop PCs is now a Pentium II with a 400MHz processor and 128 megabytes of memory.

Bus Tech Mainframe Appliance

Two high-speed appliance devices were purchased from Bus Tech to replace the existing IBM 3172 Interconnect Controller. The mainframe appliance increases the overall bandwidth speed of the mainframe network to 100Mbps. In addition, the mainframe appliance connects the mainframe subnet to the ACS infrastructure.

Web Design Standards

ACS, as a member of the "Web futures" team, has helped developed a set of design guidelines and standards for web-based application development at the university. The purpose of these standards (referred to as the Rutgers Toolkit) is to provide a common "look and feel" and consistent navigation for web applications developed at the university and to support re-use and portability of code.

Using the Toolkit as a basis, ACS developed internal design standards (for ACS web application development). These standards were derived from guidelines according to the Toolkit, the w3c and the Bobby accessibility-testing tool, which helps identify barriers to web site access by individuals with disabilities. A Web Design Standards User Guide and Web Site was developed. This document and site outlines the standards and provides examples of how they should be implemented and provides downloadable components (images and code) for web design. Full-page templates, image templates, and script templates are available on the site. These templates will be used for common features and will help promote consistency with approved standards, allow for faster development and simplify development for less experienced web developers. ACS has performed a "gap" analysis across all ACS web applications in order to assess degree of compliance with these new standards. A plan for remediation has been developed for each application.

Online Web Services Linked to Main Rutgers Website

To improve service and ease of use, ACS has developed targeted menus of online services (i.e. web applications for prospective students, current students, faculty and staff). These menus have been linked into the main Rutgers homepage under the appropriate constituency heading. This makes it much easier for students, faculty and staff to locate online services. For example, current students can go to one main website to manage their directory exclusion information and to access online class schedule, web registration, student account information and financial aid status. Previously, students had to navigate numerous departmental websites to locate these services. Similar service improvements result for prospective students, faculty and staff. As new web applications continue to be developed, they will be incorporated into this navigational structure.

Testing Tools Evaluation

ACS has completed analysis and evaluation for the purchase of application testing tools. After evaluating multiple vendor offerings, a decision was made to purchase Mercury Interactive's Winrunner and Loadrunner testing tools. These tools support automated functional testing as well as load and performance testing. Benefits include more rapid delivery of web applications and reduction of risk associated with software errors and application availability. These tools will be used for ACS web application implementations and for the RIAS project.

Lightweight Directory Access Protocol (LDAP)

ACS is researching LDAP for ID/password verification, but more specific information could be used for other purposes in the future. ACS worked with NBCS on an LDAP server running Netscape's iPlanet Directory Server version 4.1. Most of the LDAP information came from the people database through weekly feeds. The LDAP server also merges account information from the six primary RUCS' UNIX clusters. ACS has developed ASP code to authenticate users through LDAP, but more research and testing is required before moving this service into production.

ACS Conference multimedia upgrades

ACS has evaluated and purchased the following equipment with plans for installation in June 2001: digital whiteboard, desktop PC with a flat screen monitor, video projector,

conferencing phone, wireless keyboard and mouse, and a digital video camera for to facilitate video conferencing sessions.

Oracle 9i Application Server

Two additional SUN E420R servers were purchased this year to run the Oracle Internet Application Server 9i. One server will be utilized as the functional server to test all the applications before they're converted to 1AS. The second server will be utilized to test Pay for Performance and the Online Credit Card applications. A 128-bit certificate was purchased for SSL support. Quality testing will be completed by June 2001.

This new application server from Oracle has a list of features including greater stability, support for Java, load balancing and web caching. ACS and has completed initial testing of existing Oracle web applications in the 9iAS environment.

Forms & Reports 6.i

The Oracle Developer Server 2.1, also known as Forms & Report Server, was implemented on all development, test, and production tiers. The software was utilized to develop the Pay for Performance web pages replacing the current client/server applications and will be used in future web page development. This centralizes application changes and will eliminate the field distribution of change forms.

Data Base Administration and Data Management

The ACS database administration team supported a diversity of application development initiatives (including many of those mentioned earlier in this report). The team performed a variety of activities ranging from database planning, design and development to performance monitoring and troubleshooting. Other noteworthy achievements include support for infrastructure upgrades, configuration work in support of Portal and Oracle Discoverer initiatives, upgrades for BMC ChangeDataMove Tool, and installation and configuration of Oracle Enterprise Manager (OEM) and Oracle Forms & Reports Server.

Additional data management activities performed by ACS staff included the FAMS web dictionary implementation, the expansion of the SRDB and SDW, the implementation of "Real SSN for FAMS and SAR and monthly data dictionary turnovers for updates to all ACS databases.

ORGANIZATIONAL GOALS – STATUS UPDATE

Professional Development and Performance Management

Goal: Provide continual professional development for the ACS staff through formal and informal training and cross-training in concert with business needs. Provide ongoing performance feedback and annual formal appraisal to manage individual performance and development.

Status: ACS continued to achieve this goal as formal development plans were developed and refined by each area in ACS. These plans were used in conjunction with goal setting, feedback and performance appraisal to manage overall performance and growth.

In 2000/1, ACS committed increased funding to support professional development and new opportunities for growth and learning were continually sought, encouraged, and created. Staff has participated in self-study initiatives (e.g. computer-based training), formal classroom training, presentations, conferences and seminars. Staff attended internally sponsored "breakfast" meetings and "seminars" that highlighted particular applications and/or technologies. Staff rotation and cross-training were used to provide growth opportunities and ensure backup support. Samples of the past year's educational experiences are listed below:

Educational Conferences

- Oracle Applications User Group (OAUG) Conference
- Data Management (DAMA) Conference
- EDUCAUSE
- CUMREC
- International Oracle User Group (IOUG) Conference
- Wolfpack Conference (Financial Aid)
- Electronic Access Conference (Financial Aid)
- Direct Loan Conference (Financial Aid)
- Java in Administration Special Interest Group (JA-SIG)
- Microsoft Developer Days 2000
- Oracle Application User Group
- IMS Technical Conference
- SHARE Conference
- Docutext Workshop
- Print On Demand Expo
- SAS User Group Meeting
- Introductory to IAS

Technical Education

- Oracle PL/SQL (basic, advanced)
- Oracle Developer 2000 (basic, advanced)
- Oracle Discoverer for End-Users
- Oracle Discoverer for Administrators
- Seagate Crystal Reports (basic, advanced)
- Oracle Enterprise Manager
- Oracle 8i Administration
- VB/ASP (basic, advanced)
- Web Development Fundamentals
- Mercury Interactive Winrunner, Loadrunner
- XML Programming
- Oracle, Discoverer for Administrators
- Oracle, Java Programming
- Oracle, Java Programming Part1
- Oracle, Java Programming Part2
- Oracle, 8i: SQL Statement Tuning
- Oracle, Advanced PL/SQL
- Sun, Java Programming
- JA-SIG uPortal development
- IMS System Administration
- Solaris System Administrator
- Enterprise System Performance Management
- Solaris System Administration I
- Sun Systems Fault Analysis Workshop
- Cisco Network Training
- Cisco Virtual Private LANS
- Cisco Seminar
- Internet Information Sever 5.0
- Windows NT Security
- Netbackup NT Advanced Training

- Oracle 8i SQL and PL/SQL
- Oracle, Applications Server
- Fundamentals of Solaris
- IMS Installation & Maintenance
- A+ Microcomputer Certification

Management and Supervisory Education

- Performance Management and Coaching
- Establishing Performance Priorities
- Team Building
- Building and Developing Effective Work Teams
- Problem Solving and Decision Making
- Leadership Workshop
- Motivation and Leadership
- Communication Skills
- Conflict Management
- Microsoft Project

Education, General

- Customer Service Seminar
- Indispensable Assistant
- Project Management Training
- Administrative Assistants Conference
- Pay for Performance

Emphasis on development, education, and training will continue to be a goal for ACS. In the coming year, emphasis will be placed on development of skills to support additional web development projects and the RIAS initiative. Emphasis will also continue to be placed on staff rotation and cross training thus building stronger competencies and flexibility in the organization which will allow ACS to more efficiently and effectively meet the evolving needs of the university.

Customer Satisfaction

Goal: Provide mechanisms for customer input and feedback in order to effectively respond to customer needs.

Status: ACS managers and staff are increasingly reaching out to our clients to provide feedback and assistance in advising on priorities as well as operational issues. In an effort to expand our customer outreach monthly standing meetings with clients have been established to discuss client needs and project priorities. Also project meetings (e.g. requirements and design reviews, user-acceptance test planning) are occurring.

Quality: System Development Methods and Procedures

Goal: Establish additional methods and procedures to govern software implementation in order to ensure quality and efficiency of operation.

Status: This past year ACS has continued the use of the System Development Process (SDP) for system development. ACS has also developed and documented database administration procedures, testing procedures, web design standards and change control procedures. These procedures will be refined over the upcoming year.

Quality: Operational Methods and Procedures

Goal: Establish additional methods and procedures to govern operations and production control in order to ensure quality and efficiency of operation. Evaluate the existing change management process to ensure adequate controls are in place across all platforms and data center operations. Implement new changes and provide training and documentation for support staff.

Status: The existing change management processes were reviewed and modified to reflect mainframe data center disciplines on the UNIX and NT platforms. In addition, weekly manager meetings were scheduled as a forum to discuss changes, turnovers, and job related issues. A change management coordinator was appointed to keep track of logs and programming changes. The original change management form was modified and staff employees were retrained in its use. ACS will continue to enhance the form and process as required.

Additional performance indicators were developed for the PSF/ACTS group. We now provide statistical information for the following:

- Operations
- Data Entry
- Production Control
- Network
- NT
- UNIX
- Mainframe
- Desktop/Tech Support Specialist groups

The matrices continue to be a useful tool for management and staff. Some of the new indicators demonstrate Library Turnovers, Change Control Indicators, Monthly Work Request, Monthly Virus Intercepts, Desktop Metrics, and Web Monitoring.

Quality: Project Management Methods and Procedures

Goal: Establish additional methods and procedures to govern project implementation in order to ensure quality and efficiency of operation.

Status: This past year ACS has continued the use of the System Development Process (SDP) for project management. ACS also integrated system release planning with project planning to better plan and schedule system enhancements and new features. ACS is also putting in place mechanisms to more effectively control and track client requests that are incoming to the organization.

Communication

Goal: Establish additional mechanisms to enhance organizational communication

Status: This past year ACS established monthly directors "partners" meetings for discussion of project priorities and project progress, level-setting and strategic and tactical planning. ACS also established weekly managers meetings to discuss detailed tactical and operational plans, upcoming events and open issues. The monthly "breakfast meetings" for all staff members were expanded and formalized in order to more effectively communicate project and technical topics. An ACS staff web site was also created (see next section) to facilitate communication among staff.

ADDITIONAL ORGANIZATIONAL ACCOMPLISHMENTS

ACS Staff Web Site

ACS created this internal web site to highlight internal documentation, training materials and user guides. The site was launched in January 2001 and is currently available to ACS staff. Documents developed by ACS staff include (but are not limited to): PL/SQL Web Utilities, An Introduction to the Neon Shadow Web Server for Application Programmers, ACS Web Design Standards, ACS Policies & Standards and Operations Procedure manual.

Work Request and Problem Reporting System

ACS developed this internal web application to increase efficiency by providing staff with a simpler method of requesting service (work requests and problem reports) from PSF/ACTS. An MS Access database was implemented and was front-ended with a web page designed by the ACTS Group. This system was developed in November 2000 and has become the standard method of requesting support or alerting on internal issues. This application is used by all of ACS and has been extended to the RIAS Team. It has reduced workflow interruption and has provided structure for the day-to-day staff activities, increasing employee production and user satisfaction.

Professional Development Application

This application was developed for the submission and tracking of all staff within ACS. ACS managers will use this application to enter training requests for their staff into the system, which is then approved or denied by their director. The system also tracks training related costs including travel and lodging.

Automated Time Reporting (TRF)

ACS has developed the Time Reporting Form (TRF) System and piloted the application within ACS. TRF is a desktop application that provides the user with the ability to create both the hard copy TRF rosters and a text file suitable for electronic transfer directly to the mainframe payroll system. The main benefit to this application is process streamlining (increased efficiency of completing the weekly benefit/non-benefit cycles) and the elimination of keypunch for data entry.

Organization Restructuring

Administrative Computing Technical Support (ACTS) was restructured to enhance control in setting goals for the department. The group was broken down into smaller groups, improving job distribution and communication. The department has increased productivity and now has a sense of direction, as priorities are set in advance. The work request and problem reporting system along with change management have all contributed to this success.

ACS Development was reorganized to provide cross training, further develop back-up capabilities and to better align the development team with the RIAS initiative. Approximately eight developers and two project managers were re-assigned in this move.

Network Area and Lab Renovation Project

The Network Area and the adjacent office were renovated to accommodate the Network Lab and to increase cubicle space for the fast growing NT staff. Two additional cubicles were added in the network office and the Lab was moved into the adjacent office. Moving the Lab out of the network office decreased the traffic flow and provided for a more professional atmosphere.

