Information technology (IT) plays a critical role at the University of Arizona by supporting the university’s vision for excellence in research, teaching, outreach, and lifelong learning.

At the UA, information technology is not just about email, Internet service, or the latest mobile app. IT is about people—the students, faculty and staff who benefit from technology and use it in their daily lives, whether to register for classes or discover water on Mars. The campus IT professionals are committed to providing the UA community with the resources and services necessary to ensure their success.

Information technology also enables us to stimulate innovation, collaboration, communication, and information sharing on campus. As the stories in this annual report show, the Office of the Chief Information Officer and University Information Technology Services (UITS) are working with partners across the UA on initiatives to advance cutting-edge research, bring teaching and learning into the 21st century, enhance the student experience, and transform the way we do business on campus.

The accomplishments detailed in this report are made possible by CIO and UITS staff along with UA community partners that have collaborated with us, given input and feedback, and helped make our IT initiatives the best solutions for customers’ needs.

I look forward to working with our partners on campus as we continue to build a strong and vibrant IT community at the University of Arizona.
The new state of the art, high performance, high efficiency, research-focused data center, proposed and funded by the Chief Information Officer, Vice President of Research, UA Space Committee, and College Deans, went live in January 2012.

- Monitored by staff 24 hours a day
- Secure
- Redundant power, UPS
- Redundant cooling
- 10Gbps high-speed network access to National LambdaRail (NLR) and Internet2

**HIGH PERFORMANCE RESEARCH DATA CENTER**

The University of Arizona research computing resources are vitally important to compete for grants and to attract the highest caliber research faculty and students to our campus. Research computing tools enable scientists—like Dr. Brant Robertson, a theoretical astrophysicist contributing to astrophysics databases—to increase the world’s scientific knowledge.

The University of Arizona’s Research Data Center is the centerpiece of the University’s Research Computing Services. This new state-of-the-art facility houses five centrally funded research computers and is home to research data storage systems. The Center also serves as a space for college and department-owned research computing systems.

UITS is committed to supporting the University of Arizona’s needs as a Research 1 university by providing free computational support to all departments on campus. Departments may buy in to the Data Center for priority access to the processors they purchase, but any researcher or sponsored student can schedule time on the centrally purchased processors and “windfall” time—unscheduled time on processors that would otherwise be idle.

UA Research Computing includes:

- High Performance Computing (HPC) and High Throughput Computing (HTC) systems.
- Dense, high-capacity data storage.
- A 3D immersive visualization facility—AZ-LIVE.
- UITS Research Computing Support (RCS) services.

**RESEARCH COMPUTING AT WORK**

**MARINE VIRUS STUDY**

A study in the Sullivan Lab looks at viruses and their microbial counterparts in the deepest parts of the ocean where oxygen levels are low. Bonnie Hurwitz, a PhD candidate working under the direction of faculty advisor Dr. Matt Sullivan, compares the 1.8 million protein sequences of her samples to 40 million known viral protein sequences using high-performance/high-throughput computing to determine which are new and unique discoveries, demonstrating genetic diversity in ocean life.

**STAR EVOLUTION**

Researchers in the Department of Astronomy test why space dust sometimes evolves into a star. For Dr. Brant Robertson, an assistant professor of Astronomy studying theoretical astrophysics, resolving the structure of supersonic turbulence in star factories requires a hundred billion calculations over and over, necessitating the use of high-performance/high-throughput computing.

**VIRTUAL ARACHNOPHOBIA**

The College of Psychology tests phobias in the Arizona Laboratory for Immersive Visualization Environments (AZ-LIVE). Sarah Burger, a graduate student working under the direction of W. Jake Jacobs, Ph.D., is using the 3D visualization lab to compare the reactions of study participants when confronted with their fear in a virtual setting versus live.
Academic and Student Services

CADET TECHNOLOGY UPGRDES PROJECT

Launched in October 2011, the Classroom Technology Upgrade (CTU) project is a commitment to technology in classrooms across the University of Arizona to enrich the teaching and learning mission of the university. It is a collaborative effort led by the Chief Information Officer, Provost’s Office, and Student Affairs, and approximately 50 faculty and staff who participated in the research and planning process. Funding is provided by the Student IT Fee.

