TECHNOLOGY SYSTEMS DIVISION

Annual Report for Fiscal Year 2013

Providing **Innovation**

Extending **Research**

Supporting **Diversity**

Enabling **Access**

***Strategically* connecting Mason *with the* World**

Information Technology Unit
George Mason University
July 2013

TECHNOLOGY SYSTEMS DIVISION

Welcome

The excellence of a technology organization can be measured by the values, goals, and relationships that drive its achievements. For the Technology Systems Division, your success served as the primary aim behind our initiatives and accomplishments this fiscal year. We are pleased to share the results of the division's efforts with you through this annual report.

This year, the division invested in ten (10) key initiatives that advanced critical needs related to business intelligence, information security, IT service management, wireless and data networks, and processes where IT solutions significantly increase efficiency and effectiveness. These initiatives—in conjunction with over 50 additional IT projects undertaken by TSD departments—served to strengthen Mason's IT infrastructure and to ensure that the right processes and tools are in place to support the academic and administrative needs of Mason and the strategic goals of the Information Technology Unit (ITU) and university. We are proud of the work accomplished this year. These endeavors, alongside our daily operations, provide an IT environment that enriches our community and strategically connects Mason with the world.

Throughout the year, TSD worked closely with our ITU sister divisions and five IT governance groups. The governing bodies consist of the Architecture Standards Committee (ASC), the Faculty Senate Technology Policy Committee (FSTPC), and three Banner Governance groups. Together, they provide insight for TSD decision-making and direction for the division's development of IT strategies, policies, priorities, and services.

Going forward, TSD remains committed to increasing our focus on IT leadership, service management, and innovations that strengthen customer and client relationships and promote institutional excellence. We want to thank Walt Sevon for the leadership and legacy he provided TSD during his tenure. We look forward to building upon this foundation and working alongside you to more fully support your success and bring to life the *IDEA* of Mason.

Sharon P. Pitt
Director, Technology Systems Division & Interim Deputy CIO

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Thank You TSD!

Paul stayed on the phone attempting to help me for almost 2 hours! He definitely went above and beyond the call of duty! *– Mason Student*

Jesse was professional, friendly, competent, and thorough…. [He] talked to me and explained what he was doing at a technical level that matched my level of understanding, which I really appreciated. I have to say, all in all, it was an informative and very enjoyable experience. Thank you, Jesse, for being there for me and others at Mason and for doing your job with skill and excellent customer service. *– CHHS Professor*

Taran helped me with my flash drive problems which allowed me to save my data all safely. Without his help, I would not have passed my classes after losing all my work. *– Mason Student*

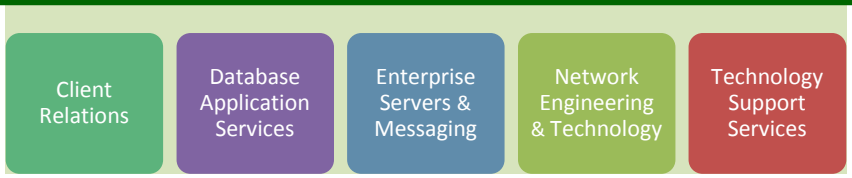
IT Specialist Cheng Cheu provided outstanding help to me yesterday over the phone…. He was patient, helpful, and really excellent to work with. *– Engineering Professor*

[Juan] has shown superior professionalism, has been available and approachable, and knows the systems we use. He has done a great job getting me up and working. I truly appreciate his help and everyone from the ITU. I cannot do my job without you and people like Juan. *– Operations Manager*

Working with Stephanie…was a wonderful experience. She was our go-to person from beginning to end as we redesigned our website, re-worked all of our content and structure, and finally moved it to ITU's server where we now are users of CommonSpot. She always made me feel that I was top priority…. Everyone in our department was very excited on launch day, and we certainly owe a big thanks to Stephanie! *– Housing and Residence Life*

TECHNOLOGY SYSTEMS DIVISION

Annual Report for Fiscal Year 2013



The **Technology Systems Division** (TSD) of George Mason University provides technology infrastructure, strategic business resources, and computing services to the entire university community. To accomplish this mission—and advance the strategic goals of the Information Technology Unit and the institution—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 Technology Systems Division consists of five departments. 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

153.5

Student Resident Technicians

29

Student Employees

13

Client Relations supports the measurement, evaluation, and documentation management related to Service Level Agreements (SLAs), Operational Level Agreements (OLAs), and Memorandums of Understanding (MOUs). The department also facilitates cross-university relationships and communication about important TSD projects and events within TSD and the Mason community. It supports several communication sources including the IT Services Alerts and Outages page and the ITU Maintenance Calendar. CR also provides customer service support to Mason website users and manages the Mason search engine and *A to Z* page.

Database Application Services (DAS) plans, implements, and maintains integrated and distributed information systems and associated databases in support of the business needs of Mason. Services are provided through five groups within DAS: Administrative Applications, Database Support, Data Mart Support, Portal and Web Applications, and Application Integration. Primary services include Business Intelligence reporting and support, administration and/or programming for servers, Banner, data marts, and specialized web applications.

Enterprise Servers and Messaging (ESM) is comprised of four groups: Enterprise Messaging, Engineering & Architectural Support, Server Support Group, and Systems Engineering. Together, these groups acquire, install, implement, and maintain systems for administrative support, academic research and instruction, and electronic messaging. Departmental activities include enterprise server support, systems engineering, systems administration, storage administration, data-file backups, restore and replication, systems security, electronic mail processing, and disaster recovery.

FY2013 Key Initiatives

10

State, National & International Affiliations

17

Advanced Certifications

30+

Caught in the Act Awards

84

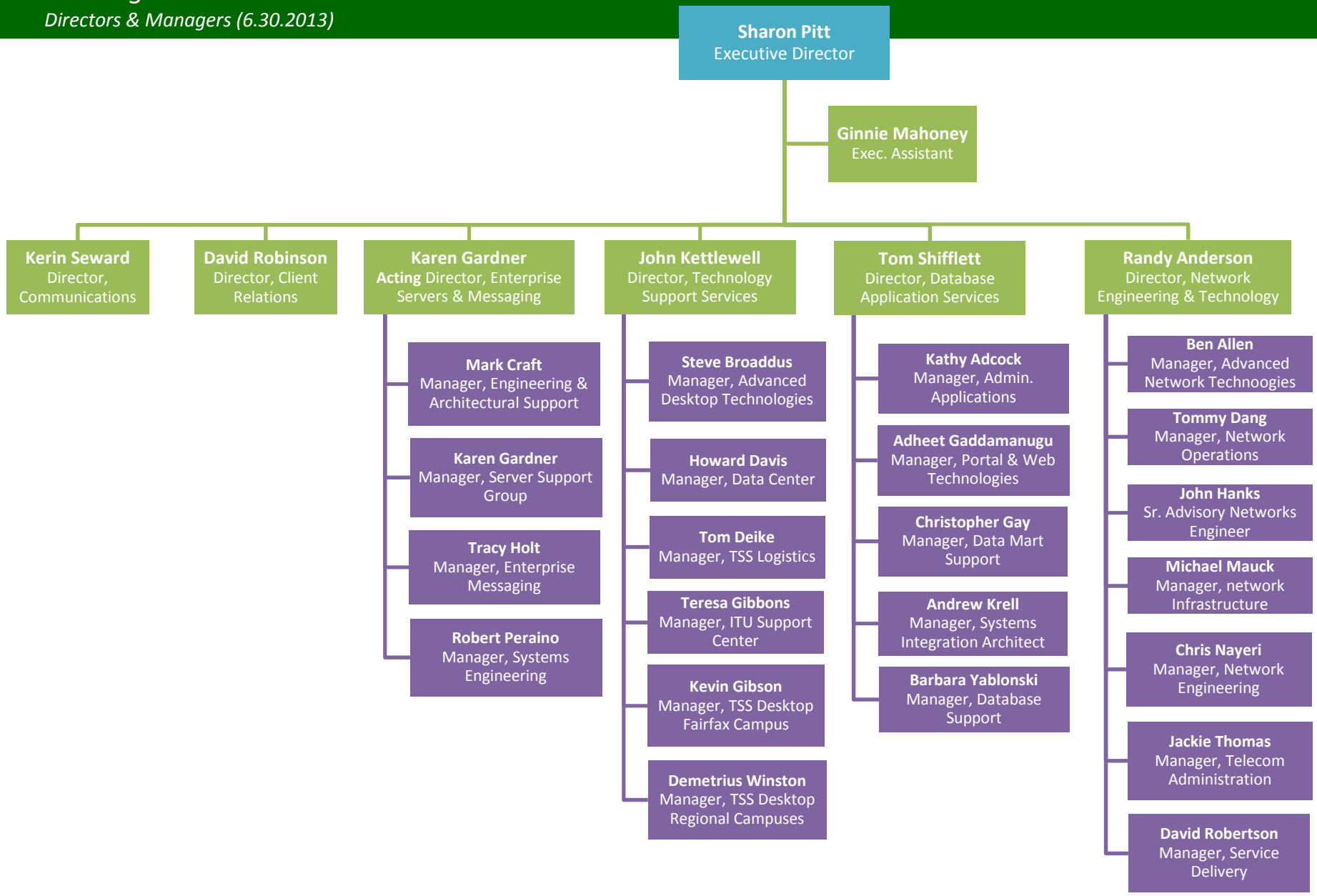
Network Engineering and Technology (NET) plans; designs; monitors; and maintains Mason's data, voice, and video networks. The department also evaluates and implements new networking technologies that support and enhance the goals of the university. NET is comprised of five units: Advanced Network Technologies, Network Engineering**,** Network Infrastructure**,** Network Operations, and Telecom Administration**.**

Technology Support Services (TSS) is a customer facing and customer service focused department providing first and second tier technical support for the Mason community. The department is organized into four groups: the ITU Support Center, TSS Desktop, TSS Logistics, and Data Center Operations. These groups provide support for the various university technologies including microcomputers, mobile devices, system monitoring, maintenance, software, and backups. TSS staff also lead or participate in critical projects and researching of technologies and methods that will improve support services and delivery.

Additional information about TSD is available online at **http://tsd.gmu.edu**. The division's website for IT Services (**http://itservices.gmu.edu**) provides a comprehensive catalog of services currently offered or supported by the division. The following page presents an organizational chart of TSD directors and managers as of June 30, 2013. A directory of all TSD staff is available at **http://asd.gmu.edu/directories/index.cfm?div=TSD**.

TSD Organizational Chart

Directors & Managers (6.30.2013)



TSD Staff Directory: http:// http://asd.gmu.edu/directories/index.cfm?div=TSD

TECHNOLOGY SYSTEMS DIVISION

Information Technology Governance

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. Charter and membership information for each of these governing bodies is provided in Appendix A. Brief descriptions are below, followed by projects highlighting the important and growing collaboration between IT governance groups and the TSD.

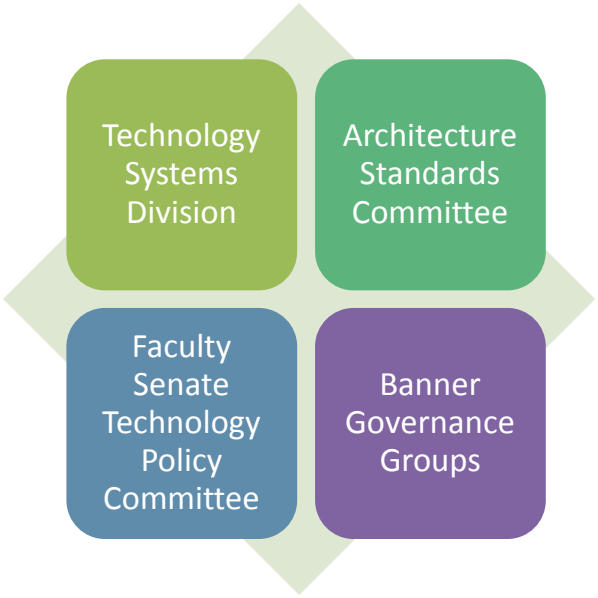


Figure 3 *IT governance groups*

The **Architecture and Standards Committee** (ASC) is responsible for reviewing, verifying compliance, and providing recommendations on software and hardware procurement projects across Mason.

