

TECHNOLOGY SYSTEMS DIVISION

Annual Report for Fiscal Year 2014

Providing **Innovation**

Extending **Research**

Supporting **Diversity**

Enabling **Access**



Strategically **connecting Mason with the World**

Information Technology Unit
George Mason University
July 2014

TECHNOLOGY SYSTEMS DIVISION

Welcome

We are pleased to present this year's Technology Systems Division (TSD) report to you. The report highlights our key initiatives and how we are effectively leveraging the resources of the Information Technology Unit to fulfill our mission. It shares the fiscal year activities, opportunities, and challenges undertaken by the TSD leadership and staff who work diligently to provide our community with creative innovations and excellence in Information Technology (IT) services, support, and infrastructure.



This report also speaks to our culture of collaboration, customer-focus, and our alignment of the strategic goals of the division with the goals of the institution. TSD works closely with the Mason community, our ITU sister divisions, and five IT governance groups. Together, these groups provide insight for TSD decision-making and the development of IT strategies, policies, priorities, and services.

Mason's continuing challenge to provide excellence in education at an affordable rate requires the adept application of ever evolving technology capabilities. In FY2014, TSD invested in eight key initiatives that addressed critical institutional needs. These initiatives—in conjunction with over 80 additional projects led by TSD departments—have strengthened Mason's IT infrastructure and are working to ensure that TSD has the right processes, roadmaps, and tools in place to support our academic and administrative needs and strategic goals.

While TSD made great strides this year, we recognize that new challenges and opportunities await us in FY2015. We remain committed to provide new IT solutions and services that strengthen customer and client relationships and promote institutional pride. Working alongside you, we will more fully bring to life the *IDEA* of Mason and fulfill the vision of connecting Mason with the World.

A handwritten signature in black ink, appearing to read 'Sharon Pitt', with a stylized flourish at the end.

Sharon P. Pitt

Director, Technology Systems Division & Interim Deputy CIO

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Thank You TSD!

We have a unique and demanding network infrastructure at the National Center for Biodefense and Infectious Diseases. We require very specialized technical and security requirements. Every time we have a network issue, Byung is not only responsive, he is technically knowledgeable and beyond courteous. I would like to extend our appreciation for all he has done for us and will do in the future.—*Faculty, BRL*

It is always nice to put a Face with a Name. But, it is Even Nicer when you finally get to meet people with whom you are always communicating with and whom always help you at the drop of a dime too.—*Staff, ITU*

True customer service is difficult to come by these days, so when one receives it, I believe the employee deserves a BIG KUDO! Thanks to Debbie's hard work and commitment to providing excellent customer service, I can now utilize my GMU email system with many more options.—*Faculty, College of Humanities & Social Sciences*

IT Specialist Cheng Cheu provided outstanding help to me yesterday over the phone.... He was patient, helpful, and really excellent to work with. Thanks to his clear, step-by-step instructions, I was able to install a Firefox browser, which then enabled me to set up my email signature on my Macbook; he also walked me through how to print emails and other basic functions.—*TA, Civil Engineering Department*

I need you to know how incredibly outstanding Emilio Goncalves has been when it comes to taking care of my group. Emilio is professional, prompt, and if he does not have an answer (rarely), he will find one for us or research the best he can or direct us to where we venture to find what will work. It is a pleasure to have such a team player that works across divisions so well.—*Manager, DoIT*

TECHNOLOGY SYSTEMS DIVISION

Executive Summary

Executive
Summary

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Overview

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Scholarship

This fiscal year was one of the **Technology Systems Division's** (TSD) busiest, most productive, and most transformative years. The work done this year was broad and deep—spanning from changes in discrete IT processes and institutional planning to key performance metrics and new strategic goals. It reflects TSD's maturation as an organization and hallmarks the cultural renovations empowering the division to be more proactive, agile, customer-facing, and successful. Working within our budget and staffing constraints, we are simultaneously adjusting our approach to, and engagement in, the provision and management of IT resources, tools, services, and infrastructure that will enable us to become even more effective in addressing the expanding needs of our institution for technology resources.

CHALLENGES

This year, TSD leadership identified four overarching challenges in providing the technology required to meet Mason's collective objectives. These challenges are (1) ensuring Mason's wireless network supports Mason's requirements both strategically and architecturally, (2) managing strategic and structural change, (3) maintaining excellence in IT service and support while addressing complex environmental prescriptions for IT compliance, and (4) providing high quality services in a timely manner and within budget and resource constraints. These challenges are described more fully below.

#1: Mason's Wireless Network

Like many institutions, Mason is in the middle of a tremendous increase in the educational and personal use of mobile and wireless devices by faculty, staff, and students. To address this challenge, TSD expanded, strengthened, and increased the capacity of Mason's wireless network to meet the nearly 33% increase in user demand over the last year.

Our Infrastructure

Data, Voice and Wireless Networks

1184.5 miles of outside fiber plant

413 Total Servers

237 Virtual Servers

178 Discrete Virtual Networks

Over 70 Oracle servers

Over 100 software applications

Banner ERP Management

75+ Terabytes of Used Storage

3,571 Configuration Management

Database (CMDB) Assets

45 routers, 11 firewalls

Our Voice & Wireless Networks

9,135 Peak # of Phone Calls per Hour

34,960 # of Wireless devices in use

51,000 Peak # of IP Addresses in use

45,871 Total # of wired Ethernet Ports

Our Email System

2.4B Total Email Messages

2.3B Threat Messages Filtered

(95.6% of Total Message)

44,316 Employee Mailboxes

8,843 Student Mailboxes

#2: Change and Change Management

Taking into consideration staffing constraints, TSD and the ITU began implementing cultural, structural, and operational changes during this fiscal year. These changes will help ensure 1) that TSD's efforts contribute directly to the strategic direction of the ITU and university and 2) that we deliver high value services to our customers transparently and agilely. In the coming year, as the institution further refines its highly divergent, cross-institutional objectives, TSD will continue to implement changes to support those objectives even more effectively.

#3: Environmental Prescriptions

Significant due diligence and resources were required on the part of TSD this year to ensure that services met institutional mandates, as well as federal, state, and external and internal compliance requirements. TSD efforts this year focused on attaining four milestones: (1) achieving full compliance with all outstanding internal audit requirements, (2) completing the Business Intelligence initiative to help with critical institutional and ITU reporting, (3) working with IT governance groups to provide strategic direction to the division, and (4) collaboratively developing Key Performance Indicator metrics dashboards to support each of Mason's 12 strategic goals outlined in the 2014-2024 Strategic Plan, effective July 1, 2014. This coming year, the division will need to continue these efforts and pursue additional measures in order to maintain IT requirements and standards while increasing its capacity to focus on operational needs and achieve its strategic goals.

#4: Budget and Resource Constraints

As budgets tighten while the institution's need for new services and infrastructure increases, the division must continue to find ways to meet these needs. Through its key initiatives, together with strategic leadership, TSD is leveraging its existing staff in even more creative ways while seeking to maintain the division's high standards of quality and excellence.

KEY INITIATIVES

In FY2014, the Technology Systems Division led eight key initiatives in support of ITU and university strategic goals. TSD initiatives created efficiencies by combining effective service management processes with increasingly integrated support and robust operations architecture. On the following page, Figure 1 shows each initiative under the fiscal year challenge it addresses.

Our Customer Support

40,000+ Banner Users

1,000+ Business Intelligence Reports

500 Research Grant Reports (COEUS)

40 Commonsport Web Sites

155 WordPress Web Sites

57,170 Support requests received

4,764 Average incidents opened per month

4,752 Average incidents closed per month

48,294 Calls answered by Support Center

82% of Calls answered within 60 seconds

80% First Call Resolution

Our Top 5 Support Call Categories

38% - Patriot Pass

6% - MasonLive

4% - General

3% - Device Registration

2% - Computer Repair

Our Computer Support

Over 23,000 technology devices

16,074 TSS barcoded equipment

5,150 MESA connected computers

1,250 classroom and lab computers

(1,192 PCs & 58 Macs)

Challenge 1: Mason's Wireless Network	Challenge 2: Change & Change Management	Challenge 3: Environmental Prescriptions	Challenge 4: Budget & Resource Constraints
<ul style="list-style-type: none"> • Network Assessment 	<ul style="list-style-type: none"> • TSD Communication Plan • Creation of ITPP Department • IT Service Management • Cloud Brokered Services 	<ul style="list-style-type: none"> • Business Intelligence Reporting 	<ul style="list-style-type: none"> • Office 365 • Network Upgrades

Figure 1 *Challenges and initiatives relationship chart*

The first four initiatives were completed this fiscal year. The remaining four initiatives will be completed in FY2015.

1. TSD Communication Plan for Alerts and Outages (Challenge 2)

This year the TSD formalized its approach for proactively communicating IT information to the Mason community. The plan establishes pathways for providing timely and useful information for IT alerts and planned and unplanned outages, including the division's intent to investigate root causes, find resolutions, and take measures to prevent recurrences. With respect to unplanned outages, the plan articulates five phases in the TSD communications process: (a) outage detection, (b) outage confirmation, (b) alerting the IT community, (d) resolution and recovery, and (e) after action. Conduits for communicating service disruptions were also defined in the plan and include a "Push" conduit, "Pull" conduit, and "Push Shared" conduit.

2. Creation of Information Technology Process & Planning Department (Challenge 2)

The Information Technology Process and Planning Department (ITPP) was created to bring increased attention to initial requirements gathering and planning for capital building projects, and to lead the ITU's efforts to standardize and improve its Information Technology Service Management (ITSM) processes. The department's initial focus was the Technology Systems Division, but the scope has now broadened to include all of the ITU's services. The department was established in September of this fiscal year. Additional information on the ITPP department is available in the *Fiscal Year Activities* section of this report and also online at <http://tsd.gmu.edu/depts/itpp>.

3. Business Intelligence Reporting Tool Selection & Implementation (Challenge 3)

TSD completed its initiative to select and implement a new Business Intelligence (BI) Reporting Tool for Mason. Catalyzed by Oracle's announcement that it would no longer support Oracle Discoverer—Mason's primary reporting tool—and Mason's critical need for a robust Business Intelligence (BI) tool, a focus group was created in FY2011 to evaluate and recommend BI solutions to replace Discoverer. An Evaluation Committee reviewed RFP responses and unanimously selected MicroStrategy as Mason's new BI tool. In March 2013, the project refocused on software implementation and report migration from Oracle Discoverer and a BI support team was formed to help functional office representatives prepare for report migration. MicroStrategy reports are providing the institution with a robust and fresh platform for measuring goals. Presently, over 800 users of Finance reports have been migrated to MicroStrategy and TSD has started testing User

Acceptance for HR/Payroll reports and training on Procurement Pipeline data mart reports. In addition, TSD completed dashboards for the Office of Sponsored Programs, the development of the initial round of reports and tactical dashboard, and the Dashboard/KPI technology review for the Board of Visitors and Presidents Council.

