

## FISCAL YEAR 2008 ANNUAL REPORT

### EXECUTIVE SUMMARY

The Division of Information Systems and Technology (IS&T) provides leadership and services related to technology and instructional design for the university community. The division strives to be the recognized leader in applying innovative technology to enhance the university experience.

#### AREAS OF NEW DEVELOPMENT

The fiscal year ending June 30, 2008 was a year of continued progress for the planning, development, and deployment of new technology initiatives for the university. The following areas launched several significant initiatives this year:

- **Academic Support Initiatives**, including streamlining of academic support services with the merger of University Educational Technology Services, Advanced Campus Services and Library Support Services into University Academic Technology Services; exploration of emerging technologies resulting in the development of two islands in Second Life, a 3-D virtual learning space; launch of Georgia State University in iTunes U, an area in Apple's iTunes store where leading universities share knowledge with their campus, communities and alumni; and planning for the launch of a faculty technology resource center, the Exchange.
- **Research Support Initiatives**, including the deployment of a large-scale high-performance computer, acquiring of a storage management system, continued increased use of research computing assets, and alignment with national and regional high-speed research networks.
- **Administrative Systems Initiatives**, including development of an Emergency Web notification system, major upgrade to the Banner Student system, upgrades to the PeopleSoft Human Resources and Financials systems, implementation of a student housing application, and continual development of the new campus portal, PAWS (Panther Access to Web Services).
- **Technology Infrastructure Initiatives**, including the upgrade to Proofpoint, a new anti-spam system to enhance capacity and maintenance levels; initiation of planning for a new Help Desk service request system, Numera Footprints; and continuation of the university identity management project, enhancements to the security of the university network and systems, and improvements to enterprise-wide automated systems including desktop management, e-mail services, the wireless network and institutional Web sites.
- **Organizational Improvement Initiatives**, including the initiation of strategic university-wide communications for campus projects and IT changes and updates; continuation of customer service advancements, staff certifications, project management, and work effort accountability.

Detailed accomplishments related to these primary focus areas are described beginning on Page 4 of this report with reference given to alignment with either the [University Strategic Plan](#) or the [University Information Technology Strategic Plan](#).

## CONTINUING SUPPORT AREAS

In addition to the major new development efforts accomplished during fiscal year 2008, IS&T is also responsible for the maintenance and operation activities related to the following twenty-three core activities which represent essential IT services provided to the university community.

Administrative Systems - Alumni	Initiative Analysis and Development
Administrative Systems - Financial	Institutional Software Licensing
Administrative Systems - Human Resources	Instructional Support
Administrative Systems - Independent Systems	Library Support
Administrative Systems - Research	Network - Voice, Video and Data
Administrative Systems - Student	TOC (Technology Operation Center) Services
Customer Support and Help Center	Performance Metrics
Desktop Management	Research Computing
E-mail Systems and Services	System Hosting
GIL, GALILEO and GPLS	Technology Planning and Futures
Identity Management	Web Strategy and Support
Information Security	

During fiscal year 2008, IS&T received approximately 50,000 customer requests related to these areas and expended approximately 65% of its work effort maintaining and operating these services.

## IS&T OVERVIEW

The IS&T division is managed by the Associate Provost for Information Systems and Technology, J.L. Albert, who also serves as the Chief Information Officer (CIO) of the university. The university CIO is responsible for providing an institution-wide perspective on IT and promoting effective planning, adoption and support of technology initiatives. The activities of the office are guided by the *University Strategic Plan* and the *University Information Technology Strategic Plan*. The CIO and his management team work closely with several advisory committees composed of university faculty, staff and executive leadership. IS&T follows a strong customer service philosophy and promotes a systematic approach to improving business procedures and processes.