Faculty Senate Technology Policy Committee (FSTPC) advises the Vice President of Information Technology and other administrators in four key IT areas: (1) investing in and implementing computer-based technologies that impact educational techniques; (2) developing of new computer-based educational techniques and research capacities; (3) creating a technology budget that reflects the FTSPC's recommendations and faculty position regarding allocations to programs and/or individuals; and (4) reviewing and maintaining an equitable intellectual property rights policy for faculty.

The **Banner Governance** structure was established in 2007. In addition to the ASC, the following three Banner Governance groups provide guidance and counsel to TSD's Banner related decisions:

- **Portfolio Governance Council** (PGC) guides and oversees the implementation and adoption of the Banner Suite and related administrative applications.

- **Portfolio Evaluation Committee** (PEC) aligns project management of the Banner suite and related administrative applications with Mason's institutional objectives, maximizes the benefits

derived from these applications, and supports the efficient use of enterprise-wide ITU resources in pursuit of common goals.

- **Project Coordination Sub-Committee** (PCS) communicates and coordinates with Banner functional offices, the Information Technology Unit, and other stakeholders in the university community on the management of the Banner suite of systems and ITU projects that impact Banner or functional operations.

The TSD engaged each of these governing bodies in numerous IT related activities, important projects, and key initiatives this fiscal year. Two projects listed below highlight the collaborative work being done.

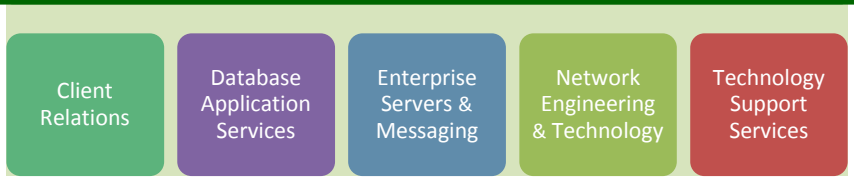
- **Architecture Standards Committee - Process Review Redesign:** TSD staff is helping redesign the ASC review process (including security, accessibility, and integration) for software and hardware development projects and acquisition requests submitted by university constituents. This redesign encompasses the processes required to review mobile applications and services better provided through Cloud vendors. A review and update of ASC documentation is also underway, which includes the procedures and templates for software development.

- **Banner Governance Charter and Duties:** TSD staff members are participating in the review and updating of the charters and duties of the Portfolio Governance Council, Portfolio Evaluation Committee, and Project Coordination Sub-Committee. This review includes an assessment of the committee structure, duration of membership, affiliations, and responsibilities.

TSD believes that having integrated and informed IT governance can yield institutional IT excellence. This coming fiscal year, TSD will continue to pursue new opportunities to work with the Mason community to share knowledge, identify critical IT priorities and endeavors, and refine mutually beneficial roles and responsibilities. The division is committed to strengthening its collaborative relationship with the IT governance groups and to recognizing their collaborative role in creating a dynamic and customer-focused IT architecture that results in a quality educational experience for faculty, staff, and students at Mason.

TECHNOLOGY SYSTEMS DIVISION

Executive Summary



This year the **Technology Systems Division** continued to strengthen the union between information technologies and the goals critical to Mason's complex, diverse, and innovative community. This annual report highlights how our accomplishments and daily activities are transforming the relationships germane to higher education and—along with them—our own approach to, and engagement in, the provisioning and managing of IT resources, tools, services, and infrastructure.

Our Customer Support

4.80 - Overall Customer Satisfaction
(*5 Point Scale, 5 = "Very Satisfied")*
52,878 Support requests received
3,551 Average incidents opened per month
3,572 Average incidents closed per month
40,473 Calls answered by Support Center
93% of Calls answered within 60 seconds
73% First Call Resolution

Top 5 Support Call Categories

44% - Accounts
18% - Password Patriot Pass
4% - MasonLive
4% - Claim Code Patriot Pass Reset
4% - Device Registration

Our Computer Support

Over 23,000 technology devices
16,074 TSS barcoded equipment
5,143 MESA connected computers
1,250 classroom and lab computers
(1,192 PCs & 58 Macs)

At the heart of this report is the division's commitment to providing exceptional IT leadership, strengthening customer and client relationships, and creating IT efficiencies by combining effective service management practices with increasingly integrated support and a robust operations architecture. With a highly technical and experienced staff as its hallmark, the TSD carried this commitment into its daily activities and fiscal year strategic planning, communications, collaborations, and critical initiatives.

In addition to this commitment, the division's fiscal year achievements were buoyed by our strategic pursuit of efficiencies and efforts related to IT service management. With respect to IT efficiencies, the TSD continues to improve in eight critical IT areas: (1) enterprise storage collection, (2) server virtualization, (3) network virtualization, (4) imaging and remote desktop management technologies, (5) Voice over Internet Protocol or VoIP, (6) service catalogs and service and operational level agreements, (7) wireless and mobile expansion, and (8) cloud standardization.

With respect to service management planning, this fiscal year the TSD undertook an extensive evaluation of the division's service management processes, capacities, and practices. This effort was timely given continued and increasing demands for IT resources, the need to prioritize and align available resources with strategic institutional goals, changes in organizational structure, increased interest in project management and auditing, changes in technical complexity, and technological advancements.

ACCOMPLISHMENTS

This year's accomplishments speak to the commitment of division leadership and the exceptional depth and breadth of knowledge held by TSD members. In addition to the efficiencies and evaluation noted previously, the Technology Systems Division engaged in ten (10) key initiatives in FY2013 that significantly and positively impact business management for the Mason community. These initiatives reflect the division's sensitivity to the needs of a diverse and innovative community and the varied–and at times daunting–changes and challenges inherent in the oversight of information technologies. Brief project summaries follow. Additional project information is provided in Appendix B and the department specific sections of this report.

Our 10 Key Initiatives

Information Technology Service Management (ITSM) Assessment
Business Intelligence Reporting Tool
Office 365 Email & Calendar
Mason's Wireless Network
Information Security Support
COEUS Grants Management
Harris PBX Decommissioning
Software Distribution & Imaging
Data Mart Support
Flexible Work Resource

1. **Information Technology Service Management (ITSM)**
   This initiative involved an extensive assessment of TSD's information technology service management (ITSM). Processes and functional areas assessed include (1) service desk, (2) incident management, (3) problem management, (4) change management, (5) configuration management, (6) catalog management, (7) and service level management. An onsite consultation with Plexent, Inc. was conducted in January along with follow-up interviews with over 20 stakeholders and subject matter experts. Using the information gathered, the consulting company provided TSD with an analysis of its IT management maturity and identified critical growth areas. The report also included a detailed long-range plan for further improving resource efficiencies and asset allocation. A cross-functional team was created to review and implement recommendations and a position secured to support this implementation. TSD will seek to fill the new position of Service Process Coordinator this coming fiscal year.

2. **Business Intelligence Reporting Tool Selection & Implementation**
   TSD continued its effort to select and implement a new Business Intelligence (BI) Reporting Tool for Mason. A key event catalyzing this initiative was Oracle's announcement that it would no longer support Oracle Discoverer—Mason's primary reporting tool. This loss of support was coupled with a substantial need at Mason for a robust BI tool to meet the data and statistical analysis needs of stakeholders, addressing a growing need for analytic reporting, and supporting

future plans for the Enterprise Data Warehouse. In FY2011, a focus group was formed and charged with evaluating and recommending BI solutions to replace Discoverer. In March 2012, the committee completed its requirements and published a Request for Proposals (RFP). An Evaluation Committee reviewed RFP responses and unanimously selected MicroStrategy as Mason's new BI tool. Reasons for the selection include overall product design, excellent dashboards and visualization, platform independence, an integrated forecasting tool, strong technical support, and solid recommendations from reputable external reviewers (i.e., Forrester, Gartner). Starting in March of this year, the project refocused on software implementation and report migration (from Oracle Discoverer). A BI support team was formed to help functional office representatives prepare for report migration. The team is utilizing an AGILE project methodology approach. [1]

3. Office 365 Email & Calendar

The Office 365 initiative consists of three main objectives: (1) to develop a set of requirements for a new system that would replace the current email system (MEMO) 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. In fall 2011, TSD formed a cross-functional team to begin the process of selecting a new email and calendaring system. The team reviewed Mason's current email and calendar systems, identified requirements for a new system, and investigated solutions. Team membership consisted of faculty, staff, administration, and members of the ITU. The chair of the Faculty Senate Technology Policy Committee participated on this team. The Mason community provided input and feedback through a variety of venues, including open town hall meetings and online surveys. In spring 2012, the team completed its review of solutions and executive leadership selected Microsoft Office 365 as the new email and calendar system. Following this decision, TSD initiated three additional projects to implement Office 365: (1) Office 365 Employee Calendar Implementation, (2) Office 365 Employee Email Implementation, and (3) Office 365 Student Email Implementation. Presently, Mason is using Office 365 as its new employee email system. Employee calendars will migrate from Oracle Calendar to Office 365 in October 2014. Student email accounts will transition to Office 365 in August 2014. Additional details on these three projects, including information on Wave upgrades, are provided in Appendix B.

4. Improving & Expanding Mason's Wireless Network

TSD continued its work to deploy a centrally managed wireless LAN system that provides convenient, secure, and authenticated access. The system currently covers 99% of the university's floor space (100% of residence halls, 99% of academic/administration buildings). To date, TSD completed the wireless installations for Prince William and Arlington campuses,

[1] The AGILE approach allows project participants to complete a project in incremental, iterative steps with numerous opportunities for feedback and refinement. Using AGILE project methodology, functional office stakeholders are helping to develop and review report requirements, prioritize reports for migration, and provide user acceptance testing (UAT) of developed reports.

redeveloped the wireless Service Set Identifier (SSID), and upgraded the wireless coverage in Mason's residence halls. TSD also installed 132 new access points in student apartments, deployed MASON-SECURE, and put a new control system for wireless into production to increase capacity and capability. The division is in the planning stage for adding wireless to all buildings with intended renovations. With respect to wireless access, TSD focused additional efforts toward providing a reliable, consistent, and convenient wireless data network service to targeted areas on Mason campuses. Targeted areas include residence halls and classrooms, with added coverage for outdoor areas to improve roaming and user experience. This summer TSD will continue to engage in the planning, purchasing, and installation of needed equipment. It will also conduct focused testing to determine how to best improve signal and reliability.

5. **Information Security Support: Account, Identity & Password Management**

   This initiative addresses account, identity, and password management in an effort to strengthen information security at Mason. Fiscal year achievements include significant strides made toward (1) replacing Mason's outdated Accounts Management System (AMS), (2) identifying Banner account management specifications, and (c) improving identity and password management of Mason's Patriot website. To date, a project team has documented the electronic identity lifecycle process, identified requirements to be met by a new AMS, and articulated pertinent AMS specifications. A second project team involved in AMS evaluation and selection conducted a survey and high-level AMS solution cost estimation. Using the AMS requirements and specifications developed, an open source AMS solution called CIFER was selected. In parallel, a cross-section of institutional stakeholders created a committee to establish guidelines for the provisioning and de-provisioning of users accounts for both IT and non-IT services based on employee roles or classes. TSD staff also increased identity and password management of Mason's Patriot website. This effort required the implementation of the Oracle Waveset Identity Management (IdM) solution for the provisioning of Enterprise LDAP Directory, White Pages LDAP Directory, MESA, Kerberos, Banner, Active Directory, Mason Unix, and Volgenau School of Engineering computer systems. The team enhanced the Strong Password management (Patriot Pass) site (**http://password.gmu.edu**) and also integrated LDAP authentication for back office applications (e.g., INB, ePrint, Discoverer) using native Banner authentication capabilities.

6. **COEUS Grants Management Software**

   In conjunction with the Office of Sponsored Programs (OSP), TSD completed its work to implement COEUS—a Grants Management System. COEUS provides a university-wide system that supports an integrated and electronic approach to developing and routing grant proposals, collecting pre-award and post-award financial data, reporting grants and financial data, and submitting and receiving information from granting agencies and organizations. The COEUS proposal development and institute proposal modules make it possible to prepare proposals, route them internally to obtain proper approvals, and submit them to sponsors electronically. Its award module stores detailed information on awards, reporting requirements, terms and conditions, and the required approvals.

