

An abstract geometric diagram consisting of several circles and lines. A large solid circle is at the top left, with a smaller dashed circle inside it. A vertical line extends from the center of this circle down to a small circle at the bottom left. A horizontal line extends from the center of this bottom-left circle to the right, ending at the center of a dashed circle. Another line connects the center of the top-left circle to the center of the bottom-right dashed circle. A thick yellow vertical bar is positioned to the left of the main text.

EMPOWER DISCOVERY

Texas A&M Information Technology | 2016 Annual Report

FROM THE CIO

Whether transforming learning, increasing innovation or expanding our impact, technology plays an essential role in supporting the university's mission.

In only one semester at Texas A&M University, I've been immensely impressed with our institution. Texas A&M's commitment to "Lead by Example" is an inspiring aspiration, and Texas A&M Information Technology is dedicated to providing tech services to empower our students, faculty and staff to fulfill this far-reaching goal.

Whether transforming learning, increasing innovation or expanding our impact, technology plays an essential role in supporting the university's mission. In 2016, Texas A&M IT made significant strides in our collective efforts to foster innovation, improve shared IT services and plan for the future. We expanded our network and strengthened our security posture. We are building an innovative new Service Desk and Security Operations Center, as well as a state-of-the-art Data Center that will grow with Texas A&M for decades to come.

In 2017, we will establish IT governance on campus, integrating important voices from our students, faculty, researchers and administration. We will roll out new, robust tools that will enhance efficiency for the enterprise, and we will drive discovery through a joint initiative with High Performance Research Computing to facilitate campus researcher's access to the XSEDE system, the most advanced, powerful and robust collection of integrated advanced digital resources and services in the world. Through it all, empowering the university's mission will be paramount.

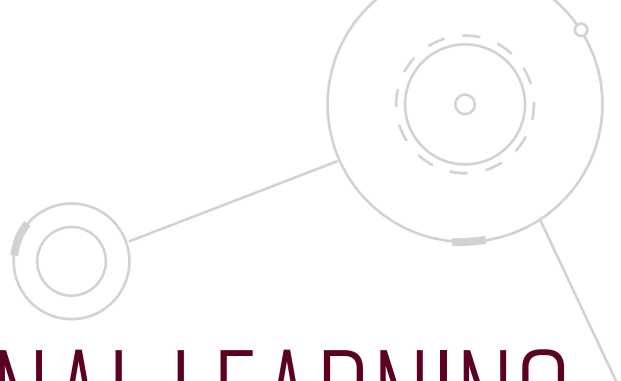
I'm excited to lead Texas A&M IT. This year's report highlights only a few of the ways Texas A&M IT is Leading by Example, and I look forward to supporting the university as we lead the way in learning, innovation and impact.

M. Dee Childs

Vice President for Information Technology
and Chief Information Officer
Texas A&M University

ENGINEER

TRANSFORMATIONAL LEARNING



Geography Ph.D. student Andrew Evans climbs into a manhole to begin the fiber mapping process.

Students Step Up, University Succeeds

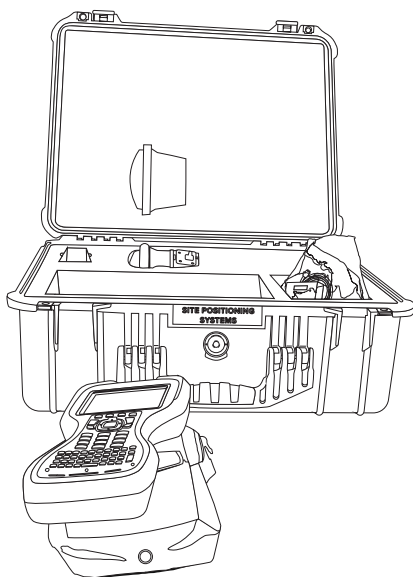
You might think the students were looking for treasure as they wandered campus with devices resembling metal detectors, but this hunt is unique. Their treasure: fiber optic cable that supports phone and internet services buried four feet below ground. Their mission: creating an updated map of the campus fiber infrastructure.

Because the Texas A&M campus is the size of a small city, this turned into one of the largest fiber optic mapping projects in the nation. Most universities would outsource to a private firm, but Texas A&M IT wanted to provide Aggies with a transformational learning opportunity and collaborated with the Department of Geography to assemble

a team of students. Launched in 2016, this project will give the students two years of valuable hands-on experience.

Using a utility line finder, the team has been able to locate 100 miles of underground cable, mark it and digitally record it for spatial accuracy. This data will be used to create an interactive 3D map of the university's fiber infrastructure to prevent construction line cuts, ensure outages are quickly repaired, and more effectively plan campus building projects.

View the team in action at u.tamu.edu/fibermap.



BEYOND THE CLASSROOM

Technology enhances and empowers learning.



10,014
online chats



90,931
phone calls



14,848
counter visits

Help Pops Up

New in 2016, Help Desk Central Pop-Up Stations were placed in busy locations the first two weeks of the semester to provide in-person IT support. This initiative allowed students to quickly get the help they needed and get back to their studies. With an innovative, state-of-the-art facility renovation underway, Help Desk Central will be able to assist an even greater number of Aggies with their tech needs, whether they call or walk in.



The new Help Desk Central facilities are projected to open in summer 2017.