2) UNIVERSITY COMPUTING SERVICES

University Computing Services is led by Dr. Charles Hedrick, the university director of campus computing services and the chief technical officer of RUCS. In this capacity, Dr. Hedrick coordinates regional computing services and provides direction and guidance for the development of the future computing environment of the university.

The following information explains how Computing Services used its 25 percent portion of FY01 student computer fee dollars to provide student services and support activities, and to advance RUNet 2000 implementation.

INSTRUCTIONAL COMPUTING INITIATIVE (ICI) STUDENT FEE

STUDENT SERVICES PROVIDED BY THE STUDENT COMPUTING FEE

- Obtaining an account
- Connection to the network
- Dialup access
- Email, web and directory services, and direct authentication support
- Central storage of files
- Academic instructional computing support
- Bibliographic databases, provided by arrangement with the Rutgers University Libraries
- Computing site licenses
- One year account extension to alumni

PROJECTS FUNDED BY THE STUDENT COMPUTING FEE

Approximately half of the student fee income provided to RUCS supports RUNet 2000. Of the remaining funds, the majority provides continuing support such as hardware maintenance, phone lines for modems, and staff. The projects shown here represent a sample of projects funded by ICI.

Disk space

Disk space allocations were increased to 60 megabytes (MB) for fall, 2000. While many of the expenditures to implement this were done in 2000/1, the project was finished this year. This year the emphasis was on reliability, projects to use mirroring or a Redundant Array of Inexpensive Disks (RAIDing of disks), to provide uninterruptible power supplies in some locations, to improve backup in some locations, and to provide round the clock hardware service in locations where the equipment is not redundant.

New central services

Webdrive was site-licensed. This is software to provide transparent access to files on our UNIX servers from Windows systems such as those in the labs.

The Camden systems now support web programs written using PHP, which is a widely used, special purpose language for constructing web applications. (PHP was introduced in New Brunswick and Newark last year.)

System Management

This year we improved system management in a number of ways. The most visible is better statistics. Major usage data is now available via the web for New Brunswick and Camden. We also upgraded hardware and software, in accordance with our 5-year upgrade cycle. Highlights include:

- Operating system upgrades
- New versions of statistics software such as SAS and SPSS
- Upgrades of central servers in all three campuses
- Funding for uninterruptible power supplies in Newark and Camden (to be implemented in FY02)
- Firewall added to the central campus server in Camden, to improve security of the system

Modem Support

A major effort was made to analyze modem usage and improve management of the modems. As a result of this, a time limit of 10 hours was placed on sessions. This was intended to prevent users from staying on modems forever. This caused a significant reduction of busy signals.

3) UNIVERSITY TELECOMMUNICATIONS

FISCAL YEAR 2001 GOALS

RUNet 2000 Deployment

TD will be deploying a tremendous quantity of both plant and electronics associated with the RUNet 2000 project. These efforts will be performed in a coordinated, efficient manner with full accountability and inventory control. The management of this large-scale effort poses unique challenges to the division. TD will employ project management best practices in order to complete all tasks in accordance with approved schedules.

Modems

The university modems are in need of restructuring. While there has been much effort associated with cleaning up the billing mechanisms, the actual operation of this facility also needs improvement. In order to improve modem availability, long-term limits will be imposed across all modems. In addition, any new modems that are added will be considered express modems with extremely short (15 minute) time outs. These modems will facilitate rapid cycling and are intended primarily for customers to logon quickly and get email.

Network Database

The TD network database will be completed and will become a central facility in the management of the university network. This major software development effort utilizes a custom designed Oracle database to manage all information associated with the university networks. A public front end will be provided as well as mechanisms for the university community to develop their own front ends. This infrastructure will be utilized to provide both Domain Naming System (DNS) and Dynamic Host Configuration Protocol (DHCP) services on both the legacy network as well as RUNet 2000.

Network Management System

The Network Management System (NMS) will be completed in the following fiscal year. This coordinated and cohesive set of tools, policies and procedures will improve the overall operation of the university network. This effort is critical to the efficient and predictable delivery of services to our customers. Some components of this system are configuration control, inventory management, and security response.

Customer Support

TD will complete the customer notification policy and system. While network outages are primarily communicated via global mailing lists, TD will put a system into place that will send more tailored messages to appropriate parties in an automated fashion. This will address a common complaint that an outage was planned and they were not aware. While the larger global message may clearly indicate that a maintenance outage may occur, a more personal message should garnish more attention. In addition, a program of follow-up contact will be implemented such that TD can ensure that customer problems have actually been resolved to their satisfaction.

Remote Campuses

TD will focus attention and energy to improve the integration of effort on the Newark and Camden campuses with the New Brunswick area. While all campuses are treated equally by formal policy, distance makes it more difficult to be responsive organizationally to needs in Newark and Camden. TD will be evaluating staffing levels and other organizational changes to ascertain how to best accommodate the needs of the remote campuses while maintaining consistency in New Brunswick.

FISCAL YEAR 2001 ACCOMPLISHMENTS

Outreach Projects

In the second year of the U.S. Department of Education grant-funded initiative, the following projects were accomplished:

Newark:

- Newark Library: Electronics configured and installed; project completed.
- Newark Museum: Electronics configured and installed; project completed.
- University Heights Science Park Office: Fiber optic cable installed; electronics being configured.
- Science High School: Fiber optic cable installed; electronics being configured.
- NJPAC: fiber optic cable installed; electronics received.

New Brunswick:

- Lincoln School: Fiber optic cable installed; electronics being configured.

Rutgers Regional Network:

- Bid document completed.
- Preliminary fiber pathway surveyed for New Brunswick; license application prepared.

Network Plant and Projects (NPP) Completed Projects

The Network Plant and Projects group provided design, engineering and project management for a variety of interior wiring and network connectivity projects funded by departments as well new construction and renovation projects. Some of the projects that have been completed in FY01:

- NPP has completed network connectivity at the EcoComplex. The EcoComplex is now connected to RUNet and has full-feed cable television activation. New Jersey EcoComplex is a joint venture between Rutgers University, Stevens Institute of Technology and Burlington County.
- Jacques Cousteau NERR, Tuckerton, NJ
- Nelson Biology
- Paul Robeson Center
- Zimmerli Art Museum – additional interior wiring
- Areas of Lucy Stone Hall
- Busch Dining Services
- RIAS (ERP) Bldg. on Livingston
- 13 Senior St., CAC; 17 Senior St., CAC
- 56 College Ave., CAC
- ATM Network, Livingston
- Graduate Music House, C/D
- Internet2 – Graduate School of Education, CAC
- Career Services (61 Nichol Ave) – data network connectivity
- Dining Services (University Inn) – moved from ISDN to RUNet connection
- Foran Hall Renovation
- Turf Grass Building

Network Installations Group (NI)

NI group has completed 290+ jobs for a total of \$700,000 billed for the year.

Cable management "CableMaster"

- Initial RUNet 2000 completed buildings and outside plant documentation received from the contractor and successfully imported into CableMaster.
- A new process for automated comparison and error detection was created and implemented allowing for greater speed and efficiency in importing documentation.

Video

- The fiber ring architecture developed by Rutgers personnel has proven to be well suited to Rutgers needs.
- The head-end built to feed the distribution ring and hubs has been in service for 9 months with no significant failures or downtime.
- Rutgers' personnel have undertaken several RUNet video projects and they have all been successfully completed. These include the design, installation and activation of satellite dishes for the Keck Neuroscience Center and Winants Hall and the design, installation and activation of a distribution system for the NJ EcoComplex.
- Rutgers' personnel have designed and built video systems for a number of academic Buildings such as the Livingston Student Center and Robeson Cultural Center and currently are designing systems for 11 others. Samples of them are Alexander and Douglass Libraries, Werblin Rec. Center and the Civic Square Building.

Voice Services

FY01 saw the Telephone Office continue to deliver steady, solid service despite the corporate growing pains of its two main vendors. Bell Atlantic's transition to Verizon and Lucent's to Avaya were more than simple name changes. Changes in vendor personnel, policy and procedures were problematic for TD staff but transparent to our customers. Over 1,000 service requests and an equal number of repairs were successfully completed at a cost of \$500,000. Meanwhile, billing disputes with vendors were resolved with savings of about the same dollar amount.

The Telephone Office also provided consultation and leadership for 25 major projects with communications budgets exceeding \$1,000,000 total. These included 15 new phone systems and 5 major upgrades with over 500 telephone sets. Also completed were building surveys and wiring designs for two years of RUNet 2000 activity.

Wireless Networking

The Director of Telecommunications made several information presentations to various Rutgers leadership forums:

- New Brunswick Computing Advisory Council (NBCAC). The intent of this presentation was to provide basic education regarding these technologies as many university members had been utilizing marketing information. The information provided was balanced and thus showed both the advantages and disadvantages of this technology.
- University Administrative Council. This presentation successfully provided information to influential staff and faculty at the university to better enable them to make educated and appropriate decisions regarding this technology. Subsequent feedback has indicated

that this information came at a critical time for many of the participants. They were able to leverage this information against critical technology initiatives within their areas.

- University libraries. New Brunswick staff assembled at Alexander library while Newark staff attended via video conferencing. TD provided one of two featured speakers and provided detailed descriptions of wireless networking technologies in addition to relevant caveats associated with engineering and security. The presentations and a lively question and answer session were well received by those in attendance.

Dorm Networking

During FY01, over 60 dorm buildings were wired for direct network connections. Usage by students in networked residential buildings more than doubled from the previous year. In addition to this, there have been significant upgrades to the electronics in buildings that had been previously networked. The overall effect was to raise them closer to RUNet 2000 specifications. Currently, 80% of the 15,000 beds at the university have a corresponding computer network port in the same room.

Backbone Operations Group (BOG)

During the course of the fiscal year, the Backbone Operations Group has deployed and installed network equipment in over 70 locations throughout the university for the RUNet 2000 initiative.

In order to reduce reliance on SNA by Dining Services, numerous sites have been moved to the general university data network: The remaining locations will be migrated during the following fiscal year.

Backbone Operations implemented the first phase of the RUNet 2000 network core deployment on the Busch and Livingston campuses. While preliminary deployment was limited to Gigabit class technologies, ongoing evaluation and development allowed for an early deployment of OC48 class technology. This high-speed core is already enhancing our ability to deliver RUNet 2000 class connectivity to residence halls and RUNet 2000 upgraded buildings on each of these campuses.

The group also implemented a network-wide multicast infrastructure to support the Internet Packet Exchange (IPX) and Appletalk transition efforts to an Internet Protocol (IP) only environment. This multicast infrastructure facilitated the web cast of the spring 2001 university commencement proceedings by the Office of Print & Electronic Communication.

Bandwidth Management

The university was faced with dramatically changed traffic patterns at the beginning of the fall semester. Nearly every university in the country felt the rise of peer-to-peer networking and its corresponding impact on external handoffs. In response to this increased bandwidth usage, TD enacted an aggressive program to both monitor usage on a single host basis and to control excessive usage through the enforcement of existing policies. A university firewall was implemented to provide for the creation and enforcement of long term as well as short-term restrictions. Abnormal usage patterns have been made much more readily visible and changes to external connectivity have reduced overall congestion. These policies and practices have ensured fair access to Internet resources by all faculty, staff, and students.

Internet 2

Internet 2 is a collaborative project between 180 US research universities, including Rutgers, and has a goal of developing advanced applications for academic information technology (IT) requirements. Rutgers University has continued to expand its use of Internet 2. As a charter member, Rutgers has been proactive in obtaining and managing bandwidth across this infrastructure. The university currently sustains approximately 40Mbit of traffic

to Internet 2. Enhanced wiring and switching enables Internet 2 class bandwidth to more buildings this year. In addition, other locations have been targeted for more advanced upgrades as part of the RUNet 2000 project.

DSL Testing

Backbone Operations concluded Phase I of Digital Subscriber Line (DSL) testing. Tests indicate that it is technically feasible to link remote locations to RUNet via DSL infrastructure. Phase II testing commenced with the designation of a number of end points that would be directly connected to the university DSL head end.

These tests have not produced any insurmountable technical problems. However, providers have had great difficulty delivering simple, reliable service and each installation required significant time and energy to bring on-line. This will pose genuine scaling concerns if DSL is used for external connectivity to the university. At this time, DSL as a pilot project will continue as a very limited deployment.

Voice Over Internet Protocol (VoIP)

As part of RUNet 2000, TD has collaborated with Verizon to establish a pilot VoIP infrastructure to allow for testing on RUNet. VoIP allows phone connections to take place over the network infrastructure. The VoIP infrastructure was installed, which required configuration of servers, routers, and end devices. Tests indicated that the technology is robust and performs well on controlled infrastructures. This limited deployment is providing useful information to ascertain how to best scale this application for broader use and advantage at the university.