7. **Harris PBX Decommissioning**

The ITU installed the Avaya PBX system approximately fifteen years ago. Located at Harris Theater, the system supports faxes, queues, voice mail applications, other telephony services, and nearly 8,000 lines. Since its installation, the system has required a series of upgrades and enhancements. Its increasingly outdated hardware demands substantial physical space and expense to maintain. In order to downsize and decommission the outdated system, TSD launched an initiative to evaluate the system's design, assess the risk of relocating its associated applications, and identify the steps required for migrating routing services and end-user data to a new platform. The project team selected the CS 1000E to be this new platform. TSD is transitioning all faculty, staff, and resident students using voice services provided through the PBX system to the CS 1000E platform. In parallel, the division is migrating users from digital and analog to VoIP. TSD completed its migration of digital to VoIP, providing users (including departments) with new telephones and training. All associated features and functions are now managed through the CS 1000E. TSD anticipates completing its migration of analog users to VoIP during fall 2013 and concluding the entire project in FY2014, which includes decommissioning the PBX hardware.

8. **Software Distribution and Imaging Architecture**

The TSD and its sister organization, the Division of Instructional Technology (DoIT), have nearly completed a key initiative that impacts the performance and availability of classroom and lab computer systems. The project team developed a common set of functional processes and technical infrastructure requirements. It also made recommendations for the use of Altiris, Ghost, and Microsoft System Center Configuration Manager (SCCM) and, ultimately, selected SCCM for both software distribution and computer imaging services at Mason. Presently, the team is working on a detailed statement of work (SOW) and an engagement schedule with Microsoft. Project team members racked the new servers for the upgrade in the Data Center and placed orders for the last few networking items needed to complete the build. With an updated version and better design, the SCCM platform will deliver more features to current customers and offer its central management efficiencies to new customers. With the help of TSD—who provided administration of the SCCM platform and direct desktop hardware support—DoIT used SCCM successfully this year to image 1,192 PC systems and 58 Macintosh computers located in Mason's classrooms and computer and specialty labs (i.e., 332 University lab PC computers, 753 University classroom PC computers, 26 classroom Macintosh computers, 97 specialty lab PC computers, 32 specialty Macintosh computers).

9. **Data Marts - Refactoring and Release**

TSD continued its work this fiscal year on critical projects related to data marts. Two major efforts in particular targeted the refactoring of Mason's Admissions Data Mart (ADM) and the release and review of a new data mart for the Office of Sponsored Programs. Mason's current ADM was taken from Virginia Tech back in 2004. Working alongside numerous university entities (e.g., the Admissions Office, the Office of the Provost, the Office of Institutional Research & Reporting, and a number of academic units and department at Mason), TSD fully redesigned the

database and rewrote the Extract, Transform, Load (ETL) code to meet Mason Enterprise Data Warehouse (EDW) standards and future objectives. TSD looks forward to completing the work required to implement security and validity checks and to significantly enhance reporting capabilities. In parallel, TSD worked with the Office of Sponsored Programs (OSP) to develop a comprehensive data repository that allows the OSP to track and monitor the proposal process. The process includes components organized under three headings: Proposal Development, Institutional Proposals, and Awards. The data mart's initial release addressed process components related to Institutional Proposals. Security was implemented at the end of this fiscal year and this release is presently in production. Stakeholders will begin gathering requirements and reviewing information related to Proposal Development components this coming fall.

10. **Flexible Work Project**

    TSD and Human Resources worked collaboratively this year to design and develop a comprehensive website detailing Mason's flexible work options. Using the resources and tools on this site, supervisors, current flexible work users, prospective users, telecom coordinators, and others who support flexible work at Mason can determine if flexible work options are appropriate for their work situations and learn how to implement and manage flexible work arrangements. The website launched this spring (2013) and is available at **http://flexwork.gmu.edu**.

CHALLENGES

- **Maintenance and improvement of Mason's data network**
- **Expansion of Mason's wireless network**
- **Support, delivery, and management of strategic, high demand IT services**

At the close of this fiscal year, TSD positioned itself to build upon a solid foundation for future growth. This position, however, is secured provisionally and tied directly to the division's ability to strengthen Mason's IT infrastructure and ensure that the right processes and tools are in place to support the strategic goals of the ITU and university, as well as the academic and administrative needs of Mason's students, faculty, and staff. TSD leadership identified two overarching challenges that most significantly impacted business management this year.

Challenge #1: Data and Wireless Networks

Supporting the mission and vision of Mason's complex, diverse, and innovative community is the availability, reliability, and capacity of Mason's data and wireless networks. Rather than simply maintaining the current infrastructure, challenges experienced this fiscal year foretell the need to *actively strengthen* the data network and *proactively expand* Mason's wireless network.

Serving as the institution's primary physical IT infrastructure, Mason's data network supports over 70 discrete virtual networks and enables completion of daily academic and administrative operational requirements for the entire institution—including the provision of nearly all voice systems, over 100 IT applications, security cameras and locks, and building automation controls. The data network also negotiates access to sensitive student and employee information and university resources, and supports research and corporate collaborations that build upon Mason's vision, mission, and goals.

Our Infrastructure

Data, Voice and Wireless Networks
385 Total Servers
213 Virtual Servers
Over 70 Oracle servers
Over 100 software applications
Banner ERP Management
100+ Terabytes of Used Storage
3,538 Configuration Management Database (CMDB) Assets
38 routers, 20 firewalls
22 security gateways

Voice & Wireless Networks

9,200 Peak # of Phone Calls per Hour
22,500 # of Wireless devices in use
48,000 Peak # of IP Addresses in use
51,000 Total # of wired Ethernet Ports

Email System

99.98% Uptime-Email System
1,675,365,070 Total Email Messages
1,563,115,610 Threat Messages Filtered
(93% of Total Message)
18, 653 Employee Mailboxes
137,783 Student Mailboxes

During this fiscal year, Mason experienced periodic poor performance and network outages as a result of failed hardware and an outdated network core that needs to be replaced. TSD's inability to maintain a high standard of reliability and availability for its network services results not only in customer satisfaction concerns but also in concerns related to information security. TSD made concerted efforts this year to maintain Mason's data network by forming new partnerships, deploying more efficient technologies, installing network upgrades, and—when possible—replacing important hardware. While these efforts are essential to maintaining Mason's data network, they are not sufficient. Mason's data network must be actively strengthened to help ensure performance and utilization at the levels expected and required by the institution. The challenges related to the data network are compounded by the exponential growth of wireless devices and the expectation of their use by faculty, staff, and students.

The growth of wireless devices on campus was identified by this year's EDUCAUSE IT Issues Panel as the number one IT issue facing institutions of higher education in 2013. Referred to as a "device explosion," Mason is also experiencing the sudden increase of mobile and wireless devices—such as tablets, Smartphones, and laptops—being used by faculty, staff, and students for both educational and personal use. Mason's wireless network typically supports in excess of 12,000 endpoints on any given weekday and over 22,500 wireless devices (up from 7,500 devices just one year ago). Not only is the number of devices proliferating, but the bandwidth required by these devices is growing exponentially and has already outpaced Mason's current wireless network capacity. Applications now running on Smartphones and tablets allow these devices to be used not only to access course materials but also to communicate using SKYPE, access cloud-based storage, share music, download movies and videos, and much more. TSD is actively engaged in efforts to increase both network capacity and availability, while maintaining

secure computing environments. However, Mason will remain behind in wireless capacity unless additional efforts are made to proactively expand the institution's wireless network.

Challenge #2: Advancing IT Service Support, Delivery, and Management

The second challenge identified by leadership this fiscal year is the support, delivery, and management of strategic and/or high-demand IT services. Presently, TSD supports over 100 critical IT services and as many applications necessary for administrative and educational activities of the institution. These services range from webhosting and enterprise system support (e.g., Banner ERP) to server collocation, desktop support, and creating and maintaining Service and Operational Level Agreements. An example concern relates to the increasing pressure on TSD to provide desktop support. Specifically, TSD technicians must demonstrate expertise in an IT field with burgeoning technical specifications for computing hardware and software. Technicians must also be knowledgeable of the prolific variety and complexity of network, mobile, voice, and wireless technologies and devices. The department is addressing support needs in creative ways—such as transitioning to Voice over Internet, deploying new imaging technologies, implementing its Residential Technician program, and actively sponsoring Mason's "Get Wired" program. However, challenges will continue to increase as quickly as Mason's IT support requirements do. Providing quality and timely support to Mason's infrastructure, facilities, students, faculty, and staff will require increasingly more depth and breadth of knowledge by support technicians and—simply—more technicians.

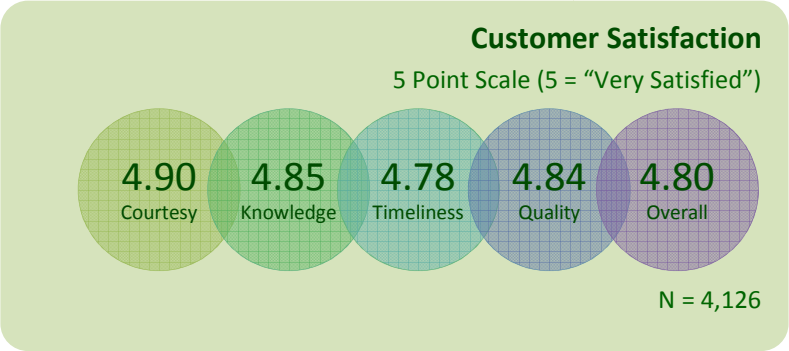
Similarly, as expectations and requirements for IT support grow, so does the need for TSD to be increasingly efficient, effective, and transparent in the management and delivery of its IT services. Division leadership recognizes the benefits gained from a renewed focus on IT within a customer-focused, assessment-rich environment. To this end, TSD is already working to strengthen customer relationships with specific emphasis placed on improving new and current Service Level Agreements and Operational Level Agreements. The division is working proactively to (1) identify key areas of growth related to ITIL standards and service management, (2) develop greater collaborations with university constituents and IT governance, and (3) broaden the collaborative development of meaningful IT goals that can move the entire institution forward. While these efforts are necessary to ensure excellence in the support, delivery, and management of IT services—the continued rate of change and growth in IT services will again stretch TSD's capacity to move projects and process review forward effectively while providing sufficient support to consumers and customers of IT at Mason.

Going forward, it will remain critical for the division to be able to invest in the support, systems, and technologies necessary to strengthen and expand Mason's infrastructure. Equally important will be its ability to not only maintain—but also improve—the quality and efficient delivery of the strategic and high-demand IT services that help bring to life the goals and the *IDEA* of Mason.

OPPORTUNITIES

- **Refreshing TSD mission and goals within University, ITU strategic planning**
- **Optimizing client relationships and corporate and institutional partnerships**
- **Improving service efficiency, capacity, and service management best practices**

In FY2014, the TSD looks forward to completing its present initiatives and continuing its participation in and support of the strategic planning underway at the University and in the ITU. It also looks forward to further employing organizational knowledge and the best practices identified this past year to optimize client relations, hone infrastructure design, strengthen organizational effectiveness, and improve service capacity. Externally, the division anticipates broadening its partnerships and developing deeper client relationships through meaningful collaborations with members of the Mason community and academic and corporate entities. Recognizing the need to interface increasingly with units and teams within the division, TSD members will take greater advantage of our own knowledge base and talent. This tandem approach will enable the division to improve Mason's return on investment in information technologies and the overall IT experience for Mason customers and consumers alike.



By focusing on customer service and greater collaboration, the division will be better positioned to deliver on operational requirements and strategic institutional needs while promoting innovation, research, and development. Strengthening external relationships will allow TSD to foster greater clarity and precision around procedural level workflow and interactions, which can in turn improve articulation of operational and service level agreements. Greater engagement in cross-unit and cross-institutional communication will provide opportunities to enhance workflow automation and reduce repetitive tasks. TSD anticipates this engagement will also allow for improved efficiency, balanced staff workloads, and increased customer and stakeholder satisfaction. We look forward to harnessing the benefits of this new focus and the resulting venues for community members to share processes, tools, objectives, and key performance indicators that can help improve the IT experience for Mason as a whole.

Similarly, increasing our focus on intra-division collaborations and communication will allow TSD to improve overall service management best practices with respect to (1) standardizing and integrating processes; (2) identifying interdependent processes more quickly; and (3) articulating processes so that they ensure adherence, efficiency development, and continuous improvement. In addition, the division as a whole will be better able to identify and articulate individual as well as cross-department key performance indicators that can assist the division in optimizing and aligning available resources effectively and supporting a multi-point performance evaluation plan.