\$2.6
MILLION
IN SAVINGS
OFF RETAIL PRICE
on Microsoft Office alone

Small Cost, Big Advantage

The cost of higher education has increased significantly over the past decade, and Texas A&M IT strives to lessen the financial burden by providing essential software at deeply discounted prices through its Software Center. In 2016, campus members saved over \$2.6 million on Microsoft Office purchases alone.

Expensive, highly specialized software such as SAS, Matlab and ArcView are offered free of charge to Aggie students through licensing negotiations with major software companies. "The opportunity to gain real-world experience using Matlab is essential to securing my dream job," said junior biomedical engineering major Michael Zimmerman.

"More professors are using these tools in their classes because it gives students a tremendous advantage without additional cost," said Ed Pierson, Director of IT for the College of Engineering.

Leading & Learning

Texas A&M IT's Technology Summit creates a unique opportunity to blend technical learning with leadership and project management skills. In 2016, over 300 IT professionals across The Texas A&M University System attended. The conference provides a unique opportunity for collaboration across The System, while also encouraging the growth and development of IT professionals as they showcase innovative technology practices and lessons learned.



Sherita Love, Director of Distance Learning & Instructional Technology, presents at Tech Summit.



lynda.com

227 SUBJECTS

8,500 COURSES

28,400 TUTORIALS

Dive Deep, Expand Horizons

Producing highly-competitive graduates for the job market is a top priority. In 2016, Texas A&M IT, in collaboration with other university departments, launched the Lynda.com video training service to all students and employees. With free access to thousands of video tutorials, Aggies can learn to develop websites, improve presentation techniques, and more. In the classroom, Lynda allows faculty to easily enrich their courses, while empowering students to expand their knowledge and skills.



Communications major, Zinat Ahmed, browses the TechList website.

Set Up for Success

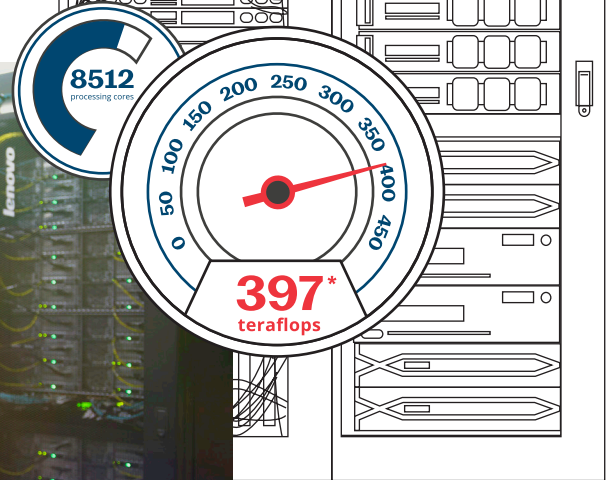
"What computer should I bring to campus?" After hearing this question from hundreds of new students and parents each summer, Texas A&M IT developed an innovative TechList website to give personalized technology recommendations based on a student's major. In 2016, more than 10,000 new Aggies and their parents visited the website - it.tamu.edu/getstarted.

EMPOWER

INNOVATION & DISCOVERY



Honggao Liu stands in front of the new supercomputer, Terra.



*1 Teraflop is a unit of computing speed equal to one million (10¹²) floating-point operations per second.

More Power, More Discovery

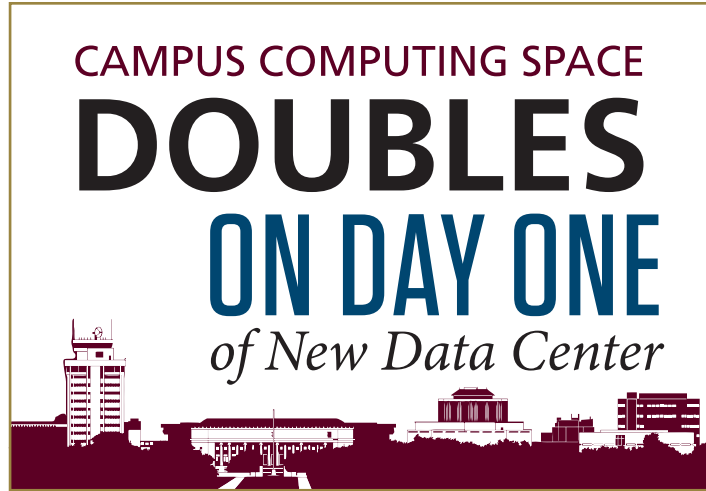
Supercomputers play a vital role in faculty recruitment, and compute hours are frequently assigned to new faculty to highlight the university's commitment to facilitate data-driven discovery and research. In May 2016, Texas A&M IT got the call about plans for the new Terra Supercomputer. Our team jumped into action, preparing the Teague Data Center for its new occupant. Modifications and enhancements were made to the power and cooling infrastructure to support this new, high-powered supercomputer. After only six months of coordinating with vendors, researchers and groups across campus, the Terra cluster was installed.

Texas A&M University's supercomputers have transformed the search for Malaysia Airlines Flight MH370, helped saved lives with the Texas Transportation Institute's predictive crash simulations, and helped the Texas A&M University Department of Oceanography chart oil dispersion along the Texas and Louisiana coastline. The new Terra cluster offers 10 times the processing power of its predecessor, and the increased computational power will continue to increase Texas A&M's competitiveness in computational sciences. Currently, more than 150 faculty members engage in computational science as either a primary discipline or as an essential part of their research.