The CTU project is focused on four key areas:

- Classroom Upgrades—technology infrastructure updates in classrooms for a consistent teaching and learning experience.
- Emergency Response Communications System—to alert classrooms to emergencies on campus and allow communication between classrooms and University Police Department.
- Audio/Video Capture Streaming—for satellite campuses and online learning.
- Innovative Spaces—for group learning and collaborative environments.

For the first phase of the project, the team identified 83 classrooms needing an immediate upgrade. Of these, 42 were updated during the summer of 2012 with an initial investment of $671,368. By Fall 2013 start, all 83 will be upgraded.

DEGREE SEARCH / DEGREE TRACKER

The university is turning to technology to help students find their major, stay in school, and reduce time to graduation. Degree Search helps potential and current students make informed decisions about degree choices with a user-friendly website showing degree opportunities at the UA, their curriculum specifics, and career information. In April 2012, the Mosaic Project implemented a beta version.

A pilot of Degree Tracker (Smart Planner) was implemented in the College of Agriculture and Life Sciences. Degree Tracker creates and maintains individual degree plans for students to allow them and their advisors to track progress and optimize time to graduation. Degree Tracker will be rolled out to all colleges in the fall of 2012.

ENTERPRISE INSTRUCTIONAL SUPPORT

The Office of the CIO invested extensive capital and effort in Enterprise Applications’ university instructional support portfolio:

- Desire 2 Learn (D2L) realized a 7% increase in usage (over 252,000 seats in 6,365 courses).
- Student Administration enrollment data integration was refined.
- Various security, redundancy, stability, data storage, and monitoring service enhancements were implemented for D2L and iTunes.
- Early Alerts was integrated with D2L.
- A course management and fees process using automated workflow approvals was implemented.

ONLINE LEARNING

Number of Classes Fully Online

<table>
<thead>
<tr>
<th></th>
<th>Fall 10</th>
<th>Fall 11</th>
<th>Fall 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>135</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of Hybrid Classes (In-Person and Online)

<table>
<thead>
<tr>
<th></th>
<th>Fall 10</th>
<th>Fall 11</th>
<th>Fall 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of Classes Using D2L

<table>
<thead>
<tr>
<th></th>
<th>09-10</th>
<th>10-11</th>
<th>11-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,405</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,978</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5,457</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DEGREE SEARCH USAGE

April 4 – July 15, 2012

- total page views: 324,104
- unique page views: 212,056
- average page views per day: 3,147
- average time spent per page: 0:01:50

DEGREE TRACKER USAGE

Advisors/Advising coordinators: 35
CALS students: 2,114
WHAT’S IN THE STUDENT IT FEE?

Over $8.4 million generated by the Student IT Fee was distributed among the following programs and initiatives:

- A new, enhanced Microsoft Campus Agreement, effective July 1, 2012, includes a Student Option that covers licenses for Microsoft Office and Microsoft Windows upgrades for a PC or Mac at no charge.
- Classroom Technology Upgrade to ensure availability of teaching technology in classrooms.
- Wireless network enhancement (99% indoor coverage, 85% of outdoor wireless planning area).
- Tech support for campus 24 hours a day/7 days a week.
- OSCR Student Computing Laboratories, including refresh of two computing laboratories.
- Purchase of data storage capacity for D2L.
- Student-related software renewals such as Right Answers (web database for IT answers) and Sophos Anti-Virus and Security.
- Online Education Project (OEP): improves campus excellence in teaching and learning within fully online or hybrid course environments; creates additional content available to off-campus students.
- Arizona Mobile, student mobile app to deliver campus information to mobile devices.

ORIENTATION

Even the most non-technical major requires student interaction with online tools, and the Office of the CIO works to ensure students have the support, security, software, and lab resources they need. The CIO’s Communications and Marketing staff reaches the 7,000+ incoming new students with information on the IT resources available to them at orientation events. New this year, Communications staff met with incoming law students at the Law School Orientation, explained Student IT Fee resources to parents at the Wildcat Family Conference (parent orientation), and worked with the 24/7 IT Support Center to develop a resource webpage for new students.