Network Service Systems (NSS)

In July 2000, Network Systems deployed the NSS servers. This group of identical servers, which are distributed across the Rutgers network, are designed to provide the university with centrally administrated services that are necessary for most systems to utilize resources on the Internet. The services provided on these servers include DNS (Domain Naming System) and NTP (Network Time Protocol). In support of RUNet 2000, Dynamic Host Configuration Protocol (DHCP) was added to the list of services provided in May 2001.

Departmental Firewall

Network Systems, in conjunction with the Center for Molecular and Behavioral Neuroscience (CMBN) and Newark Computing Services, implemented three departmental firewalls in the Aidekman Research Center on the Newark Campus. Three Cisco PIX firewalls were designed to provide a non-obtrusive secure environment. The project was designed, staged and executed within four weeks in response to an emergent condition.

Split horizon Domain Naming System (DNS)

Network Systems implemented a DNS architecture for the university that allows Local Area Network (LAN) administrators to hide arbitrary information in the university's DNS system from Internet users outside RUNet. This change will allow the university to begin using RFC-1918 private address space to supplement the IP addresses which have already been assigned to the university. This service enhancement also enables a LAN administrator to shield information in DNS from outside users, while still permitting Rutgers' users to retrieve it.

University FTP Server

The upgraded university File Transfer Protocol (FTP) server has provided stable, useful service to the Internet as well as the entire university community. This server provides mirrored access to many popular software packages, including Netscape and a variety of Linux

distributions. In addition to allowing for extremely fast downloads within the university network, this server helps reduce congestion on the university Internet handoffs. All software repositories are mirrored from their source at least on a daily basis. Additional mirroring opportunities are explored on a regular basis.

Network Database (NETDB)

Network Services designed the NETDB, a distributed access backend Oracle data store to maintain network data centrally. This allows for storage of key network information, as well as distributed access control. Stored information includes DNS, DHCP, Layer2–Layer3 mappings, and authorization data. The current number of customers managing data remotely is small but is expected to rise throughout the following year.

Hostmaster Tools

Network Services created the hostmaster toolset. Enhancements include several query tools and a data integrity checker. These tools permit designated Network Liaisons to control/maintain their own network information. The tools were released in support of spread control of name registration closer to the Unit Computing Specialists in the field.

Router Tool

In an effort to increase the consistency and integrity of tools used to ensure the proper operation of RUNet, Network Services developed the Network Information Model (NIM). After building and populating this data store, tools were created to make changes and guarantee data integrity. Over a 6-month period, all network tools were redesigned to configure themselves from this central data store. This is the first milestone in enabling TD to implement an emerging industry standard, Directory Enabled Networking (DEN). Long term, it is envisioned that network devices will configure themselves.

Professional Development/Preparation for the Future

Rutgers University Computing Services – Telecommunications Division sponsored two Networking Protocol-Troubleshooting/Internetworking Routers and Switches classes for Rutgers University Information Technology (IT) staff. Global Knowledge, a Cisco IT training company, agreed to tailor the course to meet the needs of Rutgers staff. They also conducted the training. Unit Computing Specialists from departments throughout the University were invited to apply for a place in the class. A total of 48 IT staff members from different departments across Newark, New Brunswick, and Camden Campuses were selected to attend the two training sessions, one of which was held in October of 2000 and the second in May 2001. The goal was to help departments facilitate the changes taking place with RUNet 2000 transition by providing networking training for the university staff responsible for Local Area Networks.

B. Campus Computing Services

1) CAMDEN COMPUTING SERVICES

FISCAL YEAR 2001 GOALS

General University/Campus Support

- Develop and implement plans for Novell, UNIX, NT, 2000 and other operating system improvements.
- Provide leadership to campus departments in developing their Information Technology (IT) needs and plans.
- Provide networking leadership for the campus to improve backbone services, assist in building design, communicate standards and assist in transitional networking plans. Prepare and assist building occupants for a smooth transition to RUNet 2000.
- Promote continued collaboration and cooperation with the Library, Teaching Excellence Center (TEC), and Faculty of Arts and Sciences (FAS) staff in supporting computing components of the planned technology-based classrooms.
- Evaluate the Educational Series for improvements.
- Improve security measures for the community through education, firewalls and virus protection software.

Instructional Support

- Provide IT leadership to the campus in the development and implementation of plans for public computing facilities on the campus.
- Encourage and assist faculty in developing web-based instructional materials for classroom presentations.

Research Support

- Encourage and support faculty participation in I2-related and other projects requiring information technology. Schedule I2, RUNet 2000 and Information Technology for the 21st Century presentations in Camden to encourage support for grant submissions.
- Participate in the integration and support for departmental outreach programs including distance learning and off campus instruction.

Outreach Support

- Gain knowledge of and assist in video distribution for distance learning programs.
- Collaborate with other departments planning for off campus programs.

Administrative Support

- Collaborate with administrative departments on campus to improve office workflow and assist in planning for their systems and software upgrades.

Operational Goals

- Continue improvement of front line service by implementing the plan to improve student assistants training through seminars, coaching, evaluations and support.
- Maintain communications to faculty, students and staff through paper mailings once per semester, email through Rutgers Events at Camden Today (REACT), the student newspaper and online web announcements.
- Operate and advertise separate Email servers for faculty/staff and students for improved e-mail service to all.
- Continue staff participation on RUCS teams to improve Rutgers University Computing Services and to foster the RUCS values.
- Further align services with the campus and institutional needs through participation on the Camden Academic Technology committee, Camden FAS Information Sciences committee, and communications with administrative offices, academic departments, and advisory councils.
- Insure staff professional development to enhance their skills appropriately for their job function and growth.
- Continue the implementation of the customer satisfaction evaluation plan designed last year.
- Implement final changes to the Camden Help Desk process to improve efficiency within Rutgers University Computing Services while improving response to our community.
- Work more closely and regularly with the campus Unit Computing Specialists to improve the support to all constituents in Camden.
- Continue our communications improvement plan to keep the campus informed and educated about computing at Rutgers and RUCS.
- Upgrade the main UNIX servers for the campus (Crab & Clam).
- Investigate the requirements and potential to upgrade the test scoring software and/or equipment (Op Scan).
- Implement second stage of dynamic DHCP for roaming/mobile customers on campus.
- Improve web services to include real audio/video service and investigate a server.

FISCAL YEAR 2001 ACCOMPLISHMENTS

STRATEGIC ACCOMPLISHMENTS

General University/Campus Support

The Business & Science building was successfully transitioned to RUNet 2000 from the legacy network starting on Thursday, May 10. Significant planning had been done by RUCS in order to minimize any anticipated disruption of services during this period and to coordinate support with the various computer support personnel in Camden. The movement of the central services over to RUNet 2000 was first on the list. Following a short failure, the conversion of the remaining central services went along as smoothly as originally expected with minimal disruption of services. Individual complications were reported and quickly resolved by either RUCS or the other campus technology support staff. RUCS appreciated the help of all IT staff in Camden who participated in this successful conversion of our most complicated building.

RUNet 2000 installation of wiring for the Business & Science building and Armitage Hall were completed this year. Wire installation started in the Fine Arts building in May and the Science, Campus Center and Law buildings will follow in order into next year. As the campus acquires and remodels the buildings on Cooper Street, RUCS works to assist in designing them to the RUNet 2000 standards.

CCS participated in the IT planning on the ELF Project proposals for RUCS, RUCS-Camden and the Camden campus. Developed the RUCS-Camden projects by linking them to campus support in RCI (Research Computing Initiative), streaming video, and wireless technology.

CCS participated in the second year of the PC Purchase program resulting in budget allocations from across the schools on campus to provide improved equipment to mostly faculty, but also to some student labs.

Student surveys conducted in December and April indicated an 87% satisfaction level with most services. A staff focus group was held in November (following the faculty focus groups held last summer). Help Desk service and methods of communication with our customers continued to be the focus of our meetings. Results are evaluated and improvements were implemented during the year.

CCS continued to adjust and implement the plan for three-year life cycle of public lab systems in the Camden computer labs. These upgrades will provide the capacity to move to the new operating system, Windows 2000, along with the support for the latest versions of applications.

Full participation occurred on the Faculty of Arts and Sciences (FAS) IT committee to provide IT guidance in developing plans for technology for faculty office and classroom activity. Computing staff also participated on the Student IT Competency Committee, an ad hoc committee of the Faculty Senate (FAS).

A computer training survey was sent to the faculty and staff on campus to determine the common needs across the community. As a result, there appears to be a need for both introductory and advanced training in web design and construction and the full suite of Microsoft Office products to enhance productivity (Word, Access, PowerPoint and Excel). As a first step a collection of tutorials on CDs have been purchased and made available for sign out to our community. Plans will be developed with other departments on meeting these training desires.

The Spring/Fall Educational Series was presented with very positive evaluations from attendees. Sessions included Introduction to Netscape Email, Introduction to Pine Email, Introduction to MS Word, Introduction to MS PowerPoint, Dialup Access to Rutgers, and Creating Web Pages with Netscape Composer.

Camden staff along with members of the other divisions of RUCS investigated wireless technology and its potential at Rutgers. In particular, the Camden staff worked with the campus administration on the feasibility of bringing wireless technology to the campus and the question as to the scope of such a project. A survey of existing wireless technology and campuses that have implemented such access was performed. RUCS will plan on a pilot introduction of wireless technology next year as part of the ELF program.

CCS planned and implemented various operating systems improvements throughout the year: upgraded all Macs to the latest version of Mac OS (8.6); upgraded all UNIX systems (both servers and clients) to Solaris, version 8; and, upgraded all Novell central servers to version 5.0.

Staff also maintained communications with campus constituents through REACT email messages, online announcements, Fall and Spring newsletters, email reports to administrators, meetings with departments and classroom presentations upon request.

System administration support for the Science Vision project, with systems located across various departments such as Chemistry, Math, Computer Science, Psychology and Fine Arts, continued.

Instructional Support

Camden Computing Services (CCS) provided the technical expertise and server support required to install and maintain the software that is driving the Streaming Video Project of Dr. Robert Wood. Implementation of this project was a joint effort of the Department of Fine Arts, the Department of Sociology, Anthropology and Criminal Justice, Camden Computing Services, and the Teaching Excellence Center. The website makes extensive use of streaming audio and video to make available to the world Julianne Baird's music, interviews, and performances.

Camden has transitioned its Dynamic Host Configuration Protocol (DHCP) server software from Microsoft's software running under NT to the new International Switching DHCP software running on a Sun Solaris system. This is allowing us to offer true dynamic IP addressing for faculty/staff who need to plug their portable computers into several locations around campus (their office, classrooms, etc.). This movement to new software makes it much easier for faculty/staff to be mobile on the campus with their laptops.

RUCS and the Registrar Office combined to offer three presentations on the new method to not only view their class rosters online, but to download the class roster of email addresses into a mailing list using majordomo.

Camden staff helped expand a Computer Science departmental lab (in BSB room 416) from 10 to 25 systems using the older PC systems that were cycled out of the public labs this past summer. This departmental lab supports the popular Computer Science courses in Systems Administration and Networking.

Staff also installed, tested and activated the equipment ordered for the public labs: twelve Sun UNIX clients, eleven Apple PowerMacs, fifty-seven Dell Pentiums, and three Hewlett-Packard Laserjet printers. Additionally, two Dell PowerEdge servers with disk mirroring were installed supporting the upgraded labs and the main student Sun server, clam, was upgraded to an Ultra 80 system running Solaris 8.

Cooperative purchases and special pricing for the systems purchased for the student labs resulted in savings and/or better systems.

Student disk space quotas (or limits) were raised significantly this year with the addition of 130GB of disk space to allow an increase from 20MB each to 50MB for home directory, plus an additional 25MB on incoming mail. This disk system is also more reliable since it is configured as RAID 5, a Redundant Array of Inexpensive Disks that provide continued service even if a single disk failure occurs.

Research Support

High Performance Computing support remained a quality service, with system administration of a powerful 6 CPU server and an Internet 2 lab of high-end Sun workstations performed by the Camden staff. The Rutgers Computational Grid (RCG) was upgraded this year to improve service and enhance security.

The main faculty/staff Sun server, Crab, was upgraded to an Ultra 80 system running Solaris 8. This provided computing capacity to meet the demand for the year. Plans for the remainder of the upgrade are included in the ELF projects for next year.

Outreach Support

The LEAP academy continues to utilize their high-speed link with the campus to encourage faculty collaboration with Rutgers.

RUCS staff is working with campus Facilities and the provost's office on the renovation work being done on various buildings on Cooper Street in preparation for the LEAP High School and the relocation of staff to other renovated buildings along the street.

The Camden summer outreach programs were bolstered through lab support and assistance for their successful implementation/demonstration of software applications in the

labs. Staff participated in two outreach programs during the year: the annual Camden Math-Science Fest and the Academic Challenge Program for the Camden competition.

Administrative Support

RIAS activity to date has included arrangement to bring the team on campus to present the status of the project and the plans for its implementation. Three meetings were held in Camden. Camden staff is working with the training group to assist in locating a training facility and in determining the level of competence of the community.