Innovative Infrastructure

State-of-the-art high performance computing and data storage are essential to any research-intensive university. To meet the university's current and future infrastructure demands, Texas A&M IT is building a new 30,000 square foot, fully redundant Tier 4 data center in the Fred W. Dollar Commissary building.

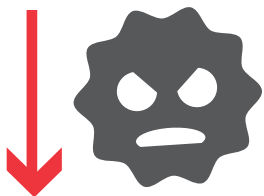
By more than doubling the existing data center footprint on campus, Texas A&M can consolidate many individually managed servers to one site and focus its security and bandwidth resources to a single location. Many of these local servers are inefficient and require considerable cooling, resulting in higher energy costs. The power delivery and cooling effectiveness of the new data center will be about 80 percent more efficient than if left on campus. Centralizing server infrastructure also gives college IT staff more time to focus on creating innovative IT solutions and supporting faculty needs.



The new data center will include cutting-edge, self-service server virtualization services as well as build-to-suit co-location spaces designed specifically for new High Performance Computing Systems. With increased resource space, Texas A&M IT can respond more quickly to the university's need for additional services and compute resources.

A secure and robust cyberinfrastructure positions Texas A&M to take advantage of **billions of dollars of federal research funds.**

In the
FIRST WEEK
of operation,
THE NEW FIREWALL



BLOCKED
1 MILLION
virus downloads

Securing Our Reputation

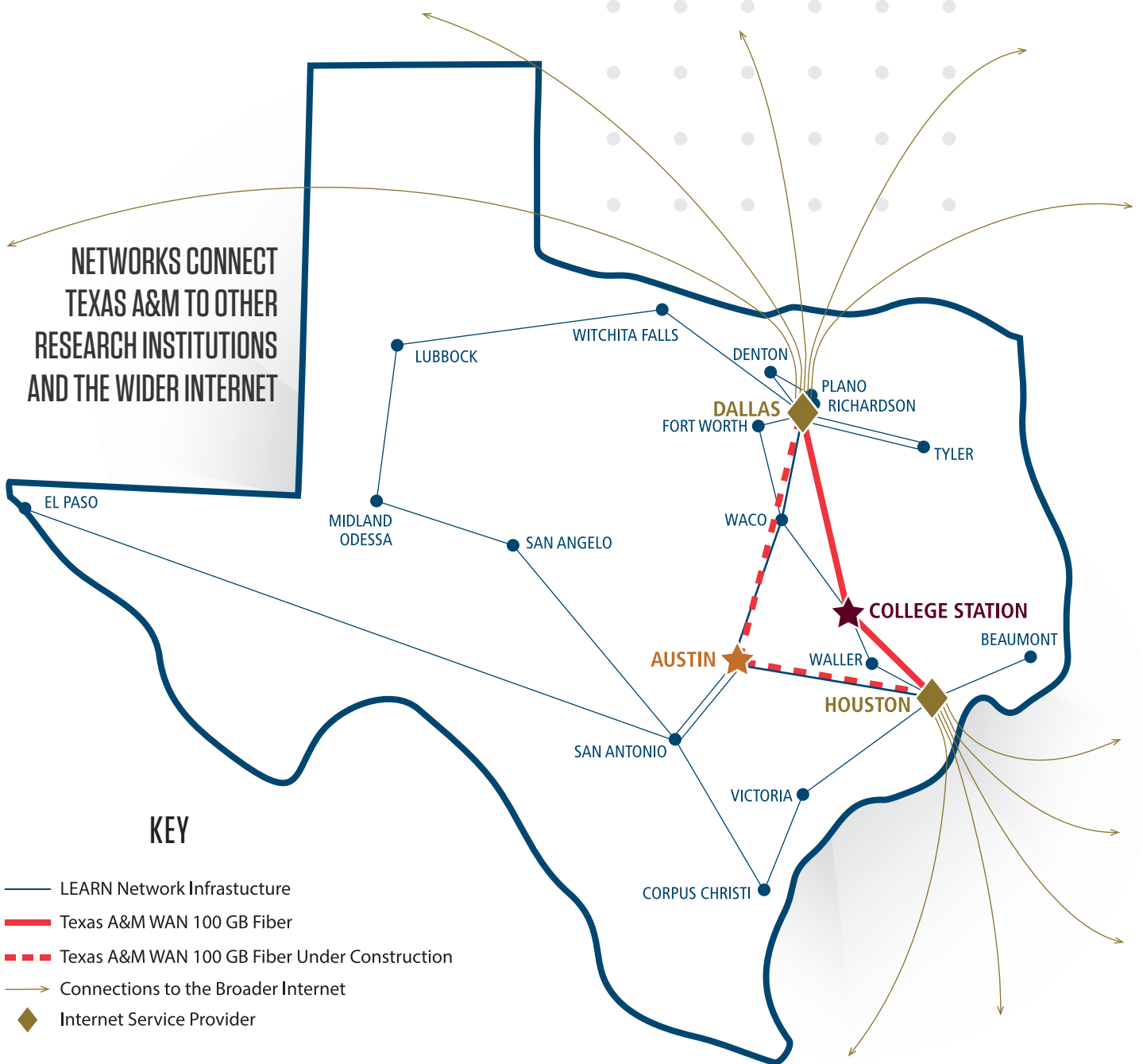
With infrastructure and security regulations increasing, it's essential to the university's reputation and our ability to compete for federal research dollars that we have a secure and robust cyberinfrastructure on campus. Texas A&M IT is working diligently to improve the campus' security posture and our confidence in the identity of our account holders. These proactive efforts position Texas A&M to take advantage of billions of dollars of federal research funds.