In FY2014, TSD looks forward to contributing both tangibly and beneficially to the goals of the Instructional Technology Unit and the vision and mission of George Mason University. The chart that follows frames the division's accomplishments within its strategic plan and in relation to specific ITU goals. A fiscal year assessment of the goals and objectives comprising TSD's present strategic plan is provided in the subsequent report section titled *Results of 2014 Strategic Plan Assessment*. Highlighted in the remainder of the report–particularly in the departmental reports that follow–are the fiscal year achievements that reflect the leadership, creativity, and dedication of TSD staff to critical day-to-day operations, to innovation and the core values of the division, to the *Idea* of Mason, and to open communication with members of the institution. We look forward to strategically connecting Mason with the World, and to serving you, this coming year.

Technology Systems Division

Strategic Plan At-A-Glance

ITU Goal 1: Improve and expand technology infrastructure to meet new needs *(Supports GMU Strategic Goals 2 & 7)*

- **Objective 1.1:** Expand student IT facilities, including more wireless coverage, wireless printing, etc., as a by-product of new construction
- **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
- **Objective 1.3**: Upgrade the PBX system for increased reliability by installing redundant processors and physically diverse connections
- **Objective 1.4**: Partner with other Virginia institutions to obtain funds for and implement a high capacity research network
- **Objective 1.5**: Implement power, temperature, performance, and leak detection monitoring in the new data center
- **Objective 1.6**: Continue to optimize server and storage area network environments though the use of contemporary and emerging virtualization and consolidation technologies
- **Objective 1.7**: Expand the real-time performance monitoring of servers, storage, networks, and application systems

ITU Goal 2: Improve efficiency of IT service management *(Supports GMU Strategic Goals 2, 6 & 7)*

- **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
- **Objective 2.2**: Continue to automate IT management processes
- **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
- **Objective 2.4**: Continue ITIL deployment and prepare an ITIL implementation plan covering the next three years
- **Objective 2.5**: Provide a content management system that is generally available to academic and administrative departments for complex content management needs
- **Objective 2.6**: Maintain current levels of SPAM control using security applications
- **Objective 2.7**: Add new Unified Messaging features and expand the use of IP telephony
- **Objective 2.8**: Expand support for non-Windows systems and mobile devices
- **Objective 2.9**: Closeout the Password Identity Management project
- **Objective 2.10**: Implement a Systems Status website to improve the management of information and inform users about system availability and performance
- **Objective 2.11**: Provide improved desktop support services through the use of new processes and technology
- **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
- **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.

ITU Goal 3: Ensure projects are completed on time, within budget *(Supports GMU Strategic Goals 2 & 7)*

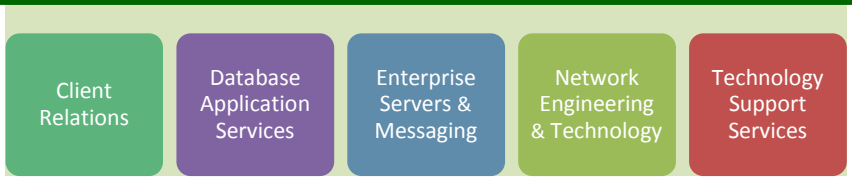
- **Objective 3.1:** Work with the ITU Project Management Office to ensure that projects are completed on time and within budget

ITU Goal 4: Develop corporate partnerships *(Supports GMU Strategic Goals 1, 6 & 7)*

- **Objective 4.1:** Participate on corporate and non-profit advisory committees, task forces and academies
- **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

TECHNOLOGY SYSTEMS DIVISION

Strategic Plan Assessment



The Technology Systems Division developed a strategic plan in concert with, and in support of, the mission and strategic goals of the Information Technology Unit and George Mason University. The plan carries the division through 2014 and includes four key ITU goals with associated TSD objectives and performance indicators. TSD made significant strides this fiscal year to achieve these goals. A substantial number of objectives were accomplished while others remain ongoing. This section of the annual report relates the current status of TSD's progress within the established plan. Results are summarized by goal. In July 2012, George Mason University welcomed a new president and a new strategic vision for the institution. TSD looks forward to supporting forthcoming strategic planning activities and will evaluate its strategic plan this coming fiscal year, refreshing it as needed to ensure appropriate support and alignment with the vision, mission, and goals of the institution.

ITU Goal 1: Improve and expand technology infrastructure to meet new needs *(Supports GMU Strategic Goal 2,7)*

Objective 1.1	Expand student IT facilities, including more wireless coverage, wireless printing, etc., as a by-product of new construction	**(= Ongoing)**
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	**(X Completed)**
Objective 1.3	Upgrade the PBX system for increased reliability by installing redundant processors and physically diverse connections	**(✓ On Schedule)**
Objective 1.4	Partner with other Virginia institutions to obtain funds for and implement a high capacity research network	**(X Completed)**
Objective 1.5	Implement power, temperature, performance, and leak detection monitoring in the new data center	**(X Completed)**
Objective 1.6	Continue to optimize server and storage area network environments though the use of contemporary and emerging virtualization and consolidation technologies	**(= Ongoing)**
Objective 1.7	Expand the real-time performance monitoring of servers, storage, networks, and application systems	**(= Ongoing)**

Summary of Results, Goal 1

Objective 1.1: Expand student IT facilities, including more wireless coverage, wireless printing, etc., as a by-product of new construction

- Since 2008, all new buildings and major renovations have included wireless network infrastructure
- FY2011-2012 (Summer): over 200 additional wireless access points were installed to boost network capacity in selected buildings
- FY2012: Analyzed wireless access to determine need by buildings for additional access points and documented in a wireless plan
- FY2013: Initiated two major projects to expand wireless network capacity and capability, deployed new MASON-SECURE wireless network to simplify access and increase data transmission security, improved wireless data coverage in the buildings that follow:
  - Housing VII complex
  - President's Park
  - Student Apartments
  - University Commons
  - Enterprise Hall classrooms
  - Innovation Hall classrooms
  - Robinson Hall classrooms
  - Other areas requiring wireless coverage improvements will be identified and addressed throughout the year

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

- Completed
- December 2009: MPLS enabled in network core and extended to all three campuses
- June 2010: MPLS capability deployed to all buildings
- May 2011: Redundant Headend router/firewall system deployed at Mason's DR site
- FY2012: Obtained new IPv6 address assignment for the university's network, began drafting IPV6 deployment plan to prepare for production IPV6 services
- FY2013: Upgraded main "Head End" routers to accommodate anticipated capacity increases and doubled Internet capacity for a total of 8 Gigabits per second

Objective 1.3: Upgrade the PBX system for increased reliability by installing redundant processors and physically diverse connections

- March 2009: New CS1000E Split-Core PBX call server installed on Fairfax campus
- Fall 2009: New Survivable Media Gateway installed in new Police & Public Safety Building
- November 2010: Upgraded Arlington PBX, adding new survivability and security features

- FY2011: Upgraded Fairfax PBX systems, migrated over 50% of the existing digital phones to VoIP, prepared plan to move campus to VoIP and eventual elimination of the analog/digital PBXs
- FY2012: Additional upgrades to Fairfax PBX system with an accelerated move to VoIP
- FY2013: Decommission the Prince William PBX system and move that campus to the new VoIP system, continue to remove telephones and services from the original Fairfax PBX to simplify the voice system architecture, enhance system failover capability by adding redundant connections and High Availability features.

Objective 1.4: Partner with other Virginia institutions to obtain funds for and implement a high capacity research network

- Completed
- Fall 2003: Mason joined with other Virginia doctoral research institutions to create the MidAtlantic TeraScale Partnership (MATP)
- Fall 2005: Mason connected to MATP's National LambdaRail (NLR) node, enabling campus access to a second high-capacity national research backbone
- FY2012: Worked with MATP membership to incorporate MATP as a 501(c)(3), now called the Mid-Atlantic Research Infrastructure Alliance (MARIA)
- FY2013: Solidified Mason's participation in MARIA, which provides affordable and reliable high speed access to the world's top research facilities, via Internet 2 and the National LambdaRail (NLR). TSD has a relatively low cost of connection due to (1) Mason's physical proximity to key DC-area network facilities and (2) collaboration and cost sharing through MARIA. The MARIA research network connections are being upgraded with more capacity and redundancy, both of which will benefit the university. Specifically, MARIA's National Science Foundation Cyberinfrastructure grant is funding an upgrade that will increase our shared capacity to Internet 2 and NLR by ten times, moving from 10 Gigabits per second to 100 Gigabits per second.

Objective 1.5: Implement power, temperature, performance, and leak detection monitoring in the new data center

- Completed
- TSD uses APC Netbotz software to monitor the power, temperature, humidity, and water leak detection beneath the data center floor.
- FY2013: TSD updated the APC Netbotz software and installed an additional server to run the applications. Additional sensors and devices were also placed in the main Aquia Data Center, Prince William data room site, and Harris Theatre Telecom Room for monitoring the environment. Smart Protocol Data Units (PDUs) were added to racks for real time monitoring of power in racks.

Objective 1.6: Continue to optimize server and storage area network environments though the use of contemporary and emerging virtualization and consolidation technologies

- Summer 2011/FY2012: deployed a VMware cluster using Dell servers and a NetApp Network-Attached Storage NAS array for collocation client, configured "backup" for the system to minimize the number of "hard" servers for collocation, improved management, and reduced energy consumption
- FY2012: deploy multiple virtual servers for the portal tier of the Banner ERP system, replace the 3PAR Storage Area Network (SAN)
- FY2013: 3PAR SAN replaced with a Compellent SAN at both Fairfax and the Disaster Recovery site and storage capacity increased 100%

Objective 1.7: Expand the real-time performance monitoring of servers, storage, networks, and application systems

- Continue to expand the use of SiteScope monitoring including the deployment of Web Script Monitor. Configure SiteScope monitoring to work with all "colo" virtual servers
  - FY2008: 304 SiteScope monitoring ports deployed
  - FY2008: 25,000 network ports monitored
  - FY2012: 664 SiteScope monitoring ports deployed
  - FY2012: 48,400 network ports monitored

ITU Goal 2: Improve efficiency of IT service management *(Supports GMU Strategic Goals 2, 6 & 7)*		
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	**(Completed)**
Objective 2.2	Continue to automate IT management processes	**(= Ongoing)**
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	**(Completed)**
Objective 2.4	Continue ITIL deployment and prepare an ITIL implementation plan covering the next three years	**(✓ On Schedule)**
Objective 2.5	Provide a content management system that is generally available to academic and administrative departments for complex content management needs	**(Pending Review)**
Objective 2.6	Maintain current levels of SPAM control using security applications	**(= Ongoing)**
Objective 2.7	Add new Unified Messaging features and expand the use of IP telephony	**(No Progress)**
Objective 2.8	Expand support for non-Windows systems and mobile devices	**(X Completed)**
Objective 2.9	Closeout the Password Identity Management project	**(X Completed)**

Objective 2.10	Implement a Systems Status website to improve the management of information and inform users about system availability and performance	**(X Completed)**
Objective 2.11	Provide improved desktop support services through the use of new processes and technology	**(✓ On Schedule)**
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	**(X Completed)**
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.	**(✓ On Schedule)**

Summary of Results, Goal 2

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

- Completed
- In FY2012 content was migrated to managed sites and the ITU Gateway was taken offline

Objective 2.2: Continue to automate IT management processes

- FY2012: Began automating Banner Security Officer approval process and standardizing processes and ordering forms—to be completed in Spring 2014
- FY2013: Implemented the new process flows and ordering forms for all services in the IT Services Catalog

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

- Completed
- In FY2012, the ITU Services Catalog became available online, populated with approximately 70 IT services

Objective 2.4: Continue ITIL deployment and prepare an ITIL implementation plan covering the next three years

- An ITSM Gap Assessment was completed by Plexent in FY2013. The resulting report identified gaps in current IT service processes and outlined a three-year roadmap for improving these processes. The report also included a recommendation to create a position that would assist in this new initiative.
- TSD created a project team to act on the recommendations in the report and a new position was secured to help lead the initiative. The position of Service Process Coordinator was filled during third quarter FY2013.

Objective 2.5: Provide a content management system that is generally available to academic and administrative departments for complex content management needs

- Work continued in FY2013 to provide additional support both academic and administrative departments
- Objective is pending review by TSD in FY2014 - TSD is part of a committee, led by University Communications & Marketing, that is tasked by the President to find an enterprise-wide CMS solution in FY2014

Objective 2.6: Maintain current levels of SPAM control using security applications

- In 2008, Mason procured IronPort Anti-Spam appliances to prevent spam from entering Mason's email system. Mail is first delivered to these appliances. Between 90% and 95% of all inbound mail is currently rejected by the appliances because it meets the criteria for SPAM. Prior to implementing the appliances, Mason saw in excess of 20% of email spam reaching member email accounts. With the move to Office365 for employees this year, TSD has retained use of the IronPort appliances given the effective performance to date.