OPERATIONAL ACCOMPLISHMENTS

A Student Consultant Training Program developed by the staff took place during the last week in August and again in January for all student consultants at RUCS. This full day program covered a wide range of job duties, policies, and how to deliver good customer service to the campus. A new "Consultant of the Month" program was introduced with students selected & announced. Consultants earn the reward by providing exemplary assistance to faculty, staff, and students. Also, a new student bonus program was introduced to encourage participation in specific RUCS projects.

User Services staff have developed Internal Support pages (including Internal FAQs) for use by staff and consultants to help everyone to better answer questions or solve problems that our community may have.

A significant effort was made this year to update the most used documentation on the web pages and in paper form, including documents on the suite of Microsoft Office 2000 applications and SPSS. A large portion of the UNIX and Mac documents were also reviewed and updated.

Staff participated in the following campus programs: Freshman Orientation, Transfer Orientation, and the annual Open House.

The combination of the People Data Base and the web-based Account Creation application resulted in the most significant improvement in the Account Creation process ever experienced in Camden.

Dorm connections increased from 170 last year to about 300 this year (which represents approximately 60% of the beds). Camden dormitory students were serviced in a very timely fashion this year through the two RUCS student employees supporting this project. There is no substitute for experience and these two talented individuals have been very responsive to the requests for computer connections in the dorm rooms. They were available to work extra hours during the first two weeks to meet the surge in requests during the move-in days.

Significant upgrades and improvements were made to client workstations in the public labs: new Sun login screen setup (dtlogin) and a new desktop environment (CDE); more reliable and faster access to software on the Mac clients through local storage of applications and utilizing keyserver software to distribute; the network in the labs running at 100Mbps; the latest Netscape browser/mail/composer software; PCs are now running the Microsoft Office 2000 suite; Sun systems have installed new versions of Maple (a mathematical package) and ssh 2.0 (a secure replacement for telnet); OmniPage10 software installed to support the conversion of scanned images into a "text" format; and the Oracle 8 server database software was installed on Clam for instructional support.

Two new email servers for the Camden campus (one for faculty/staff and one for students) were placed into production this year and are running successfully. The transition to the new email servers went smoothly. One of the major benefits is that everyone should now address their email as "From: username@camden.rutgers.edu" and it will be delivered to recipients with this new address. The other major benefit is that Email service will no longer

be adversely affected by large computer jobs or by large numbers of simultaneous users on Clam or Crab.

RUCS-Camden has created a Searchable FAQ (Frequently Asked Questions) database for faculty, staff, and students to use. Adding questions to and maintaining the database will be an ongoing RUCS project. At the present time, the database is primarily populated with questions about Netscape mail, pine, and various account related questions.

Regularly scheduled meetings with all campus information technology (UCS) staff have been started to provide a forum for communicating RUCS direction, to gather information about the direction of the departments on campus, and to encourage sharing of ideas and issues among the group. The three meetings held to date have been productive.

To meet the demands of the Computer Science department growth, one of the rooms that previously housed PCS (BSB 132) was converted to a UNIX lab and the PCS in the lab were moved from the Business & Science building to the Campus Center lab. This move will not only provide the Computer Science faculty with a larger teaching lab for their UNIX classes, but will increase seating at the popular Campus Center lab where student surveys had indicated that students wanted more systems housed in that building.

Instituted a program to proactively test public lab systems (PC, Mac and UNIX). On a weekly basis, a student assistant is sent to each lab to evaluate every system for a specific list of functions – both hardware and software.

SUMMARY OF MAJOR SERVICES

Email and Web Services

RUCS-Camden continued to support the basic infrastructure for electronic mail, web and directory services for the campus. Camden servers processed roughly 221,000 email messages per week for the campus. REACT lists were still maintained on the two main campus servers (one for faculty/staff and one for students) to send regular (minimally weekly) announcements to the campus.

Academic Instructional Computing Support

Instructors wanting to provide hands-on computer training to students can reserve instructional microcomputer labs. In Camden, the labs were used 18 times during the summer terms for a total of 583 hours, 29 times during the fall term for a total of 625 hours, and 3 times during the winterim term for 20 hours, and 36 times during the spring term for a total of 699 hours. In Camden, there were 5,509 student accounts, 878 Alumni accounts, 1,152 faculty/staff accounts and 64 departmental accounts.

Help Services and Resources

On the Camden campus, staff handled 3,914 walk-in questions and 462 telephone questions from students, faculty, and staff. Public computing labs provided a broad range of services to students during the fiscal year. In Camden, public computing labs were open for about 40,250 hours. During this time there were 220,282 PC/Mac logins from the public labs to the server covering 90,365 hours of system usage.

Short hands-on workshops or lecture/demonstration type seminars on various supported software applications and systems are presented every semester.

CCS staff are committed to maintaining and increasing the number and content of the documentation describing the services and applications offered to the community in Camden. The Camden Computing Services website is updated regularly while the entire set of documentation is stored online. Of particular value to our customers are the online weekly announcements, the HELP section, and the New User section. Fall and spring news publications were produced and distributed widely across the Camden campus to inform the

community about changes, new services, service improvements and other computing activities of interest. All articles include web addresses for further information.

INFRASTRUCTURE

Campus Computing Facilities

RUCS directors from all three campuses continued the practice of coordinating one large purchase order for new computers in instructional labs. For Camden, this resulted in both a saving and an improved system over what would have been purchased independently on the sixty systems ordered through the Rutgers Computer Store.

As work progresses on RUNet 2000 across the Camden campus, the following are the highlights for the year: interior wiring was completed in the Business & Science Building (BSB) and Armitage Hall; BSB was transitioned to the RUNet 2000 components; and the conduit for the outside plant (OSP) was placed into the ground in the spring with the fiber to be pulled soon.

ORGANIZATIONAL MANAGEMENT

Quality Improvement Initiative (Commitment to Excellence)

Staff members are reminded regularly about the commitment to working efficiently and effectively with all of our coworkers and constituents to deliver a quality service to all. The Help Desk process continues to be evaluated and improved, communications are regularly reviewed for better methods (pens and magnets were distributed with our HELP information printed on them), students are surveyed each semester for their input into our services, and faculty and staff focus groups are held yearly to gather input for improvements and to foster cooperation.

Human Resources Development

Eleven (11) employees from Camden received outside training during the fiscal year as part of their professional development. Most staff attended either the customer satisfaction or leadership seminars offered by Rutgers Office of Organizational Development and Leadership. This year saw the successful implementation of the Rutgers Information Technology program (and new salary structure) that was the result of the yearlong evaluation of IT positions within RUCS.

Additionally, one Camden staff member received a Masters of Arts in Teaching degree and one member received a Bachelor of Science in Computer Science degree this year.

Public Awareness

In Camden, RUCS continued to send service updates to students, faculty, and staff through the weekly REACT emails and our online Announcements. Two RIAs presentations were made on campus this year.

2) NEW BRUNSWICK COMPUTING SERVICES

FISCAL YEAR 2001 GOALS

General Access Services

- Continue performance improvements in email
- Research web-based email option
- Establish university Lightweight Directory Access Protocol (LDAP), the technology used by Microsoft, Novell, Cisco, Sun, and other major companies for their next generation of services
- Enter testing phase of certificate-based authentication
- Explore university-wide calendaring system
- Continue progress in web access for major services, including web-based password change and quota management
- Improve integration between instructional services, such as WebCT, and mailing lists and administrative data so that faculty will not have to add student information by hand
- Evaluate Blackboard, the major competitor to WebCT

Departmental Service

- Expand activities of UNIX support group in department
- Recommend a firewall product
- Scan university systems for major security problems
- Plan for support of Microsoft Active Directory; implement necessary central infrastructure
- Develop and approach for preventing future attacks like the "I Love You" virus
- Provide leadership and staffing for RUNet 2000, particularly in the areas of the departmental transition plan and PC support services
- Develop necessary central infrastructure to support Novell transition

User Services

- Reorganize New Brunswick web pages
- Work with HR and the Teaching Excellence Center (TEC) to train departmental staff in email and web-related areas
- Continue support for training facility
- Advance the help desk initiative: improve help desk software, training and monitoring
- Send regular email newsletter to all users
- Participate in training and support for RIAs project needs

FISCAL YEAR 2001 ACCOMPLISHMENTS

ORGANIZATIONAL ISSUES

Reorganization

During 1999/0, New Brunswick Computing Services was reorganized into two parts, each with its own director. One handles central services and UNIX technology, and the other handles user and departmental support and PC technology. During 2000/1, this organization came into operation, as both director positions were filled. By providing more managerial manpower, this reorganization has given us the opportunity to deal with several long-standing problems. One of the most important is dealing with staff vacancies.

During this year, the central services area moved from 20% vacancies to 5%. All positions should be filled shortly.

Now that both directors are in place, several additional changes are planned for 2001/2. These include changes in associate directors in the central services area, and a reorganization in help desk services. In central services, two areas (Network Services and Systems and Operations) are being combined under a single associate director. These two areas have similar responsibilities and staff. Combining them will produce significant economies, as a single set of system administration and development staff will share all projects.

Single Help Desk

Computing Services staff is in the process of creating a new help desk organization that should be functioning by September 2001. This is a joint project, involving staff from all RUCS divisions. We expect to have a single phone number and email address for all support in New Brunswick. In addition to improving service for our users, this reorganization should boost staff productivity. Currently the same staff are being used for the help desk and for higher-level support activities. The resulting responsibilities are too broad, compromising both types of activity. With the new organization, staff will be able to concentrate on a manageable set of responsibilities.

GENERAL ACCESS SERVICES

Usage of General Access Systems

Most students use our systems. Last year there were about 40,634 normal student accounts on Eden, with a student body of 35,308 in New Brunswick. This apparent impossibility is due to the fact that technical difficulties had prevented us from closing accounts for students who had graduated.

At this time, 11,682 faculty and staff have accounts on RCI, the New Brunswick central system. This represents a 14% increase in the number of accounts compared with last year. One way to judge usage is to look at registered email addresses. Currently, 11,667 faculty and staff have email addresses registered in the People Database. This represents a significant increase over the 9,857 who were registered last year. One priority in FY01 was to get faculty and staff to register their email addresses.

Of those registered, about 54% use Computing Services central facilities (including RCI, Eden, and the equivalents at Newark and Camden), 29% use departmental facilities at Rutgers, and 17% use non-Rutgers facilities. The percentage of people using non-Rutgers facilities increased 7%, of which 2% came from RUCS facilities and 4% from Rutgers departmental facilities. (NOTE: the actual number of addresses on RUCS facilities went up. The percentage of the total went down as more people registered their addresses in the People Database.)

Usage of Public Labs

Total usage in the public micro labs has been essentially constant since 1996/7, with a small peak in 1997/8. Here are the changes since last year:

Total	Busch	College Ave.	Cook/Douglas	Livingston
-4%	+3%	-4%	-8%	-5%

There was a 1% total decrease in FY00, for the first time. In last year's report it was projected that there would be another decrease this year, because the largest number of dorms were wired during this year. It is believed that some students are now doing work in their dorms that they used to do in the labs. However once that shift has happened, lab usage is expected to continue to go up slowly.

Changes in the Public Labs

By September 2001, the public labs will have been changed from Windows 95 to Windows 2000. During this year there has been a major project to develop a way to install and manage Windows 2000. Because of the number of systems and heavy student usage, the systems have to be set up so that software can be reinstalled automatically if problems occur. Systems need to be protected so that one user doesn't make changes that will affect the next one, or leave viruses on the system. The tools for doing this under Windows 2000 are completely different than they were with Windows 95.

Support for Smart Classrooms

During this year, NBCS took responsibility for network support in the smart classrooms. While the Library has overall responsibility for support of the smart classrooms, it was proving difficult for them to get network problems resolved. NBCS now acts as second-level support, taking over problems that the Library staff is unable to deal with. As part of this change, small network devices were installed in each location. This allows equipment at the location to be tested remotely, which makes it possible for problems to be identified before students show up in a class. The devices also provide automatic host configuration services. This greatly simplifies the process of using a laptop computer in the smart classrooms.

New Instructional Services

After consultation with the Instructional Technology Support Committee, NBCS started two major projects to support instruction. Both of these projects use class rosters and other data from Administrative Services to simplify the jobs of faculty. The first project will automate class maintenance for WebCT. WebCT is a general-purpose set of web tools for use in courses. It includes tools such as a gradebook, chat rooms, discussion areas, and facilities to build quizzes. It is currently used by about 400 courses, with 20,750 users. At the moment faculty have to enter students manually to use WebCT. NBCS staff are in the process of automating this. If faculty request it, staff will automatically maintain the membership of their courses, using roster data. The second project does something similar for mailing lists. Many faculty like to use email lists to distribute announcements and conduct class discussions. At the moment they have to maintain these lists themselves. NBCS is developing a facility that will maintain mailing lists for them, using roster data. Both of these projects were started in spring 2001, and should be ready in the fall.