In 2016, Texas A&M implemented innovative security measures, including Two-Factor

Authentication for university NetID accounts, launching a 100G next generation firewall, upgrading our domain name management system, introducing cutting-edge self-service vulnerability management tools, implementing a data loss prevention service and making tremendous progress in implementing an enterprise-wide identity management tool. In concert, these systems work to protect the university's network, computers, data and personnel, while also protecting our reputation and ability to focus on research and discovery.

EXPANDING OUR IMPACT

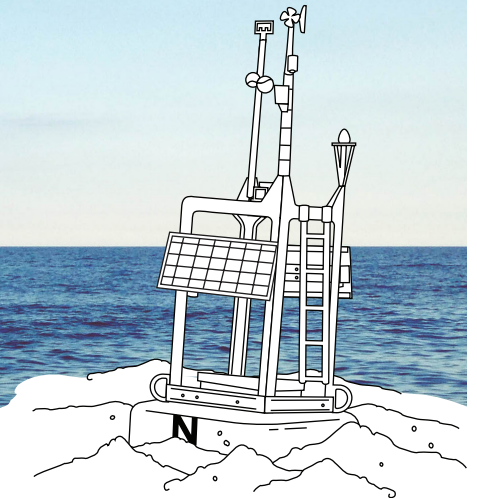
For Texas A&M to remain a leader in research and compete for funding on a global scale, we must continue to create partnerships and make investments to attract high caliber students and researchers.



150 MILLION PEOPLE

IMPACTED BY RESEARCH

in the Gulf of Mexico and Mediterranean Sea



Collaboration Across Continents

In 2016, Texas A&M IT maximized the university's ability to share large amounts of data with colleagues across the state, nation and world through upgrades to our campus and wide area networks. The 100G TX Backbone upgrade is a joint project with the University of Texas that upgrades our internet connections between Dallas, College Station, Houston, and Austin to 100G. This upgrade will benefit not just Texas A&M, but A&M System members as well. In 2016, the connections from College Station to Houston and Dallas were upgraded to 100G. The Austin to Dallas and Houston routes are awaiting equipment installs at UT sites, and the project should be wrapped by summer 2017.

The Campus Data Intensive Network (Science DMZ) supports "big data" research. The Science DMZ now includes 10G and 40G connections to research laboratories and campus HPC facilities and connects to the TX Backbone at 100G. This 100G connection enables the Texas A&M engineering, science and medical research communities to more efficiently connect to The Texas Advanced Computing Center (TACC) Lonestar 5 supercomputer, jointly funded by the University of Texas System, Texas Tech University and Texas A&M University.

The combination of robust campus networks and high bandwidth connections to the

internet also allows for collaboration with universities around the world. Texas A&M and the University of Haifa in Israel have announced an international partnership to leverage the expertise of both universities by establishing joint observatories in the Gulf of Mexico and Mediterranean Sea. Involving over 20 faculty from the two universities, our advanced networks will be used to share data, analysis, modeling and research. Faculty and students from both institutions will remotely participate in joint symposiums and data modeling, participate in courses and access real time data for research projects. This data is expected to advance weather and sea forecasting, and improve ecosystem science and management.