Objective 2.7: Add new Unified Messaging features and expand the use of IP telephony

- FY2013: No progress
- Objective is pending review by TSD in FY2014

Objective 2.8: Expand support for non-Windows systems and mobile devices

- Completed
- Partnered with DoIT to research and implement an expanded System Center Configuration Manager (SCCM) platform to provide additional support for Macintosh computers in both classroom, labs, and specialty labs
- FY2012-2013: Completed and actively engaged in activities that expand wireless availability and capability across Mason campuses, including deployment of MASON-SECURE
- FY2013: Launched a project to participate in the EDUROAM worldwide federated identity system that enables students, faculty, and staff to use wireless network services at participating institutions around the world
- FY2013: A team was created to find a viable solution for securing and managing mobile devices. Factors were considered (e.g., ownership, mobile device management features, security features, pushing content and applications). Data was gathered from vendors and demos were provided by Air-Watch, NotifyMDM and MaaS 360. Product trials were provided by Air-Watch and MaaS 360. After review of vendor capabilities and testing various solutions, the team concluded that it would not be in the best interest of the division or institution to purchase a management solution at this time.

Objective 2.9: Closeout the Password Identity Management project

- Completed
- The project deliverables are serving as the basis for three new Accounts Management System (AMS) projects, which specify the components and integration necessary for implementing a new AMS for Mason

Objective 2.10: Implement a Systems Status website to improve the management of information and inform users about system availability and performance

- Completed
- TSD integrated the Systems Status page into the ITU Alerts process in FY2013

Objective 2.11: Provide improved desktop support services through the use of new processes and technology

- Use of Bomgar, a remote assistance tool, increased this year by technicians resolving technical issues for customers of the TSS groups as well as other ITU support teams
- This year, the Bomgar systems were upgraded to an enterprise level, allowing for future expansion and a more stable environment for supporting end users
- Microsoft SCCM software was configured, tested, and deployed to support ITU customers by providing an efficient process to create and distribute desktop images. SCCM also provides an efficient way to distribute software, complete software updates, inventory software, and apply patches to one or many desktops across the network. This eliminates a desktop technician from having to physically touch desktops to complete these tasks.

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

- Completed
- Microsoft Office 365 was selected as the new email and calendaring system for faculty and staff. The email portion of the system was implemented April 2013. Faculty and staff calendar account migration is scheduled to take place in October of FY2014.

Objective 2.13: Pilot mobile applications for the iPhone, iPad and Android devices. This includes a protocol for reviewing proposed applications through the Architecture Standards Committee where appropriate and a proper division of responsibilities within ITU for licensing, procuring, testing, troubleshooting, and deploying applications.

- Work on this objective will be continued in FY2014

ITU Goal 3: Ensure projects are completed on time and within budget *(Supports GMU Strategic Goals 2 & 7)*

Objective 3.1	Work with the ITU Project Management Office to ensure that projects are completed on time and within budget	**(✓ Ongoing)**

Summary of Results, Goal 3

Objective 3.1: Work with the ITU Project Management Office to ensure that projects are completed on time and within budget

- TSD remains dedicated to employing effective project management practices and improving management of large-scale projects to ensure timeliness and efficient use of resources
- TSD staff and leadership to use resources available from the Project Management Office (PMO) and its EPMO website and collaborate on a regular basis with members of PMO—a representative from PMO participates in the TSD Directors meeting
- The TSD division participated in ten key projects this fiscal year. A description of these projects is provided in Appendix B. Project briefings are available on the PMO website: **https://pmo.gmu.edu/ituprojects/**.

ITU Goal 4: Develop corporate partnerships *(Supports GMU Strategic Goals 1, 6 & 7)*		
Objective 4.1	Participate on corporate and non-profit advisory committees, task forces and academies	**(✓ Ongoing)**
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	**(X Complete)**

Summary of Results, Goal 4

Objective 4.1: Participate on corporate and non-profit advisory committees, task forces and academies

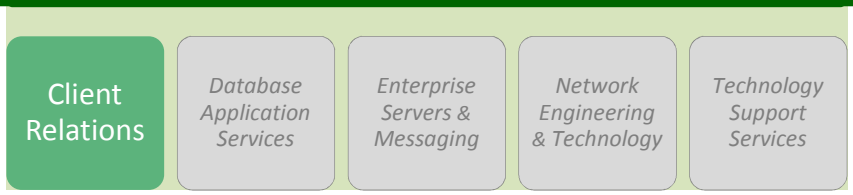
- TSD staff continues to participate actively with the following corporate and non-profit related entities:
  - 4-VA (Ben Allen, Sharon Pitt)
  - Association of Collegiate Computing Services of Virginia (Teresa Gibbons)
  - E&I Cooperative Purchasing (Sharon Pitt)
  - EDUCASE Program Committee (Sharon Pitt)
  - Help Desk Institute (HDI) Higher Education Forum (John Kettlewell, Teresa Gibbons)
  - IBM Cloud Academy (Sharon Pitt)
  - Internet2 Identity and Access Management Group (Tracy Holt)
  - Internet2 Net Plus (Ben Allen, Sharon Pitt)
  - Internet2 Middleware Group (Tracy Holt)
  - MARIA (Randy Anderson, Sharon Pitt)
  - Virtual Computing Laboratory Services (Ben Allen, Sharon Pitt)
  - Virginia Software Licensing Summit
  - Southeastern Universities Research Association IT Committee (Sharon Pitt)

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

- Completed
- TSD partnered with CalMover to replace the calendar system used presently by Mason's faculty and staff. The current Oracle system will be replaced by Microsoft Office 365. The calendar transition entails the successful migration of over 2,000 Oracle Corporate Time Calendar user accounts. TSD and CalMover developed a comprehensive plan for the migration, which is scheduled for October 2013, relying on the CalMover software and services.
- TSD partnered with B2B Technologies and Microsoft this year to complete the deployment of a new email system for students, faculty, and staff. The partners were responsible for planning the implementation and ensuring a successful rollout for Mason faculty and staff in April 2013 of FY2013.

CR DEPARTMENT REPORT

David Robinson, Director



TSD's **Client Relations (CR)** department provides support for the Technology Systems Division through facilitating internal and external division related communications, developing processes and related documentation, and by providing web support and web hosting services for the institution. As its most critical function, CR supports the measurement, evaluation, and documentation management related to Service Level Agreements (SLAs), Operational Level Agreements (OLAs), and Memorandums of Understanding (MOUs). It assists in identifying, creating, and documenting business processes. CR also supports the division through developing and creating communications processes and mediums related to change and service management.

Client Relations also serves as the primary venue for the division's marketing and communication efforts. These efforts include CR's establishing communication processes, developing communications, and providing venues for division related messaging (e.g., the TSD website, IT Services Catalog, Office 365 website, Strong Password website, and ITU Maintenance Calendar). CR also provides support for communication campaigns focused on special TSD initiatives and projects.

Complementary to these efforts is the work done by CR with respect to Mason's online presence. Specifically, the department is home to Mason's Webmaster, a position that provides first-line contact for both internal and external customers who need assistance with Mason websites and technical assets. The webmaster chairs and manages the Mason's Technology Coordinators group and provides additional support by maintaining LISTSERVS for customer interest groups (e.g., Jiju, webmaster, Tuscany, CommonSpot, and Technology Coordinators). The webmaster also provides expertise and guidance to users on topics ranging from technical advice and troubleshooting to permission requests, virtual host requests, and how to obtain space on ITU web servers. The Webmaster role will transition to a sister TSD department in FY2014. Two additional services provided by Client Relations this year, which will also transition to a sister TSD department this coming year, are web content management and web hosting.

Web hosting consists of web design assistance and consultation for WordPress and CommonSpot—two web content management systems (CMS) available to Mason groups and departments. CR support of WordPress includes (1) website creation; (2) installation and assistance with the Web Communications "Kuma" WordPress template; and (3) maintenance and updates of the base WordPress software,

themes and plugins. In addition to system maintenance and upgrades, CR support for CommonSpot includes the design, creation, development, and maintenance of departmental and academic websites. CR also provides related training, troubleshooting, special coding, and custom element design for CommonSpot.

ACCOMPLISHMENTS

This fiscal year, Client Relations expanded its communication coverage and web support while increasing its articulation of service processes and creation and management of related documentation. CR staff participated in 12 major projects and supported the measurement, evaluation processes, and documentation management related to 34 SLAs, OLAs and MOUs. Staff also provided development assistance and maintenance for over 45 websites across the institution. CR provided client interface and technical support of all websites on the **www.gmu.edu** server, the ITU WordPress server (**tuscany.gmu.edu**), and the CommonSpot server—often serving a liaison between clients and the system engineers. The CommonSpot and WordPress websites include those for the College of Health and Human Services, Housing & Residence Life, Career Services, Office of the Registrar, Staff Senate, Technology Systems Division, IT Services, Center for Global Studies, GMU-TV, and the Office of Student Scholarship, Creative Activities & Research (OSCAR).

The Webmaster responded to over 5,351 Webmaster emails and created over 490 Service Desk Express tickets to assist customers. CR's CommonSpot (CMS) Manager fielded an average of 400 emails or phone calls monthly from clients. Client needs were categorized generally into five web-related areas: (1) support and troubleshooting needs, (2) requests for additional modality or features, (3) account changes, (4) general requests, and (5) creating or updating a website. In addition, CR reviewed and acted on over 300 customer requests and comments related to the deployment of new email systems for students, faculty, and staff.

With respect to its marketing efforts this past fiscal year, CR conducted four (4) major campaigns targeting critical rollouts and initiatives such as Microsoft Office 365, cloud computing, infrastructure projects, and the new Flexible Work website. Launched this fall (2013), the **Flexible Work Project** is an example of the collaborative work undertaken by the CR department. CR worked with Human Resources to create a comprehensive website detailing Mason's flexible work options. Using the resources and tools on this site, Mason employees and supervisors can determine if flexible work options are appropriate for their work situation and learn how to implement and manage flexible work arrangements. A second collaborative venture includes CR's work with Mason's Communications & Marketing to assess the Mason web space. CR continues to support this group's ongoing web space initiatives. Other cross-functional and cross-departmental collaborations include the transfer of service ordering processes, workflows, and standardized forms to an online environment; developing SLAs with service measures for services; and supporting the CommonSpot cloud migration (a major move of all existing sites, plus a software upgrade).

CHALLENGES

Review of this past year's activities resulted in the following challenges being identified by the CR department.

- **SLA/OLA Focus:** The completion of an IT Services Catalog last year is of incredible benefit to the Mason community. However, most of the services in the catalog exist either without operational or service level agreements (OLAs, SLAs) or—at a minimum—a set of terms, conditions, and/or baseline metrics to support the longitudinal assessment of the service and the generation of reports for strategic decision-making. A renewed focus on service-based SLAs (versus customer-based agreements) would allow TSD to create and revise the agreements to include key performance indicators (KPIs), measures, and relevant metrics that target both value and effective provision of the service offered. As a result, TSD can be more clear and efficient in its delivery and management of services while strengthening its client and customer relationships.

- **Transition Processes:** As process management matures within the division, CR looks forward to working with departments to strengthen transition processes that are incomplete and/or not aligned with a customer-oriented service delivery focus. For example, at the time of writing, no documented release and deployment policies are in place. This makes it difficult for the ITU to effectively communicate release and deployment events to customers in a logical and timely manner. Similarly, the current change management process leaves little room to attenuate the impact of these changes to customers. Many Requests for Change (RFCs) have short windows—often less than five days—between approval and implementation. This results in little room for the division to get input from customers or to communicate changes in a timely manner. Going forward, CR review of RFCs will include how staff can better: (1) incorporate TSD's Service Desk, change management processes, and maintenance calendar; (2) format and complete RFCs so that information can transfer from the RFC to the maintenance calendar without reformatting; and (3) provide sufficient information to easily identify assets affected by service change.

- **Service Operations Management:** In FY2014, CR looks forward to supporting the division in its effort to develop service level management strategies that include intentional and positive business relationship management (e.g., maintaining a positive relationship with customers, identifying customer needs, and ensuring that the division is able to meet those needs). One specific strategy includes refining service operation functions that are incomplete, lack a clear owner, or are missing altogether. When a problem arises and the management function has no clear owner or chain of accountability, it is less likely that a TSD department will conduct and document a root cause analyses. Root cause analyses benefit the division in the long run because they support its ability to provide customer feedback related to the cause of a problem and the resolution of related incidents and events.