The People Database: online directory and account creation

For the last two years, NBCS made a series of changes in several closely related services through a joint project with Administrative Computing Services. These services are all driven from information about faculty, staff, and students. The most visible services are the online phone/email directory and the process used to create new accounts.

In 1999/0 the system was completely redesigned. It was first put into production in January 2000. During FY01, NBCS produced a second release. This release increased the level of automation, and improved performance for very large systems such as Eden (the system where all undergraduate students have accounts).

As part of this project, staff members are doing a complete revalidation of the data about users. This data goes back 10 years. Some of it was gathered by previous software, which wasn't intended for the current environment.

This project has been a major success. In September 2000 new students were able to create accounts quickly, with few special cases or failures. This is the first time accounts creation for new students has ever worked smoothly.

Official Email Lists

Two years ago, NBCS began a process for creating mailing lists based on administrative data. That process was redesigned to use the new People Database. As a result, staff can now create mailing lists based on a variety of fields in the student and payroll data.

During this year work has continued on the system, aimed at improvements in performance and ease of administration. Staff have also started a redesign of this software to permit mailing lists for courses, as mentioned above. The current system would not be able to handle that number of lists nor would it provide the degree of automation needed for this project.

There are now a total of 1990 mailing lists maintained by NBCS. Of them, 254 are lists based on administrative information. Those automatically maintained lists are evenly divided among Camden, Newark, New Brunswick and university-wide lists.

Email Performance

The official mailing lists place a much higher demand on email delivery than previously. Email now goes regularly to 30,000 or more people. Until this spring, the delivery of a message sent to all students regularly took several days. This has been decreased to less than 2 hours, and it may be possible to decrease the delivery time even further. However, it has not been proven that email is appropriate for time-critical announcements such as snow closings.

Next-Generation Email System

In addition to continuing work on email reliability and performance, NBCS and the other campus divisions have started on a project to design a next-generation email system. While our current email systems handle the needs of most users, there are a number of things that they do not do.

This includes the following:

- New services such as reading email through the web
- Security improvements, such as encrypted connections and checking email for viruses
- Facilities for departmental staff to do some tailoring of the system for their needs

As a result, many departments find it necessary to run their own email systems. This is becoming an increasing problem. As attacks on Internet services become more common and more sophisticated, many departments no longer have the manpower or expertise to keep up. There is also a good deal of duplication of effort.

The campus divisions are gathering information from both individuals and departments to assess what services users and staff need from a central email system. The design for a new system should start late in 2001, with implementation targeted for September 2002.

Web Hosting

Many individuals and departments depend on NBCS services in one way or another to support their web pages. The most visible is our web-hosting service. This year, 14,243 students (about 3 times last year's number) and 2,347 faculty, staff and departments (an increase of 13% from last year) maintain web pages using our central servers. There are 1,415 departmental accounts on RCI. These are accounts associated with departments or projects rather than individuals. Almost all of these were created to host departmental web pages.

Hits on these web servers roughly doubled since last year. RCI now supports a fairly complete set of web services. These include virtual hosts, forms processing, web applications programming using PHP and MySQL, and web log analysis.

Other Web Services: Search Engine and Portals

In addition to the web hosting services on RCI and Eden, NBCS' most visible web service is the university search engine. During this year, an ad hoc group of representatives from NBCS, Administrative Computing Services, University Communications, and Student Information Services worked to design a new structure for the university search page, which NBCS staff implemented.

NBCS has been engaged in several other web-related projects, most under the guidance of the same ad hoc group. These projects include preparation of mailing lists for web staff around the university, development of standards and best practice documents, and the exploration of portal technology.

Portals are a technology designed to provide a single, web-based interface to information at the university. A portal combines administrative and academic information, as well as services such as email. A number of departments at Rutgers (particularly student-related) are interested in developing portals. NBCS and ACS have been testing products and are in the process of developing a joint project plan to pilot portal technology during the fall of 2001. An implementation for at least one large group is planned for 2002.

DEPARTMENTAL SERVICES

Wireless Networking

Wireless networking is a technology that could make a big difference to the university. Unfortunately it also poses a number of problems. The most worrisome of these is security, but there are also problems of multiple standards and implementation difficulties. After talking with groups around the campus, NBCS has decided to provide leadership for the campus in this area. NBCS intends to do pilot wireless implementations in a number of different types of locations, such as libraries, student centers, and other public spaces. In the process, the infrastructure necessary to authenticate users and provide secure services will be developed. These implementations should provide a model for departments that wish to implement wireless technology. NBCS also proposes to maintain central services that might be needed by departments to support their wireless networks.

NBCS has developed a test network that uses what is believed to be the best approach. Public pilot implementations are expected to start in fall 2001.

UNIX Support

NBCS supplies a number of services to support departments that use UNIX-based equipment. This year, NBCS added a second staff member to the UNIX support group. This will enable NBCS to provide system administration services to departments that want to contract for them. Among the most significant accomplishments of this group is the creation of a repository of commonly requested software for Solaris, based on the standard RPM distribution mechanism.

It's worth noting that the UNIX support group spends much of its time helping departments deal with security threats. Among the services that NBCS provides are web-based documentation that recommends best practices in the security area, scanning systems to check for security problems, and on-site emergency assistance for systems that have been compromised.

Strategic PC Support

As with UNIX, NBCS supplies services to support departments that use Windows and Novell. This includes on-line information, consulting, regular campus meetings, and a mailing list.

Departments can also contract with NBCS for system administration and other functions. This year three additional staff were added to this area. One provides system

administration functions to departments. Two of them represent a new service _ the design of web-based services for departments. This service area is expected to grow. In addition to these two staff, NBCS is now prepared to provide web hosting on an NBCS-operated Microsoft IIS server. This allows staff to use Microsoft-specific tools such as FrontPage extensions. One major area of activity has been Old Queens, where a new support structure based on lifecycle maintenance and a proper resource level has been developed.

NBCS staff run training courses for departmental support staff. A major priority this year was training for Novell upgrades. NBCS also worked with the Internet Institute to arrange Microsoft certification training for departmental staff.

The Computer Store and the PC Purchase program

For the second year, the university ran a major program to help departments purchase computer equipment. This program was administered by the Computer Store. This year we made significant improvements, such as the creation of a web-based configuration. Based largely on this program, the Computer Store is now being used more heavily for departments.

This year the computer store sold about \$5 million of equipment. Of this, about 95% (by dollar volume) was to university departments. The rest was to individuals, primarily students. This represents an approximate doubling of sales, with the same staff.

RUNet 2000

Working in cooperation with Telecommunications staff, NBCS has been leading the process of transition to RUNet 2000. Transition includes everything that happens after a department is wired. This involves any changes that the department will need in order to move its equipment to the new facilities, and preparing the information necessary for Telecommunications staff to configure network equipment to meet the needs of the department.

We have now completed the documentation and process design for transition, and have begun using the process with a large number of departments.

Moving to RUNet 2000 requires that departments change the way they handle AppleTalk and Novell networking. NBCS has provided training and support for this process. Two servers needed to support the Novell transition effort are now in operation.

Security

With the creation of an Information Protection division, some of the responsibility for security and abuse handling has now moved to a specialized staff. However NBCS continues to provide a good deal of support in this area. NBCS operations and systems staff do the initial handling of reports about security violations or abuse. They also provide technical consulting on security-related issues, including best practices documents and help with systems that have been compromised.

USER SERVICES

Training and management for student staff in the public labs

Managing the public labs is a major job. With several hundred-student staff in 12 locations, a structured program is necessary to recruit, train, supervise and evaluate staff. The first portion of the training is done during the summer before an employee starts work.

Summary statistics for this program include the following:

Summer 00 training	> 175 New consultants; 18 hours of training each
Spring 01 hiring	225 people selected
Evaluations	Between 175 and 225 formal evaluations conducted
Recognition	About 70 awards given
User feedback	Over 25 reports thanking consultants
Continuing training	100 class sessions; >1000 attendees to these sessions

This represents a significant increase in numbers. Specifically, new hiring was increased from 196 to 225. We are experiencing large turnover of student staff. This is partly a measure of our success in training, as they are finding higher-paying jobs elsewhere on campus or in full-time positions. However the turnover rate is high enough to be a problem.

Customer Service Training

NBCS has initiated a program to improve customer service skills for our staff. The program began this year with training on phone skills and on the NBCS service model.

3) NEWARK COMPUTING SERVICES

FISCAL YEAR 2001 GOALS

Computing and Information Technology

- Provide campus-wide leadership in the integration of information technology resources to support the missions and activities of the campus.
- Provide leadership, advice and direction to the campus-computing committees.
- Provide campus leadership in the development and continuous change of the public computing facilities to meet the needs of the campus.
- Encourage and support faculty research through participation in Internet 2 and implementation of RUNet 2000.
- Promote departmental support through a campus computing support model developed collaboratively with campus representatives.
- Promote and expand the collaboration and cooperation between Computing Services, the Teaching Excellence Center (TEC), and the library.

Community Service and Support

- Facilitate campus outreach programs through departmental consulting and support.

Customer Service and Support

- Make appropriate operational changes based upon analysis of customer satisfaction survey to improve customer satisfaction with services provided.
- Improve operation and staffing of the student labs through continued development of appropriate policies, improved hiring, training and supervision of lab assistants, and improved reporting and repair of hardware and software.
- Improve operation of cs-Net group through implementation of trouble reporting and tracking application.

Connectivity

- Support the implementation of RUNet 2000 through leadership and participation in campus planning and preparation.
- Provide leadership and support to campus departments transitioning to RUNet 2000.

Communication

- Continue full implementation of the communications plan and assess its functionality to inform campus faculty, staff, and students of the mission, function and responsibilities of the division.

FISCAL YEAR 2001 ACCOMPLISHMENTS

Computing and Information Technology

Configurations of all central systems were reviewed to align with the campus needs, improve reliability and efficiency of the resources, and relieve manual and attended maintenance requirements. A package server was established that provides the ability to easily upgrade programs. System services were off-loaded to distributed equipment to streamline access to the service and on-going maintenance of the software. Two new servers were

installed in the Pegasus cluster, and all systems were realigned. Operating systems on five UNIX servers were upgraded to Solaris version 8.

Research and analysis of documented system vulnerabilities was completed on a regular basis and patches were applied as appropriate. An intrusion detection system was implemented on Pegasus that monitors traffic and warns of attacks on the system. Central servers were monitored regularly to detect system compromises or anomalies and minimize opportunities for abuse.

All existing services and programs were upgraded to more secure versions. Open Secure Shell was installed to provide users with secure communications between systems. This free software package is used extensively to secure communications between servers and clients and to provide secure remote administration.

A framework for system planning was developed and will be used for all system changes. This process ensures that all phases of design, implementation, and contingencies have been considered before proceeding with system changes.

A documented plan for recovery in the event of a DHCP failure was developed that ensures the ability to bring network services back into operation with only a short down time.

A failure notification routine was designed to automatically page a system administrator in the event of a failure of any service on any system. The status of all systems was incorporated into a web-based display that quickly shows the origin of the problem system.

The rotation and storage of log files was improved by centralizing the collection of logs under a limited and organized directory structure and developing an automated rotation cycle. This provided better control over log files, more accuracy of logs, and easier access to the information and resulted in more accurate accumulation and analysis of system usage.

The network disk storage unit was fully implemented with the relocation of Andromeda and Pegasus accounts. The snapshot on-line backup feature provides easy access to stored information by users in cases of accidental file deletion.

An AIT (Advanced Intelligent Tape) backup system with Syncsort was installed to provide backups for all UNIX systems. This system holds 30 100-MB tapes and backs up over 1.5 TB of data.

Dynamic Host Control Protocol has been implemented for the RUNet 2000 transition. In addition, DHCP has been utilized to support the open access labs and the laptops for Law School students.

Configuration of the nine lab servers was revised resulting in the elimination of two servers and a more reliable operating environment. The Hill and Engelhard lab servers were replaced with larger and more powerful platforms, and the hardware components of the 5 remaining servers were upgraded. The Novell Backup system was replaced with a Dell PowerEdge server using ARCserve software with an attached 7-cartridge Exabyte DLT Autoloader. Each tape can store up to 70 GB of data.

Software applications used in the labs were upgraded to the latest releases. Images used on the workstations were reworked to resolve operational problems and make each lab image as consistent as possible. Workstation images include Microsoft Office 2000, Microsoft Visual Studio, and Corel 2000. Macintosh workstations were upgraded to OS 9. With the introduction of SAP into the Graduate School of Management's courses, the SAP client was made available in the Hill and Engelhard labs. Server software was upgraded to Novell 5.1.

Computer projectors were installed in three instructional labs replacing the older portable unit. The new projectors are similar to other projectors in campus classrooms making it easier for instructors to use the equipment in a variety of rooms.