Oct. 11, 2016

184 THOUSAND

DEVICES

ON THE NETWORK

IN ONE DAY



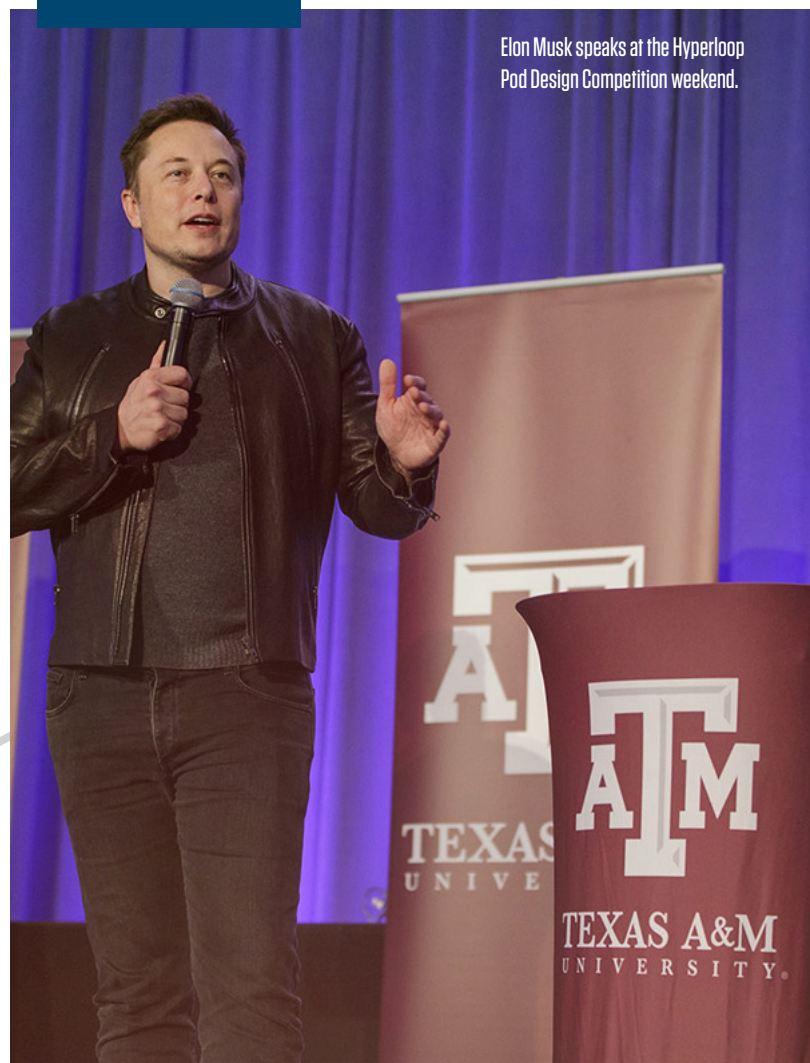
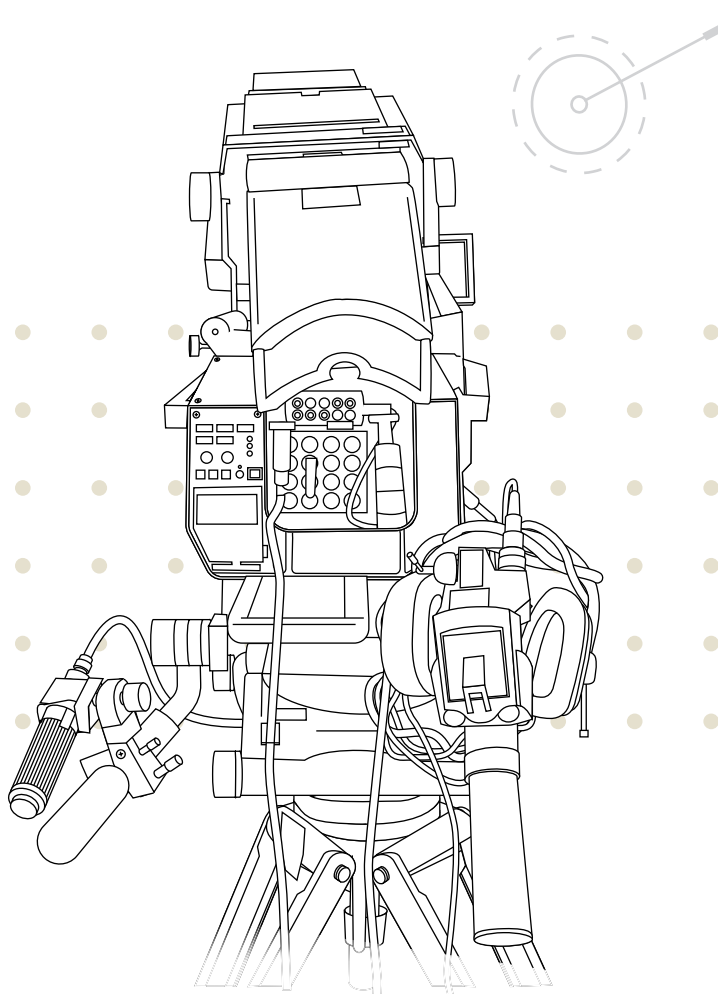
Breaking Records

Our campus continues to add both square footage and students, with Aggies bringing more and more wireless-enabled devices to campus. Texas A&M IT focused tremendous efforts in 2016 on adding wireless access points across campus and facilitating network planning and installation in a large number of construction projects.



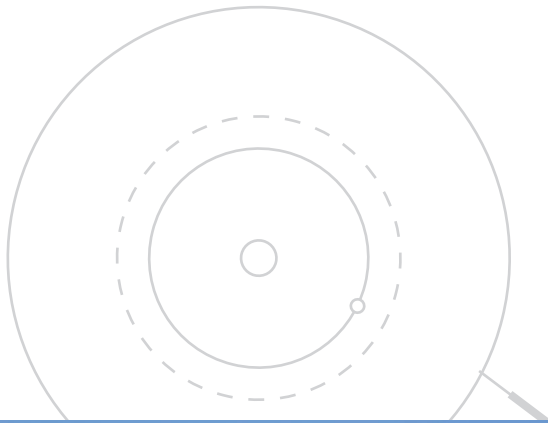
IN FOCUS

This year Texas A&M IT supported several high-profile events with both network and video streaming support.



Elon Musk speaks at the Hyperloop Pod Design Competition weekend.

- In January 2016, Texas A&M Hosted the SpaceX Hyperloop Pod Competition Design Weekend. With over 1,000 students from 27 countries and 20 U.S. states participating, wireless networks were enhanced to support the volume of users and traffic. SpaceX founder and CEO Elon Musk made a surprise appearance on the last day of the competition. This high-visibility event was streamed by the TTVN video team. The two-day event was watched by over 11,000 unique viewers in 108 different countries, garnering lots of attention for Texas A&M.