SYMPA CLASS LISTS

New email list management using Sympa open-source software replaced the aging Listserv software in 2012. One of the distinct advantages of Sympa is the ability to create lists that automatically update their subscribers against the University’s databases. Instructors can now create class lists instantly in Sympa with a web interface that shows their classes so they can simply click to request their list, containing all students registered for the class.

WEPA CLOUD PRINTING KIOSKS

The Office of Student Computing Resources (OSCR) partnered with the Student Union and FastCopy to pilot WEPA (“Wireless Everywhere, Print Anywhere”) cloud printing in January 2012. Five OSCR labs replaced their Pay-for-Print printers with WEPA printing kiosks. Customers can print to a WEPA cloud account set up under their NetID.

Customers can swipe in with a CatCard at any WEPA kiosk to access their print queue and select a job to print. WEPA kiosks also print jobs from USB drives. The University of Arizona is the first WEPA partner to use campus authentication for accessing their cloud system.

STUDENT COMPUTING LABS

<table>
<thead>
<tr>
<th>Lab Type</th>
<th>FY11 Login count</th>
<th>FY12 Login count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-access computing labs</td>
<td>118,135</td>
<td>127,605</td>
</tr>
<tr>
<td>Open-access multimedia labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labs with dual use: open-access or reservable for instruction</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Additional labs reservable for instruction only</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Gear-To-Go Cameras and Multimedia Equipment</td>
<td>3,542 checkouts</td>
<td></td>
</tr>
</tbody>
</table>

GEAR-TO-GO CAMERAS AND MULTIMEDIA EQUIPMENT

Academic and Student Services
Infrastructure

WHAT DOES INFRASTRUCTURE SERVICES DO?

The UITS infrastructure units are responsible for managing a wide array of IT functional areas, including the University’s primary data centers, and voice and data networks.

NEW EQUIPMENT PROVIDES BETTER, FASTER INFORMATION PROCESSING AND STORAGE RETRIEVAL IN CENTRAL SERVICES, SUCH AS:

- Adding UAConnect required a new storage array, which also provides faster data retrieval from systems like UAccess.
- New SAN (storage area network) switches increased bandwidth from 4GBs to 8GBs, meaning less wait time to get data from systems like the web servers.
- D2L’s new database servers are faster and have less downtime.
- New tape libraries mean faster retrieval of backups when Data Center systems need data restoration.

In FY2012, new services and systems in the UITS Data Center meant an increased demand for capacity, and many pieces of existing hardware were coming to the end of their maintenance contracts. It was more economical to buy entirely new hardware rather than to add to the existing capacity and purchase a new service contract on the older equipment.

UITS SERVER VIRTUALIZATION

Running virtual servers means greater flexibility when new services need to be implemented. Instead of buying a new machine, virtualization uses available capacity on an existing one, offering energy savings, space savings, less configuration time, and better disaster recovery. UITS has a 3-year Enterprise License Agreement (ELA) with VMWare that includes licenses to upgrade all our existing VMWare servers and add another 40 CPUs, which will translate to 1,200 additional virtual servers.

WHAT’S IN THE DATA CENTER?

- Email
  - UAConnect email, calendar, and IM for faculty and staff; Sympa email list management

- Enterprise Instructional Support
  - D2L, Blackboard, Elumenate, iTunesU

- Service support
  - UAssist Remedy tech support ticketing system; CSS student lab software images

- Departmental servers
  - colocation of department servers, virtual server space, storage space (fee-for-service)

- Web servers
  - www.arizona.edu, uanews, numerous department and research sites; site license campus software

- Identity management
  - NetID authentication and authorization, database of university affiliations

- UAccess
  - Payroll, Benefits, Personnel, Budget

- UAccess Employee
  - UAccess Financials, Analytics, Space

- UAccess Student
  - enrollment, financial aid, account, transcripts, Degree Search, Dagsio Tracker

- 24-hour security
- redundant power (UPS)
- redundant cooling
- 24 hour device and environmental monitoring

INCOMMON AUTHENTICATION/SSL

UITS leveraged its membership in the InCommon federation of institutions to be able to use UA NetID authentication with additional services, including:

- Research.gov (National Science Foundation’s grants/research portal)
- Terradotta (study abroad/travel registration)
- WEPA (cloud printing kiosks)
- DMPTool (to create research data management plans for federal funding agencies)
- Zimride (carpooling/ridesharing)
- Omnilert (emergency notification)

UITS also subscribed to InCommon’s SSL certificate service. Campus IT managers can now request free certificates for secure (“https”) websites instead of purchasing them individually. This is an outright savings for departments and an overall savings for the university:

- Cost of certificates for campus secure websites if purchased individually: over $75,000 a year
- Cost of InCommon subscription: $15,000 a year
  - a savings of 80%
NETWORK MASTER PLAN

With network and telecommunications technology constantly advancing, the University of Arizona has to have a plan in place to keep up with growing demands. Work began in FY12 on the Network Master Plan to upgrade and advance campus network infrastructure and communication systems over the next 10 years. The first step was to develop the strategic goals to be accomplished with the plan, identified as:

- Greater mobility for campus community.
- Greater efficiency in managing infrastructure technologies.
- More resilient networks on campus.
- Greater flexibility in delivery of telephony and data services.
- Increased cellular connectivity and capacity on campus.

In order to develop the strategy to accomplish these goals, UITS has engaged various colleges, departments, and IT governance groups on campus to provide strategic direction and input on technology elements that should be considered to enhance the network.

EDUROAM

Secure wireless access is now available to visitors from other institutions to the UA campus and UA community members visiting other institutions, as long as the institution is part of the eduroam consortium. UITS provides the same high-speed, secure wireless as UAWiFi on an eduroam account. Visitors can log in using their home institution credentials for safe surfing. Similarly, UA community members can use their UA NetID and password for secure wireless access when visiting an affiliated institution.

PHOENIX BIOMEDICAL CAMPUS

HEALTH SCIENCES EDUCATION BUILDING

UITS Client and Infrastructure team members planned, designed and installed the network infrastructure for the new Health Sciences Education Building (HSEB), based on the needs of the member institutions of the Phoenix Biomedical Campus (PBC): College of Medicine-Phoenix (COM-P) and NAU’s College of Health and Human Services Departments of Physical Therapy, Physician Assistant, and Occupational Therapy programs. The HSEB a six-story, 268,000 square foot building that opened in July 2012 to promote interprofessional education.

The CIO formed the PBC IT Support Working Group to focus on the IT environment for the Phoenix campus. The group, comprised of IT representatives from COM-P, College of Pharmacy, College of Public Health, College of Nursing, College of Medicine-Tucson, Cancer Center, and UITS, defined an IT support and funding model for the campus.
The Office of the CIO negotiated a new, enhanced Microsoft Campus Agreement (MCA) effective July 1, 2012, which includes:

- Enterprise Server products for campus at no cost to departments and colleges.
- SQL and Systems Center server products for all campus servers at discount rates.
- Student Option that covers licenses for Microsoft Office and Microsoft Windows Upgrades for a PC or MAC at no charge to students.
- Faculty/Staff Option that covers licenses for Microsoft Windows upgrades and Office, Visio, and Project for a PC or Mac at no charge to departments and colleges.
- Home Use Program for faculty and staff to enjoy Microsoft Office, Project, and Visio for personal use at home for a nominal fee.
- Microsoft's IT Academy eLearning tutorials are free to all students, faculty, and staff.

CYBER CITIZEN FORUM

In recognition of the strong education efforts by the UA’s Information Security Office (ISO), the US Department of Homeland Security (DHS) partnered with ISO to make Tucson a stop on their select national tour to promote online safety measures for the general public. ISO engaged in extensive outreach efforts to the community, bringing high school students, citizens from community groups, and UA campus community members to the Cyber Citizen Forum October 27, 2011. ISO experts, University researchers, and a speaker from DHS shared tips and examples on how individuals can protect themselves from fraud, identity theft, cyberbullying, and more.