4. Office 365 (*Challenge 4*)

The Office 365 initiative consisted of three main objectives: (1) to develop a set of requirements for a new system that would replace the MEMO email system and the Oracle Calendar for faculty and staff, (2) to select and deploy a new email and calendar system for faculty and staff, and (3) to upgrade the MasonLive student email system from Microsoft's Live@EDU platform to the new employee email messaging system. The process of selecting a new email and calendaring system began in Fall 2011. A cross-functional team was formed to review Mason's email and calendar systems, identify requirements for a new system, and investigate solutions. In spring 2012, the team completed its review of solutions and Mason's executive leadership selected Microsoft Office 365. Presently, Mason employees are using Office 365 for both email and calendaring. The student system, MasonLive, was upgraded to the Office 365 software platform in January 2014 and the maximum size for both student and employee mailboxes was increased this year from 25GB to 50GB. The university enrolled in Microsoft's Student Advantage program, which provides students with free access to the Microsoft Office suite. This program will be available Fall 2014, at which time TSD will also begin work on a project to simplify the authentication process for students using web, client, and mobile devices.

5. Information Technology Service Management (ITSM) (*Challenge 2*)

The overarching goal of the ITSM Program is to build a holistic framework that ensures the ITU's services are customer-facing, consistent, efficient, and achieve university needs. In support of this initiative, the TSD created the ITPP department, hired an ITU Process Coordinator, and established a cross-functional ITSM Steering Committee. To date, the Process Coordinator has worked with the Committee to develop and implement process improvements for (1) the IT Support Center, (2) incident management, (3) problem management, (4) change management, (5) confirmation management, (6) catalog management, and (7) service level management categories. The Committee has reviewed and approved an ITSM Roadmap Implementation project plan and made significant progress in providing baselines for current ITU roles, responsibilities, and processes. The committee's work also includes the identification, approval and documentation of current ITU Services, service owners and managers, and process owners and managers in concert with the ITIL Framework. This information has formed the basis for recommendations to improve the current Change Management, Software Asset Management and Service Level Management Processes. TSD looks forward to implementing the committee's process recommendations and working with the IT Governance structure to improve TSD and ITU services.

6. Network Assessment *(Challenge 1)*

In consultation with WTC (<http://wtc-inc.net/>), the TSD launched an initiative to conduct an assessment of Mason's network and develop a new telecommunications rate structure. The main objective of the network assessment is to provide eight options for future network growth based on three binary variables—criticality of wireless, resiliency of network electronics, and resiliency of physical infrastructure. The ITU will present these options to university leadership for strategic direction. After receiving strategic direction, the ITU will work with WTC to create a ten-year lifecycle plan for network upgrades and maintenance. To date, TSD's Network Engineering department and members of project technical committees have met with WCT and provided a preliminary information set on the current state of Mason's network and future design requirements. TSD anticipates work with WCT to continue through the remainder of 2014.

7. Network Upgrades *(Challenge 4)*

Expanding and strengthening Mason's networks remain both critical and top priorities of the TSD. Launched this year, this new initiative has three critical objectives that, when achieved, will transition Mason's firewalls, upgrade its virtual private networks, and create a new inter-campus optical transport network. Additional detail is provided below.

- A. Firewall Transition:** The TSD is migrating from Juniper-Netscreen to PaloAlto firewalls. When complete, all Juniper-Netscreen firewalls will be retired and replaced by three PaloAlto 5060 devices. The PaloAlto firewalls will process the majority of university data traffic from two installations: a High Availability (HA) cluster in the Datacenter and a backup system at TSD's disaster recovery site. To date, all systems have been migrated to a single PaloAlto device in the Datacenter except for firewalls in front of the residence hall, wireless, and disaster recovery site networks. TSD configured the second device in the HA cluster and plans to test HA failover in August 2014. The division expects to complete all remaining upgrades this fall.
- B. Virtual Private Network (VPN) Upgrade:** TSD implemented a new VPN gateway device based on the Cisco Adaptive Security Appliance (ASA) platform. Currently, the new VPN is offered as a parallel service to Mason's older Juniper Secure Sockets Layer (SSL) VPN. The new VPN offers four major benefits: (1) an installable client that is not dependent on Java; (2) the ability to use native Internet Protocol Security (IPSEC) clients on several platforms; (3) accounts for all faculty, staff, and students; and (4) differential access services for individual university business units. As of July 2014, the new VPN platform will be available. TSD will progressively roll out additional capabilities this coming year and expects to decommission the SSL VPN next summer.
- C. Optical Network and New Network Core:** With its FY2015 Education Trust Fund (ETF) budget, TSD purchased devices to build a new inter-campus optical transport network with a new network core design. The optical transport network enables the instantiation of any-by-any optical links of up to 100 gigabits per second between core devices on Mason's campus network. The new core design was developed to simplify operations and lower operating costs by reducing the number of core routing devices. The new design also increases network

electronics resiliency by removing single points of failure upstream of the network access layer. During the January 2015 inter-session break, TSD hopes to build the new optical transport network and configure the new core devices.

8. Cloud Brokered Services (*Challenge 2*)

This year the TSD researched the impact of cloud computing models with the goal of increasing support for the university's business functions and addressing customer demand. As a result, it launched this initiative to create a pathway for cloud service requests, establish a mechanism to evaluate those requests, and provide the ability to implement approved requests using the best option or combination of traditional, cloud or hybrid IT services. Implementing a cloud model at Mason is expected to reduce the number of customers and clients creating de-centralized instances of cloud services. By implementing cloud capabilities centrally, the TSD expects to not only support business and academic objectives of the institution but also mitigate support of de-centralized cloud services which may result in security concerns, increased cost to the institution, and overall loss in productivity. Work completed includes the hiring of a cloud analyst, defining initial cloud review for ASRB, and working with the Procurement Office.

OPPORTUNITIES

This coming year, the division looks forward to completing its present initiatives and continuing its participation in and support of Mason's strategic planning efforts. In addition, we will continue to improve the management of our services and build on the foundation and achievements of this year.

IT Service Management

Our commitment to improving IT Service Management will require a number of changes including (1) increasing our employment of change management processes, (2) identifying impactful, unit-wide metrics, (3) aligning those metrics with the academic and business needs of administrative computing at the institution, (4) training on those metrics, and (5) seeking to address the critical and growing need for transparency, justification of resources, and reporting against other institutions in meaningful ways. While steeped in hard work, the benefits of these changes are tremendous and the TSD leadership and staff look forward to embracing the cultural and structural changes required. TSD also looks forward to working across the ITU to support its sister divisions through greater cross-functional collaborations and strategic support.

Building on FY2014

Looking ahead to FY2015, the TSD will be able to build on a solid foundation of purposeful initiatives and meaningful goals. Specifically, it looks forward to further harnessing the benefits of the initiatives completed this year and advancing IT at Mason through the following objectives:

- Supporting the development and implementation of an IT Governance structure to focus on prioritizing and making decisions regarding ITU projects and maximizing value that the TSD delivers to the Mason community

- Participating in the strategic planning and development of three-to-five year roadmaps for major functions of the TSD, ITU, and IT at Mason
- Completing its assessment, with WTC, of Mason’s wired and wireless networks and developing a strategic plan and implementation roadmap for the network’s advancement
- Identifying and articulating departmental and divisional key performance indicators that can assist the division in optimizing and aligning available resources effectively and supporting a multi-point performance evaluation plan
- Completing network upgrades to include the transition of its firewalls, upgrade of its VPN platform, and development of a new inter-campus optical network

In addition to identifying fiscal year challenges and opportunities, TSD conducts an annual assessment of its strategic goals to ensure continued alignment with the strategic direction of the institution. In FY2010, TSD conducted an assessment and developed a four-year plan which carried the division through this fiscal year (TSD Strategic Plan, FY2010-FY2014). This






Figure 2 *Customer satisfaction ratings*

plan addressed four key ITU goals through associated division objectives and performance indicators. TSD made significant strides in meeting these goals and achieved many of its objectives. The chart on the following page captures TSD’s progress to date. TSD departments report annually on their major operational activities and fiscal year challenges and opportunities as they relate to TSD’s strategic plan. These reports are provided in Appendix A. A complete assessment report of the TSD 2010-2014 plan is available online at <http://tsd.gmu.edu/about/annualReports.cfm>.

Technology Systems Division

Strategic Plan At-A-Glance

ITU Goal 1: Improve and expand technology infrastructure to meet new needs	
Objective 1.1: Expand student IT facilities, including more wireless coverage, wireless printing, etc., as a by-product of new construction	Yellow
Objective 1.2: Employ network virtualization technology (MPLS) on campus, enabling TSD to overlay separate logical networks on one physical infrastructure for enhanced security and network performance	Green
Objective 1.3: Upgrade the PBX system for increased reliability by installing redundant processors and physically diverse connections	Yellow
Objective 1.4: Partner with other Virginia institutions to obtain funds for and implement a high capacity research network	Green
Objective 1.5: Implement power, temperature, performance, and leak detection monitoring in the new data center	Green
Objective 1.6: Continue to optimize server and storage area network environments through the use of contemporary and emerging virtualization and consolidation technologies	Yellow
Objective 1.7: Expand the real-time performance monitoring of servers, storage, networks, and application systems	Yellow
<div>  Complete  Ongoing / On Schedule  No Progress/ Pending Review </div>	