- **Continuous Improvement Opportunity:** Lastly, CR supports the division's ongoing effort to make continuous service improvement a regular function. Looking closely at IT services would

provide TSD with a means of identifying important service-related metrics and service owners who can account for and report on the service, related processes, resulting data, and service impact. This additional information could support stronger analyses and the development of meaningful reports for clients. It would also allow the TSD to document successes and improve processes based on division and client input as well as customer feedback.

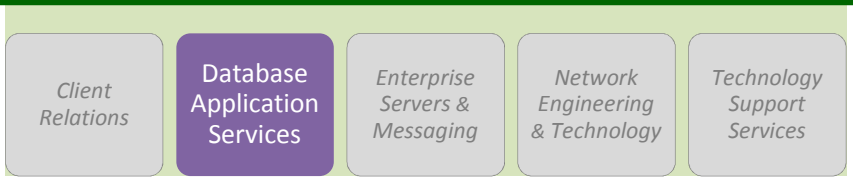
- **Website/Webhosting Resources:** By providing website and web hosting services, CR meets a critical need of both the TSD and institution. As demand for these services continues to grow, so do the resources required to provide continued and essential support for web development, management, and maintenance. Mason members partaking of these services would benefit tremendously from additional resources being dedicated to support web related services, particularly in relation to web development and programming.

OPPORTUNITIES

This coming year, members of CR look forward to continued participation in and support of Mason's strategic planning efforts and the internal review of the Information Technology Unit. With a strengthened organizational structure, the CR department anticipates opportunities to align its staff and projects strategically, allowing for increased agility and capacity to provide services that meet current and future customer needs. One such alignment includes the transition of CR's quickly growing web related activities to TSD's Database Application Services department effective October 2013. The department also welcomes a role in nurturing a service-oriented culture and providing marketing and communications support to new and ongoing initiatives. Going forward, the CR department is well-positioned to support TSD's goals and to assist in two-way communications and collaborations across the institution, while increasing simultaneously the opportunities for customer feedback and the quality of performance measures and reporting mechanisms available to members of the TSD, ITU, and Mason community.

DAS DEPARTMENT REPORT

Tom Shifflett, Director



The mission of **Database Application Services (DAS)** is to plan, implement, and maintain integrated and distributed information systems and associated databases in support of the university's business needs. DAS is home to five units: Administrative Applications, Database Support, Data Mart Support, Portal and Web Applications, and Application Integration. A description of each DAS unit is provided below followed by Table 1, which summarizes the major operational activities and projects that each unit engaged in this fiscal year.

Administrative Applications supports Mason units relying on Banner for mission-critical business functions. Support includes programming services and primary technical support to ensure the reliability, integrity, and accessibility of Banner and related suite applications.

Database Support establishes, maintains, and manages the databases that support centralized administrative system applications (e.g. Banner), decentralized system applications, and data warehouses. The team installs and maintains application server software maintains security and access authorization for Oracle, Banner, and other applications.

Data Mart Support provides centralized reporting support for Mason through data marts that are updated nightly from Banner. The group is divided into two teams: Data mart and Reporting Support (including Business Intelligence).

Portal and Web Applications is responsible implementing and maintaining applications that use Cold Fusion and Web and J2EE technologies. Many of the applications are not core Banner applications. The group is also responsible for managing policy and deployment issues for mobile applications.

Application Integration works with users to help articulate IT service needs and requirements and to create service requests. Through the Architecture Standards Committee (ASC), the team leads IT architecture definition efforts and defines ASC processes, procedures, and policy. Additional responsibilities include the design and implementation of cloud brokerage services and the creation of related policy, procedure, and processes for cloud review.

Table 1 *DAS fiscal year activities and projects*

Administrative Applications	Database Support	Data mart Support	Portal & Web Applications	Application Integration
Major Operational Activities • Resolve production problems as necessary • Monitor Serena Business Manager (Team Track) for requests • Design and code modifications or enhancements to Banner functionality as requested by Banner Functional Offices • Provide Banner integration for applications used by Mason units	**Major Operational Activities** • Monitor Serena Business Manager and Service Desk Express • Check health and performance of systems and databases • Monitor the Daily Job Change Report and remove access to back-office applications when appropriate • Install Banner upgrades and patches in test and development instances • On call 24x7 to handle production problems • Participate in daily Operations Meeting	**Major Operational Activities** • Monitor nightly refresh of data marts (done via ETL) • Monitor Serena Business Manager (SBM) for requests • Monitor Discoverer Problem Reporting for user requests • Participate in daily Operations meeting • Run Data Center • Handle tickets for Discoverer related problems • Troubleshoot Banner Data Mart security issues	**Major Operational Activities** • Requirements analysis and scoping • Application programming and administration • Development, testing, coordination, communication, and deployment for new web applications and content management systems • Maintenance and production support for various applications and systems (e.g., COEUS, eVA, CommonSpot, Mason Travel Authorization system, Alumni directory, ODPR, Mason Alert, UPIC)	**Major Operational Activities** • Review and route ASC review requests from users to ASC reviewers • Work with users to assist in ASC form submission • Provide analysis assistance and architecture guidance as needed • Document DAS processes and requirements • Work as campus outreach for DAS to Mason units
Major FY2013 Projects • Banner to AMS • Blackboard to Banner Grade Push: Groovy/Grails framework running on Tomcat application server • Clockwork Data Sync • Degree Works Localizations • Math Placement: Test score push to Banner • Cost Sharing Solution (for Office of Sponsored Programs) • Banner integration: Q-Nomy • Equity Training Tracking and Notification • Banner Integration: Symplicity (HireMason) • "No Active Jobs" Reports • Online Deposit Enhancement for Student Accounts	**Major FY2013 Projects** • Opnet Project management and implementation • Oracle Database Migration (from Solaris to Linux) • Clean Address Implementation (for batch and self-service) • Docushare Server Migration and Upgrade (Version 6.6.1) • Banner XE Implementation: Investigation and planning • Banner Upgrade Planning: Core upgrades and patches • Disaster Recovery: Assist in planning/testing of disaster recovery and business continuity; implement applications and databases at disaster recovery site • Blackboard to Banner Grade Push: Install backend software, application	**Major FY2013 Projects** • BI Implementation: MicroStrategy Reporting Tool • Production Implementation (hardware, software, security, configuration, tuning, et cetera) • Report Migration (migrating reports from Discoverer to MicroStrategy) • Admissions Data Mart Redesign: Improve data access, security and validity checks • Student Data Mart Oracle Warehouse Builder (OWB) Migration	**Major FY2013 Projects** • Commonspot Content Management System to Cloud Services Migration • Roam Secure: Enhancements to Mason Alert • Cold Fusion: Application migrations from Version 7 to Version 9 • University Process Improvement Council (UPIC) Application Rewrite • Legislative Monitoring Application Design and Coding (for Government and Community Relations) • Accounts Management System implementation: Provide project support and implementation assistance	**Major FY2013 Projects** • Accounts Management Systems (AMS): Provide user design, and documentation support • Cloud Broker Implementation: Define user groups, high level guidance for cloud processing, implementation process and procedures, and "Safe Cloud" a risk education program for the university on Cloud computing • ASC Review: Work with ASC subcommittee to redesign ASC form and processing, document this process and lead team to select and implement a solution to meet identified requirements

ACCOMPLISHMENTS

This year, DAS expanded its planning, implementation, and maintenance of integrated and distributed information systems and associated databases. The department provided database administration services for approximately 70 Oracle databases, supported data marts for all Mason functional (administrative) units, and processed 25 Architectural Standards Committee related assessments. The group also maintained Mason specific modifications to the ERP system (Banner) and custom integrations for many university applications relying on Banner data. In addition to resolving incidents reported through Service Desk Express, DAS closed 1,738 tickets (of 1,768 total) opened in Serena Business Managers by Mason functional offices. On a daily basis, DAS supports the systems below:

- Banner ERP (Student, Financial Aid, Finance, HR/Payroll)
- Data Warehousing (Data marts)
- Banner suite application (Imaging, DegreeWorks, Workflow, Evisions, Appworx, ePrint, fsaATLAS)
- Document Management (Docushare)
- Oracle Database Management System (DBMS) and Fusion Middleware
- Business Intelligence (Microstrategy)
- Cold Fusion and Java Applications (in-house developed and commercial)
- Web Content Management (Commonspot and Wordpress)

DAS staff also participated in a wide range of operational activities, including those listed below:

- Applied regulatory, functionality enhancement and bug-fix patches and upgrades to ensure Banner is up-to-date
- Worked with the Registrar's Office to implement Degreeworks—a software tool that provides support for academic advising, degree audits, and transfer articulation tools
- Commenced moving the enterprise content management system to cloud services
- Initiated an assessment of Xtender Imaging system in cooperation with functional offices
- Worked with the University Process Improvement Council (UPIC) to develop a survey tool capable of ongoing information collection (versus single survey use)
- Initiated a project to build the integration necessary for grades to be pushed automatically from Blackboard to Banner
- Worked with business units to write a process that locks back-office accounts when a job change occurs, providing the opportunity for individual units to evaluate the locked account for appropriate action
- Monitored and reviewed requests submitted by Mason functional units to the Architectural Standards Committee
- Helped an ASC subcommittee create a more transparent and expeditious review process for university initiatives by overseeing the implementation of ASC recommendations

- Processed 25 ASC related assessments (examples listed below) in cooperation with Information Technology Security Office, Equity and Diversity Services, Registrar, Human Resources and Payroll, and departments within the TSD
  - SBDC Website for Mason Enterprise Center
  - TaskStream (student assessment) for the College of Education and Human Development
  - Online Adult Student Information System (OASIS) for the Office of the Provost
  - Education Advisory Board (predictive tools for advisors) for Student Academic Affairs
  - Campus Lab's Beacon (student retention) for University Life
  - Symplicity Reflection and Insight for the Center for International Student Access
  - Royal and Company (direct marketing and recruitment) for the Office of the Provost
  - TriageLogic for Student Health Services
  - Banner Integration and Shibboleth Authentication for Symplicity (HireMason) for Career Services
  - College Scheduler for Registrar

Major Projects

In addition to its operational activities, DAS staff held key leadership roles in numerous fiscal year initiatives on behalf of the department and division. Twelve (12) of these major initiatives are described below. The department looks forward to continuing to provide management, implementation, and research support for projects presently active and those newly initiated in the year to come.

- **Business Intelligence Tool Selection & Implementation:** A critical project for TSD this year was working with a cross-section of Mason staff to identify a new Business Intelligence (BI) Reporting Tool for the institution. This project was initiated when Oracle announced that it would no longer support Oracle Discoverer—Mason' s primary reporting tool. This loss of support was coupled with a substantial need at Mason for a robust Business Intelligence (BI) tool to meet the data and statistical analysis needs of stakeholders across the institution while mitigating risk, addressing a growing need for analytic reporting, and supporting future plans for the Enterprise Data Warehouse. In FY2011, a BI Focus Group was formed and charged with evaluating and recommending BI solutions to replace Discoverer. In March 2012, the committee completed its evaluation of criteria and published a Request for Proposals (RFP). An Evaluation Committee reviewed RFP responses and selected MicroStrategy as Mason's new BI tool. Starting in March 2013, the project refocused on software implementation and report migration (from Oracle Discoverer). A reporting support team was formed to help functional office representatives prepare for report migration. The team is utilizing an AGILE project methodology to migrate reports.[2]

[2] The AGILE approach allows project participants to complete a project in incremental, iterative steps with numerous opportunities for feedback and refinement. Using AGILE project methodology, functional office stakeholders are helping to develop and review report requirements, prioritize reports for migration, and provide user acceptance testing (UAT) of developed reports.

- **COEUS Grants Management Software:** In conjunction with the Office of Sponsored Programs (OSP), DAS completed its work to implement COEUS—a Grants Management System. COEUS provides a university-wide system that supports an integrated and electronic approach to developing and routing grant proposals, collecting pre-award and post-award financial data, reporting grants and financial data, and submitting and receiving information from granting agencies and organizations. The COEUS proposal development and institute proposal modules make it possible to prepare proposals, route them internally to obtain proper approvals, and submit them to sponsors electronically. Its award module stores detailed information on awards, reporting requirements, terms and conditions, and the required approvals.