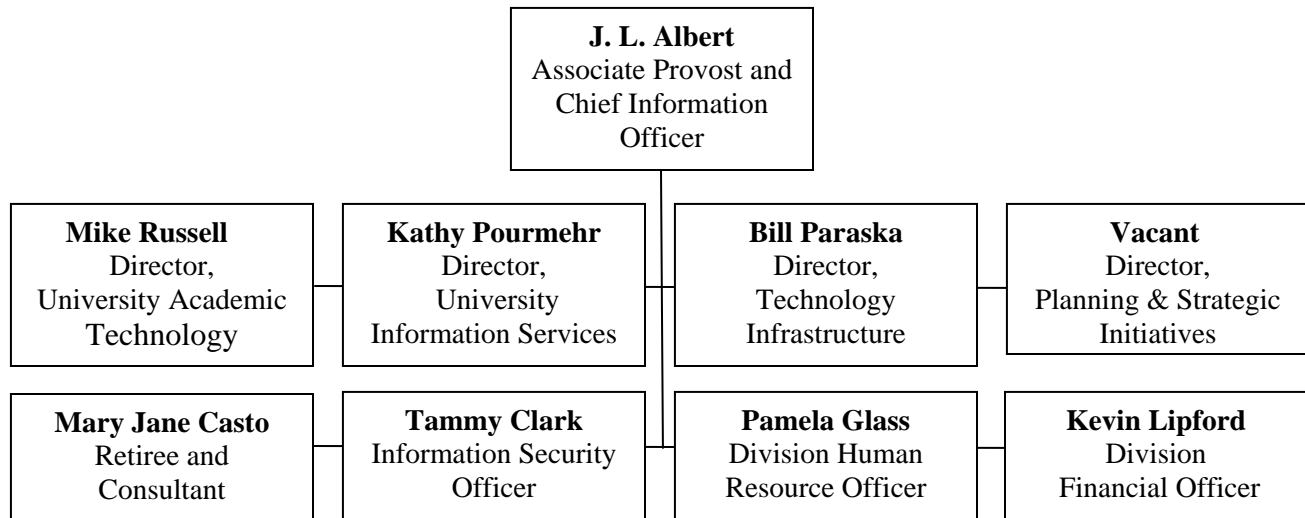
## INFORMATION TECHNOLOGY ADVISORY STRUCTURE

Advisory groups are central to the success of IS&T and assist in the ongoing communications with the university community's many constituency groups which results in better alignment of IS&T services and resources with customer needs. One key partner in the advisory structure is the Senate Information Systems and Technology Committee (ISAT). It is composed of the Information Technology Support and Security Subcommittee (ITSSS) and the Student Technology Fee Subcommittee (STFS). The Senate ISAT Committee assists in developing long-range plans for the computing needs of the university, advises the Associate Provost on academic and administrative matters involving technology, reviews annual IS&T programmatic plans, reviews annual budgetary submissions by the Associate Provost and provides a liaison between its subcommittees and IS&T.

A second key partner is the IT Steering Group (ITSG), which is composed of the university provost, associate provosts, vice-presidents, and the chair of the Senate ISAT committee. The ITSG is actively involved in providing strategic guidance and in prioritizing the initiatives that are requested by IS&T customers.

## ORGANIZATIONAL OVERVIEW

IS&T is organized into four major units that collectively plan, develop, operate and support technology for the Georgia State community. Approximately 167 filled staff positions, 17 temporary workers, 42 student assistants and 5 GRAs are deployed across the four units. A description of the major functions provided by each unit follows.



- **Technology Infrastructure (TI)** manages and operates the networking, computing and telecommunications resources; offers technical consultation on hardware, operating systems, software and security; assesses and installs hardware and software.
- **University Academic Technology Services (UATS)** manages institutional instructional-technology support, research computing, digital media services, library support services and technology training services.
- **Planning and Strategic Initiatives (P&SI)** supports the planning and management of IS&T's projects; supports customer needs through the IS&T Help Center; provides support for lab and classroom technology; maintains staff and faculty workstations; and provides strategy, design and development services for the university Web site.
- **University Information Services (UIS)** provides application systems implementation services, operational and production support for administrative applications, database administration, decision support and data warehousing services.