INFORMATION SECURITY EDUCATION

Students reached with email info on security and resources 100%

12,448 employees completed security awareness training

Phoenix College of Medicine savings from the campus agreement:

$5,780 student software
$1,000 server licenses

SOFTWARE LICENSING PROGRAMS

OVERALL RETAIL VALUE OF DOWNLOADED PRODUCTS FY12

Microsoft $830,328
CIO paid $600K
28% savings

Apple $259,386
CIO paid $50K
81% savings

DOWNLOADS

Microsoft 17,187
Apple 6,813

THE 24/7 IT SUPPORT CENTER

The University’s 24/7 IT Support Center's first year with UAssist online ticketing had a noticeable impact on phone and walk-in support requests, although overall usage by students, faculty, and staff continued to rise. A special phone and online response unit for Exchange and Outlook was put in place for the UAConnect email migration, with UAConnect questions reverting back to all the 24/7 employees and student workers after the migration. UAConnect and other new services and systems implemented in the past year brought the number of systems the 24/7 staff is trained to assist with up to 137.

UACONNECT

To unite faculty and staff across campus with integrated email, calendaring, and instant messaging, UITS established an on-premise Microsoft Exchange system. Over the course of the weekend of May 19-20, 2012, UITS moved 18,000 faculty, staff, and retirees on central email to the new UAConnect service. The project was a partnership between UITS and IT professionals from across campus who collaborated on the best solutions for campus and departmental personnel.

20/7 IT SUPPORT CENTER USAGE

<table>
<thead>
<tr>
<th></th>
<th>FY11</th>
<th>FY12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calls</td>
<td>57K</td>
<td>54K</td>
</tr>
<tr>
<td>Email/Online</td>
<td>12K</td>
<td>19K</td>
</tr>
<tr>
<td>Walk-Ins</td>
<td>12K</td>
<td>11K</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>81,598</td>
<td>83,880</td>
</tr>
</tbody>
</table>

The launch of UAssist (online portal to Remedy ticketing) in May 2011 created a 58% increase in online submissions versus 5 and 8 percent drops in calls and walk-ins, offering greater efficiency in issue handling.
UACCESS ANALYTICS

This business intelligence software from UAccess allows business managers, administrators, and leadership to delve into the data collected in the University’s systems. Analytics can be used to create reports, dashboards, or ad hoc query responses for better monitoring of current metrics and informing decision making.

79% of queries in Analytics completed in under 2 seconds

UACCESS USERS

Student administrative
2,205
Student self-service
107,819

Employee administrative
14,545
Employee self-service
27,915
Financials
30,498
Analytics
4,312

most people use Analytics between 7am and 4pm
largest peak 11am
2nd largest peak 9am

of 4,355 people with access to UAccess Analytics
540 people used Analytics each day and
159 people logged in 4 days a week

79% of queries in Analytics completed in under 2 seconds
With the demand for smartphone and tablet-based applications on the rise, there is a strong interest in mobile app development on campus. UITS, in partnership with other groups and departments at UA, will launch Mobile Matters, a campus-wide community of students, faculty, and staff that can work together to develop, design, and launch mobile apps. Mobile Matters will provide a forum for sharing ideas, finding resources, and learning about best practice approaches for all things mobile.

UITS is developing a new website system for UA departments, organizations, and ASUA clubs that conforms to UA branding standards and is quick and easy to create. Site in a Box websites meet ABOR security requirements, require no technical skills to create, and are mobile responsive. UITS will launch Site in a Box in 2013 in partnership with UA External Relations.

UITS has chosen Cisco’s Unity Connection to replace its current Octel voice mail service for Unity’s synchronization with the UAConnect and its more extensive feature set. Approximately 9,000 voice mail customers and 400 menu mailbox customers will be migrated to the new system.

UITS is planning to add more services that can be logged into with UA NetID via our InCommon membership, including Gartner (IT research), Evanced (library resource scheduling), Blackboard Transact (for CatCa$h), and Desire2Learn. The Office of the CIO will also be acquiring:

- X.509 client certificate service for email digital signatures and encryption.
- Multi-factor authentication, a phone-based secondary authentication for online services with enhanced security/privacy concerns.
Thank you to members of the UA community across campus who have partnered with us, collaborated, given input and feedback, and helped make our projects the best solution to our constituents’ needs.