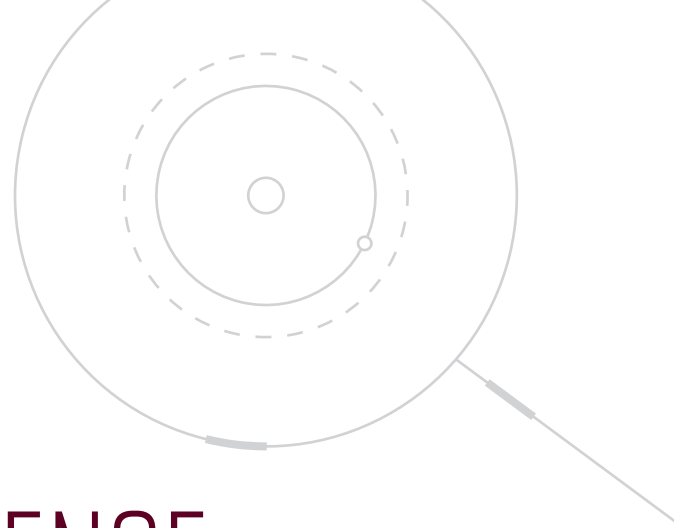
President Michael Young addresses the university on its 140th birthday.



ESPN GameDay arrived on campus on October 8 for the Texas A&M vs. University of Tennessee matchup. Texas A&M IT was on site, ensuring the high-profile show had all the networking and telecom equipment needed at their remote site in Spence Park. This nationally televised game also resulted in even higher than normal demands on our wireless infrastructure. Data usage at Kyle Field was over 9TB, more than was used at the 2016 Super Bowl! Texas A&M IT was prepared to handle the increase, and this event certainly put Texas A&M on a national stage.

Texas A&M IT also supports the university's mission of education and outreach by offering video conferencing, live streaming or recorded playbacks of key university events. In 2016, TTVN provided a live stream of the **President's State of the University Address**, allowing Aggies from across the nation to tune in. TTVN is also essential to the distance learning programs at the **George Bush Presidential Library and Museum**, which offers rich educational and public programs, original museum exhibits and access to archival holdings to schools across the nation.

SERVING WITH EXCELLENCE

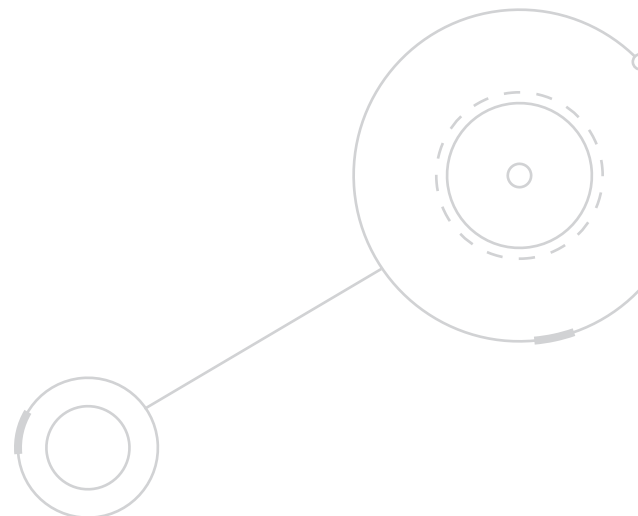


Focus on IT Accessibility Services

- Promoted accessibility best practices, provided consulting services and increased accessibility awareness with campus stakeholders.
- Evaluated the accessibility of key university websites and applications including www.tamu.edu, Code Maroon and the Howdy student information portal.
- Performed accessibility testing on essential security and resource sharing applications prior to purchase.
- Expanded content on the IT Accessibility website to include not only web accessibility, but also document creation, captioning resources and procurement best practices.
- Revamped existing web accessibility training sessions for a more interactive experience and expanded training offerings to include document creation and procurement.
- Incorporated accessibility into business processes to optimize its impact across campus.

Improve IT Policy and Risk Management

- Launched a new eDiscovery application and database for the TAMU System Office of General Counsel.
- Developed the Texas A&M Information Security Control Catalog, replacing many university Standard Operating Procedures.
- Transitioned and trained on a new campus risk assessment tool (SPECTRIM).
- Developed an Information System Recovery and Reconstitution (ISRR) Program and ISRR Plan.