## **FISCAL YEAR 2008 DETAILED ACCOMPLISHMENTS**

IS&T, with assistance and guidance from its customers and advisory committees, established its FY2008 goals and objectives in alignment with the goals and objectives articulated in two university plans, the *University Strategic Plan* and the *University IT Strategic Plan*.

### **ACCOMPLISHMENTS LINKED TO THE 2005-2010 UNIVERSITY STRATEGIC PLAN**

#### ***Recruitment***

IS&T supports the university's recruitment goals through application and web enhancements. Accomplishments this year include partnerships with the Admissions Department to provide a new undergraduate admissions site (<http://www.gsu.edu/admissions>) for prospective students and parents. In addition, the creation of a new Honors Program site (<http://www.gsu.edu/honors>), a critical thinking writing courses site (<http://www.gsu.edu/ctw>) and improvements to the Spanish site (<http://www.gsu.edu/es/espanol>), which targets non-English speaking parents whose children are interested in Georgia State by providing an overview of the university and its services and admissions process, were also achieved.

IS&T continued its work with Enrollment Services in the development of Panther Access to Web Services (PAWS), a Web portal for students, faculty and staff. In addition, the ongoing development of an on-line orientation process for transfer students (<https://webdb.gsu.edu/preorientation>) provides choices to these students by giving them an alternative to attending an on-campus orientation, yet ensures they are knowledgeable about institutional academic policies.

#### ***Undergraduate and Graduate Experience***

The undergraduate and graduate experience was improved in FY2008 through several projects that IS&T implemented with its functional partners. IS&T continued to upgrade the number and quality of media-equipped and/or wireless classrooms and Library Commons computer workstations. There was an expansion of the university wireless network system, providing high-capacity wireless connectivity in classrooms and infrastructure enhancements for increased availability. In addition, IS&T added a walk-up help desk for wireless support to supplement requests handled by the IT staff in the campus computer labs and the Library Learning Commons.

Multimedia and technology support continues in the highly successful Digital Aquarium ([http://www.gsu.edu/digital\\_aquarium.html](http://www.gsu.edu/digital_aquarium.html)). This facility is funded by the student technology fee and is open to all students regardless of major and offers high-end workstations equipped with multimedia tools for students to enhance their coursework.

#### ***Faculty – Research and Academic Support***

During FY2008, IS&T provided instructional support to Georgia State faculty by designing and supporting instructional courseware. This included technology training and digital media production. Most of this effort is centered on the learning management system called uLearn (<http://gsu.view.usg.edu>). Georgia State is one of the largest users of the USG-provided system, powered by Blackboard Learning System. Participation in the annual New Faculty Orientation event also offers IS&T the opportunity to inform incoming faculty of the breadth of services available to them in the research and academic area.

The use of iPods and podcasting as a dynamic teaching and learning tool has become increasingly popular on campuses around the country as a means of delivering content and creating new

content. In the past year, IS&T staff continued to explore podcasting options, its benefits and uses, and has developed a support program for Georgia State instructors for content creation.

In 2008, Georgia State became the first higher-education institution in Georgia, and one of the first 35 in the United States, to have an active page in iTunes U (<http://www.gsu.edu/itunesu>), an area in Apple's iTunes store where leading universities share knowledge with their campus, communities and alumni. Georgia State's presence in iTunes U also provides national attention to the institution and allows the university community access to a wide variety of innovative podcast content, including class lectures, learning modules, student projects and campus tours.

There is also ongoing support for the Web site that provides information and instructions on creating podcasts (<http://www2.gsu.edu/~wwwpod>). A number of iPods, cameras and recorders have been purchased for instructors to checkout for podcasting activities with their students.

Preparation for the highly anticipated faculty Exchange (<http://www.gsu.edu/exchange.html>) continued. In FY09, it will bring one-on-one and group training to faculty members and their support staff. The multi-faceted facility will also provide faculty a place to work on their online courses, course components and research. The facility's blueprint includes private work spaces, open work areas, a conference area and a recording studio. In addition, a well-trained staff is planned to be available for assistance.