- **Patriot Pass—Identity and Password Management:** The primary audience for this project included the ITU, the Volgenau School of Engineering, and all Mason functional offices. The project required the implementation of the Oracle Waveset Identity Management (IdM) solution for the provisioning of Enterprise LDAP Directory, White Pages LDAP Directory, MESA, Kerberos, Banner, Active Directory, Mason Unix, and Volgenau School of Engineering computer systems. In addition, TSD enhanced the Strong Password management (Patriot Pass) site (**http://password.gmu.edu**) and integrated LDAP authentication for back Office applications (e.g., INB, ePrint, Discoverer) using native Banner authentication capabilities. Additional needs and outstanding deliverables were identified during the course of this project. As a result, Patriot Pass project deliverables, issues, audit responses, and other project related documents were transferred to three new project sites on EPMO related to account management.

- **Mobile Application Development:** This project launched in response to the growing interest in mobility by administrative units and prospective, current, and former students. Project objectives include developing a framework for delivering tools to faculty and students using mobile devices and providing a mobile development platform for future use. The project includes creating the governance, team(s), policies, standards, methodologies, and procedures necessary to (1) implement Blackboard Mobile and university-wide and departmental iOS mobile applications for iPhone and (2) distribute in-house and third party developed university and departmental iOS mobile applications through Apple and Android App Stores. To date, the procurement of Apple iOS Enterprise and Developer Licenses is complete. Phase 1 of Blackboard Mobile Central has been released and is available under the Apple and Android App Stores as "Mobile Mason." The project team is working on related methodologies and procedures.

- **Student Data Mart Extract, Transform, Load (ETL) Re-write:** The intent of this project is to resolve data issues in the existing Student Data Mart (SDM) and replace the Oracle Warehouse Builder (OWB) code base in production. The SDM project has three releases—R1, R2 and R3. R1 contains Student and GPA data; R2 consists of course section information; R3 contains registration and degree information. DAS plans to deploy R1 into production September 2013 and begin work with stakeholders to document data requirements and accurately model security for R2 and R3.

- **Admissions Data Mart Refactoring:** Mason's current Admissions Data Mart (ADM) was appropriated from Virginia Tech in 2004. The goal of this project is to fully redesign the database and rewrite ETL code to meet Mason Enterprise Data Warehouse (EDW) standards and future objectives. Primary project stakeholders include the Admissions Office, Office of the Provost, Office of Institutional Research and Reporting, and Mason's academic departments and units. This fiscal year, the project team successfully completed the following objectives: (1) combined Undergraduate and Graduate Admissions, (2) migrated from SQL Loader to direct inserts, (3) redesigned the underlying data mart database, (4) refactored the ETL code, (5) rewrote the ADM reports, (6) integrated EDW common audit logging standards, (7) integrated the EDW common extraction routine, and (8) deployed the newly designed system and ETL code into production (EDWP). DAS is currently finalizing its report conversion in Discoverer from the legacy system into the newly designed system. This is all in preparation for Microstrategy, the new Business Intelligence (BI) tool.

- **Sponsored Programs Data Mart - Release 2:** When completed, the Sponsored Programs Data Mart (SPDM) will be a comprehensive data repository that allows the Office of Sponsored Programs to track and monitor the Proposal process. The data mart's initial release addressed the Institute Proposals and is in production presently. Security was implemented at the end of this fiscal year. Work is underway to address processes related to Proposal Development and Awards. The requirements gathering and review of information related to Proposal Development is expected to begin this coming fall.

- **Account Management System (AMS):** The AMS project has two primary goals: (1) to develop a clearly defined and agreed upon set of criteria for provisioning and de-provisioning accounts for Banner employees, students, and others and (2) to create a methodology for capturing the additions and subtractions of people eligible for accounts. Working with ITU staff, functional office personnel are developing a set of guidelines for the provisioning and de-provisioning of user accounts based on employee roles or classes. DAS is working with these offices to define and manage this information, which will impact user access to both IT and non-IT services and technical resources. Going forward, the team will review previous project work and isolate additional needs, define next steps, and identify project stakeholders. The team will also finalize technical specifications of selection criteria for Mason employees.

- **Application Performance Tool Implementation:** This year the department sought to increase its support of Banner Functional Office personnel and other Banner and Banner Suite of Application users at the institution. In February of this year, a project team finalized Proof of Concept of a suite of tools called OPNET. It was determined that the OPNET Application Performance Monitoring tools could be used to identify end-to-end performance problems related to Banner and Banner Suite of Applications. The tool would also monitor activity from the client to the database server and back, being aware of all components in between. In March, TSD purchased the OPNET tools. In late April, the project team developed a project plan for implementing the

tools and creating an Operational Level Agreement (OLA). The project includes the creation of processes and triage procedures for the individual departments groups within TSD that must resolve performance problems collaboratively. Participation includes Database Support, Systems Engineering, Network Engineering, and Desktop Support.

- **Implementation of Cloud Broker Role:** The major outcome of this project is to establish Database Application Service's Integration group as the broker for Cloud Services for George Mason University. In this role, DAS will become a full partner with Mason units in selecting and procuring cost competitive, secure, and accessible Cloud services.

- **Installation of Banner XE Test Environment:** The architecture of Banner XE represents a shift by the vendor away from Oracle Forms and PL/SQL toward Groovy/Grails and Java. Along with changes in functionality, this new platform poses challenges to the ITU and university units in terms of planning and training. This coming fiscal year, DAS will begin to build a test environment and plan for a full implementation of Banner XE.

- **Deploy Content Management as Cloud-Based Service:** DAS, along with Server Support Group (SSG) and Client Relations, currently supports CommonSpot content management for ITU and some university units. These departments will be moving CommonSpot to a Cloud vendor site as an interim step to finding a more flexible, cloud-based content management solution.

CHALLENGES

As the structure of Mason's Information Technology Unit is assessed, DAS leadership looks forward to creating a more efficient and responsive organization better able to provide IT leadership and service to the Mason community, the ITU, and TSD. The department also recognizes the challenges inherent in successful change management and the critical role that transparency and two-way communication will play in supporting DAS staff during the reorganization. In addition to the restructuring of the ITU, DAS also identified the fiscal year challenges listed below:

- **Third-Party Services:** This coming year, DAS looks forward to the challenge of leveraging mature and cost effective third party services for university business functions to help Mason staff provide services of higher value.

- **Staff Development and Recognition:** With respect to staffing at critical positions, DAS leadership anticipates the need to explore avenues of staff development and recognition that will allow for critical growth in IT related expertise and an appropriate method of rewarding effort and merit. Staff will also need opportunities and training to increase proficiency in integration work and functions related to business relationship management.

- **Increased Collaboration:** The department looks forward to strengthening its collaboration with other TSD units to achieve a better cross-unit understanding of services that TSD provides.

OPPORTUNITIES

The reorganization of the ITU affords the opportunity for DAS to become a more service-oriented department and to leverage a number of initiatives already in progress to help the unit and division achieve this goal. The DAS department looks forward to this as well as those listed below:

- **Operational Flexibility:** This coming year offers an excellent opportunity to build operational flexibility into the organization by embracing a well-planned mix of hosted (Cloud) and in-house solutions. Increased flexibility will help DAS and TSD prepare for Mason's dynamic IT-related needs.

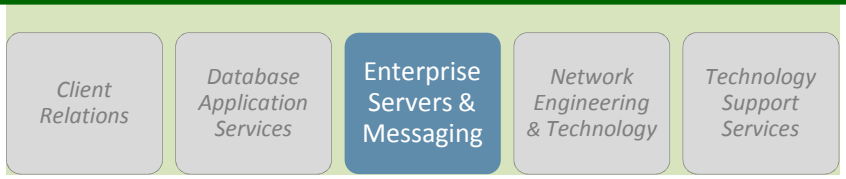
- **Opnet Implementation:** The department looks forward to the long-awaited implementation of the Opnet performance monitoring tools. These tools will serve as a common methodology for all infrastructure groups to troubleshoot problems and improve system performance.

- **Strategic Planning:** As Mason nears the final approval of its new strategic goals, DAS looks forward to working collaboratively to improve forecast and trend reporting and to build new metrics and key performance indicators (KPIs).

- **Information Technology Infrastructure Library (ITIL):** Lastly, DAS welcomes the opportunity of working with other TSD units to implement ITIL as a framework for supporting the strategic goals of the institution and helping ensure TSD's ability to deliver value, provide meaningful reporting for client and customer planning and decision-making, demonstrate compliance, and assess the overall appropriateness and quality of services provided.

ESM DEPARTMENT REPORT

Karen Gardner, Acting Director



The **Enterprise Servers & Messaging (ESM)** department is comprised of four groups: Enterprise Messaging, Engineering & Architectural Support, Server Support Group, and Systems Engineering. Together, these groups acquire, install, implement, and maintain systems for administrative support, academic research and instruction, and electronic messaging. Departmental activities include enterprise server support, systems engineering, systems administration, storage administration, data-file backups, restore and replication, systems security, electronic mail processing, and disaster recovery. Fiscal year accomplishments of the department are highlighted below. On the following page, Table 2 summarizes the major operational activities and projects that each ESM team participated in during the fiscal year.

ACCOMPLISHMENTS

This year the ESM department provided central management for 385 servers (including 213 servers designated for virtual computing) and provided oversight and support for 3,538 configuration management database (CMDB) assets. The team fielded 2,142 Service Desk Express tickets and 1,029 Request for Changes submissions. ESM also continued to manage data storage for the Mason community by way of the Virtual Computing Laboratory (VCL, 14 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 (192 terabytes) and Post De-duplication (20.4 terabytes). Daily operations include the following major services:

- Enterprise Calendar, Enterprise Email for faculty, staff, students, affiliates
- Central Authentication & Directory Services: LDAP, Active Directory, Kerberos
- Central Federation Services: ADFS, CAS, Shibboleth
- Managed Hosting - Enterprise applications (e.g., Banner, Traq)
- Managed Hosting - Department applications (e.g., RMS)
- Web Hosting - Departments and organizations (e.g., **www.gmu.edu**)
- Virtual Computing Labs (VCL)
- Central Account Management & Identity Management
- Disaster Recovery: SAN and server data backup and replication
- Mason Enterprise Services Architecture (MESA) personal & department data storage and sharing
- F5 Application Delivery Control Systems (Load Balancers)

Table 2 *ESM fiscal year activities and projects*

Enterprise Messaging	Engineering & Architectural Support	Server Support Group	Systems Engineering
Major Operational Activities • Enterprise Email for faculty, staff, students, affiliates • Enterprise Calendar • Central Authentication & Directory Services: LDAP • Central Federation Services: Shibboleth • Central Account Management & Identity Management • InCommon Certificate Services • Internet2: Participation in Identity Federation • University Announcements & HR/Registrar Liaison • LISTSERV Management	**Major Operational Activities** • Research & development of new technology services • F5 Application Delivery Control Systems (Load Balancers) • Virtual Computing Labs (VCL) • VMware/Windows/Linux Enterprise Architectural Support	**Major Operational Activities** • Central Federation Services: ADFS • Central Authentication & Directory Services: Active Directory • Managed Hosting - Department applications (e.g., RMS) • Web Hosting - Departments and organizations (e.g., Gunston and CMS) • Managed Hosting - Enterprise applications (e.g., Banner, Traq) • VMware/Windows/Linux Enterprise Architectural Support • Disaster Recovery: server data backup • Virtual Collocation Server Hosting • Research & Development of new technology services	**Major Operational Activities** • DNS/DHCP Infrastructure Support • Research & Development of new technology services • MESA personal & department data storage/sharing • Web Hosting - Departments and organizations (e.g., www.gmu.edu) • Managed Hosting - Enterprise applications (e.g., Banner) • VMware/Windows/Unix/Linux Enterprise Architectural Support • Disaster Recovery: SAN and Server data backup/replication • Central Authentication & Directory Services: Kerberos • Managed Hosting - Department applications
Major FY2013 Projects • Account Management System (AMS) Specifications • Faculty & Staff Email Requirements and Selection • Office 365 Student Email Implementation • Office 365 Employee Email Implementation • Office 365 Employee Calendar Implementation	**Major FY2013 Projects** • VCL Storage System Upgrade • Cloud Research • Office 365 Student Email Implementation • Office 365 Employee Email Implementation • Office 365 Employee Calendar Implementation	**Major FY2013 Projects** • Centralization of Housing Servers (RMS, Electronic Access) • Remote Disaster Recovery Deployment • Opnet: Performance Management Tool • Auxillary Services Upgrades (BBTS, Sequoia, PhotoID, Pay4Print) • Windows 2003 Upgrades (to Windows 2008) • System Center Configuration Manager Upgrade (SCCM 2012) • Office 365 Employee Email Implementation	**Major FY2013 Projects** • Account Management System (AMS) Evaluation • Remote Disaster Recovery Deployment • Opnet: Performance Management Tool • Sun Migration to VMware/Linux

- VMware/Windows/Unix/Linux Enterprise Architectural Support
- Research & Development of new technology services
- DNS/DHCP Infrastructure Support
- InCommon Certificate Services
- Internet2: Participation in Identity Federation
- University Announcements & Human Resources & Payroll/Registrar Liaison
- LISTSERV Management
- Virtual Colocation Server Hosting

Major Projects

In addition to its significant operational efforts, this report highlights major projects that the ESM staff participated in during FY2013. Summaries of these projects are provided below. The department looks forward to continuing to provide management, implementation and research support for projects presently active as well as those that will begin FY2014.

