2016-2017
Year in Review
Information Technology and Computing Services

ECU

A MESSAGE TO THE ECU COMMUNITY

On behalf of ECU's Information Technology and Computing Services (ITCS) department, I am pleased to present this Year in Review on Information Technology (IT) for the 2016-2017 fiscal year.

This report highlights a number of the important, high-impact projects we completed this year. In total, we completed 132 IT projects, while providing a consistently high-level of operational reliability in a very complex environment. Our achievements over the past year continued to build on a solid platform for future growth and development.

Highlights from the past year include...

➢ **meeting our goal of 99.5% uptime**, with less than 0.5% unplanned downtime for the infrastructure of critical systems and the network.

➢ **expanding the university's wireless network** to accommodate the heavy and growing reliance on Wifi service on campus, including installing outdoor access points in student-centric locations.

➢ upgrading hardware and software to **optimize the university's mobile and interactive reporting and analytics solution**.

➢ establishing processes and formalizing procedures to **create a solid IT Accessibility framework** for the university.

➢ implementing **new security solutions and mandatory employee training** to ensure a more secure and reliable technology infrastructure in an increasingly hostile cybersecurity environment.

➢ beginning the **migration of the Banner application tier** to Linux virtual machines, in preparation for the Banner 9 implementation.

➢ developing for FY18 deployment, a **more structured, highly-reliable web development environment** using Red Hat technology and WordPress.

➢ piloting and implementing several **new educational technology tools** in support of student success and faculty teaching.

➢ **assisting campus departments through the Central Project Office (CPO)** to help guide projects through their full life cycle, from ideas to decisions to delivery.

Looking ahead, we will continue to provide vital services while pursuing additional projects in support of the university's progressive strategic plan.

Don Sweet
Chief Information Officer
East Carolina University

ABOUT US
A Little More Detail

We aspire to build an organization with committed and skilled people accountable to and serving students, faculty, and staff; streamlined processes making it easy to work with us, do our jobs and deliver results; and innovative technology that is the right technology for the right reasons.
- ITCS Mission

Sue Stox
Executive Assistant to the CIO

manages the CIO calendar and internal and external meeting invitations, coordinates special projects and social events within ITCS, performs specifically-assigned research on a wide variety of topics as requested by the CIO, and resolves specific duplicated student records in Banner.

Andy Anderson
Director

Network Services – provides technology leadership on the design and support of voice communications and enterprise wired and wireless network infrastructure including storage infrastructure for the enterprise.

Jack McCoy, EdD
Director

Information Security –advises university leadership on information security management strategies, assesses the security of new technology purchases, coordinates IT risk management, and serves as the information security point of contact for federal, state, and industry agencies.
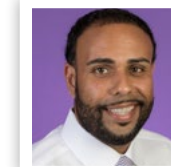
Hector M. Molina
Director

Central Project Office – in partnership with team leaders, coordinates high-impact and high-risk IT projects in collaboration with technical and functional managers, subject matter experts, vendors and users throughout the ECU community.

Wendy Creasey, EdD
Director

Academic Technologies – provides leadership and support for educational platforms, audio visual and classroom technology, video conferencing and telemedicine, student computer support and computer labs, multimedia creation and communications, service desk management, and university web platforms.

Ray Drake
Director

Systems and Application Support – provides technology leadership and support of desktop technologies, the administration of enterprise applications, enterprise systems and operations, operational security, and the university data centers.
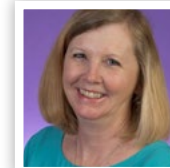
Wanda Sandeford
Director

Finance & Personnel Administration – provides support and administration of budgets and financial reporting, billing of telecommunication devices, the university switchboard, personnel and payroll, purchasing and inventory.

Skip Kirby
Director

Strategic Information Services – ensures the security, integrity and availability of ECU's mission-critical data; enables data-driven decision making in support of the university's mission, strategies and objectives; and promotes effective management and strategic use of institutional data.

Zach Loch
Director

Enterprise Information Systems – provides leadership on a wide array of administrative systems, the development and support of the university application portal, and provides state of the art document management technologies.

ECU employs 213 central ITCS staff and there are approximately 106 decentralized IT (non-ITCS) staff units across campus. Approximately 140 students are employed within ITCS and distributed across colleges in IT positions during the academic year.

IT GOVERNANCE

Aligning Priorities and Policy with University Strategies

Throughout the year, we work with information technology committees comprised of representatives across campus to seek input into priority setting, IT planning, risk assessment and planning, policy setting, and customer-centered decision-making processes.

The **Information Resources Coordinating Council (IRCC)** is the primary IT Governance committee at ECU and has representatives from all areas of campus. This year, the IRCC:

➤ Reviewed **technology-enhanced classroom standards** and the prioritized list of 110 classrooms.

➤ Reviewed the **IT Accessibility Regulation**, approved by Faculty Senate, and continued to move the regulation forward in the ECU Policies, Regulations, and Rules (PRR) process.

➤ Reviewed features of the faculty and staff **cloud archive environment** in Microsoft Office 365.

➤ Reviewed the **software purchase process** developed in conjunction with the university's Purchasing Department, Materials Management, and Disabilities Support Services that provides a framework for the procurement of all technology for the university.

➤ Discussed the development of the **mobile regulation** to define employee responsibilities for ensuring the protection of university information.

➤ Reviewed plans for **Data Center upgrades and growth**, including Banner Hardware replacements (database and application phases); expanding the Data Center to meet growth patterns and ensure the necessary power, server rack space, and cooling needs are in place; and replacing ~25 Blade systems

to maintain functionality.

➤ Reviewed the university's **multiple security layers in place to prevent ransomware attacks** and the tools in place to retrieve data in the event an attack occurs, including but not limited to **Cisco SourceFire**, which prevents file-sharing traffic and blocks known malware vulnerabilities and spam sites; **Cisco Umbrella**, which provides DNS and IP-level protection that stops malware from reaching the network; **Piratedrive** (125gb available) storage space, used for sensitive data, which is secure, password protected, and backed up twice daily; **Microsoft OneDrive** storage space that is FERPA approved; and the **CrashPlan** utility that backs up data to the cloud.

Highlights from the **Web Oversight Committee** (a subcommittee of the Information Resources Computing Council) include:

➤ Reviewed plans for a **restructured university website environment** that will create a stable and distributed environment that takes advantage of open-source tools.