ITU Goal 2: Improve efficiency of IT service management	
Objective 2.1: Migrate content from ITU Technology Gateway to more manageable repositories such as the ITU Support Center, ITU Service catalog, and other actively managed sites	Green
Objective 2.2: Continue to automate IT management processes	Yellow
Objective 2.3: Continue to move several departments up the process maturity scale by developing a service catalog for the top 20 services requested by ITU customers	Green
Objective 2.4: Continue ITIL deployment and prepare an ITIL implementation plan covering the next three years	Yellow
Objective 2.5: Provide a content management system that is generally available to academic and administrative departments for complex content management needs	Yellow
Objective 2.6: Maintain current levels of SPAM control using security applications	Yellow
Objective 2.7: Add new Unified Messaging features and expand the use of IP telephony	Red
Objective 2.8: Expand support for non-Windows systems and mobile devices	Green
Objective 2.9: Closeout the Identity Management project and transition to a Accounts Management project.	Green
Objective 2.10: Implement a Systems Status website to improve the management of information and inform users about system	Green

availability and performance	Green
Objective 2.11: Provide improved desktop support services through the use of new processes and technology	Yellow
Objective 2.12: Working with the university community, select a new email and calendaring system for employees that will provide the university with improved tools to enhance collaboration	Green
Objective 2.13: Pilot mobile applications for the iPhone, iPad and Android devices. This includes a protocol for reviewing proposed applications through Architecture Standards Committee where appropriate and a proper division of responsibilities within ITU for licensing, procuring, testing, troubleshooting, and deploying applications.	Yellow
ITU Goal 3: Ensure projects are completed on time, within budget	
Objective 3.1: Work with the ITU Project Management Office to ensure that projects are completed on time and within budget	Yellow
ITU Goal 4: Develop corporate partnerships	
Objective 4.1: Participate on corporate and non-profit advisory committees, task forces and academies	Yellow
Objective 4.2: Identify and select corporate partners to assist with the implementation of a new email and calendaring system for students, faculty, and staff	Green

TECHNOLOGY SYSTEMS DIVISION

Division Overview

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The **Technology Systems Division (TSD)** of George Mason University provides technology infrastructure, strategic business resources, and computing services to the entire university community. The mission of TSD is to advance the institution's strategic goals, to support learning, enable scholarly endeavors, and improve institutional management. To accomplish this mission, TSD staff is committed to outstanding customer service and to ensuring the reliability, availability, and continuity of critical IT resources for community members and through select academic and corporate partnerships.

The division consists of six departments: Client Relations (CR), Database Application Services (DAS), Enterprise Servers & Messaging (ESM), Information Technology Process & Planning (ITPP), Network Engineering & Technology (NET), and Technology Support Services (TSS). Together, these departments provide the leadership and expertise necessary to maintain the division's successful track record as a reliable provider of IT services and a university resource valued for its focus on end-user satisfaction, innovative business strategies, operational efficiencies, service management best practices, and cross-functional collaboration.

Full-time Equivalency
Employees

152.5

Student Resident
Technicians

29

Student Employees

15

The Technology Systems Division works closely with five IT governance groups: the Architecture Standards Committee (ASC), the Faculty Senate Technology Policy Committee (FSTPC), and three Banner Governance groups. These groups provide insight for TSD decision-making and direction for the division's development of IT strategies, policies, priorities, and services. Figure 3, on the following page, illustrates TSD's relationship with its sister divisions and IT governance structures.

The division's website (<http://tsd.gmu.edu>) provides additional information on its mission and respective departments. Also available online is an annual report supplement titled *Division Overview* (<http://tsd.gmu.edu/about/annualReports.cfm>). The IT Services website (<http://itservices.gmu.edu>) provides a comprehensive catalog of services currently offered or supported by the division. An organizational chart of TSD directors and managers as of June 30, 2014 follows Figure 3.

Technology Systems Division—Relationship Map

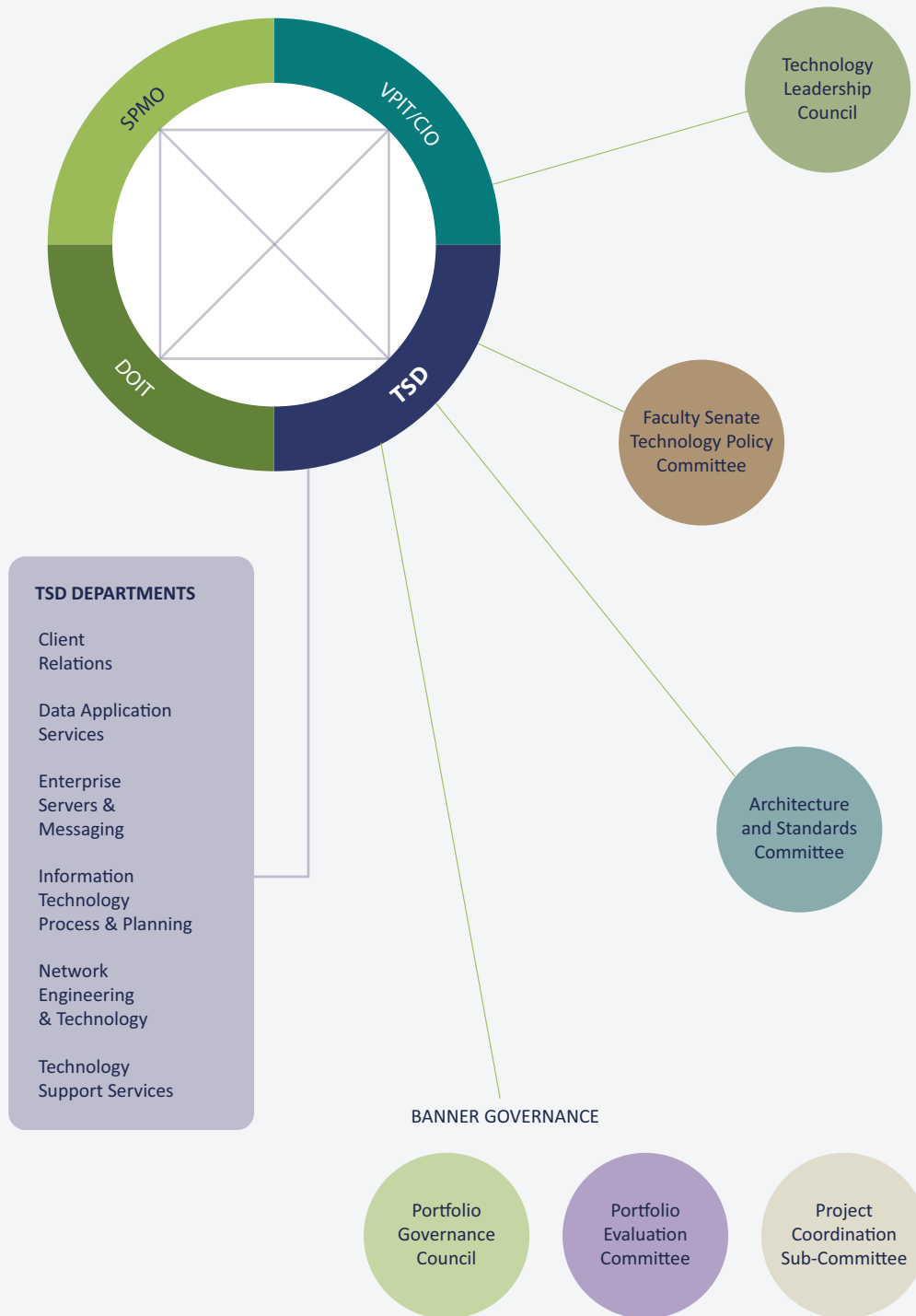
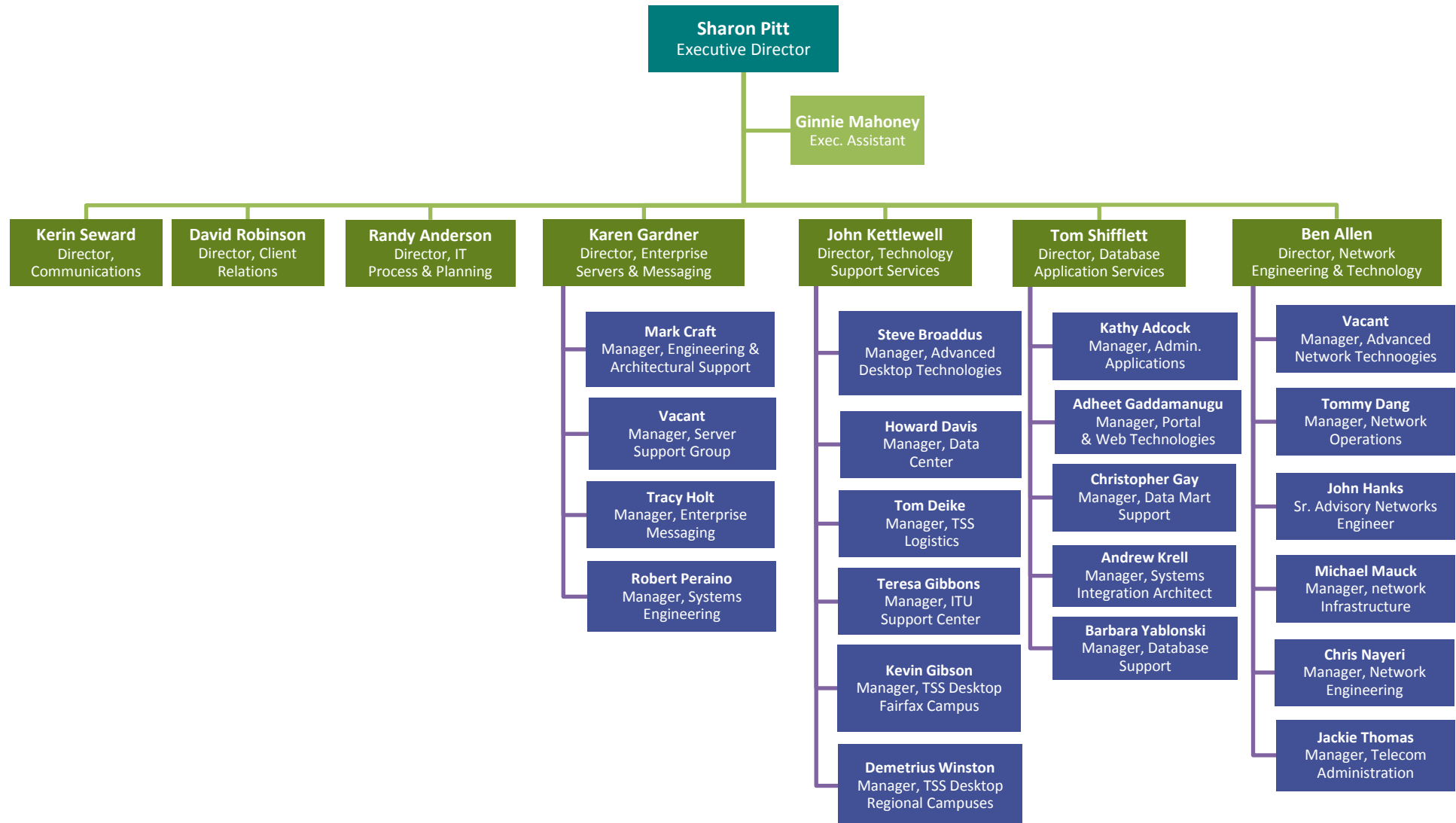