Lab computers were upgraded in preparation for the fall semester. A total of 176 computers were replaced with new PCs, Macintosh, and UNIX workstations. Printers and scanners were also upgraded. Replaced lab computers were made available to faculty and student organizations through a streamlined Request for Proposal cycle. The RFP notice was widely distributed on the campus, and submitted proposals were evaluated according to

pre-established criteria that would benefit the instructional process. The Newark Information Technology Advisory Council awarded the computers to 34 organizations and departments. The process was streamlined by removing data from the computer disks and installing the basic software at the time the equipment was removed from its working location.

Web pages were evaluated in mid-year, and several changes and improvements were determined to be appropriate. In accordance with the changing division operation other changes were also recommended. Many of these revisions have been completed and new pages have been developed as new functions are implemented and as needs become apparent.

Community Service and Support

Equipment and technical support were provided for Governor Whitman's Newark announcement of the New Jersey Quitline. Students had an opportunity to access the web-based program that supports efforts to quit smoking.

A lab and technical support were provided for the international Workshop on Differential Algebra and Related Topics conference held in November. The lab permitted conference participants to keep in touch with their home universities and their email messages.

Consulting and installation services were provided to set-up a networked server and 22 computers for Project s.E.A.R.C.H. located in Newark.

Consultant services and technical support were provided for the Greater Newark Conservancy summer workshops. The GNC is a non-profit organization that teaches advanced math, English, and computer skills to under-privileged youth in the Essex County area. Consultants were available to assist the middle school students in use of the equipment and applications and to resolve problems that would diminish the benefit of the activity.

The Greater Newark Business Development Consortium held their annual training session in the Hill labs. Computing services made a presentation on technology to the group during their program and provided consultant support for the participants in the workshops. This program to build basic computer skills used in the workplace was held for individuals from the Newark business community.

Registration tables and email stations were set-up by computing services for the American Society for Public Administration annual conference held in Newark. Consultants were available to assist conference participants in accessing the network and their email messages.

Customer Service and Support

The Help Desk was implemented in July and went into full operation in September with hours of operation from 9:00 a.m. to 6:30 p.m. Opening of the unit was advertised through flyers distributed to campus locations and broadcast emails. Staffed by one full time employee and a cadre of student consultants, the unit handled questions and problems by telephone, email, and walk-ins. Activity averaged 294 calls per month, 115 email messages answered per month, and 173 walk-ins per month. Training for consultants was integrated into the regular training for lab consultants. A web page for the help desk was incorporated into the computing services web pages. A draft strategic plan for the help desk was developed.

The student lab repair group headed by a full time staff member received 603 repair requests and resolved 52.4% the same day and 27.7% in 1–2 days. cs-Net received 163 requests for installation and repair services requiring 635 hours of work.

An operation manual for cs-Net technicians was developed documenting wiring techniques, workstation network changes, methods of network troubleshooting, methods of installing modules, detecting and removing viruses, computing policies, and employee expectations.

Smart classroom support responsibilities for the TEC, computing services, and facilities were identified and documented to improve the process for support of smart classrooms and functionality of rooms. Support contacts will be posted in each smart classroom and phones will be installed providing better service to instructors using the rooms.

Ed Series workshops were planned in collaboration with the Dana Library and the TEC. Each area prepared and presented distinct workshops avoiding overlap and duplication. Computing Services' Ed Series focused on system and design topics, the library focused on research applications and topics, and TEC focused on applications and course development areas. A total of 21 workshops were taught in the fall and spring programs with 138 attendees. Workshops were developed and presented by staff members and student consultants.

Special workshops were planned and carried out for faculty to experiment with the classroom management software. This application ensures that the instructor is in full control of classroom technology at all times.

An instructional module was developed and presented to incoming Law School students that described the process for using their laptops in the Center for Law and Justice. Students wishing to use their laptop in the building must set-up their computers with the necessary parameters and report the address of their laptop to computing services. This address will be entered into the verification table for network access.

Account creation sessions were planned and carried out for FAS-N, Law and GSM. These sessions included presentations on RUCS support, the use of the laptops in the CLJ, and individual assistance in making a computer account.

Staff participated in planning sessions for the campus open house resulting in a unified presentation of the campus amenities. Activities completed by computing services included tours of the labs, technical presentations, distribution of informational materials, and Q&A sessions.

Computing services assisted in the orientation and registration sessions for all undergraduate incoming students. Consultants were available to assist students with on-line registration and make-account processes.

Over 45 individuals were interviewed and 30 were hired as lab and help desk consultants. The new staff members attended a training program completed in May that covered policies and procedures, use of software, and troubleshooting.

NCS received over 300 responses to an on-line customer satisfaction survey. Respondents clicked on a rating scale from 1 (poor) to 5 (excellent) in various categories of skills and characteristics such as courtesy, knowledge, and overall satisfaction.

- Lab survey results ranged from 2.86 for Service Wait time to 3.39 for print quality and lab condition. Overall satisfaction rating was 3.69.
- Help desk results ranged from 3.66 for hours of operation to 4.15 for courtesy and communications. Overall satisfaction rating was 4.40.
- Administration received only 5 responses with an overall satisfaction of 4.5.
- cs-Net received only 1 response with an overall satisfaction rating of 5. This respondent had high praises for the technician.

Incorporating many of the suggestions received about the web-based customer surveys, the pages and questions were revised providing more accurate and focused information as well as comments.

The Computer Classroom Scheduling process was replaced with an automated program that schedules the room, checks for conflicts, and sends confirmation messages to the instructor. The Scheduling Policies and Procedures document was revised to reflect changes in the scheduling of labs and the process for resolving scheduling conflicts. User Policies and Procedures were also revised to include all expectations of lab users.

Connectivity

A wireless pilot was deployed in R-place, the campus cyber-cafe, in collaboration with Robeson Campus Center. The pilot, using Cisco's Aironet products, was funded by the center and implemented and supported by Computing Services. This pilot provided information and experience that will be used in additional campus pilots in the library and the Center for Law and Justice.

In the instructional classrooms of the Center for Law and Justice, 495 seat location jacks were brought into operation through a collaborative effort by Newark Computing Services, Telecommunications, New Brunswick Computing Services, and the Law School. This project included location analysis and assessment, activation of physical areas, DHCP implementation, and detailed testing. In the library area, over 100 seat location jacks were brought into operation through a similarly phased process.

The transition to RUNet 2000 has been completed in Smith Hall and preparatory work for the transition in Blumenthal has been completed. Following the first transition, operational guidelines were revised to better inform building occupants and to better manage the process.

Communication

A presentation entitled "NCS Connected" was planned and presented to RUCS directors, the Newark Information Technology Advisory Council, and campus personnel. Staff members developed scenarios that highlighted accomplishments of the past year, as well as endeavors of the present and future. Presentations included the wireless pilot, iPlanet portal, Network Appliance snapshot feature, on-line instructional lab reservation page, and the Help Desk using remote PC control.

The newsletter was distributed electronically and in hard copy during the fall, spring, and summer sessions. Each newsletter included articles prepared by staff members with topics on lab and system information, managing web pages, technical and application tips, and spotlights of student staff. The newsletter was accessible on-line from the web pages.

With a trial version of iPlanet web portal software, a demonstration portal was developed and presented for a campus audience.

Brown bag lunches were implemented with the first session on Customer Relationship Management. The presenter provided an overview of the philosophy and facilitated a wide-ranging discussion on how this concept could be used in our division to improve customer support.

Brochures were created for cs-Net, computing labs, and computing services that described the activities of the unit and provided contact numbers. The brochures were distributed to customers requesting jobs, to visitors at open house, to prospective students at orientation, and at other public events held on campus and are available in the computing labs.

Technical liaisons, RUNet 2000 building contacts, and lab consultants were identified and campus mail lists created for these groups. Notices of network, system, or lab items of interest to the campus community were distributed through these mail lists as well as through the Newark mail-code lists.

A system notices section was created as a link from the web pages. Areas are available for UNIX, Novell, and lab messages that would be of interest to the campus community regarding changes or issues that develop in those technical areas.

Other methods used to communicate with campus personnel included lab announcements, Newark Accountability Report; automated mailing lists; Message of the Day for UNIX logins; and semi-annual meetings with Deans, Associate Deans and other faculty personnel.

Staff meetings were held twice a month with agendas that included information updates, technical presentations, goal setting, and planning activities.

Computing Support Planning Committee

A campus committee was created to develop a campus-wide model of computing support services for departments, faculty, and staff. The committee met several times to determine the process and timeline to complete the work. A survey was developed to obtain information on the types and quantities of computing equipment on campus with analysis of the results to be completed over the summer and the model developed in the fall.

Staff Recognition Program

Each quarter, nominations from employees were accepted for the quarterly employee recognition award and twice yearly, nominations for team awards were accepted. Employees receiving the quarterly awards were recognized at staff meetings and in the newsletter. Employees value the support and cooperation of their peers and readily observe outstanding efforts made in regular daily operations or in unusual situations. They appreciate the opportunity to recognize this work in a special way.

On staff recognition day we held a celebration with games, prizes, and refreshments, to recognize and thank the students and temporary workers that provide support for the labs, help desk, systems, and office.

Staffing and Development

NCS currently has four open positions. Two employees transferred to positions on another campus and three employees left for positions outside of Rutgers. Three new employees were hired during this year. Although the number of qualified applicants in the technology area has increased lately, it remains difficult to find skilled personnel in the UNIX area. Because of the difficulty in hiring personnel, an emphasis has been placed on training existing personnel to fill new positions as well as to enhance and expand their skills.

Professional Development

A prioritized training and development plan was created for all staff members that encompasses needs for specific skills, cross training, enhanced personal skill development, and future needs. Because of the need for UNIX knowledgeable staff, the emphasis is on a wide and deep training in this area. Training needs filled through attendance at third party training sessions and in-house workshops. As possible, NCS staff take advantage of vendor shows, conferences, and self-study initiatives. This year, staff members attended the following: PC Expo, Mac Expo, EDUCAUSE 2000, Project Management, Time Management, RUSAVY Tech Day, Introduction to UNIX, UNIX System Administration I, UNIX System Administration II, Shell Programming, Windows 2000, Windows Planning & Development, Cisco Multilayer Switch Networks, Advanced Excel, SAS, SPSS, First-time Management, Leading a Team, Effective Presentations, Paper Pipeline.

C. INFORMATION PROTECTION AND SECURITY DIVISION

FISCAL YEAR 2001 GOALS

Mission

The Information Protection and Security Division, established in September 2000, has begun to fulfill its mission to develop a university-wide information protection program and coordinate activities and policies that provide for a secure and protected computing environment.

Vision

The vision of the Information Protection and Security Division is to support an open university environment while maintaining a balanced approach toward security. The division will endeavor to maintain an environment that is free to the open exchange of ideas and access to information, while protecting users from unwanted intrusions. The reputation of Rutgers University and reliable error-free data are high-value commodities that must be secured.

Program Goals

The four elements of the program offer a strategic view of security that supports the following:

- Integrating information technology into the university's strategic plan
- Planning centrally and executing locally
- Providing resources and expertise
- Offering training and education to system administrators and unit computing specialists

This strategic effort includes providing multiple layers of security at the network, host, and desktop levels.

FISCAL YEAR 2001 ACCOMPLISHMENTS

Although the Division consists of only 2.3 staff members, it has established an aggressive schedule that includes an Intrusion Detection System pilot with the Telecommunications Division, a Forensics Lab for education and service, and an active policy committee. In an effort to coordinate security efforts, an organizational plan was developed to provide a platform for a secure and protected technological university environment. This organizational plan includes three groups.

Team for Information Protection/Security (TIPS)

TIPS provides a forum for interdivisional RUCS staff and university community members to discuss and advise on the following:

- Information protection improvements
- Trends
- Strategy development
- Policy and policy proposals
- Community education

TIPS membership currently consists of representatives from RUCS divisions, Internal Audit, Rutgers Police Department and Risk Management. Guidance from the Team

provides a basis for strategic planning and policy development to the Information Protection and Security Division.

Computing Incident Response Team (CIRT)

As an arm of TIPS, the CIRT provides abuse management through the following activities:

- Identifying/verifying/forwarding internal abuse complaints
- Tracking incidents
- Follow-up on violations
- Advising via statistics and reports (CIRT began retaining statistics in December 2000)

Protection Performance Groups (PPG)

The PPGs are virtual teams that are comprised of members of RUCS interdivisional staff. These teams work with the guidance of RUCS directors and with the members of TIPS to provide the following proactive security measures:

- Interpreting data and trends
- Performing proactive scanning and follow-up
- Auditing systems internally

While the PPG teams offer proactive security, the CIRT provides reactive support to create a balanced effort. The TIPS, CIRT and PPT influence and guide the Information Protection and Security Division.

Incident Tracking

In December 2000, the New Brunswick Computing Services staff was trained to record student computing incident abuse on a tracking system. Tracking will allow the university to identify trends in abuse and provide for future responses. The incident tracking system will provide benchmark data that will facilitate strategic planning and help to identify staff and user training requirements.