Two-Factor Authentication



Add an **EXTRA LAYER OF SECURITY** to your **NetID account.**

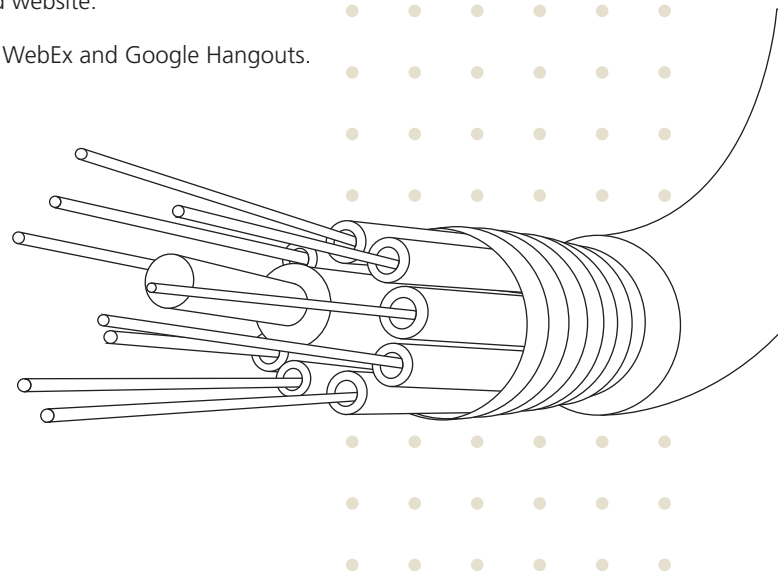
<https://gateway.tamu.edu/duo-enroll/>

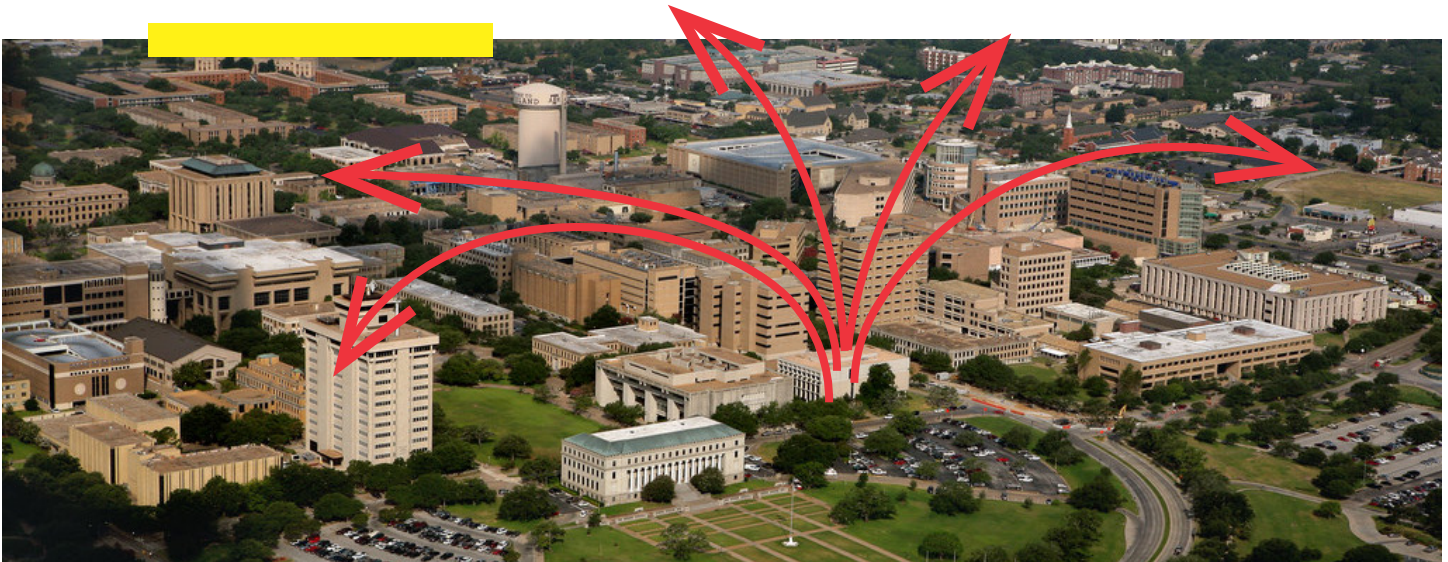
Increase IT Security

- Launched Duo Two-Factor Authentication for university NetID accounts.
- Launched a 100G next-generation firewall that includes deep packet inspection, anti-virus and intrusion prevention, and is designed to support high-throughput scientific and research flows.
- Introduced cutting-edge, self-service vulnerability management tool that combines passive monitoring of traffic entering and leaving campus, with an unlimited number of on-campus scanning servers. Tool includes a self-service portal for campus IT professionals that initiates scans and supports compliance reporting for many audit categories such as PCI-DSS and HIPAA.
- Implemented a data loss prevention service to enable automated scanning for social security numbers with the ability to block or encrypt SSNs upon discovery.

Expand Campus Network and IT Infrastructure

- Remotely installed Exchange 2013 on an International Ocean Discovery Program (IODP) ship.
- Expanded storage and compute capacity in campus data centers, including an additional 380TB of Storage as a Service (SaaS) and an additional 1,050 virtual machines, now in use by campus customers.
- The campus connection to the internet was increased to 30Gb, the wireless network backbone was increased to 20Gb, and the dorm backbone increased to 10Gb.
- Network installation and upgrades were complete in 16 new construction projects, 14 renovation projects, and 14 system upgrades and system takeovers.
- Made tremendous progress in implementing One Identity, an enterprise-wide identity management tool.
- Over 1,000 wireless access points were added on campus. Peak traffic increased to 44.29TB, a jump of 10TB over the year before. The all-time record for unique users in a 24-hour period was broken on 10/11/16 with 183,452. The record for unique users at a single point in time was broken on 9/22/16 with 60,731.
- Infoblox, a new domain name management system, was deployed. The new system detects and mitigates malware, redirecting customers if they try to visit an infected website.
- Texas A&M IT launched several collaboration tools including WebEx and Google Hangouts.
- 1,777 TTVN teleconferences were scheduled in 2016 for a total of 3,412 hours, and 1,014 video streams were scheduled for a total of 1,830 hours of video communication and collaboration.
- Texas A&M IT added over 1,432 new Voice-over-IP customers in FY16. 8,453 VoIP systems are now installed on campus.