Figure 3 Technology Systems Division relationship map

TSD Organizational Chart

Directors & Managers (6.30.2014)



FISCAL YEAR HIGHLIGHTS

Projects, Trends, and Statistics

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This section of our annual report provides additional detail on TSD's eight key initiatives and offers select highlights from its major projects, service trends, and support statistics. This year's service and support statistics clearly reflect how Mason's use of IT—and hence, TSD's support of IT—is trending distinctly upward. Data examples include (1) incidents opened and closed by TSD, (2) customer satisfaction ratings, (3) emails fielded and filtered, (4) use of the wireless network at Mason, and (5) department operational activities. Listed below are some of this year's most salient achievements, wherein TSD:

- Provided division leadership for 90 IT projects
- Managed eight key IT initiatives that advanced critical institutional needs related to communications, processes and planning, business intelligence, email and calendaring services, service management, Mason's networks, and cloud-brokered services
- Established a new Information Technology Process and Planning (ITPP) department in September FY2014
- Began developing plans for the deployment of Information Technology Service Management (ITSM) by launching its Information Technology Service Management initiative, hiring an ITU Process Coordinator, and establishing an ITSM steering committee
- Initiated the *TSD Communications Plan for IT Alerts and Outages*, which puts into place a consistent process framework for conveying critical IT information to members of the Mason community
- Responded culturally and operationally as a mature organization to academic and business needs
- Began integrating the new ITU goal of becoming *One ITU*—a customer-focused, collaborative, strategic, agile, and transparent division and business partner
- Working with WTC, launched a review and strategic planning program for Mason's wired and wireless network with the goal of creating a ten-year lifecycle plan for network upgrades and maintenance and a new telecommunications rate structure
- Began migrating from Juniper-Netscreen to PaloAlto firewalls

Key Initiatives FY2014

1. TSD Communication Process
2. IT Process & Planning Department
3. Business Intelligence Reporting Tool
4. Office 365/MasonLive
5. Information Technology Service Management (ITSM) Assessment
6. Network Upgrades
7. Network Assessment
8. Cloud-brokered Services

- Implemented a new Virtual Private Network (VPN) gateway device based on the Cisco Adaptive Security Appliance platform
- Purchased devices to build a new inter-campus optical transport network with a new network core design
- Completed our Business Intelligence (BI) initiative, which will progressively transition the institution from Oracle Discoverer reports to MicroStrategy reports
- Participated in the development of Key Performance Indicator (KPI) metrics dashboards
- Supported a number of critical university moves and renovation projects
- Completed our Office 365/MasonLive initiative, which transitioned Mason employees to Office 365 for both email and calendaring, upgraded the students email platform from MasonLive to Office 365, increased employee and student mailbox sizes, and enrolled Mason in Microsoft's Student Advantage Program
- Addressed internal audit compliance requests, ensuring full compliance of the division and allowing TSD to increase its operational focus
- Participated in the vendor selection process for Mason's web redesign projects and the task force charged with selecting a new Web Content Management System
- Successfully implemented upgrades of key applications and systems, including Banner—an administrative application that has over 40,000 users
- Launched a new initiative on cloud-brokered services to allow for improved support of Mason's business functions and to respond to the growing customer and client desire for cloud capabilities

PROJECT OVERVIEW

This year, the TSD directed 90 division-based projects and participated in many additional cross-institutional projects and activities. Table 2 lists the number of TSD projects led by each department this fiscal year, which includes projects related to TSD's eight key initiatives: (1) TSD Communication Process, (2) creation of the IT Process & Planning Department, (3) Business Intelligence Reporting Tool, (4) Office 365/MasonLive, (5) IT Service Management, (6) Network Upgrades, (7) Network Assessment, and (8) Cloud Brokered Services.

New this fiscal year, TSD inventoried its projects using a project portfolio methodology developed by ITU's Project Management Office.

The project portfolio enables TSD to monitor each project's progress and hone its allocation of resources. The project portfolio methodology includes a categorization schema that empowers TSD to better prioritize projects and resources based on the types of projects that the division implements and the estimated effort and resources required. On the following page, Figure 5 provides an overview of TSD projects reported by categorization type. TSD completed 56 of its 90 projects this year.

Table 2 *Number of projects led by TSD departments*

Department	Number
CR	12
ITPP	11
DAS	28
NET	6
ESM	27
TSS	6

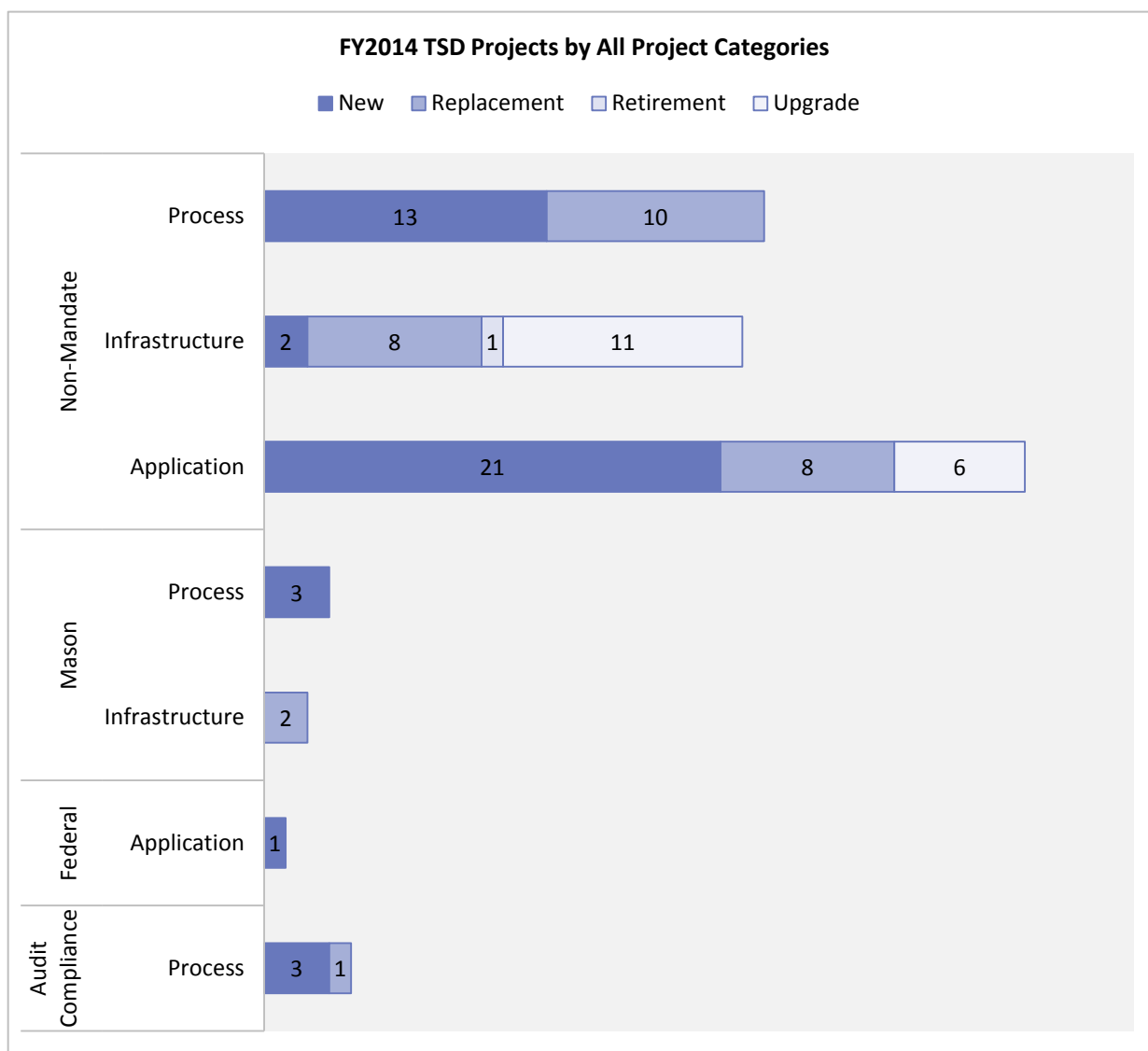


Figure 5 Number of TSD projects by all project categories

Table 3 provides an inventory of TSD projects listed according to category type. Appendix B provides an additional list of all FY2014 projects organized by TSD department and classified according to project phase. Mason faculty and staff can find additional information on each project—including project descriptions, owners, start date, and end date—in *Project Briefings* on ITU’s Project Management Office website (<http://pmo.gmu.edu>).

Table 3 TSD project list organized by project categories

Mandate	Application	Infrastructure	Process
Federal	New	New	New
Multi-factor Authentication Implementation	Application Performance Tool Implementation	Centralization of Housing Servers	After Action Report Process Plan
Mason	Application Virtualization Phase 1	DW-BI Implementation	Internal Audit
ITU Mason Hall/University Hall Move Planning	CLEAN Address	Replacement	Internet2 Bronze/Silver Assurance
Loudoun Site Move: IT Planning	DW - BI Dashboards	AMS Implementation	ITSM Program: Baseline Assessment
Loudoun Site to Signal Hill move	Encrypted Email	F5-Cisco Migration	ITU Audit Repository
Mason Inn Conversion (INTO) IT Planning	Executive Dashboard for KPIs	F5-Foundry Migration	ITU COOP Project
MASONLIVE Student System SSO Replacement	Foundation Call Center	ISE Deployment	ITU Mason Hall/University Hall Move Planning
Audit Compliance	INTO Salesforce and Banner Integration	JIU Virtualization	Loudoun Site Move: IT Planning
Internal Audit	IRISAccess	Loudoun Site to Signal Hill move	Mason Inn Conversion (INTO) IT Planning
ITU Audit Repository	ITSM Tool Requirements	MASONLIVE SSO Replacement	Migration to Online Ordering Forms Project
NSF Audit	Lexis Nexis	Network Security Firewall	MoU Strategy and Management
PEC portfolio reorganization and development	Management for OS X	SAN Storage Replacement	NSF Audit
	Mobile Application Development	SIP PRI Replacement	OLA Policy and Process
	Multi-factor Authentication	Retirement	Unexpected Service Disruptions
	Office 365 Student Advantage	Harris PBX Decommissioning	Roam Secure replacement - RFP participation
	Offsite Monitoring	Upgrade	SLA Policy and Process
	Roam Secure	Active Directory 2012 Upgrade	Software Licensing
	Serena Version Manager	Banner Upgrade Planning	Tech. Architecture Program Development
	TSS - Self-Service AppStore	Banner XE Investigation and planning	TSD Process Documentation Management
	Univ. Process Improvement Council	Discoverer Upgrade	Replacement
	VCL pilot for HR/Payroll	DocuShare Server Migration/Upgrade	AMS Specifications
	WatchGuard DashCam Server	Listserv Upgrade	ASC Review
	Replacement	Mail Routing Review/Server Upgrades	Backup Architecture Review
	Blackboard Grade Export	Oracle Critical Patches	Change Management Process Improvement
	Degree Works Localizations	Oracle database upgrade	DAS - Banner to AMS
	DW-Sponsored Program Data Mart (R2)	Video Surveillance Upgrades	Incident Management Process Improvement
	Flexwork Site	Windows 2003 Upgrades	ITU Move Process Improvement
	Imaging extension		ITU Orientation Strategy and Plan
	Online Deposit application redesign		Mason Web Presence Branding/Realignment
	Shibboleth		NET Web Space Redesign
	Student Data Mart ETL Re-Write		PEC portfolio reorganization and development
	Upgrade		
	Call Pilot Voice Mail		
	Office 365 - Employee System Phase II		
	R25 Application Interface Upgrade		
	Software Dist. and Imaging Architecture II		
	T&E System Enhancement		
	TicketMaster Upgrades		