➤ Reviewed and provided input on the development of an **updated ECU website homepage**, being launched in September 2017, with the new university branding.

➤ Reviewed **updated Web Standards** that include guidelines for URL management and website hosting on and off campus, as well as vendor involvement.

➤ Discussed the implementation of **Siteimprove reporting for Quality Assurance** (broken links and misspelled words) and Accessibility set up for website owners upon request. When migrating a site to WordPress, website owners are signed up to receive both reports automatically.

ITCS is working closely with Data Stewards and other institutional data stakeholders from academic and business units across the campus to operationalize the University's Data Governance Program, as framed in the interim Data Governance Regulation that was approved in May 2016. In addition to providing technical input and resources, ITCS facilitates meetings for the **Enterprise Data Management Steering Committee** and the **Data Stewardship Committee**. In so doing, ITCS is contributing to the successful completion of projects and other work activities in support of the effective governance of institutional data. Examples of these activities include:

➤ Classification of institutional data according to level of sensitivity

➤ Establishing and maintaining a comprehensive inventory of institutional data

➤ Augmenting existing Banner data standards to encompass the entire complement of institutional data spanning all line-of-business systems

The **Administration Information Systems Committee** is continuing planning and rollout for Banner 9, which will be available in production starting summer 2018. Banner 9 will bring an updated user interface and the ability to access Banner on mobile devices.

A few highlights from the **Clinical Information Systems Committee** (CIS; a subcommittee of the IRCC) include:

➤ **Reviewed 51 (+8% increase from FY 15/16) systems with a healthcare component** to ensure compatibility with existing healthcare information technology systems while

promoting operational efficiency, limiting storage of patient information outside of the university's designated Electronic Health Record (EHR) system(s), and ensuring both patient and university data are protected within the scope of applicable university policies, government regulations, and state laws.

➤ Began including **research systems** in the assessment, review, and approval process.

➤ Worked collaboratively with ITCS to **streamline and enhance the assessment request process**, including refined communication with the requestor.

The **Distance Education and Learning Technologies Committee:**

➤ Reviewed and provided input regarding the rollout of **Microsoft Office 365** to faculty and staff. Through Office 365, users have access to 1 terabyte of OneDrive storage, which was approved for managing and storing student FERPA data.

➤ Reviewed and approved the **WebEx conferencing solution** pilot.

➤ Reviewed and approved the **IT Accessibility Regulation** and the accompanying procedures.

➤ Provided suggestions for the **Blackboard Operating Procedure** on course access.

➤ Provided valuable input on the **transition from Tegrity** to VoiceThread and Mediasite.

➤ Provided support for the adoption of a **Turning Clicker license** for students.

ASSESSMENT

Improving the Efficiency and Effectiveness of IT Services
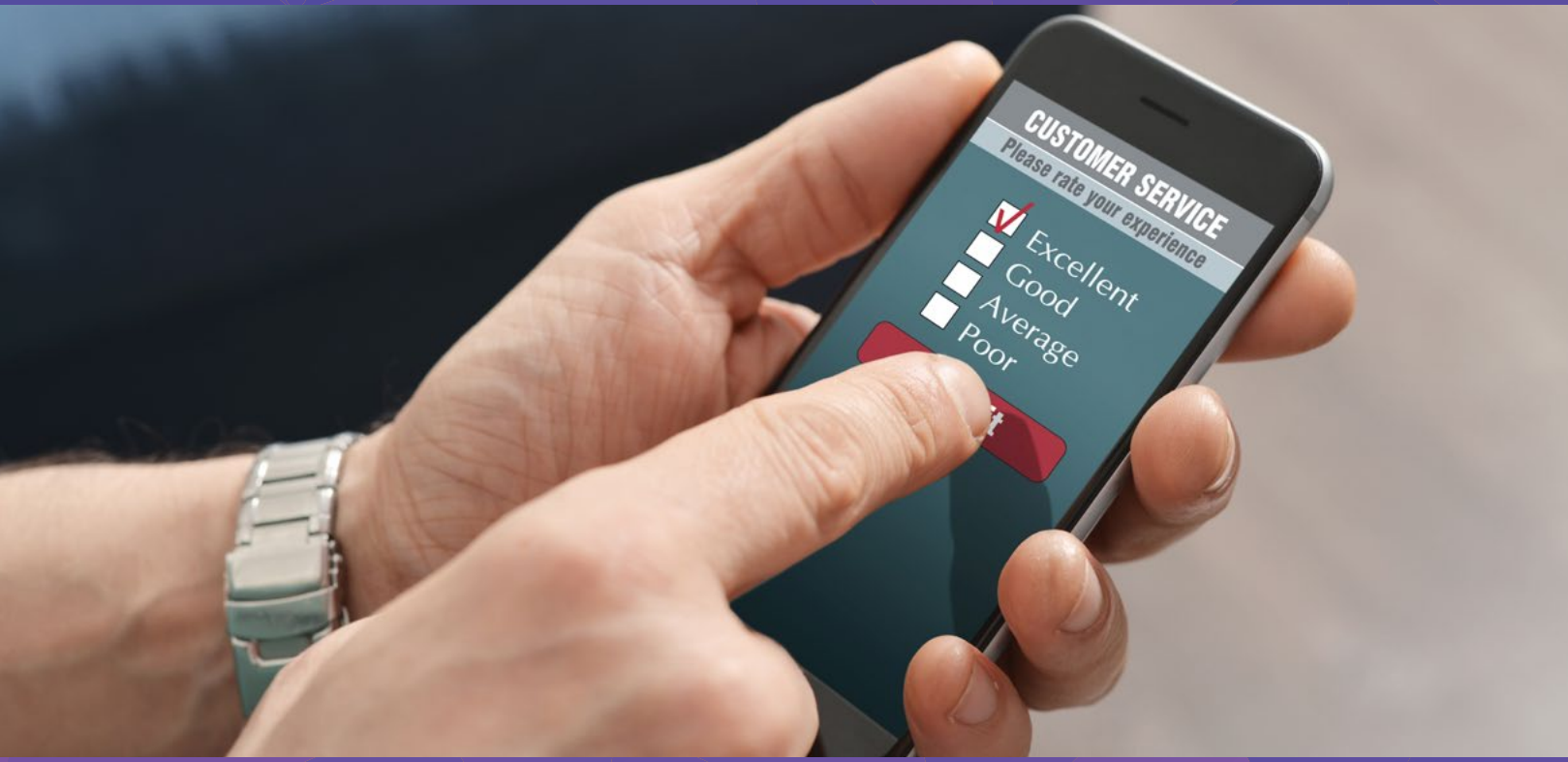
TCS reports annually to the ECU Assessment Review Committee (ARC) on the university's critical services uptime goal. This past year, **we met the 99.5% service uptime goal** for the university network, Banner, Blackboard, Email (Exchange), the main ECU Web site, and Tier 1 storage. Logs and statistics are kept on the availability of each individual core data center enterprise service, intranet and internet networks and we track all unplanned downtime. Scheduled downtime for maintenance, upgrades, and planned system outages does not impact this number. Only unplanned and/or emergency downtime impacts the calculation and can reduce the overall % of availability of major systems.