Faculty technology support was streamlined by consolidating three IS&T departments that provide academic support. University Educational Technology Services (UETS), Advanced Campus Services (ACS) and Library Services Support (LSS) became University Academic Technology Services (UATS) with a goal to provide integrated educational, research and library technology services.

The exploration of emerging technologies resulted in the development of two islands in Second Life (<http://www2.gsu.edu/~wwwets/instructionalsupport/secondlife>), a 3-D virtual learning space. The instructional team, along with several faculty members, is actively involved in testing this medium as an alternative-learning environment. This initiative garnered Georgia State a feature in the Washington Post and recognition in more than 100 media outlets.

Support for research computing was a significant focus for IS&T during FY2008. The IBM System p5 Supercomputer for research continues to provide 3.9 Teraflops of computing power to support faculty's research efforts. In addition, a Tivoli storage-management solution provides 18 Terabytes of disk space. There are currently 120 active accounts on these systems. Georgia State's participation in the Southeastern University Research Association Grid has provided access to an additional 18 Teraflops of computing cycles for researchers. The university remains a partner in IBM's World Community Grid. As a SURA grid partner, Georgia State contributes idle computing cycles to the consortium. IS&T funded and installed a separate research network capable of bringing 1 Gigabyte connections to labs and offices.

### *Staff*

IS&T continues to focus on improving the delivery of services to its customers by engaging the staff in process improvements around service and support. This year the Heat trouble ticketing system was replaced with a new product called Numera Footprints. This system is highly user-friendly, allowing users to place their own tickets using their CampusID and password. Overall, the new product offers better structure and consistency in maintaining process flows for incident and service request resolution, including adherence to service-level commitments.

Staff development in FY2008 focused on technology training and certifications in order to attain qualifications and knowledge consistent with best practices and institutional technology. A staff member in IS&T's Technology Operations Center received the prestigious Sandra Bergeron Women in Technology Scholarship, awarded by the J. Mack Robinson College of Business. Additionally, two staff members in the IS&T's Technology Infrastructure received the Six Sigma Green Belts during the last year while another staff member in Information Security became a Certified Information Systems Security Professional. As IS&T has become more involved in the Information Technology

Infrastructure Library (ITIL) framework for service management and support, several staff have achieved ITIL Foundations Certification. Our Help Desk Manager also received a Help Desk Manager Certification and members of our Technology Infrastructure group received training in Avaya ASA and several others received their Extreme Network Associate Training and Certification.

### ***Facilities***

During FY2008, IS&T oversaw numerous renovation and construction projects and continued to offer technology support at several off-campus facilities including the Brookhaven, Henry County, Alpharetta and Buckhead. Renovation and construction projects included:

- 75 Piedmont Avenue **Citizens Trust Bank Building**
  - Basement MDF Closet – Payroll training facility
  - 2<sup>nd</sup> Floor Counseling Center
  - 4<sup>th</sup> Floor IS&T University Information Systems Offices
  - 9<sup>th</sup> Football Coach's office
  - 10<sup>th</sup> Floor IS&T Technology Infrastructure and Security Offices
  - 11<sup>th</sup> Floor VP for Enrollment Services Offices
- 95 Decatur Street **Classroom South**
  - 4<sup>th</sup> Floor Classrooms
  - 5<sup>th</sup> Floor Classrooms
- 103 Decatur Street **Library South**
  - 1<sup>st</sup> Floor IS&T Help Center Walk-up Window and Workstation Support Offices
  - 1<sup>st</sup> Floor Faculty Resource Center
- 100 Decatur **Library North**
  - 4<sup>th</sup> Floor Renovation
  - 5<sup>th</sup> Floor Renovation
- University Commons
- Executive MBA Center Buckhead
- 58 Edgewood - Collab Tech, Zygonen, Research Department
- Police Command Center Relocation

### ***Technology***

The student Banner system underwent an upgrade to version 7.4 and incorporates BOR modifications from the vendor. To be more proactive in responding to system changes, Georgia State became a beta partner for implementing the new 8.0 version of Banner. This beta test that completed in March 2008, gave Georgia State the opportunity to test the system on behalf of the University System of Georgia and SunGard Higher Education.