SERVICE TRENDS & STATISTICS

Captured in Figure 6, TSS opened a total of 42,613 incidents and closed 42,876 incidents in FY2013. This year, the total number of incidents opened by TSS was 57,170—up 34.2% from FY2013—and the total number of incidents closed was 57,029—up 33.0% from FY2013. Monthly averages of incidents opened and closed reflect this same percentage increase. The average number of incidents opened per month increased from 3,551 in FY2013 to 4,764 in FY2014. The average number of incidents closed per month increased from 3,572 in FY2013 to 4,752 in FY2014.

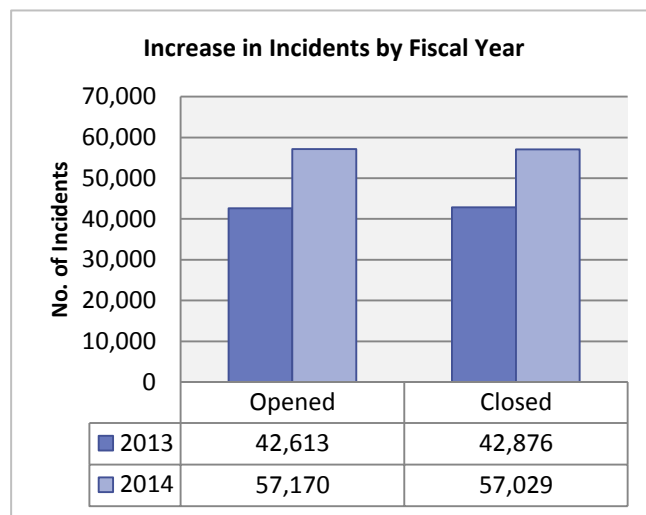
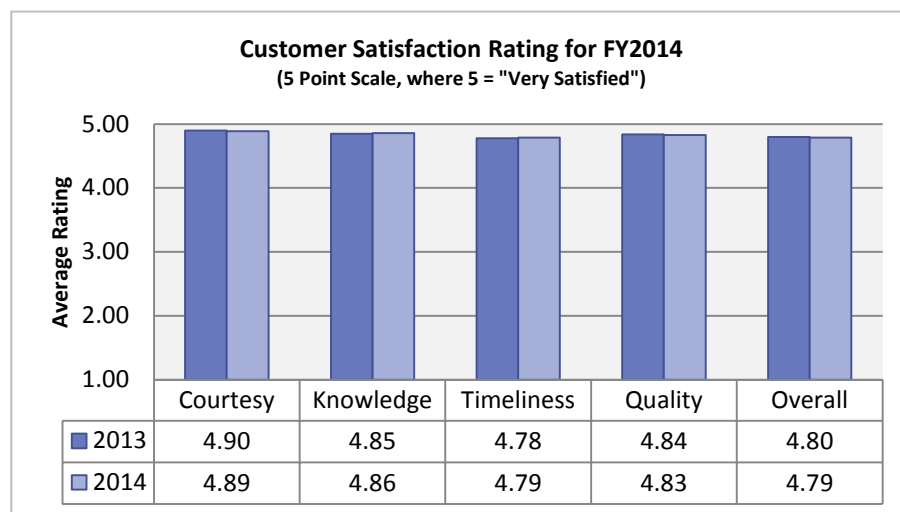


Figure 6 Increase in incidents by fiscal year

This year a total of 4,693 surveys were submitted by Mason community members using the Help Desk Institute (HDI) Customer Satisfaction Index Tool. While the number of surveys submitted was up 13% from FY2013 (N=4,126), the total responses received reflects a decrease in submission rates from last year. The percent of customers submitting a survey response in FY2013 was 9.62% of all opened and closed incidents, compared to a submission rate of 8.23% in FY2014. However, the surveys remain a solid indicator of TSD's continued excellence in customer support.

Customers who have had an incident opened and then closed by a TSS group can complete an HDI Customer Service survey based on a five point scale. The survey measures the customer's level of satisfaction in the categories of Courtesy, Knowledge, Timeliness, Quality, and Overall Satisfaction. TSD utilizes the survey results to evaluate its performance against internal department goals and compare this performance to companies within the industry. Once again, as shown in Figure 7, customers were



extremely satisfied with the service provided by TSS staff in all performance categories. On a five point scale, with 5 being "Very Satisfied," the department's overall performance achieved a 4.89 for *Courtesy*, 4.86 for *Knowledge*, 4.79 for *Timeliness*, 4.83 for *Quality*, and 4.79 for *Overall Satisfaction*.

Figure 7 Customer satisfaction ratings, FY2014

Email communications also increased significantly this past year. Captured in Figure 8, the total number of email messages managed by the TSD this year was up 44% compared to last year. Similarly, the total number of threat messages filtered this year was up 48% over last year. Threat messages comprised 95.6% of all email messages in FY2014 versus 93.3% in FY2013.

One last example of Mason’s increased use of IT is exhibited in the utilization of its wireless network. Not only has the number of devices proliferated, but the bandwidth required by these devices continues to grow exponentially and has already outpaced Mason’s current wireless network capacity. Shown in Figure 9, Mason’s wireless network typically supports in excess of 12,000 endpoints on any given weekday and over 34,000 wireless devices—up from 22,500 devices just one year ago and 7,500 devices in FY2012. FY2014’s estimation of approximately 34,690 devices presently in use represents a significant increase of 55.4% over FY2013 and 362.5% over FY2012.

TSD staff also engaged extensively in the daily operations required to maintain Mason’s IT infrastructure and offerings. Select highlights of their operational accomplishments are listed below under individual department headings.

- **Client Relations (CR)**

- Provided oversight and/or support for nine marketing campaigns—key campaigns included those for the university-wide deployment and service management of MasonLive and Office 365, the role of and availability to faculty and staff of eduroam, and the promotion of upgrades and improvements to Mason’s wireless network
- Provided oversight and/or support for 28 Service Level Agreements, one (1) Memorandum of Understanding, and one (1) Operational Level Agreement

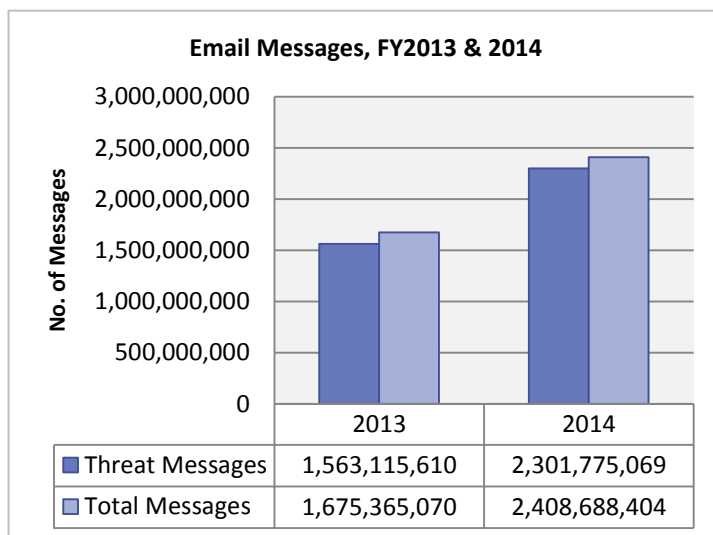


Figure 8 Email messages, FY2013 & FY2014

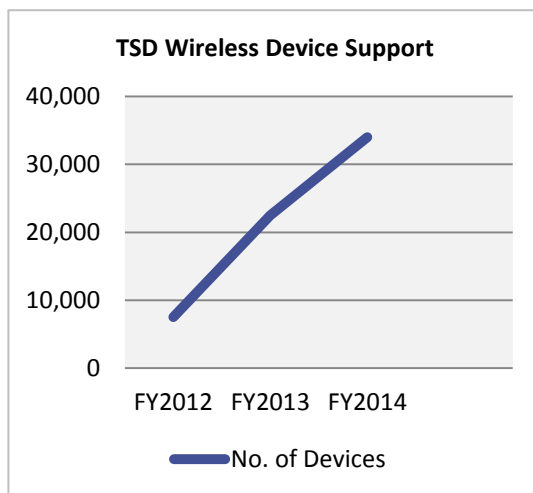


Figure 9 TSD Wireless device support

- Provided extensive support for the collaborative launch with Human Resources & Payroll of the Flexible Work website (<http://flexwork.gmu.edu>)
- **Database Application Services (DAS)**
 - Provided database administration services for over 70 Oracle databases
 - Supported data marts for all of Mason functional (administrative) units
 - Processed 62 Architectural Standards Committee related assessments—the number of assessments processed this year reflects an increase of 248% from that of FY2013 (N=25)
 - Maintained Mason specific modifications to the Enterprise Resource Planning system (Banner) and custom integrations for many university applications relying on Banner data
 - Fielded 2,006 tickets through Team Track—up nearly 15.5% from last year (N=1,738)
- **Enterprise Servers & Messaging (ESM)**
 - Provided central management for 413 servers—an increase of over 7% from FY2013
 - Maintained 237 servers designated for virtual computing
 - Provided oversight and support for 3,571 configuration management database (CMDB) assets
 - Fielded 2,142 Service Desk Express tickets
 - Managed 1,175 Request for Changes submissions—a 14% increase over FY2013 (N=1,029)
 - Managed data storage for the Mason community by way of the Virtual Computing Laboratory (VCL, 18 terabytes usable disk space), COLO (6 terabytes usable disk space), Video Surveillance (12 terabytes of usable disk space), SAN (117 terabytes of usable disk space) and Data Domain's Backup Data (29 terabytes) and Post De-duplication (8.6 terabytes)
- **Information Technology Process & Planning (ITPP)**
 - Helped identify 107 service processes
 - Formally mapped 70 percent of personnel Roles and Responsibilities
 - Has 50 service maps in progress
 - Helped define 105 IT Services, where owners and managers were identified for 95 percent (target is 100 percent)
 - Worked with Mason's Facilities division to identify communications services needs, and to help track progress on IT systems for over ten substantial construction projects
 - Participated in moving computers and telephones for 1000 people this fiscal year
- **Network Engineering & Technologies (NET)**
 - On a daily basis, oversaw more than 550 managed devices supporting over 45,000 ports and a network with over 30,000 active nodes
 - Supported over 178 discrete virtual networks—an increase of 248% from FY2014 (N=73)
 - Supported and maintained Mason's wireless network which boasts nearly 2,618 wireless access points that often support in excess of 12,000 endpoints on a typical weekday and as