Additional assessment measures include a **customer satisfaction survey** that is sent to users

72,242 - number of service request "tickets" processed by ITCS

once a Help Desk service request is closed. In 2016-2017, on a 5-point scale, where 5 is excellent and 1 is poor, average customer service ratings were: 4.6 for calls answered in a timely manner; 4.6 for employee courtesy; 4.6 for employee knowledge; 4.7 for employee professional ability; and 4.7 for quality of service.

This year, Information Technology and Computing Services (ITCS) followed a different survey approach regarding compiling feedback about and satisfaction with current technology services and resources. We **collaborated with an external survey organization**, Info-Tech Research

Group, to administer a short survey to a small sample group of faculty, staff, and students. The survey response rate was low, thus we will be administering additional surveys in fall 2017 to obtain feedback from a wider audience.

In addition, we will be administering **very brief surveys** focused on specific educational technologies and general services to a broader group. Survey responses will be shared with campus technology committees for input and planning purposes.

This year we administered two surveys to collect faculty feedback on **Classroom Technology Standards** and **Blackboard**. The Classroom Technology survey collected input for recommendations on Classroom Technology configurations, new technology requests, and specific classroom technology issues. The Blackboard survey collected input on how we can improve the overall Blackboard experience,
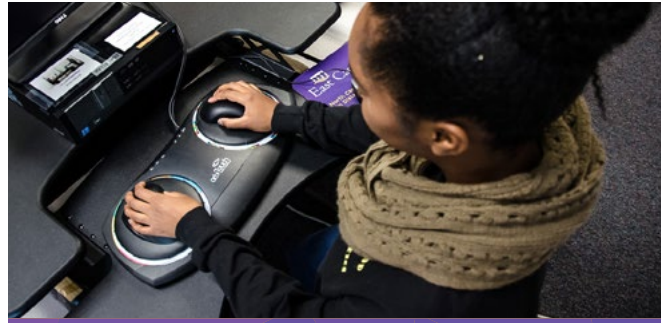
features faculty would like to see in Blackboard, and recommendations on additional support resources.

All UNC institutions are required by General Administration (GA) to administer the **Graduating Senior Survey** every three years during the spring semester and report the results to GA. Because of the importance of this survey, ECU has elected to administer it each term. The survey asks graduating seniors to evaluate their academic and non-academic experiences at ECU as well as their future plans.

The **Sophomore Survey** is also required by General Administration (GA). Students eligible to participate must have earned 45-59 credit hours, at least 30 of which must be from courses at ECU. The survey includes standard questions that are administered by all 16 UNC campuses as well as some ECU-specific questions.

In 2016-2017, on a 5-point scale, where 5 is very satisfied and 1 is very dissatisfied, average student ratings were:

ECU Information Technology Services Student Survey	Average Rating			
	2016		2017	
	Sen.	Soph.	Sen.	Soph.
Training on the technology I need to use	3.9	3.6	3.9	3.8
Assistance from the help desk in solving my technology problems	3.9	3.8	4.0	3.9
Hours of operation for university computer labs	4.0	3.9	4.0	4.0
Availability of equipment and software in university computer labs to meet my needs	4.1	3.9	4.1	4.1
*Availability of wireless access on campus	3.5	3.1	3.7	3.6
Online course management system(s) used in my classes (e.g., Blackboard)	4.1	3.9	4.1	4.0
Effectiveness of information technology in improving my learning experience	4.1	3.9	4.1	4.0
Information technology services overall	4.0	**	4.1	**

*Significant investments have been made the past several years to improve the university's wireless connectivity including adding wireless access points across campus and in particular, to outdoor common areas that receive high traffic from students; upgrading wireless management tools to provide additional levels of support when troubleshooting network issues; implementing the eduroam world-wide roaming access service; and replacing the Pirates wireless network with ecu-wifi to provide an open, non-secure network for ECU users to onboard to eduroam.

** This question was not included on the Sophomore Survey.

IT ACCESSIBILITY

Creating a Solid, Inclusive Framework

As part of our commitment to improve accessibility, **ITCS partnered with the Office for Disability Support Services** to initiate an Information Technology Accessibility Committee with the responsibility of advising the university on IT Accessibility. The overarching goal of the committee is to provide governance on Information Technology Accessibility and provide equitable access to all students, faculty, and staff to technology and information. Although this was the IT Accessibility Committee's first year, we have made tremendous progress. During this time, we have established many processes and worked on formalizing procedures that will establish a solid IT Accessibility framework for the university.

Our progress and highlights from FY17 are listed below:

➢ The **IT Accessibility Regulation was approved** by various committees and was passed by Faculty Senate and sent to the Chancellor. We received notification that the proposed regulation was received by the Chancellor as Faculty Senate advice. The proposed regulation is awaiting the next step in the PRR process.

➢ The **Web Regulation was updated** to include improved accessibility standards and requires all university websites conducting ECU official business to link to the university's Accessibility webpage that includes a statement of ECU's commitment to Web Accessibility.

➢ A **report form was added to all web pages** in CommonSpot to make reporting accessibility issues easier.

➢ **Web Governance software** that scans all ECU websites was implemented and users were notified on how to access reports that detail accessibility issues, broken links, and misspellings.

➢ We created and offered **training on IT Accessibility** for the developer, those responsible for IT communications, web content, and for faculty developing instructional materials.