IS&T launched Blackbaud Raisers' Edge, the primary fundraising system used by the Office of Development. It replaces the Banner Advancement system and provides the necessary IT infrastructure to develop an external affairs operation. This will increase Georgia State's effectiveness at fundraising, stewarding gifts to the university, engaging alumni and external constituencies, and supporting the next capital campaign.

Development work continued on the implementation of the Luminis portal – dubbed PAWS – Panther Access to Web Services. An upgrade of the PeopleSoft Financials system began in 2008 and will provide improved support, functionality, security, synchronization and reporting with the BOR data warehouse. There will be cost savings with the decommissioning of the Citrix software and hardware and by leveraging development and training dollars from the BOR. IS&T also initiated the rollout of the new Grants Management system to provide better integration into the Financials system. This project will continue through FY09 with the launch date set for July 2009.

Almost two years ago, IS&T completed the replacement of the university's telephone service to provide for approximately 6,000 Voice over Internet Protocol (VoIP) telephones. Redundancy in the system has increased the survivability of voice communications in selected university buildings. Other features, such as universal messaging, are under development.

IS&T initiated a server virtualization project (SVP) in its data center, the Technology Operations Center (TOC), in an effort to reduce costs; reclaim space, air conditioning, and electrical capacity; and extend the life and availability of servers. Migrating 41 existing physical servers and 26 new servers to 7 virtual server hosts completed the first phase of the SVP. The reduction in heating, ventilation, and air conditioning requirements (HVAC), power consumption and space within the TOC show positive return-on-investment in a short amount of time. The second phase of the server virtualization project will relocate 30 physical servers to 4 additional hosting servers. The TOC received several national media recognitions for its "green" environment. IS&T is also examining options for an initiative to determine the needs for data storage in all parts of the university.

## **ACCOMPLISHMENTS LINKED TO THE UNIVERSITY IT STRATEGIC PLAN**

### ***Information Accessibility***

#### ***Network Security***

IS&T's information security monitoring systems afforded continuous (24/7) protection to critical information technology resources and data to minimize and prevent service disruptions, breaches/theft, and unauthorized access. IS&T helped the university achieve ISO 27001 Certification in two areas of the University, the Information Security Department and the Office of Disbursements. Georgia State became the first university in the nation to achieve this designation.

In IT security, IS&T completed a project to remove social security numbers as a primary campus identifier and developed the Information Protection and Access policy to proactively protect confidential information. In our on-going efforts to simplify and enhance electronic identity management at Georgia State, we implemented a self-service system for CampusID account activation and password reset (campusid.gsu.edu) that allows access to 14 various campus applications.

IS&T's Information Security unit completed more than 52 large scale risk assessments on information technology projects at the University, integrating controls to mitigate threats and vulnerabilities, including more than 100 student Technology Fee projects, 25 vPMO projects, and multiple security reviews of University departments (Financial Aid, Office of Disbursements, Revenues and Receivables, Student Accounts, Development, College of Law, IS&T's UIS and Advanced Campus Services).

In a year that saw increasing numbers of unwanted data exposures of confidential information, both at USG sister universities and nationwide, Georgia State University did not experience a single breach.