many as 34,690 wireless devices in use at one time—the latter amount reflecting an increase of approximately 39% from just one year ago

- Supported 6,244 IP phones—up 5% from FY2013 (N=5,938)

- **Technology Support Services (TSS)**

- Opened a total of 51,170 incidents and closed 57,029 incidents
- Relocated 1,534 pieces of equipment across Mason campuses and ensured that the moved equipment worked properly
- Moved 651 phones and conducted extended assessments on phone equipment in order to start the Telecom Analog Conversion process
- Catalogued, installed and—where necessary—refreshed a total of 2,121 phones (includes the installation of 333 phones, moving of 572 phones, fixing and/or troubleshooting of 625 phones, and programming of 591 phones)

TECHNOLOGY SYSTEMS DIVISION

Accolades & Scholarship

Executive
Summary

Division
Overview

Fiscal Year
Highlights

Accolades &
Scholarship

TSD affiliates with a variety of organizations that enable its staff to remain current with technology and trends in application of technology within higher education. This year TSD staff held 22 statewide, regional, national or international affiliations and contributed to the field of Information Technology through presentations, publications, instruction, and participation on councils and committees. This year over 20 TSD employees received advanced certifications and 42 were awarded ITU Caught in the Act (CITA) Awards—a recognition received by ITU staff who exhibit excellence in customer service. The remainder of this section lists the professional activities and awards of TSD staff.

State, National &
International Affiliations

22

Advanced Certifications

21

Caught in the Act Awards

42

Statewide, Regional, National and International Affiliations

- 4-VA (<http://4-va.org/>)
- The Association for College and University Technology Advancement (ACUTA, <http://www.acuta.org/>)
- Association of Collegiate Computing Services (ACCS, <http://www.accsva.org/>)
- Association of Writers & Writing Programs (AWP, <https://www.awpwriter.org/>)
- Building Industry Consulting Services International (BICSI, <http://www.bicsi.org/>)
- E&I Cooperative Purchasing (<https://www.eandi.org/>)
- Edu1World: Banner Large School Consortium (LSC, <http://www.edu1world.org/>)
- EDUCAUSE (<http://www.educause.edu/>)
- The EDUCAUSE Center for Applied Research (ECAR, <http://www.educause.edu/ecar/>)
- Help Desk Institute (HDI) Higher Education Forum (<http://www.thinkhdi.com/>)
- The IBM Cloud Academy (<http://www.ibm.com/solutions/education/cloudacademy/us/en/>)
- InCommon (<http://www.incommon.org/>)
- The InCommon Federation (<http://www.incommon.org/federation/>)
- The International Avaya Users Group (IAUG, <http://iaug.org>)

- Internet2 (<http://www.internet2.edu>)
- The Mid-Atlantic Research Infrastructure Alliance (MARIA, <http://www.marialliance.net/>)
- The Mid-Atlantic Banner Users Group (MABUG, <http://www.mabug.org/>)
- The National Writers Association (<http://www.nationalwriters.com/>)
- Project Management Institute (PMI, <http://www.pmi.org/>)
- SCHEV Digital Resources Committee (<http://openva.org/>)
- The Southeastern Universities Research Association (SURA, <http://www.sura.org/>)
- Virginia Software Summit (<http://virginiasoftwaresummit.org>)

Awards and Honors

- Anita Kalyana: Outstanding Achievement Award
- Kathy Bonafede, Carolyn Combs, Pam Miller, Denise Coates, Anthony Wilson: ITU/TSD Outstanding Impact Award
- David Robinson: Golden Key International Honor Society
- Jed Frye: GMU Employee of the Month, November 2013

Caught In the Act Awards

This year TSD employees received 42 Caught In the Act (CITA) Awards. The CITA Award is customer service award that recognizes ITU employees who go "that extra mile" for a customer. All ITU classified staff, administrative/professional faculty, and non-student and student wage employees are eligible. Award nominations are submitted by Mason students, faculty and staff. The following persons are this year's TSD CITA recipients—some of them being nominated more than once:

Anita Kalyana	Justin Stith	Pam Miller
Belinda Taylor	Kate Orf	Paul Matner
Brain Mancuso	Kathy Adcock	Robert Fernandez
Byung Kook	Kim Raley	Scott Smith
Carolyn Combs	Kristen Jennette	Stephanie Klare
Cassie Carter	Leon Truong	Stephanie Werhane
Chase Gleason	Marley Withrow	Tom Deike
Debby Penny	Marques Wilson	Ubaidul Khan
Dennis Savonarola	Mike Briggs	Yi Yuan
Emilio Goncalves	Mike Cox	Yu Kuo
Ginnie Mahoney	Mike Quigley	
Juan Laguna	Mukarram Shahzad	

Certifications

The following certifications are standard for TSD staff:

- Support Center Analysts receive HDI Support Center Analyst Certification
- Desktop Technicians receive A+ Certifications
- Desktop Technicians receive Apple/Mac Desktop & iOS Certifications
- Desktop Technicians receive Network + Certifications

In addition, the following TSD members received degrees and/or certifications this fiscal year:

- Randy Anderson: ITIL v3 Foundation
- Matt Berlejung: HDI Support Center Analyst Certification
- Steve Broaddus: JAMF CAA – Certified Casper Administrator
- Jean Callahan: ITIL v3 Foundation, BICSI ICT Design Fundamentals
- Jed Frye: Apple Certified Macintosh Technician, JAMF CMA – Certified Mobile Administrator, JAMF CAA – Certified Casper Administrator
- Stephanie Gleason: CCNA Security, Bachelor's Degree
- Sarah Hamilton: JAMF CMA – Certified Mobile Administrator
- Deborah Isaacs-Kazemi: ITIL Foundation
- Stephanie Klare: HDI Support Center Team Lead Certification
- Andrew Krell: ITIL Foundation, MBA from George Mason University
- David LaRose: CCNA
- Mary Lulis: Advanced Customer Service
- David Robertson: ITIL v3 Intermediate Certification—Service Strategy
- Thomas Shifflett: PMP
- Jackie Thomas: ITIL v3 Foundation—Service Management
- Leon Truong: CCNA
- Yu Kuo: CompTIA Security+, Red Hat Certified Engineer—RHCE, Red Hat Certified System Administrator—RHCSA, Linux Professional Institute Certification Level 1—LPIC-1

Councils & Committees

- Ann Gerwitz: Project Management Institute, Washington DC Chapter
- John Kettlewell: Help Desk Institute's Desktop Advisory Board, Board Member
- John Kettlewell: Help Desk Institute's Higher Education Forum, Member
- Teresa Gibbons: Association of Collegiate Computing Services, Board Member
- Teresa Gibbons: Help Desk Institute's Higher Education Forum, Member
- John Hanks: Fairfax County Information Technology Policy Advisory Committee, Member
- Sharon Pitt: EDUCAUSE Senior IT Leadership Roundtable, Council Member
- Sharon Pitt: E&I Cooperative, Technology Committee Member

- Sharon Pitt: Mid-Atlantic Research Infrastructure Alliance (MARIA), Board Member
- Sharon Pitt: Southeastern Universities Research Association (SURA), IT Committee Member, Steering Group Member
- Sharon Pitt: 4-VA, Executive Director

Presentations and Publications

- Anderson, R., & Robertson, D. 2014. "An ITIL Conversation," Presentation for the Association of Collegiate Computing Services of Virginia (ACCS) Annual Conference. Charlottesville, VA.
- Broaddus, Steve. 2014. "Imaging Desktops in the Enterprise," Presentation for the Association of Collegiate Computing Services of Virginia (ACCS) Annual Conference. Charlottesville, VA.
- Davia, Gowen, Ghezze, Harris, Horne, Potter, Pitt, Vandenberg, and Xiong. 2013. "Cloud Computing Services and Architecture for Education", International Journal of Cloud Computing (IJCC), v. 2, no. 2/3.
- Hanks, John. 2014. "Converting to SIP Trunks: George Mason University—A Case Study," IAUG Converge. Dallas, Texas.
- Thomas, Jackie. 2014. "Converting Analog to VoIP Solutions," IAUG Converge. Dallas, Texas.
- Holt, T., & Prette, J. 2014. "A Migration To The Cloud: Lessons Learned from an Office365 Implementation" Presentation for the Association of Collegiate Computing Services of Virginia (ACCS) Annual Conference. Charlottesville, VA.
- Pitt, S & Miller, M. 2013. "Restructuring IT Organizations: Challenges and Opportunities," EDUCAUSE Annual Meeting. Anaheim, CA.

Teaching

- Ben Allen: Network Implementation Laboratory (ECE 467), George Mason University
- Tommy Dang: CompTIA® A+, Northern Virginia Community College; CompTIA® Network+, Northern Virginia Community College
- David Robinson: English Composition, Northern Virginia Community College

Appendix A

Department Activities, Challenges & Opportunities

The tables that follow list the fiscal year activities, challenges, and opportunities of each department in relation to four strategic goals of the Information Technology Unit. These goals provide strategic direction for the Technology Systems Division's Strategic Plan, 2010-2014.