➢ We have created **video tutorials** for faculty creating instructional materials and FAQ's, check lists, and universal design materials.

➢ We have created a process for **assessing course content for accessibility** and offered the review service to campus.

➢ We developed criteria for **assessing existing campus software for accessibility** and documenting issues. We have assessed Kronos, Pirate Port, Office365, Blackboard, SabaMeeting, iWebfolio, Mediasite, Tegrity, WordPress, Omeka, lynda.com, Yammer, Qualtrics, WebEx, and WordPress; we continue to move through the remaining systems and tools.

➢ **Public access electronic terminals** were evaluated for accessibility.

➢ Standard **ADA compliance language** was added to MOU's and bids issued by Materials Management.

➢ We implemented a process to **document ADA compliance**, which includes approval of exemptions, exceptions, and alternative access plans.

➢ We notified campus regarding ways to **make campus communications accessible** and offered training.

➢ We created a **closed-captioning recommendation** regarding accessibility and have distributed to campus.

➢ To support faculty, an instructional module was developed on **Universal Design for Learning (UDL)**. The module focuses on designing courses with multiple types of content, engagement and assessment in order to increase accessibility. The primary goal of this module is to discover and demonstrate ways ECU educational technologies can assist faculty with incorporating UDL into course design.

For FY18, we plan to focus on the following IT Accessibility goals:

➢ To formalize ECU's position on IT Accessibility, we will continue the process of creating an **IT Accessibility Regulation**.

➢ To improve instructional resources to support accessibility, we will **pilot Blackboard Ally**. Blackboard Ally will provide an overall course accessibility score, provide input on how to fix accessibility issues, and convert select content into five accessible formats.

➢ To improve website accessibility, we will continue to **develop WordPress as a replacement for CommonSpot** as a Content Management System. Generally, all content moved into WordPress will be accessible and mobile responsive. Additionally, we will continue the Site Improve scans to alert users of inaccessible content.

➢ To support building accessible materials for instruction, we will continue to **develop educational materials for course development**, i.e., modeling Blackboard courses by teaching style.

➢ To improve knowledge of distributed IT and communications personnel on campus, we will **add targeted communications** and training for these groups.

➢ To ensure accessible applications are available to faculty, staff, and students, we will continue to **target applications currently used** on campus that are broadly used, evaluate the applications, and provide feedback to the functional owners of the applications.

➢ To support campus with **closed captioning of videos**, we will continue to work with the Closed Captioning working group to develop standards, processes, and recommendations for campus closed captioning.

➢ To enhance knowledge of accessibility, Disability Support Services will **create materials for distribution** that inform departments of ways they can advocate for accessibility with an emphasis on IT.

➢ To ensure compliance with the purchasing process, we will randomly **review IT purchases** to determine if users are following the IT Accessibility process correctly and determine how we can better support purchasers of software.

In addition to the goals stated above, we will continue researching **Universal Design for Learning** in order to develop additional resources and training. Universal Design for Learning (UDL) focuses on designing courses in a way which creates a more inclusive learning experience for all students. Additionally, UDL is often considered the pathway to designing courses to best meet the needs of individuals with disabilities. The primary goal of this effort is to discover and demonstrate ways our educational technology toolset can assist faculty with incorporating accessibility into course design.

> As technology has become ever more central to the development and delivery of institutional programs, resources, and services, the importance of providing an accessible technology environment across a college or university has grown. To the extent that technology is critical to the core functions of the institution, the accessibility of that technology to persons with disabilities has become a key factor in determining whether facilities, programs, and services are accessible to them.
> - EDUCAUSE Policy Topic: Accessibility, www.educause.edu

SECURITY AND PRIVACY

Protecting the University's Information and Community

Ransomware: a type of malicious software that blocks access to a victim's data or threatens to publish or delete it until a ransom is paid.

May 12, 2017 – WannaCrypt Ransomware, also known as WannaCry, was used in a massive cyber attack that infected more than 300,000 computers in 200,000+ companies in 150 countries. ECU was not impacted.

May 19, 2017 – ECU began combative measures spanning several weeks against a series of phishing email campaigns. While a minimal number of ECU accounts were compromised, this number quickly increased as a snowball effect was created. Aggressive security solutions already in place at ECU enabled IT staff to successfully contain these campaigns. ITCS is in the process of implementing additional layers of security to protect the university against future attacks.

We are committed to quickly identifying and **stopping malicious cyber attacks** and potential breaches before they cause serious damage. Our security solutions provide multiple layers of protection.

As phishing campaigns usually occur through email, our primary source of protection is through **university email gateways** and technologies that inspect email messages at the perimeter network before coming into the mailbox.

In fall 2016, to increase visibility into internet activity across all locations, devices, and users, **we implemented the Cisco Umbrella security solution**. Umbrella provides increased protection against malware and phishing threats for devices connected to the ECU network. A cloud-based solution, Umbrella incorporates a world-wide network of servers that handle over 80 billion internet requests per day. Updated in real-time, this security layer prevents computers from accessing known malicious websites before the connection is ever established. It also protects computers against the theft of information and the execution of ransomware encryption. In a typical month, the Umbrella security solution blocks 368,000 malware, phishing, botnet and known bad sites from devices on the ECU network. Additionally, Umbrella helps ITCS pinpoint compromised computers before a threat spreads throughout the university network. When a computer on the ECU network attempts to access a harmful website, it will be blocked, and the web browser will be redirected to an authorized ITCS webpage.

An additional layer of protection is now in place following the implementation of **Splunk, a security information event management (SIEM)** solution that allows us to monitor logs throughout the day, creating a baseline for "normal" activity across the system. With this data in hand, it becomes easier to identify and address aberrations as they arise. Data can also be used in a forensic capacity to help analyze incidents when they do happen and to help us prevent repeat incidents.

Training the campus community addresses a vulnerable link in the quest of a secure environment- human error. Through outreach and security training, we have begun transforming the ECU population into a strong line of defense in support of information security and privacy.

This past year, ITCS launched the **university's first mandatory Information Security Awareness course** for all ECU employees. The course was developed in collaboration with stakeholder representatives from across campus to educate employees on ECU's best practices for protecting university information. The course is hosted online in the university's Cornerstone Learning Management System, where it is now part of the official employee training record. As of June 2017, 4,943 traditional employees have completed the IT Security course (~80% of those assigned) and 1,665 student employees (~60% of those assigned).