***Enhance and Extend the University Network Infrastructure***

**There were many accomplishments in this area. They include:**

- Replaced Mail Frontier Anti-Spam system with Proofpoint Anti-SPAM on virtual appliances to address capacity and maintenance issues. Provisioned Proofpoint accounts with CREATOR and authenticated with CampusID account and password.
- Provisioned virtual Red Hat Linux servers, installed application software and technical configuration and implemented CampusID LDAP authentication for new Personnel Effort Reporting System (PERS) for Georgia State Research community.
- Provisioned virtual Red Hat Linux servers, installed application software and technical configuration and implemented CampusID provisioning and authentication for Numera Footprints Help Center incident tracking system.
- Provisioned Windows servers, installed software and performed technical configuration for the fsaAtlas system in order to meet Federal Immigration SEVIS reporting requirements for international students.
- Virtual Server Phase I – Provisioned 4 additional servers and storage to the production VMware ESX server farm to host virtual servers, converted 41 physical servers to virtual servers and provisioned 26 new servers as virtual servers.
- Identity Management
  - The following systems were converted to CampusID account and password: Ulearn, GoSOLAR (Students & Faculty), PeopleSoft HR, Panther Cash Online Office, Easyproxy (Library), Whatsup Gold
  - The following systems were brought into production using CampusID account and password: Proofpoint Anti-SPAM, Numera Footprints (Help Center Incident Tracking), PeopleAdmin (jobs.gsu.edu), PERS (Personnel Effort Reporting Systems)
  - In conjunction with IS&T's UIS and Experience Design Group, the campusid.gsu.edu web application was implemented for CampusID account activation and password reset via self service.

***Evaluate Services and Customer Satisfaction***

IS&T continues to conduct customer satisfaction and usage surveys of help services. The percentage of respondents who use the IS&T Help Center as the primary source of technical help continued to remain at a high rate. The table on page 9 shows important attributes.

During Fiscal Year 2008, the Help Center received more than 50,000 service requests. Of these, 33,416 were answered via phone by a Help Desk Specialist. Others came via other methods, such as e-mail, walk-up support, etc. For FY2008, there was an increase in calls answered from FY2007 by 1,836 calls. The table shown lists each question and the overall average score from all responses. The scale runs from 1 (strongly disagree) to 4 (strongly agree). With IS&T's continued focus and effort on customer service these ratings will continue to improve. The overall result was 3.73, which is an improvement from the previous year's rating of 3.69.

For its enhanced customer service levels, the IS&T Help Center received the highest honor for customer service (Gold Level) from Chancellor Erroll Davis as part of the Governor's statewide Customer Service Improvement Initiative.

SURVEY QUESTION	Score (1-4)
1. A Help Center Agent was readily available during my initial request for help.	3.77
2. The Help Center Agent who assisted me was professional at all times.	3.83

3. The Help Center Agent had the technical skills necessary to research and trouble shoot my issue.	3.69
4. The Service Technician(s) who assisted me desk side was/were professional at all times.	3.81
5. The Service Technician(s) who assisted me desk side had the technical skills necessary to solve my issue.	3.76
6. I was kept informed of the progress toward resolution of my issue.	3.63
7. Overall, I was satisfied with the handling of my request for help.	3.73

***Enhance Support of Library Initiatives***

In this support area, IS&T received numerous recognitions and achieved many milestones. The milestones include:

- Upgraded the University System of Georgia's supported integrated library system - GIL (Voyager) - to version 6.5.1 for all 21 supported libraries.
- Applied GIL (Voyager) 6.5.3 patch for all 21 supported libraries.
- Made site visits to all 20 academic institutions supported by the Georgia State GIL Service Site (LSS).
- Participated in the Georgia State SSN/PantherID conversion process.
- Advised supported GIL libraries' Technical Staffs on elimination of the SSN from the GIL (Voyager) Patron record, and evaluated test Patron Transaction files as GIL libraries worked to convert from the reliance upon SSN to an Institution-ID.
- Designed, produced and executed production procedures to remove the SSN from the GIL (Voyager) Patron record and installed the Institution-ID as the primary access point. The procedures were applied to the GIL (Voyager) database for the 20 supported academic libraries.
- Released Voyager Reporting System (VRS) version 2008.05. In addition, to the reporting capabilities supplied in previous releases, this latest release included an inventory control module, keyword searching on bibliographic and holdings records and full record print/display.
- Processed 10+ vendor-supplied bibliographic files: processing produced for each input file an interleaved bibliographic and holdings file with embedded customized holdings codes and proxy server notations. Each customized file was then bulk imported into the respective library's GIL (Voyager) database eliminating a need for manual intervention or in-library editing.
- Electronic Reserves (ERes): Upgraded ERes to version 5.3.03 and added approximately 4700 documents to the system.
- Produced and sold approximately 1700 coursepacks through the Georgia State Bookstore.
- DSpace had the mod\_jk software installed/tested, and DSpace was placed into limited production for the University Library with an operational handle server.
- Produced bibliographic records for the Georgia State University ETDs as requested by the University Library for input into GIL. There were 358 new theses and dissertations added to the system.