CLIENT RELATIONS: Activities, Challenges & Opportunities

Major Operational Activities	
ITU Goal	Description
2	Support the measurement, evaluation processes, and documentation management related to SLAs, OLAs and MoUs
2	Conduct major communications campaigns targeting critical rollouts and initiatives
2	Support the development, documentation, and management of policies and service ordering processes
2	Measure and analyze more data related to communication and process leading to continuous process improvement and greater customer satisfaction with information delivered by the ITU
Challenges	
ITU Goal	Description
2	Find an effective method to push important communications to the Mason communities of interest
2	Market the ITU channels of communication in order to make them better known to the Mason community
2	Create better online information repositories for ITU-focused information and resources
2	Improve the abilities to effectively manage projects with cross-organizational resources
2	Update the ITU Continuity of Operations Plan to include recent changes in operations and services
Opportunities	
ITU Goal	Description
2	Promote Mason's Flexwork service offering to the Mason community and provide knowledge transfer about resources available
2	Develop a single ITU web presence that is organized so that customers can easily find the resources they want and get services they need
2	Create more opportunities to obtain feedback for customers about ITU services and incorporate ways to achieve continuous service improvement to better address the needs of customers
2	Promote the alignment and coordination of ITU team projects to ensure efficiency of cross-organizational team resources

DATABASE APPLICATION SERVICES: Activities, Challenges & Opportunities

Major Operational Activities		
ITU Goal	Objective	Description
2	2.8	Resolve production problems as necessary
2	2.8	Provide Banner integration for applications used by Mason units
2	2.8	Design and code modifications or enhancements to Banner functionality as requested by Banner Functional Offices
1	1.7	Monitor Serena Business Manager & Service Desk Express for requests
1	1.7	Check health and performance of systems and databases
2	2.3	Participate in daily Operations Meeting
2	2.3	On call 24x7 to handle production problems
2	2.3	Monitor the Daily Job Change Report and remove access to back-office applications when appropriate
2	2.8	Install Banner upgrades and patches in test and development instances
2	2.8	Monitor nightly refresh of data marts (done via ETL)
2	2.8	Monitor Discoverer Problem Reporting for user requests
2	2.3	Troubleshoot Banner Data Mart security issues
2	2.3	Handle tickets for Discoverer related problems
2	2.8	Run Data Center
1	2.3	Requirements analysis and scoping
2	2.3	Application programming and administration
2	2.3	Development, testing, coordination, communication, and deployment for new web applications and content management systems
2	2.8	Maintenance and production support for various applications and systems (e.g., COEUS, eVA, CommonSpot, Mason Travel Authorization system, Alumni directory, ODPR, Mason Alert, UPIC)
2	2.3	Review and route ASC review requests from users to ASC reviewers
2	2.3	Work with users to assist in ASC form submission
1	2.3	Provide analysis assistance and architecture guidance as needed
2	2.3	Document DAS processes and requirements
4	4.1	Work as campus outreach for DAS to Mason units

Challenges		
ITU Goal	Objective	Description
1	1.7	Opnet did not meet the requirement for fine grain monitoring of Banner due the latter's older architecture (Oracle Forms). TSD is in the process of working with the Opnet vendor, Riverbed, to configure Opnet to monitor Banner as fully as possible. Once Ellucian deploys Banner as a complete Java application, full monitoring through Opnet will be possible.
2	2.5	Moving Commonspot to Cloud services was a procurement, contractual and technical challenge and was not as smooth of a transition as anticipated. The offering is now functioning at the level expected by Mason.
2	2.13	TSD has yet to establish an enterprise mobile offering beyond applications within Blackboard Mobile Central. Responses to ad hoc review requests are being processed but there is still a lack of formal structure and policies due to the absence of overarching vision for a centrally supported mobile offering.
Opportunities		
ITU Goal	Objective	Description
2	2.5	It is anticipated that in FY 2015 TSD (in collaboration with stakeholders) will select a supportable, scalable and flexible enterprise CMS that will provide centralized enforcement of policies and process while enabling decentralized administration by Mason units.
2	2.13	TSD will endeavor to implement policies, process and procedures around a true enterprise mobile offering.

ENTERPRISE SERVERS & MESSAGING: Activities, Challenges & Opportunities

Major Operational Activities		
ITU Goal	Objective	Description
2	2.3	Plan and build replacement infrastructure for the university web site
2	2.3	Design and build work to replace Account Management System
2	2.2	Replacement of monitoring and network management equipment [This is Canary systems and IPAM]
2	2.3	Continued operational support of major IT infrastructure supporting Banner, MESA, and other central services.
Challenges		
ITU Goal	Objective	Description
3	3.1	Continuing to provide and grow services under budget constraints
3	3.1	Completing projects on time under an almost continuous stream of preemptive projects and requests
3	3.1	Retaining staff with a compensation system frozen in 1970
Opportunities		
ITU Goal	Objective	Description
2	2.3	The institution of ITIL practices may better position the organization to provide more coordinated service delivery
2	2.2	Replace the MESA Active Directory domain controllers with new operating hardware and virtual servers to utilize their full cycle lifetime

NETWORK ENGINEERING & TECHNOLOGY: Activities, Challenges & Opportunities

Major Operational Activities		
ITU Goal	Objective	Description
1	1.1	Planning and design of telecommunications network for the new Loudoun site at Signal Hill.
1	1.1	Planning and design of a new telecommunications network for the Mason Global Center (a new university program run out of the re-purposed Mason Inn). (Estimated completion in August, 2014)
1	1.1	Planning upgrades for the residence hall wired networks. Prepared a six-year lifecycle plan for upgrades in all university residence halls.
1	1.1	Enterprise Firewall Migration. NET has deployed a new enterprise firewall platform, the Palo-Alto 5060. For the last year, NET has been migrating from its legacy Juniper firewalls (SSG 550, ISG 2000) to this new platform.
1	1.1	Planning network architecture and deployment for Commerce building.
1	1.1	NET is deploying the Cisco Identity Services Engine as a network admission control system in front of wireless networks, wired networks, and a new enterprise VPN. ISE was placed in service in January, 2014, performing authentication for the MASON-SECURE encrypted wireless network. In June, ISE also took over authentication for the eduroam wireless network. On July 16, NET will launch a new VPN service using the Cisco Adaptive Security Appliance (ASA) as a gateway and ISE for authentication and authorization. On July 20, NET will deploy new wireless networks and a residence hall wired network, all authenticated by ISE. By the end of summer, NET expects ISE to have completely replaced the legacy network admission control system using the Juniper Unified Access Control product.
1	1.3	Continue the migration to VoIP and the decommissioning of the Harris Theater TDM PBX. The majority of the Fairfax Campus has been migrated from the Harris PBX (Nortel 81C) to a Nortel/Avaya VoIP system (CS1000E). The new system supports primarily VoIP telephony instruments, but also provides analog dial tone for life safety systems, modems, and fax machines.
1	1.3	Planning and testing of Windstream SIP trunk installation and DID migration (Verizon to Windstream).
1	1.7	To improve ITU's application performance monitoring capability, a cross-functional TSD team (representing NET, DAS, ESM) has completed the initial deployment of an OPNET Application performance monitoring infrastructure. The tools deployed include AppResponseXpert, AppInternalsXpert, AppMapperXpert, AppSensorXpert, OPNET dashboards and the transaction trace warehouse.
Challenges		
ITU Goal	Objective	Description
1	1.3	In late spring, 2014, the university moved several departments in order to facilitate the move of senior administration from Mason Hall and into Alan and Sally Merten Hall. These series of moves (which included moving the Telecom Admin department) caused a several month delay to the Harris PBX decommissioning project.
1	1.4	George Mason University leases dark fiber from the Zayo Group for its metro area network. Zayo was re-awarded its contract in Fall 2013 which included the expansion of Mason's metro area ring and a new ring site at the Equinix DC2 datacenter in Ashburn, Virginia. During the initial request and planning phase, the new fiber footprint was to follow an existing route between Mason's Prince William Campus and its colocation site at the Level3 datacenter in McLean, Virginia. The new footprint would incorporate

		the Ashburn facility with a new span from Prince William to Ashburn and from Ashburn to McLean. This would have cut the existing span distance from 80 to 50km, providing a performance gain. When delivered, the new footprint connected Ashburn as a spur from Prince William rather than as a site on the ring. It also followed a different path that was over 120km in length – beyond the performance envelope of Mason’s existing optical networking systems. Network engineering continues to work with Zayo to resolve this issue and needs the new network in place before deploying new core and optical network infrastructure.
Opportunities		
ITU Goal	Objective	Description
1	1.1,1.4	As facilities are installed and renovated, NET will use available capital project funds to make network improvements. NET has developed new network architecture, internally named “Supercore,” that reduces the number of routing devices while improving network capacity and resiliency. As the Supercore architecture is deployed, it will remove all single points of failure upstream of the network access switch. NET expects this to localize all internet service disruptions, improving time to resolution and general uptime performance across the university.
1	1.3	NET is installing a new voicemail system, migrating from Call Express to Avaya’s Call Pilot product.
1	1.3	NET will continue the migration of DIDs from Verizon to Windstream, scheduling a second block of 1500 numbers, followed by two additional blocks of 3000. The migration is expected to be complete late 2014 or early 2015. Decommissioning Verizon PRIs will be commensurate with number migration. When finished, NET expects an increase in resiliency and an improvement in cost.
1	1.4	NET is in the process of purchasing a new network core and optical network. These systems are 100G ready and can facilitate a new research capability with the purchase of additional components. Over FY2015, NET will deploy these new systems as part of a new core network architecture and pave the way for a new research network fabric when funding becomes available.