We also **established a new information risk management process** based on ISO 27005, an internationally recognized framework for information risk management. The ITCS Information Security Office conducts an annual Information Risk Assessment, which identifies enterprise-level information risks that are subsequently documented in a risk register for tracking. The associated risk management plans are documented in the ECU TeamDynamix Project Management System for progress tracking and reporting.

> 2017 Top 10 IT Issues – Information Security is the #1 IT issue for 2017. Last year's top challenge persists: to develop "a holistic, agile approach to reduce institutional exposure to information security threats." As both data and threats become more consequential, personally identifiable information, as well as institutional assets and reputations, is more important and more difficult to safeguard than ever.
>
> - EDUCAUSE Review, vol. 52, no. 1 (January/ February 2017)

ECU departments maintain more than 100 HIPAA systems campus wide. HIPAA administrators are required to review system logs on a monthly basis. We implemented an **automated log management solution** to enable automatic notification of security events, log review and reporting for HIPAA administrators to help them comply with requirements. This involved installing, monitoring and alerting software on approximately 100 HIPAA workstations and servers. This software assists system administrators by combing through system logs alerting them to suspicious activity.

We implemented a **new Intrusion Protection System (IPS)** to monitor for incoming and outgoing threats and vulnerabilities. This system improves security and permits greater capacity and increased granular control of permitted and non-permitted network traffic.

We underwent a **Security Risk Assessment** performed by an external risk assessor agency to gauge ITCS's security and vulnerability posture. An internal Security Assessment was also performed on our Windows-based systems to ensure consistent adherence to internal best practices on supported systems.

BEHIND THE SCENES

Powering Critical IT Resources

Infrastructure / Data Center

Supporting ECU's complex **infrastructure** is no small feat. Tremendous effort is dedicated each year to routine maintenance and upgrades that are necessary to keep the network and other systems running smoothly. Though these resources are invisible to most, they are critical for their continued success in learning, research and day-to-day operations. Being proactive at efficiently updating, maintaining and supporting these systems provides confidence to our campus community that the work and activities in which they engage will not be impeded by outdated systems.

Past Year's Activities:

➢ Additional **Cisco Nexus Data Center switches were installed** to provide resilience, unified technologies and increased data rates.

➢ We **upgraded and installed portions of equipment in the overall core, distribution and access layers** to provide greater redundancy and fault tolerance. New equipment delivers increased data throughput for endpoints and higher power over ethernet capabilities.

➢ We deployed **several additional network switches and installed infrastructure cabling** in various campus locations to increase network growth and capacity needs. This included additional capacity for users, new technology-enhanced classrooms, IP cameras, access points, fire alarms, burglar alarms, HVAC monitoring and electrical system monitoring.

Wireless

We continue to **expand the university's wireless LAN capabilities**. Over 2,500 access points are now in production supporting 23,000 concurrent users during peak times, providing greater density for the increasing number of devices and reducing

➢ Upgraded **high-use locations to 10G and 40G connectivity** to limit the impacts of the increasing bandwidth demands.

➢ **Network topology changes** to lessen the impacts of network storms and provide more efficient routing of network traffic.

➢ Conducted several **major hardware replacement projects** to replace aging hardware and to ensure continuity of service. Replacements include the voice infrastructure servers, Banner database system, Internet Native Banner, Banner Self-Service, and faculty and staff email.

➢ **Consolidated critical databases** on clustered database systems. This not only delivered system consolidation but also provides fail over redundancy for many of our critical database systems.

To accommodate our growing server-hosting infrastructure, we worked with ECU Facilities and a 3rd party engineering firm to **conduct a preliminary study and cost estimate for expanding the Cotanche Data Center**. The study assessed the physical expansion of the server room floor space, upgrades to the electrical infrastructure, replacement of aging chillers and modifications to the Data Center's fire suppression system. To provide needed cooling redundancy, we deployed a 5 ton A/C unit in our telecommunications room. To ensure efficient and appropriate responses in a fire emergency situation, Data Center staff successfully completed FM200 fire suppression training.

the contention for a limited resource.

This past year, we installed **campus outdoor Wi-Fi access points**, allowing students, faculty and staff to connect to the web with their own devices

and take their studies outside of the classroom. Locations include College Hill area, various areas on Main Campus and the North Recreational Complex. This will provide a greater continuity of mobile services as our users move around the campus.

Additional areas we installed or upgraded wireless connectivity include the new Health Sciences Campus Student Center (100% coverage with 802.11AC dual band access points); Hendrix Theater to provide high-density access (700-seat capacity); outdoor areas near the ECU Transit bus stops; and several areas within the following locations: Joyner Library, Austin, Messick, McGinnis, Rawl, Rivers, Jenkins Art, Science and Tech, Brewster, Flanagan, Bate, Joyner East, Fletcher Music, and Umstead.

In addition, we **upgraded wireless management platforms and access point software levels** to provide additional levels of support when troubleshooting network issues.

A new set of **firewalls, with greater capacity, was installed to serve the dorms** and provide greater access to the Internet.

A new set of **firewalls was also installed for the university internet connection** as well, providing

greater capacity and throughput.

Eduroam, a secure, world-wide roaming access service developed for international research and education community was implemented in fall 2016. Many institutions are now members, including several other UNC institutions. Eduroam has resolved many of the student connection issues we were experiencing and has improved service in this area.

In May 2017, **the ecu-wifi network replaced the Pirates wireless network** to provide an open, non-secure network for ECU users to onboard to eduroam and connect internet-ready devices such as Smart TVs and other multimedia devices that connect through eduroam for internet access; however, users must authenticate each time they connect. As part of accessing ecu-wifi, **My Devices Portal**, mydevices.ecu.edu, was also deployed offering users to register their device to avoid the logon process each time while connecting through the ecu-wifi network. Users may register 2 devices at a time. The **ecu-guest** SSID turn on was in August 2016.

Wired

We **added networking** to several new locations and upgraded existing networking in others, including the Health Sciences Campus Student Center, Eastern Area Health Education Center (Eastern AHEC; main Greenville office) and Office of Clinical Skills Assessment and Education, and Environmental Health and Safety. These additions along with other upgrades have **increased ECU's total data port count** to approximately 65,000 for Main and Health Sciences Campus. In addition, we **upgraded the university Digital Radio System** from analog to digital technology.