***Recognitions include:***

As part of the support team for GIL Express, the Georgia State GIL Service Site shared in the Customer Service Awards and OIIT's Library Services received the Governor's Commendation and Gold Level Award for Customer Service for all of the GIL Libraries and Service Sites.

***Enhance External Collaborations***

Of note this year is that Georgia State University remains a Partner of IBM's World Community Grid a network of 600,000+ GridMP type devices providing scientific computing to humanitarian applications in life sciences. As Partner, Georgia State contributes idle computing cycles, and researchers can propose (via grant request process) applications to run on the World Community Grid. In addition, IS&T's public relations personnel joined and participated with the EDUCAUSE IT Communications Constituent Group.

***Technology-enabled Faculty, Staff and Students***

***Ensure Faculty and Staff Development in Technology***

University Academic Technology Services (UATS) conducted many workshops including sessions on eTraining, vClass and uLearn (WebCT Vista).

***Provide Appropriate Workstation Support for Faculty and Staff***

The development of the institutional automated desktop management system continued with the joint development of a policy describing the need for common desktop management practices across the university and the definition of procedures.

***Provide Effective IT Services for Students***

In-person support for students needing WebCT help was offered throughout the school year in various computer labs across campus at varying times during the week. The Student Help Desk program continued by providing in-depth training to the IS&T student assistants stationed in the University Library to provide support related to getting connected to the wireless network and anti-virus software.

***Business Process Effectiveness***

***Improve Efficiency of Operations***

Ongoing local enhancements to the GoSOLAR system aided in streamlining student records management, including the implementation of the new policy that limits the number of course withdrawals a student is permitted and a roll verification process to comply with Title IV requirements.

In collaboration with the Office of Research Financial Services, IS&T provided resources for the Personnel Effort Reporting (PERS) system needed to manage the time and effort certification and reporting process mandated by the Office of Management and Budget (OMB) Circular A-21 Cost Principles for Educational Institutions.

In collaboration with Human Resources, IS&T continued to provide resources for the electronic Personnel Action Form (ePAF); providing Georgia State with the ability to track the movements of a PAF and take action for a PAF that is not implemented in a timely manner.

Within IS&T, continued focus on project management and work effort reporting using the vPMO system has provided better tracking and documentation of project work and increased visibility of on-going efforts.

**PROGRESS IN ASSESSING INSTITUTIONAL EFFECTIVENESS**

Several years ago, IS&T developed an Institutional Effectiveness Plan centered on four division-wide outcomes.

**Outcome 1:** The university community has access to reliable, up-to-date technology resources.

The collected data indicates that the technical infrastructure elements remain stable, leading to solid

availability for university applications. Measures also indicate increased computing cycles are available for research computing and that there is an increased use in these facilities. The ongoing maintenance of the new telephone system will require an extension to the infrastructure performance indicators to include these components. The availability of educational technologies remained strong with success in instructional design projects and increased use of uLearn, vClass and eTraining.

**Outcome 2:** The university community participates in the development and review of strategic and tactical technology goals of the university's missions. Continued use of steering groups, evaluation of the top issues reaching the Help Center, collaboration in technology selection and evaluation of customer feedback provide for community input.

**Outcome 3:** Effective communications exist between the university community and IS&T regarding technology support of academic, research and administrative activities. This year, IS&T's Communications Manager continued to assist in improving communications to customers. An IS&T Communications Team, led by the Communications Manager, consistently worked to update tactical and strategic communications plans, along with publication goals. Several customer satisfaction instruments continue to show solid positive feedback from the customer base. Forums have been established for researcher input and IS&T pursues active participation in grant proposals.

**Outcome 4:** Electronic mail can be used as a reliable method of delivering official university communications to all staff and enrolled students. Email round-trip times and available disk space met targets.