INFORMATION TECHNOLOGY PROCESS & PLANNING: Activities, Challenges & Opportunities

Major Operational Activities		
ITU Goal	Objective	Description
2	2.4	Improve IT service levels and business maturity by ensuring that the ITU's service processes are aligned with industry best practices and are effective, efficient, repeatable, and consistent
1,2		Act as primary liaisons with the Facilities division, working with them to incorporate the ITU's requirements into capital project planning and construction and to convey construction expectations and timelines to the relevant ITU departments
2	2.4	Develop processes, standards, and frameworks for the development and documentation of Enterprise IT Architecture across the ITU
2	2.4	Lead TSD's IT Service Management/ITIL program
2	2.4	Facilitate the development of IT infrastructure and services that effectively support the university's strategic goals
1,2		Ensure that IT needs associated with departmental moves and the opening of new facilities are accommodated effectively and efficiently
Challenges		
ITU Goal	Objective	Description
2	2.4	Much of the ITPP team's efforts over the past year have been directed toward building an effective framework for IT Service Management—putting in place the tools, policies, and procedures to support the program, and developing project plans to address gaps. As the program continues, its success hinges on the ITPP's ability to change longstanding operating practices and incentivize staff to embrace a new, more collaborative way of working together to provide outstanding levels of service.
1,2		Historically, ITU's participation in the planning phases of capital construction projects has been uneven; if the ITU is not included early and often in the design discussions, service problems can occur which result in unmet customer expectations or unnecessary cost and delay.
Opportunities		
ITU Goal	Objective	Description
2	2.4	Employees are the ITU's most valuable asset and are enthusiastically supporting the new direction the organization is taking as they continue to learn about ITSM principles and help = develop improved processes to better serve customers.
1,2		ITPP is continuing to build a strong working relationship with Mason's Facilities organization, working together to formally define integrated processes that will help provide more consistent and timely communications services to capital construction projects.

TECHNOLOGY SUPPORT SYSTEMS: Activities, Challenges & Opportunities

Major Operational Activities		
ITU Goal	Objective	Description
1	1.5	Performs proactive fault management to ensure that system outages are detected, corrected, or escalated to the appropriate support personnel
1	1.5	Coordinates both systems and facilities maintenance activities impacting the data center
1	1.5	Monitors academic and administrative systems, network availabilities, Cable TV, and the data center's room environment
2	2.2, 2.11	Serves as a central point of contact for the Mason community to request IT support or information
2	2.2, 2.11	Provides support through walk-in, phone, email, chat, and remote assistance
2	2.2	Refers IT related needs to the appropriate resource within the ITU for resolution
2	2.2	Logs all requests for service in Service Desk Express, resolving tickets when possible
2	2.2, 2.11	Provides support to Housing and ITE&E in the use of SDE
2	2.2, 2.11	Oversees and manages the Residential Technician program
2	2.2,2.8, 2.11	Coordinates Residential Technician participation in "Get Wired" program that helps incoming students connect personal devices to the Mason network
2	2.2,2.8, 2.11	Provides hardware and software support for microcomputers, mobile devices, VoIP telephones, printers, and various peripherals
2	2.2, 2.8, 2.11	Works on specific technology challenges and projects that focus on the support of end user devices
2	2.2, 2.11	Responsible for the relocation of equipment across Mason campuses and ensuring that moved equipment works properly
2	2.2, 2.11	Responsible for purchasing equipment, parts ordering for computers, distributing software, TSS equipment and vehicle management and building management of the Rivanna module
2	2.8, 2.11	Provides training for Mason community
2	2.2	Provides 24/7, 365 operational support for Mason's enterprise network
2	2.2	Initiates system backups
2	2.2	Manages and processes backup media
2	2.2	Coordinates file restoration
2	2.2	Provides and manages physical space within the Aquia Data Center for colocation services of departmental servers and other appliances and services for Research Computing
2	2.2	Provides daily system status reports

2	2.2	Leads the daily ITU Change Review Board Status meetings, recapping the previous 24 hours and conducting the change management process for TSD
2	2.7, 2.11	Provides support in the field for Mason's telephone systems
3	3.1	Provides overall operational and project support
Challenges		
ITU Goal	Objective	Description
2	2.11	Staff Location and Resources: TSS groups on the Fairfax campus are geographically dispersed. Collaboration and knowledge sharing would be greatly enhanced if the Support Center and the Fairfax Desktop Groups could be together or adjacent to each other. Similarly, the team would benefit from additional space being made available for Support Center staff in Innovation Hall Room 233. Lastly, related to staffing resources, there is no funding for a support position at the Mason-Smithsonian site in Front Royal.
2	2.2, 2.11	Technology Purchase Oversight: With the proliferation of personal computing devices and equipment—whether a microcomputer, printer or mobile phone—comes the challenge of balancing flexibility of choice with standardization of device and related support. TSS resources continued to be strained this year as technicians sought to support a growing variety and number of devices and equipment. Going forward, TSS encourages creation of a process for review of technology purchases where recommendations or guidelines can assist in improving the customer experience and allocation of limited department resources.
2	2.2, 2.11	Software Distribution & Licensing: TSS staff work continued to be impeded by the lack of a centralized area to manage software licensing and distribution for Mason. Information and access to licensing details is not easily available. A centralized location could significantly improve ease of access to and management of software licensing codes. A Software Licensing Committee was established this year to help address this issue and recommend an effective solution.
2	2.4	Service Desk Express (SDE): SDE needs be replaced with a centralized Information Technology Services Management (ITSM) solution that meets the requirements of all ITU groups and a number of outside departments. Replacing SDE will be addressed in the ITSM project as part of the response to the ITIL assessment completed by the consulting firm Plexent, Inc. A committee was chartered this year to launch a search for a replacement application for SDE which complements the entire ITSM structure.
2	2.2	Password Reset Process: This and other related account management incidents are the top 5 service requests handled by the ITU Support Center. The password reset process is outdated and cumbersome, requiring the customer to either come in or fax a copy of their photo ID to the Support Center. In addition, the process does not have a clear owner. Implementing a tool that allows automated password resets would both expedite resetting the password for the customer as well as reduce the amount of resources required to support the reset.
Opportunities		
ITU Goal	Objective	Description
2	2.11	Virtual Desktop Technology: An opportunity exists to identify and support a centralized, enterprise virtual desktop solution. The technology can provide users with the choice of various desktop operating system images while keeping their data secure and providing mobility. It could also serve as a desktop solution through the ETF process and be part of a mobile device management solution. A centrally supported solution would also limit the number of virtual desktop technologies being employed across Mason

		campuses that would require support from TSD resources.
2	2.4	Homegrown Technical Solutions: Homegrown solutions can be great for solving issues and promoting creativity. They are also useful when there are no commercial solutions available that can achieve the functionality and results desired. A downside, however, is that these solutions can also create single points of dependency and maintenance challenges. Overall, TSS anticipates increased opportunities to invest in available commercial products that provide the primary functionalities desired. Support can then be acquired from a solution provider should local knowledge be unavailable. A commercial solution may also make it easier to integrate with other technology solutions in use or being considered by the ITU.
2	2.2,2.4, 2.11	Hardware Standardization: Within an enterprise, TSS supports the idea of using a single manufacturer for certain hardware devices that may need to integrate with other hardware performing the same or similar functions. By standardizing hardware, the department and division can avoid additional efforts required to make devices operate with each other. This would both simplify support and reduce the chances of possible outages due to poor configurations or firmware updates.
2	2.2	Promote and Increase Research and Other Colocations in the Aquia Data Center: TSS continues to promote the benefits and services of the Aquia Data Center with Mason departments and research groups. The team provides support for potential customers of the data center services by providing move-related information and guidance based on a customer's technology requirements.
2	2.2,2.8, 2.11, 2.13	Centralized End Client Device Management: TSS will continue to encourage departments and users not attached to the Mason Enterprise Services Architecture (MESA) or Apple's Casper system to migrate to these services. MESA and Casper enrollment makes additional services available for disaster recovery of data and allows TSS to provide desktop management across the network (e.g. for software distribution, patching, and imaging).

Appendix B

Department project list organized by project life cycle phase

Projects Listed by Department w/Project Phase	
CR	
1-Identification	
	ITU COOP Project
	Mason Web Presence Branding and Realignment
	NET Web Space Redesign
2-Initiation	
	ITU Orientation Strategy and Plan
3-Planning	
	TSD Process Documentation Management
4-Execution	
	After Action Report Process Plan
	Flexwork Site
	Migration to Online Ordering Forms Project
	MoU Strategy and Management
	OLA Policy and Process
	Plan and Process to Manage the Communication for Unexpected Service Disruptions
	SLA Policy and Process
DAS	
2-Initiation	
	INTO Salesforce and Banner Integration
	Multi-factor Authentication Implementation
	PEC portfolio reorganization and development
	Roam Secure replacement - RFP participation
	T&E System Enhancement
3-Planning	
	Discoverer Upgrade
	DW - BI Dashboards

Imaging extension
Mobile Application Development
Online Deposit application redesign
4-Execution
Application Performance Tool Implementation
ASC Review
Banner Upgrade Planning
Banner XE Investigation and planning
Blackboard Grade Export
CLEAN Address
DAS - Banner to AMS
Degree Works Localizations
Docushare Server Migration and Upgrade - LDAP
DW-BI Implementation
DW-Sponsored Program Data Mart - Release 2
Oracle Critical Patches
Oracle database upgrade
Roam Secure
Serena Version Manager
Student Data Mart ETL Re-Write
University Process Improvement Council
VCL pilot for HR/Payroll
ESM
1-Identification
Backup Architecture Review
Encrypted Email
Internet2 Bronze/Silver Assurance
Listserv Upgrade
Mail Routing Review & Server Upgrades

SAN Storage Replacement
2-Initiation
Active Directory 2012 Upgrade
F5-Foundry Migration
MASONLIVE Student System SSO Replacement
Video Surveillance Upgrades
3-Planning
JJU Virtualization
4-Execution
AMS Implementation
AMS Specifications
Centralization of Housing Servers
F5-Cisco Migration
Foundation Call Center
Internal Audit
IRISAccess
Lexis Nexis
NSF Audit
Office 365 - Employee System Phase II
Office 365 Student Advantage
R25 Application Interface Upgrade
Shibboleth
TicketMaster Upgrades
WatchGuard DashCam Server
Windows 2003 Upgrades (to Windows 2008)
ITPP
3-Planning
Change Management Process Improvement
Incident Management Process Improvement
ITU Move Process Improvement
Offsite Monitoring
4-Execution
Executive Dashboard for KPIs

ITSM Program: Baseline Assessment
ITU Audit Repository
ITU Mason Hall/University Hall Move Planning
Loudoun Site Move: IT Planning
Mason Inn Conversion (INTO) IT Planning
Technology Architecture Program Development
NET
2-Initiation
Call Pilot Voice Mail
3-Planning
Loudoun Site to Signal Hill move
4-Execution
Harris PBX Decommissioning
ISE Deployment
Network Security Firewall Replacement
Session Initiation Protocol (SIP) Trunking/Primary Rate Interface (PRI) Replacement
TSS
2-Initiation
ITSM Tool Requirements
3-Planning
TSS - Self-Service AppStore
4-Execution
Application Virtualization Phase 1
Management for OS X
Software Distribution and Imaging Architecture Phase Two
Software Licensing