During the spring of 2016, ECU Voice Services started a multi-phase **VoIP Technology Refresh** project to upgrade 7,500+ 7900-series VoIP phones on campus. These phones have been in use since the early 2000's and have become obsolete from a support and repair perspective. A new telephone platform was identified which allows for enhanced features. Phase 1 of the project was completed in April of 2017 with over 4,000 new phones installed. During this project, ITCS worked with 6 student employees to assist with the phone deployment which included the local phone migration, training users on new phone features and working through the inventory process. Phase 2 includes the distribution of over

3,000 VoIP phones. This phase started in May 2017.

In FY17, Voice Services applied **two upgrades for Unified Contact Center Express** (UCCX) to implement enhancements and bug-fixes. The year started at version 10.5 and is now operating at version 11.5. The UCCX platform had a standard reporting suite built-in that did not allow for customized reports. To improve reporting features, Voice Services deployed the Cisco Unified Intelligence Center solution. This application is a web-based reporting tool that provides metrics on automatic call distribution and auto attendant phone systems affording ECU Call Center Supervisors to create customized reports to meet their reporting requirements.

Additionally, ECU began transitioning to **Cisco Unity Connection (voicemail)**. Unity Connection lets users access and manage voice messages from an email inbox, web browser, Cisco Jabber, Cisco Unified IP Phone, smartphone, or tablet. Unity Connection also provides flexible voice message access and delivery format options, including support for voice commands, speech-to-text transcription, and even video greetings.

DEVELOPING CONTEMPORARY SYSTEMS

Supporting the Effectiveness of University Operations

This year **Kronos** was implemented in Enrollment Services, Parking and Traffic, University Advancement, School of Dental Medicine, REDE, IPAR, Honors College, Office of Equity and Diversity, Academic Library Services, and the Advising Collaborative. In all, over 1,000 new users were brought into Kronos. Next year the Kronos project team will focus on implementation in the academic areas with the Kronos project slated to be fully completed in 2018.

ITCS provides programming support for **MATCH (Motivating Adolescents with Technology to CHOOSE Health)**, a grant-funded initiative that uses middle school curriculum to promote healthy living. We assisted with the programming for version 3 of this online system that includes an innovative Android and iPhone application that allows middle school students to track their healthy activity. The MATCH system has also been fully migrated from a 3rd party hosting provider to the ECU Data Center.

ECU works with thousands of vendors to conduct business, and managing vendor information such as contact information and payment changes can consume significant university resources. To provide support in this area, ITCS assisted with the implementation of **Total Supplier Manager by SciQuest (TSM)**. TSM allows vendors to manage their own contact and payment information

from within an innovative supplier portal. With the implementation of TSM, all ECU vendors now have access to and leverage the portal for updates.

To improve our **database administration** this past year, we:

➤ Replaced the **Banner Database Hardware**, utilizing the latest database appliance technology with Oracle's Database Appliance. The migration enabled many improvements in support, performance and availability of the Banner database. As part of the migration, the database software was upgraded to Oracle 12c and Oracle's Real Application Clusters, providing high availability in the event of a hardware failure. Additionally, we implemented Oracle's Data Guard, with three additional databases to enable fast disaster recovery and offload ad-hoc reporting to the alternate databases, thereby maximizing the computing resources on the Banner production databases for the core Banner OLTP system.

➤ Consolidated 12 **Oracle databases** on the new Oracle Database Appliance hardware, reducing the number of physical servers necessary to support the environment, reducing maintenance overhead, upgrading the databases to Oracle 12c, and utilizing a common operating system. The consolidation was estimated to save over $150,000 in maintenance and support costs.

➤ Installed **SQL Server clustering** to provide high availability for our SQL Server databases – our other major database management platform, supporting many of our third-party, business-critical applications.

➤ Began the **migration of the Banner application tier** to Linux virtual machines, in preparation for the Banner 9 implementation.

The **migration of our existing Internet Native Banner (INB) and Banner Self Service (SSB) application environment** was completed this fiscal year. We installed a prototype database for Banner 9 and configured the new Ellucian Solution Manager (ESM) toolset to deploy and manage Banner 9 software installations and upgrades.

In fall 2016, the **ecuBIC infrastructure's hardware was upgraded** to accommodate larger reporting and analytics workloads, and to provide high availability in the event of a hardware failure. In addition to these hardware enhancements, ecuBIC's software was also upgraded to provide a significant number of new features, including: viewing reports in any modern browser, and on mobile devices for on-the-go, anywhere insights; Power BI interactive analytics; data-driven report delivery, exporting reports to PowerPoint; integration with R (statistical language for data scientists); bookmarking analytics solutions to greatly improve accessibility; and new chart types, such as tree maps, Sankey, and waterfall.

In support of ECU's Data Governance initiative, a new software application, **Adaptive's Metadata Manager (AMM), was purchased and implemented** to capture and maintain technical and business process information for ECU's institutional data. Metadata, which is

data that describes, and provides context for "raw" data, allows both functional and technical information workers to better understand and manage the University's valuable data assets. AMM organizes, integrates and centralizes this metadata for a number of useful purposes: to enable "impact analyses" to assess the impact that an interruption in business processes would have on the availability of institutional data; to create "data lineages," which are process flows representing the movement of data through our line-of-business applications on its journey to reporting/analytics solutions and other destinations; to categorize data for the appropriate assignment of stewardship responsibilities; and to classify institutional data according to its level of sensitivity. ECU is currently maintaining an inventory of the data/metadata for Banner and the ODS. The scope of this work will expand to incorporate all institutional data in the coming years.

In an effort to increase the timely graduation of our students, ECU implemented Ellucian's DegreeWorks application to aid departments in determining optimal course offerings. This past year, the Registrar's office and ITCS worked together to create a suite of **DegreeWorks reports** that is helping the university meet established goals. These reports will allow advisors and university executives to monitor the effectiveness of their students' plans, provide course projections, and deliver support and information to the Finish in Four initiative.

The College of Business and ITCS **expanded the collection of Preliminary Registration Statistics dashboards** (completed last year) to include a set of views of data specific to the College of Business. The reports and visualizations contained in this series of dashboards delivers more focused insights into college-level student enrollments.