INITIATED/ONGOING ACTIVITIES

Health Insurance Portability and Accountability Act (HIPAA)

After final review by President George W. Bush, HIPAA was implemented on April 14. The Information Protection and Security Division will continue to work with Internal Audit, University Counsel, the University Office of Compliance and Student policy and University Health Departments to determine the ruling's impact on the university regarding the technology protocol.

HIPAA is the first comprehensive federal protection for the privacy of health information. Under HIPAA, the Department of Health and Human Services is required to adopt national standards for the transmission of health care data. The intent of the legislation is to protect the privacy of patient information.

Intrusion Detection System Pilot

The IPS will partner with the Telecommunication Division to pilot an intrusion detection system (IDS). IPS hopes to use the pilot to assist in determining if the technology is appropriate for university use.

A Network Intrusion Detection System will analyze network traffic for attacks that exploit the connections between computers and the data that can be accessed via a network connection. IDS can detect the broadest range of attacks on university information assets, including denial of service attacks that are aimed at stopping the university or its users from

accessing university IT assets. The role of the network IDS is to flag and sometimes stop an attack before it gets to information assets or causes damage. IDS' are effective for monitoring both inbound and outbound network traffic and recommended by the National Institute for Standards and Technology (NIST).

Forensics Lab

The IPS obtained hardware that will be used as an educational and support tool to familiarize technical staff with hacking exploits, which can only be analyzed after the fact. This proactive 'hands-on' approach will enable staff to envision possible protective devices and strategies. This forensics computer currently has three operating systems installed on removable media from which to work. The machine will remain in a closed environment (not networked to a server) and provide insight into the structures of computer viruses. The machine will also be available to university departments for the purpose of holding and analyzing hard drives in cases of abuse. The lab will be supervised and monitored by MSSC and IPS.

Information Protection and Law Enforcement

One of the toughest challenges to information protection in an open university environment is maintaining a balanced approach toward security. To assist strategic planning and gather trends and new information, Rutgers University staff networks with several law enforcement groups, including the New York Electronic Crimes Task Force (NYECTF) and InfraGard, which is administered by the FBI's National Infrastructure Protection Center (NIPC).

The IPS Division regularly interacts with the following internal and external organizations:

- EDUCAUSE Systems Security Taskforce
- Internet2 Security Working Group
- UNIX Administrators
- PC LAN Group
- Apple Working Group
- RUCS Directors
- NBCS Managers' Meeting
- RCI/ICI
- Team for Information Protection/Security (TIPS)
- TIPS Policy Committee Meeting
- University Copyright Steering Committee Copyright software subcommittee
- RIAS Security Group

Annual Statistics (Records have been kept since July 2, 2000)

A total of 721 incidents were recorded between July 1, 2000, and June 30, 2001. Of those, 18 incidents involved the Rutgers University Office of Judicial Affairs and 34 involved law enforcement.

Incidents reported include:

- hacked passwords
- attempted connections
- intrusions
- scans or probes
- inappropriate email
- spam
- stalking

D. RUNET 2000

RUNet 2000 is a four-year, \$100 million effort aimed at creating an advanced data, video and voice communications infrastructure for the university. The infrastructure will strengthen Rutgers' ability to address workforce development through outreach and reeducation programs and expand the reach of the Rutgers network to include K-12 schools and other New Jersey educational institutions.

Believed to be the largest single project of its kind at any American university, RUNet 2000 will complete, upgrade and expand the existing Rutgers network. The project will provide faster and easier access to the Internet and university computing resources from on- and off-campus locations. It will make it possible for Rutgers to use advanced video and multimedia communication and instructional tools and will provide private university-wide cable television services in residence halls, libraries and selected classrooms. It also will upgrade wiring so that Rutgers can take advantage of advanced voice capabilities.

FISCAL YEAR 2001 GOALS

- Deploy the Rutgers Television Network on Busch and Livingston campuses.
- Complete internal wiring on Newark Campus.
- Complete conduit construction on Newark, Camden, Cook/Douglass, and College Avenue campuses.
- Integrate planning and implementation processes with major university initiatives such as the Higher Education Capital Improvement Program, Rutgers Integrated Administrative System, and the state mandated fire safety sprinkler retrofit program.
- Plan and begin implementation of a Rutgers Regional Network (RRN).
- Develop a recommendation to the Board of Governors concerning anticipated work to be done upon completion of Phase I.

FISCAL YEAR 2001 ACCOMPLISHMENTS

Deploy The Rutgers Television Network On Busch And Livingston Campuses

After conduit installation was completed and fiber terminated on the Busch and Livingston campuses, the RU-TV distribution "head end" was completed in Davidson Hall and satellite dishes installed at the Office of Print and Electronic Communications-Livingston Campus, thereby permitting RU-TV services to be deployed on the Busch and Livingston campuses. Four thousand (4,000) students on the Busch and Livingston campuses received the RU-TV Network during the fiscal year, in the North and South Towers; Quads 1, 2, and 3; Barr, Allen, Mattia, Metzger residences; McCormick High and Low Rise residences; Davidson residences; and the Buell, Silvers, and Richardson apartments.

Complete Internal Wiring on Newark Campus

Internal wiring was completed in seven academic buildings on the Newark campus. Further deployment of RUNet 2000 in Newark will proceed after RU-TV consultations with Newark faculty and with the local cable TV provider are completed.

Complete Conduit Construction on Newark, Camden, Cook/Douglass and College Avenue Campuses

Conduit construction was completed on the Newark, Camden, and Cook/Douglass campuses and initiated on the College Avenue campus. All conduit installation is expected to be completed by September 2001.

Fiber installation continued during the fiscal year. By the start of fall semester, RUNet 2000-class fiber optic cable will connect about 270 buildings on all campuses, providing video services to 21 academic buildings and 62 residence hall buildings. To accommodate

these services, wiring was completed in 10 academic buildings and 12 residence halls on all campuses. By the start of the next academic year, wiring will be completed in an additional 12 academic and 38 residence halls.

Planning and implementation processes were integrated with major university initiatives, such as the Higher Education Capital Improvement Program (HECIP), Rutgers Integrated Administrative System (RIAS), and the state mandated Fire Safety Sprinkler Retrofit Program.

RUNet 2000 staff have worked closely with staff from the Facilities departments on all three campuses to ensure that project activities are coordinated with HECIP and the fire safety sprinkler retrofit activities. In addition, the RUNet 2000 project director met regularly with members of the RIAS management team, business managers' group, and senior project staff to ensure that RIAS considerations were included as part of RUNet 2000 planning.

Plan and Begin Implementation of a Rutgers Regional Network (RRN)

The Rutgers Regional Network will link the university's three campuses in New Brunswick, Newark and Camden, and research and educational outreach facilities in other parts of the state through connections to high-speed fibers along New Jersey's major highways in the EZ Pass system. This will establish state-of-the-art high-speed connectivity among the three campuses that will be comparable to that at the best public institutions in the country. Since donation of the fibers in January 2001, planning has been initiated for the design and construction of campus connections to the fiber-optic network along the New Jersey Turnpike. Connections are targeted to begin early next year after a carrier is identified through competitive bidding. The projected implementation date for the Rutgers Regional Network is the spring of 2002.

Develop A Recommendation to The Board of Governors Concerning Anticipated Work To Be Done Upon Completion of Phase I

Initial planning efforts for RUNet 2000 Phase 2 were started late in the fiscal year after discussions with the university's Executive VP and Treasurer. Documents detailing projections for Phase 1 completion as well as scenarios for implementing Phase 2 have been completed and are being reviewed prior to a formal recommendation/decision regarding RUNet 2000 Phase 2.

III. FISCAL YEAR 2002 GOALS

A. RUTGERS UNIVERSITY COMPUTING SERVICES STRATEGIC GOALS

1) *Computing and Information Technology*

- Provide University-wide leadership in the integration of information technology resources to support the University's mission of Instruction, Research and Service.
- Facilitate the effective and efficient functioning of policy advisory committees for computing and information technology that will serve as catalysts for implementing policy and standards.
- Identify opportunities to encourage collaboration and cooperation in adapting information technology resources to support instruction, research and service among and within the disparate disciplines offered at the University.
- Facilitate and encourage research capabilities, opportunities and support through involvement and participation in Internet2 and development of RUNet 2000 project enhancements of the Rutgers network.
- Provide advice, counsel and direction in the establishment and development of Rutgers Integrated Administrative System, which will increase efficiency and productivity.

2) *Community Service and Support*

- Extend Rutgers' resources to K-12 school districts throughout the state through proactive application of information technology.
- Encourage the development of applications across all disciplines that will maximize the use of the high capacity network bandwidth made available through the RUNet 2000 project.

3) *Customer Service and Support*

- Become a role model within the higher education community for faculty, staff and student satisfaction and service excellence.
- Recruit and retain highly qualified information technology professionals.

4) *Connectivity*

- Design, build and support a world-class network infrastructure that will support the expanding administrative, instructional, research and service needs of the University.

5) *Communication*

- Develop and execute communications plans, which inform the Rutgers faculty, staff and students of University Computing Services' mission, functioning and activities.
- Work closely with the Department of University Relations to inform the Rutgers community and local media about Computing Services' activities.

B. University Directorates

1) ADMINISTRATIVE COMPUTING SERVICES

FISCAL YEAR 2002 GOALS

PUBLICLY VISIBLE GOALS

RIAS

Complete work on RIAS interfaces and legacy system enhancements to support RIAS implementation. Plan for and implement integration test. If necessary, support parallel testing and reconciliation.

College of Applied and Professional Studies (CAPS)

Provide leadership for planning and analysis for system implementation to support establishment and administration of the CAPS School. Implement enhancements to ACS systems to support establishment and administration of the CAPS school.

ARTSYS/ET

Complete development work in order to provide ability to process articulated transcripts through to SRDB, NJAS database and Enrollment Management Imaging system. Work with NJ Community Colleges to receive and process transcripts.

Web Online Payment (WOLP)

Complete development and testing for WOLP phase 1 (undergrad admission fee). Implement WOLP Phase 2 (Parking Fees) and Phase 3 (student tuition/fees payment).

Class Rosters

Implement Class Rosters Application Release including enhanced permissions functionality and online warning submissions. Assess feasibility of implementing online grade submission. Assess feasibility of integrating RU Connection photos with online Rosters Application.

Web Parking Registration and Ticket Inquiry

Implement Phase 2 (Parking/Ticket online payment for NB students) and phase 3 (online application and payment for NB faculty/staff). Assess feasibility of rolling out to Newark and Camden communities.

Financial Aid Management System (FAMS) Regulatory Maintenance

Complete enhancements to support regulatory requirements for the 2001/2 academic year

Institutional Research DataMart

Continue partnering with the Office of Institutional Research in development and population of the IR data mart. Assist in data architecture, technical architecture and reporting.

Student Internal Transfer Process

Provide data and support to the Office of Enrollment Management in the rollout of the new Student Internal Transfer Application.

Online Faculty Evaluations

Implement link from online Schedule of Classes to online faculty evaluations to be housed on Teaching Excellence Center web site.

Pay for Performance (P4P)

Support implementation for P4P for spring 2002.

Support for Online Course Management

Provide data feeds and other necessary services (e.g. use of rosters permissions tables) in support of online course management initiatives such as WebCT and e-Companion.

CORE Cash Register

Continue to support Student Financial Services in the implementation of the cash registering system of CORE business technologies.

Decision Support using Oracle Discoverer

Continue the Oracle Discoverer rollout to university constituents including administrative and academic offices. Make appropriate enhancements to Oracle data stores to support evolving decision support needs.

Undergraduate Admissions (NJAS) Startup for Spring/Fall 2002

Complete all system enhancements (legacy and web) supporting the NJAS Startup for spring/fall 2002.

Graduate Admissions Startup

Complete all system enhancements (legacy and web) supporting the Graduate Admissions Startup.

University Cyclical Business Process Support and Other Support

Continue to provide ongoing support for day-to-day business needs and the cyclical business processes of the university.

SSL Security for Neon Web Applications

Implement SSL security for Neon Web Applications.

INTERNAL INFRASTRUCTURE GOALS

Testing Tools Rollout

Roll out Mercury WinRunner and LoadRunner tools to the ACS development staff. Develop procedures for use of the tools.

Lightweight Directory Access Protocol (LDAP)

Continue research and testing for the feasibility of using LDAP for authentication and authorization.

ACS Conference multimedia upgrades

Perform installation of digital whiteboard, desktop PC, video projector, conferencing phone, wireless keyboard and mouse, and a digital video camera.

Upgrade of ACS Networks to RUNet 2000 Compliance

Move ACS networks from the current infrastructure on the Rutgers legacy network to the new RUNet2000 network. Additionally, replace all network hardware devices such as switches, hubs, and routers to adhere to RUNet2000 compliance.

Automated Tape Library to Backup & Restore the UNIX and NT Infrastructures

Complete the implementation of the automatic tape library replacing the current ADSM backups with Veritas Netbackup. Phase out the backups first within Administrative Computing, then with Administrative Services, and finally Desktop users.