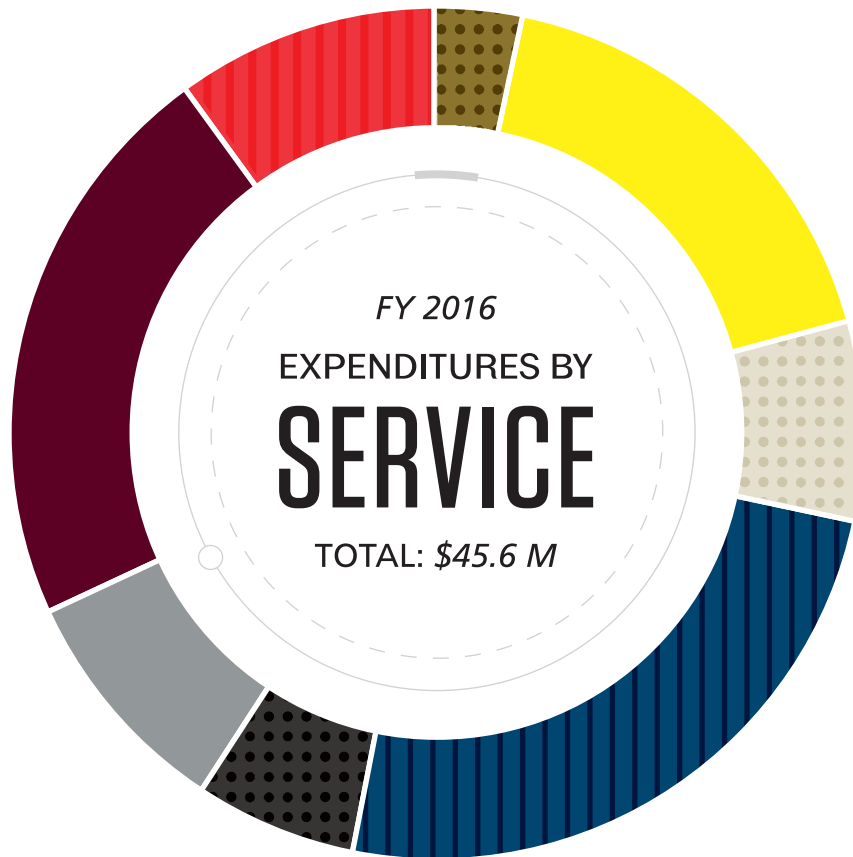












Enhance Customer Service and Campus Outreach

- Upgraded the technology equipment at the Solstice Research Center in Costa Rica, including VoIP, Video Conferencing, networking routers and switches, wireless access points, and telephony.
- Redesigned the FASTexas.org website into a new and improved [TXSmartSchools.org](#) website, and redesigned the [Apples2Apples](#) comparison tool. The goal is to improve education by identifying Smart Schools that are both effective and efficient, and highlight their successful practices.
- Assisted the Texas A&M University System Offices, Texas A&M Kingsville and Prairie View A&M University in a joint project to pilot a new contracts management system.
- Established a new [Laserfiche](#) shared service contract for the Texas A&M University System, with multiple deployment options.
- Released the [TAMUDirect](#) class roster email system with improved group management functionality.
- Established a Business Relationship Management (BRM) team, dedicated to achieving the highest value possible for services provided to our partners, advocating for partners, improving communications between IT and our partners, and increasing awareness of Texas A&M IT services.
- The BRM team completed 97 partner contacts and visited all TAMU System Member executive IT contacts in FY2016.
- Conducted three strategic planning forums to reorganize the PMO and created a formal PMO charter that better aligns with the needs of the University and Texas A&M IT.
- Created a Project Portfolio process and tool to collect information on projects for Texas A&M IT and for publication to the University. In 2016, 132 projects were opened and 50 projects were closed. On average, Texas A&M IT works on 80 projects at a time.
- Deployed a [service catalog](#) that enables online ordering of departmental software, replacing a process that was previously manual. The Service Catalog site also contains over 40 services that can be ordered without contacting Help Desk Central.
- The [IT Self-Service](#) site allows any student, faculty, or staff member to receive a history of their support requests through Texas A&M IT.
- Texas A&M IT's published [Knowledge Base](#) contains nearly 500 knowledge articles available through the self-service website.
- Began work to establish a formal Problem Management and Change Management Process. Once fully implemented, these processes will reduce inconvenience to customers and enable Texas A&M IT to better identify and address recurring service issues.

Texas A&M **Information Technology**
EXPENDITURE SUMMARY



- | | |
|---|--|
|  Help Desk Central, \$1.5 M |  Security, \$2.8 M |
|  Infrastructure, \$8 M |  Software, \$4.1 M |
|  IT Solutions and Support, \$3.4 M |  Telecommunications, \$10 M |
|  Networking, \$11.3 M |  Wide Area Network, \$4.5 M |