EFFICIENCY AND EFFECTIVENESS IN OPERATIONAL DELIVERY OF SERVICES

Ensuring Quality IT Services for the University Community

The **Pirate Print service** allows students to print at a variety of campus locations while also reducing paper, toner, and energy waste. During the 2016-2017 academic year, 6,261,219 pages were printed by students from 154 printers across campus. Color printing increased significantly, with 431,029 color pages printed, a 96% increase from the previous year.

We made available to the campus community an upgrade from **Lync to Skype for Business**, and rolled out **Office 2016** to users by request.

We developed **new layers of the campus map** based on input from campus. Campus Maps facilitate navigation of ECU for visitors and others on campus.

We created an **improved interface for the ECU Software Download Center**, used to distribute software to faculty, staff, and students, that is more user-friendly and better aligns with the ITCS website.

We implemented the **second phase of TeamDynamix**, a solution that integrates Service Desk Management and Project Portfolio Management into one combined system, integrating several colleges and departments.

> **Printed the equivalent of 1.1 million bulb hours, 18.800 kg CO2, and 52 trees**

In addition, we analyzed the change, asset, and knowledge management within this system.

We created a **video tour for prospective students** as part of the Admissions website. This website will incorporate videos captured by Creative Services for various areas on campus to promote campus to prospective students.

We **simplified the process for PRR (Policies, Rules and Regulations) administrators**, giving them complete control through the entire 3-step process.

This past year, we adopted a more structured approach for creating websites. We created a **new content management system (CMS) infrastructure** using **OpenStack, OpenShift and WordPress**. WordPress themes, widgets, and plugins have been built. The new environment is currently being piloted by several departments that are creating their departmental website. Once this pilot is complete, the new CMS will be extended to other departmental website owners to begin

creating their sites in WordPress. We estimate the migration to take approximately 3 years.

Email enhancements this past year included:

➢ Migrating Exchange 2010 mailboxes to **Exchange 2013** on new hardware with local storage.

➢ Upgrading our current on-premise Exchange email system from Exchange 2010 to Exchange 2013. Users now have a **5GB mailbox**, increased from 1GB.

➢ Moving all **email journaling and archiving** to Office 365 in preparation for moving faculty and staff email to the Microsoft Office 365 cloud environment in the future.

To facilitate collaboration, ECU is moving to a **cloud conferencing solution, WebEx Cloud**. This conferencing solution will continue to provide the convenience of Outlook scheduling, desktop sharing, audio or video calling, personal meeting rooms, mobile hosting and attendance, integration with Microsoft Office and browser integration for IE, Chrome and Firefox.

Each year, ITCS coordinates the **upgrade cycle for employee laptops and desktop computers**. This past year, we configured, ordered, and deployed: 232 computers for faculty; 420 for administrative staff; 43 for ITCS staff; and 523 for Brody School of Medicine employees, as well as 374 monitors

and 100 printers for this area.

We configured and deployed a **new remote management device** that will allow our Desktop Technology Support team to securely and quickly access, diagnose, control and fix remote computers. Features include remote control and screen sharing; chat support; help desk package integration; monitoring and auditing capabilities; and support collaboration.

To provide a greater presence for student technology support, **Pirate Techs Student Computing Support Center** closed its Rawl Building location, and relocated from its previous room in Joyner Library to a more central area within Joyner with higher traffic from students. Pirate Techs staff are extending hours of operation by offering night and weekend support. During summer orientation sessions, Pirate Techs worked alongside Dowdy Student Stores IT staff, providing assistance to incoming students and their parents.

ITCS CORE VALUES

Knowledge
We are life-long learners, utilizing emerging technologies and skills to effect positive change and capitalize on opportunities.

Relationships
We embrace teamwork, open and honest communication, working across departmental boundaries with the strength of our diversity as we foster collaborative, supportive and empowering relationships.

Ethics
We employ the highest ethical standards to guide our decisions and actions as we meet and then exceed our commitments.

Well-Being
We are committed to the personal and professional development and achievement of the individual in an environment where everyone is a valued member, treated with respect, encouraged to contribute and recognized and rewarded for his/her efforts.

Service
We provide excellence in customer service to meet and exceed the needs of our students, faculty, staff and larger community.

ENHANCING ACADEMIC TECHNOLOGIES

Ensuring Quality IT Services for the University Community

Classroom

Providing faculty and students with learning spaces equipped with current technology has and will continue to be vital to the teaching and learning experience at ECU. This year rooms and labs in multiple locations across both Main and Health Sciences Campus have been expanded/upgraded to meet growing needs.

The **Classroom Tech website and search tool** was enhanced to incorporate instructional cards, video tutorials, contact information, room build types, and photographs of each classroom.

To improve understanding of faculty resources and the technology for instruction, we created a **video tour of each type of classroom**. From the classroom desktop, faculty can link directly to a webpage that details the equipment in the room and resources.

In addition to renovations and hardware upgrades, **upgrades of current lecture-capture systems** and pilots of applications that provide **software-based lecture and video conference recording** was completed. The option for faculty to record and share classroom lectures provides students on-demand content for review, which is valuable to their overall success.

This year, we piloted a **new videoconferencing system** with the Telemedicine Center to connect to patients across the region to replace the current system that is no longer supported. As eastern North Carolina continues to grow, services provided by the Telemedicine Center are essential to adding to the quality of life of eastern North Carolinians.

A **large-scale, multi-year project involving modernizing the Brody School of Medicine's departmental conference rooms** was completed this past year. Several departments including Facilities, ITCS, and various outside vendors and contractors worked together to **upgrade 81 rooms**. This massive project involved identifying

and walking through each of the rooms – some of which had little to no technology, while others only required analog to digital upgrades; developing a standard set of AV equipment to more quickly accomplish project goals and provide easier maintenance in the future; and developing a cost assessment for modernizing the equipment.

The following A/V standards were implemented in these rooms: Air Media (to present and share content wirelessly); Flat Panel Display; Blue Laser Projector (for large rooms); Access Point (for wireless connectivity); Connectivity for the computer and laptop in the table; and SMART kapp board.