RIAS Production Infrastructure

Implement the recommended RIAS infrastructure; continue the weekly infrastructure meetings, setting timelines and assign resources to successfully integrate a best of breed solution.

Insure the successful implementation of the infrastructure and the Oracle Financial Applications conversion.

OPCE Scheduler for UNIX and NT

Expand the use of the Tivoli OPCE Scheduler for UNIX and NT platforms, improve script processing and managing output processes, and assess integrating the scheduler with the Oracle Concurrent Manager for RIAS applications.

Oracle 8.1.1 on the Mainframe

This upgrade is required to improve reliability and availability of the university's centrally supported administrative Oracle applications and Web pages on the administrative mainframe. Although currently installed and running in a test environment, the database must be successfully migrated into production. Oracle database training for the systems administrator supporting the database on the mainframe will be scheduled.

Output Management

Continue the user training and improve timely delivery of the client reports using the View/Deliver product in the New Brunswick Faculty Arts and Sciences Departments. Introduce and rollout the product to other user departments thus providing easy access while which will reduce overall data center paper usage and forms printing.

DMS Upgrade

Install the new version of the DMS Sam Disk product previously owned by Sterling Software. Computer Associates purchased Sterling Software and renamed the DMS product to CA-Disk. In addition, a new release of the product was introduced and support was discontinued on our release. This product reduces tape out dependencies on the mainframe.

Windows 2000 at the Desktop Level

Construct a work plan geared to replace the Windows NT Clients with Windows 2000. Work plan will include cost, procurement, installation, documentation, testing, and production rollout. Windows 2000 has been out for sometime now and is very stable. It also offers enhance security features for the desktop.

Windows 2000 Desktop Software Procurement

Assess current Desktop software inventory and cost recommending software upgrades for client software. Insure that desktop software is compatible with Windows 2000. Extensively test applications before rolling into production.

Oracle 9i Internet Application Server

Continue testing the new release of Oracle 9i IAS Apache Server. Test and migrate the web applications successfully onto the new E420R web server before the fall 2001 registration cycle.

Hardware Configuration Definition (HCD)

Configure the HCD on the IBM mainframe as a backup to the Bus Tech mainframe appliance device. The HCD supports an Ethernet connection between the mainframe and the ACS infrastructure.

Upgrade NT Infrastructure

An additional eight servers will come off warranty during the 2000/1 fiscal year. They will be upgraded as part of the ACS replacement program. The servers will perform the following functions:

- Test Web Server
- McAfee Anti-Virus
- Primary Domain Controller/ACS Server
- Production Web Server
- File Transfer Server

Windows NT Development, Test, and Production Tier

In response to an overwhelming need and staff requests, a three-tier Development, Test, and Production environment will be created for the Windows NT infrastructure. This environment will facilitate software development, testing and mitigate potential problems before moving new web pages, or applications into the production tier.

Windows 2000 Test Lab

Create a Windows 2000 test lab for the network staff. The test lab will be used for software installation and compatibility with Windows 2000. In addition, the test lab will provide hands on training to the staff.

Desktop Support Audit

Prepare the Desktop Support staff for this year's audit by the Internal Auditing department. The group is currently creating a database that houses information for software installations, hardware configurations, and licensing authorization. Desktop standards and procedures will be reviewed and recommendations made as needed.

Unified Help Desk

Actively participate in the newly developed committee to oversee the deployment of a unified RUCS Help Desk. The objective is to leverage existing department customer support processes as a front-end, while sharing a common database at the back-end. In addition to the unified Help Desk, ACS will continue to review Remedy Software for functionality.

2) TELECOMMUNICATIONS DIVISION

FISCAL YEAR 2002 GOALS

Single Protocol

The university will standardize on Internet Protocol (IP) as the only supported (meaning routed) protocol on the data network. This is a critical strategic initiative that will allow for improved service and reliability of the data network. In addition, it will simplify departmental transition efforts during deployment of RUNet 2000.

DPT core

The university will complete the Dynamic Packet Transport (DPT) core infrastructure on RUNet 2000. This will allow for greatly enhanced core bandwidth in the core of the data network. Also, the completion of this portion of the network in conjunction with convergence on IP as the only supported protocol will strategically position the university to consider other network improvements.

Video

The university will deploy a reference model H.323 video solution to facilitate conferencing over the data network. Currently, all traffic is statistically multiplexed and reflects best effort routing regardless of application. Full support of H.323 video conferencing through application of traffic classes, quality of service, and admission control will provide a new service to the university community as well as serve as an example to others.

External connectivity

The university will completely rebuild its external connectivity to provide for greater security and also to add functionality. The addition of generic, transparent web caching will simultaneously reduce bandwidth on the Internet handoffs while improving general performance of common pages. The addition of a Virtual Private Network (VPN) landing pad will allow for authenticated users outside of Rutgers to appear as if they are inside of Rutgers. A VPN solution also provides for encrypted sessions. The appearance of being within Rutgers will allow off net locations to have appropriate access to all resources.

Access Switching

Telecommunications will develop a management strategy for the increasing amount of equipment that will be deployed as part of the RUNet 2000 project. This equipment will be monitored and managed without correspondingly large increases in staff.

NJEDGE.net

Rutgers University will continue in its leadership role in the New Jersey higher education network. The success of this network will better enable the university to achieve its goals of outreach and distance education and, as such, will receive high-level attention.

Dorm Networking

The Dorm networking project will be restructured during the coming year to provide a more uniform and predictable level of service to its customers. Creativity in approach will be emphasized highly with a wide variety of ideas evaluated and many differing operating structures considered. The resulting organization will leverage ongoing efforts of others as a strategic asset for the delivery of services to students living in Residence Housing.

C. Campus Computing Services

3) CAMDEN COMPUTING SERVICES

FISCAL YEAR 2002 GOALS

General University/Campus Support

- Develop and implement plans for Novell, UNIX, NT and other operating system improvements.
- Provide leadership to campus departments in developing their Information Technology (IT) needs and plans.
- Provide networking leadership for the campus to improve backbone services, assist in building design, communicate standards and assist in transitional networking plans.
- Prepare and assist building occupants for a smooth transition to RUNet 2000.
- Promote continued collaboration and cooperation with the Library, TEC, and FAS staff in supporting computing components of the planned technology-based classrooms.
- Evaluate the Educational Series and other training for improvements. Coordinate with other departments to expand courses.
- Improve security measures for the community through education, firewalls and virus protection software.
- Improve email support on campus; update documentation and add a web-based email reader.
- Continued support of Science Vision project and Fine Arts systems.

Instructional Support

- Provide IT leadership to the campus in the development and implementation of plans for public computing facilities on the campus.
- Encourage and assist faculty in developing web-based instructional materials for classroom presentations.

Research Support

- Encourage and support faculty participation in I2 and other projects that require links for information technology. Schedule I2, RUNet 2000 and Information Technology for the 21st Century presentations in Camden to encourage support for grant submissions.
- Participate in the integration and support for departmental outreach programs including distance learning and off-campus instruction.

Outreach Support

- Gain knowledge of and assist in video distribution for distance learning programs.
- Collaborate with other departments planning for off campus programs.
- Support campus and university programs that extend into the community.

Administrative Support

- Collaborate with administrative departments on campus to improve office workflow and assist in planning for their systems and software upgrades.
- Work with the RIAS project to provide training and guidance on the Camden campus.

Operational Goals

- Continue improvement of front line service through continued student consultant training, coaching, evaluations and support.
- Maintain communications to faculty, students and staff through paper mailings once per semester, E-mail through the campus REACT, student newspaper, online web announcements and other modes as they may be determined effective.
- Continue staff participation on RUCS teams to improve Rutgers University Computing Services and to foster the RUCS values.
- Continue to align services with the campus and institutional needs through participation on Camden committees, such as the FAS Information Sciences committee, and communications with administrative offices, academic departments, and advisory councils.
- Insure staff professional development to enhance their skills appropriately for their job function and growth.
- Continue the implementation of the customer satisfaction evaluation plan.
- Continue evaluations and modifications for the Camden Help Desk to improve efficiency within Rutgers University Computing Services while improving response to our community.
- Continue to work closely and regularly with the campus Information Technology staff (Unit Computing Specialists) to improve the support to all constituents in Camden.
- Continue our communications improvement plan to keep the campus informed and educated about computing at Rutgers and RUCS.
- Implement through the ELF program the test scoring software and/or equipment (Op Scan).
- Improve RCI service by the ELF program the Sun server, associated disk space, and back up features of the faculty/staff UNIX server as part of the Research Computing Initiative support.
- Improve through the ELF program the video streaming services provided on the campus to expand capacity.
- Move the public lab PCs to the next level of the operating system, a Windows 2000 client.

4) NEW BRUNSWICK COMPUTING SERVICES

FISCAL YEAR 2002 GOALS

General Access Services

- Reengineer mailing list creation to permit automatically-created lists for courses
- Reengineer support for WebCT, to provide automatic maintenance of student lists, and use of common RUCS usernames and passwords
- Continue improvements in email performance
- Design and early implementation of a new email system
- Finish implementation of smart classroom support
- Provide streaming video service
- Finish review and cleanup of user/account database
- Working with ACS, develop pilot for a university portal, with NBCS providing at least system administration, authentication services, and channels for major NBCS services
- Move public labs to Windows 2000
- Explore providing Windows-based services for general use
- Continued progress in providing web interfaces for common services (e.g. quota management, email forwarding).

Departmental Services

- Finish best practices recommendations and documentation for administering Windows and UNIX, with emphasis on security issues.
- Improve security scanning, to cover the SANS list of the most common security problems.
- Provide support for departments needing to use firewalls (both hardware appliances and host-based firewalls)
- Finish set of online packages for Solaris
- Add servers to the PC Purchase program
- Coordinate purchasing for ELF
- Apply RUNet 2000 transition process to the list of buildings to be transitioned during FY02
- Finish IPX and Appletalk transition
- Assess practicality of providing central Windows-based services for departments through pilot implementation.

User Services

- Develop single help desk, in cooperation with other divisions
- Extend help desk hours (if funded)
- Reorganize NBCS web pages
- Provide coordinated publicity of NBCS services

5) NEWARK COMPUTING SERVICES

FISCAL YEAR 2002 GOALS

Computing and Information Technology

- Develop and document systems plans for the future for all platforms
- Develop checklist of daily operations for all systems
- Develop a business continuation plan
- Evaluate system security issues and define safeguards
- Conduct internal audit of operations and procedures
- Develop guidelines and recommendations for wireless technology on campus
- Evaluate emerging technologies and make recommendations for instructional use
- Evaluate use of centralized virus scanning software
- Evaluate and implement Samba
- Implement a web based email
- Plan a reorganization of the server room

Community Service and Support

- Strengthen relationships with outreach partners
- Collaboratively plan with campus partners for outreach applications
- Enhance working relationships with Dana and TEC

Customer Service and Support

- Develop a recommendation for the open access and instructional labs for the future
- Develop a strategic plan for the help desk
- Enhance services provided from the web
- Develop a plan for meeting ADA compliance in the campus labs
- Review user services policies and procedures and revise as appropriate
- Implement a call tracking system and build a knowledge base
- Conduct customer satisfaction surveys and make operational changes where appropriate

Connectivity

- Continue RUNet 2000 transition according to schedule and in conjunction with RUNet 2000 groups.
- Develop renumbering plan for servers
- Develop a campus communication and support plan for renumbering implementation

Communication

- Enhance and expand communication efforts to campus departments, within RUCS divisions, and within Newark division
- Plan and host monthly technology sessions for departmental technical liaisons
- Expand staff meetings to include presentations from other departments
- Organize and arrange for scenarios and activities that promote cooperation and teamwork
- Establish a participating presence at working committee meetings

D. INFORMATION PROTECTION AND SECURITY

FISCAL YEAR 2002 GOALS

The following goals parallel the elements of the Information Protection and Security strategic plan:

Strategic view of security

- Provide statistics for trending and benchmarking purposes
- Increase TIPS membership to include academic relationship

Plan centrally and execute locally

- Prepare policy approval process
- Coordinate policies into a central web location
- Provide Best Practices
- Vulnerability research and testing (scanning and follow-up)
- Finalize and communicate abuse handling process
- Create and distribute brochure for security awareness
- Implement Intrusion Detection Pilot with Telecommunications Division

Provide resources (training, education, software offerings)

- Training and awareness campaign
- Websites to communicate best practices, policies
- Train to make Forensics Lab available to departments as teaching and evidence tool

E. RUNET 2000

FISCAL YEAR 2002 GOALS

- Deploy the Rutgers Television Network on all New Brunswick campuses
- Plan deployment of RU-TV on Newark and Camden campuses
- Complete conduit construction on all campuses
- Integrate planning and implementation processes with major university initiatives such as the Higher Education Capital Improvement Program, Rutgers Integrated Administrative System, and the state mandated fire safety sprinkler retrofit program
- Implement the Rutgers Regional Network (RRN)
- Develop working plan for post-RUNet 2000 Phase 1 activities