Two new tools were launched for faculty: **OneDrive for Business and Office 365 Web Applications**. OneDrive for Business offers cloud storage as part of the Office 365 subscription for faculty, staff, students and alumni email. Features include 1TB of storage for non-sensitive information and FERPA data, sharing and collaboration with both ECU and non-ECU users, mobile apps for anytime, anywhere access and web apps that allow users to create new and edit stored PowerPoint, Excel and Word documents. The sync app makes saving documents to the cloud quick and easy with instant access from anywhere to the latest file version.

The Learning Management System (Blackboard Learn)

Implementing tools that improve efficiency and offer new capabilities simplifies and enhances the usefulness of our learning management system as that single, virtual location where students and faculty can engage.

Based on feedback from students and faculty, this year we implemented several tools that integrate with Blackboard to meet the needs of faculty and students:

651,263 - average daily page views in the Blackboard Learning Management System

1,548,911 - page views in the Blackboard Learning Management System on the busiest day

- ➤ **Blackboard Outcomes** was utilized in English courses 1100 and 2201, with 4,000 students. Outcomes will provide the method to download all Portfolio submitted artifacts through the admin Outcomes view and provide the ability to download rubric reports all at once.

- ➤ **VoiceThread**: Based on FY16 feedback and support tickets, we identified the need for a video tool, with features and efficient workflows to facilitate student recording assignments. The VoiceThread platform has features specifically designed for student recording assignments, student feedback and threaded discussion using video, audio and text. VoiceThread integrates with Blackboard

and can also be used for faculty lecture capture.

- ➤ **Qwickly**: The Qwickly plug-in increases efficiencies in Blackboard course development. Faculty can post announcements and content into multiple courses at one time.

- ➤ **EAC Visual Data**: EAC Visual Data makes the process of mapping, collecting, analyzing, and reporting data easy and intuitive. EAC Visual Data is designed to integrate tightly with Blackboard and enable reliability analysis of text items and outcome reporting at the individual test item level.

Audience Response: Turning Technologies

Turning Technologies has been the audience response (clicker) recommendation since 2009. Approximately 4,000 clickers are sold through the Dowdy Student Stores annually. We have acquired a **campus-wide license for Turning Technologies**, which provides numerous benefits to the university. Students can now use clickers at a much lesser cost and acquiring their licenses will be done conveniently through our learning

management system. Also, students who previously invested in a Turning Technologies clicker will not lose use of that investment. With campus-wide licensing in place, the university will be able to remain in step with changes and trends in audience response technology such as the expected progression to mobile device app polling.

ITCS: GLANCE AHEAD

What's In Store for 2018

In the year ahead, we plan to complete numerous projects that will enhance our technology offerings, accommodate the growth of our user community, improve our security, and enhance user experiences. A few major projects we would like to share with you are centered on improvements in our infrastructure, our services, and our security.

To maintain and improve our infrastructure, we will

➢ continue **replacing our oldest blade servers** with new blade systems and as appropriate workloads will continue to be moved to virtual infrastructure to take advantage of the built-in high availability of that platform.

➢ further **drive infrastructure automation** for provisioning, patching and configuration management to speed delivery of new or replacement systems and ensure overall configuration consistency.

➢ bring a **new tertiary Data Center site** online for disaster recovery protection against catastrophic failure of both Greenville Data Centers.

➢ complete implementation of the **security information and event management (SIEM)** system.

> The three trends exerting the most influence on higher education's IT strategy are (1) continued complexity of security threats, (2) student success focus/imperatives, and (3) data-driven decision making.
> - Trend Watch 2017: Which IT Trends Is Higher Education Responding To?, ECAR, 2017

➢ continue to **increase our bandwidth capacities from 1Gbps to 10Gbps** within identified areas of the distribution and access layers. Our core bandwidth will shift from 10Gbps to 40Gbps where necessary.

➢ upgrade the **primary Internet connection to 20Gbps** to handle the increasing demand for Internet bandwidth.

To improve our security, we will

➢ develop an **online information security training course** for ECU supervisors and managers. This course will cover supervisor and manager obligations for ensuring their employees are aware of their security responsibilities and have the resources to carry out those responsibilities.

➢ establish a **risk escalation process** that ensures university risks arising from unmanaged or unsecured IT systems are promptly and adequately resolved.

➢ establish a **Mobile Computing Regulation** for the University, which defines management and employee responsibilities for the safe and appropriate use of mobile computing technologies.

➢ establish an **ITCS Security Operations Center** that will provide threat identification, analysis and reporting services for managing the risks to ECU's IT infrastructures.

➢ enable **2-factor authentication** technology for student and alumni accounts to improve security and prevent phishing and ransomware attempts.

To improve our support of student success and faculty teaching, we will

➢ upgrade **Blackboard** in May 2018.

➢ implement **Blackboard Analytics** Phase 2 to improve feedback for faculty and students, and to understand usage of the university Learning Management System.

➢ pilot **WebEx with Blackboard integration** to enhance student and faculty communication and improve student engagement.

➢ upgrade numerous **centrally-scheduled and departmental instructional spaces** with the latest in audio visual technology to improve classroom instruction.

➢ to improve student access to technology, **upgrade computers in 39 computer labs** across campus this year and increase **scanning and copying** functionality in campus computer labs.

➢ continue the creation of an IT Accessibility Regulation to **formalize ECU's position on IT Accessibility.**

➢ pilot **Blackboard Ally** to improve instructional resources which support accessibility.

➢ implement **VIVO to display faculty research information** and to interface with the new faculty reporting system, Faculty 180.

➢ release **Microsoft Office 365 collaboration tools** (Teams, Sway, Forms) essential for faculty and students.

To improve our campus services, we will

➢ move users' **archived email** to a hosted Office 365 solution.

➢ improve the **university web presence** and create a more agile web environment by **implementing WordPress** as a new content management system. The move to a new content management platform will increase accessibility, mobile responsiveness and easily enable branding updates.

➢ implement the **Apple Volume Purchase Program** to enable ECU units to find, buy, and distribute apps and books in bulk for faculty, staff, and student Apple devices.

IN CONCLUSION

"As you have read, ITCS has been extremely busy this year. Once again, I am extremely proud of our staff and the work that was and continues to be accomplished for our students, faculty, and staff. Without hesitation and bias, of course, we have the best IT staff in the UNC system!"

-Don Sweet, CIO

Questions and Feedback

If you have questions about the major undertakings listed in this report, please contact a member of our ITCS leadership team. Your questions and comments help us better understand the needs of everyone at ECU who uses our services.