- **Faculty & Staff Email Requirements and Selection:** The goal of this project was to develop a set of requirements for a new email messaging system to replace the current MEMO email system and the Oracle Calendar for faculty and staff. A selection committee was formed in March 2011. The committee developed requirements for the employee email and calendaring system and attended vendor presentations and demonstrations for the various messaging solutions under consideration (e.g. Microsoft Office 365, Google Apps for Education, Google Postini, and VMware Zimbra). A features matrix was developed to compare messaging solutions and test environments. The committee finished the system requirements and put forward a Request for Proposals (RFP). The contract was awarded to B2B Technologies who partnered with Mason to deploy Microsoft Office 365.

- **Remote Disaster Recovery Deployment:** The ITU successfully established a disaster recovery facility that provides business continuity for the university's mission critical systems in the event of a major disruption to IT operations on the Fairfax Campus. With the infrastructure built and mission critical systems in place and in maintenance mode, the major objectives of this project are achieved. This project will be closed out FY2014. Any future updates will be associated with projects requiring disaster recovery support.

- **Office 365 Employee Calendar Implementation:** In November of this year, the TSD began extensive work with the calendaring portion of Office 365 for Mason's faculty and staff. The original Office 365 implementation project consisted of both email and calendar portions being released at the same time. During initial testing, it became apparent that both the implementer and version of the Sumatra software selected would not be sufficient to effectively migrate the more than 2,000 Oracle Corporate Time Calendar users to Office 365. Since that time, Mason's ITU has been working directly with a new vendor, CalMover, to develop a more robust plan for the migration that relies on their CalMover software and services. A sole source justification was

prepared and submitted and, due to timing and resources at Mason, the calendar migration was split apart from the remainder of the email migration to Office 365. The Office 365 calendar system is still scheduled to replace the Oracle Corporate Time calendar system. The project includes the migration of calendar entries from Oracle to Office 365 in October 2013.

- **Office 365 Employee Email Implementation:** Office 365 was the software selected to replace the current MEMO email system and Oracle calendar system with a more robust, integrated software package built on the Microsoft Exchange platform and hosted at Microsoft. This project included the implementation of the email portion and the migration from MEMO. The project officially launched this past November with a meeting between TSD and B2B Technologies, Mason's implementation partner. During the late fall/early winter, the technical infrastructure for the authentication (long term) and migration (temporary) was built and configured. Results of user testing showed that there would be additional time required to remediate the email errors and the calendar migration results were such that the project needed to be split into a separate initiative with additional planning. As of April 2013, the migration from MEMO to Office 365 was completed. Note, this project also entailed an additional update by Microsoft to the Outlook Web Application, which will be completed Fall 2013.

- **Office 365 Student Email Implementation:** The goal of this project was to upgrade the MasonLive student email system from Microsoft's Live@EDU platform to its Office 365 platform. When complete, students and employees will be using the same software for their email systems. In fall 2010, Mason migrated to Microsoft's Live@EDU email platform. In 2012, Microsoft announced that all Live@EDU customers would be upgraded to the Office 365 platform. The project team began planning work in February of this fiscal year to understand impacts on student and employee email systems. The initial upgrade date was set for April by Microsoft; however, the project team delayed this date until they could complete the employee email migration and explore platform differences in depth. Given Office 365 is a different infrastructure, multiple issues were considered including account creation, email address format, accounts on both systems, authentication for students, global address list management, and others. As of August 2013, TSD completed the student email system upgrade to Office 365. Note, this project also entailed an additional update by Microsoft to the Outlook Web Application, which will be completed Fall 2013.

- **Account Management System (AMS) Specifications:** In support of the AMS Evaluation Project, the goals of this initiative include documenting the electronic identity lifecycle process and identifying the requirements that must be met by any new AMS. The team documented the existing system with a focus on tasks performed by the "Accounts Database" system, which would be the first component replaced when a new Accounts Management System is implemented. The scope of the project covered the capture of existing automated and manual processes for accounts management at Mason, the converting of manual processes to

automated processes where possible, the developing of processes to satisfy new requirements and audit findings, and the identifying of information needed from Banner and other sources. The resulting AMS specifications were used in evaluating commercial and open source products and selecting a solution for Mason.

- **Account Management System (AMS) Evaluation:** The Account Management System provides identity management for access to select university IT resources. The current Account Management System is 20 years old and runs on an unsupported software package. Only three TSD staff having any system knowledge and only one of the staff can offer deep system knowledge. TSD personnel led an evaluation project to select a new Account Management System to replace the existing provisioning engine. The evaluation phase of the project is complete, resulting in CIFER being selected as the new AMS system. EMS is currently completing the first phase of a four-phase implementation. The first phase addresses necessary message routing. The phases are designed to systematically replace components of the current AMS with no disruption of service.

Below is a list of additional projects where ESM staff provided leadership and expertise:

- Opnet: Performance Management Tool
- Sun Migration to VMware/Linux
- Virtual Computing Lab Storage System Upgrade
- Windows 2003 Upgrades (to Windows 2008)
- System Center Configuration Manager Upgrade (SCCM 2012)
- Centralization of Housing Servers (Residential Management System, Electronic Access)
- Auxillary Services Upgrades (Blackboard Transact System, Sequoia, PhotoID, Pay4Print)
- Cloud Research

CHALLENGES

ESM leadership identified specific challenges related to both the restructuring of the Information Technology Unit as well as those having ongoing impact on daily activities and requirements. Regarding IT restructuring plans, unit leadership is aware of concerns inherent in organizational transitions and the long-term benefits of effective change management as it relates to institutional knowledge, staff morale, workload distribution, resource allocation, and transparency. Fiscal year challenges included those listed below:

- **Staff Vacancies:** A significant challenge this year relates to ESM staff vacancies. The ESM Director retired near the start of the Office 365 email migration project. In addition, two staff vacancies remained unfilled during the year despite recruitment efforts. The situation placed extra demands on ESM members with added strain on department resources.

- **Office 365 Email Migration:** This was a major project for the unit and a tremendous team effort across multiple departments. The project started in October and took six months to complete—a relatively short timeframe considering the team had to acquire and deploy new hardware, learn new technology, conduct testing, resolve errors discovered during testing, develop training materials and transition to a new system. The project required a large commitment of staff and hours to accomplish. The project also grew in scope due to multiple vendor specific requirements.

- **External Projects:** ESM infrastructure services are necessary for many projects initiated by other departments. Often the project timeframes overlap, resulting in competing demands for the same ESM personnel. While ESM recognizes the benefit of cross-departmental collaboration, this year's level of participation strained staff resources and limited the department's capacity to research new technologies. Going forward, ESM leadership will provide additional guidance in how to better balance operational systems duties with customer requests and project deliverables.

- **Server/Application Upgrades:** As a continuing effort to eliminate legacy software and hardware, both ESM server teams are working to upgrade their OS platforms. Typically, server upgrades also include application upgrades, resulting in the challenge of maintaining parallel systems while applications are configured, tested, trained on and migrated. Depending on the complexity of the system, dual system maintenance and application upgrades can span anywhere from months to years—a timeframe that compounds workload for both the ESM staff and application owners.

OPPORTUNITIES

As with challenges, ESM leadership identified specific opportunities related to the restructuring of the Information Technology Unit and those within the department. With respect to the restructuring of the ITU, ESM anticipates an exciting opportunity to improve the organization and impact productivity positively with limited disruption of operations and initiatives. Also included in the reorganization is the opportunity allowed for IT departments and teams to participate in identifying areas that stand to benefit from new focus and measures toward increased efficiency. Fiscal year opportunities that the team looks forward to are provided in the list that follows:

- **Email & Calendar Project Completion:** The email and calendar migration project consists of multiple phases that began October 2012 and will conclude in December 2013. ESM looks forward to completing the project and decommissioning systems that rely on aging hardware and software and require additional licensing and support costs. Completing the lengthy project will allow staff to focus on other initiatives and priorities.

- **Backup Consolidation:** ESM server teams perform similar job functions regardless of the underlying operating system. The teams follow similar operational procedures and best

practices in system administration, scripting, security, audit requirements, and data backups. ESM recently consolidated their backup storage across the units and is exploring the possibility of also combining the backup network and software. The team looks forward to the opportunity of increased efficiency through a unified solution across platforms.

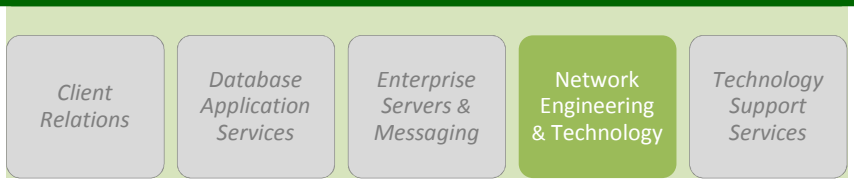
- **Cloud Services:** ESM will continue to evaluate and deploy services to the cloud where beneficial. The department will focus on completing the email and calendar system to Microsoft hosted services and work with customers to transition the on-premise Blackboard Transact system and the Content Management System to a hosted environment. It looks forward to further exploration of methods for managing and monitoring private cloud/hybrid environments.

- **Service Level Agreements:** ESM developed a Service Level Agreement and cost recovery model that will need to be refined going forward. The department will seek to streamline related processes and identify task owners to provide effective support and clear incident, resolution, and feedback pathways for customers.

- **Server Upgrades:** As a continuing effort to eliminate legacy software and hardware, ESM server teams are seeking to upgrade operating system platforms in FY2014. The migration of Solaris to VMware/Linux will expand our server virtualization and eliminate high contract support costs. The upgrades from Windows 2003 will allow ESM to gain performance improvements while staying current with vendor-supported platforms.

NET DEPARTMENT REPORT

Randy Anderson, Director



The mission of **Network Engineering & Technology (NET)** is to plan, design, monitor, and maintain George Mason University's data, voice, and video networks and to evaluate and implement new networking technologies that support and enhance the goals of the university. To complete its mission and advance the strategic goals of the TSD, NET is comprised of five units**:** Advanced Network Technologies, Network Engineering**,** Network Infrastructure**,** Network Operations**,** and Telecom Administration**.**

Advanced Network Technologies works with research faculty and corporate partners on projects involving emerging communications technologies and investigates new products, protocols, and applications for use in Mason's communication networks.

Network Engineering is responsible for designing, configuring, and upgrading the campus-wide voice, data, and video networking architecture and connects all university locations to the Internet.

Network Infrastructure oversees the planning, installation, and maintenance of university communications pathways and cabling.

Network Operations is responsible for installing, monitoring, troubleshooting, and maintaining the campus data and video networks.

Telecom Administration provides services, repair, and billing support for all university telecommunications services.

Table 3, on the following page, summarizes the major operational activities and projects that each NET team engaged in this fiscal year.

Table 3 *NET fiscal year activities and projects*

Advanced Network Technologies	Network Engineering	Network Infrastructure	Network Operations	Telecom Administration
Major Operational Activities • Works with research faculty and corporate partners on projects involving emerging communications technologies • Investigates new products, protocols, and applications for use in Mason's communication networks	**Major Operational Activities** • Responsible for designing, configuring, and upgrading the campus-wide voice, data, and video networking architecture • Connects all university locations to the Internet • Manages firewalls, and provides Tier 3 support for the university's data network	**Major Operational Activities** • Oversees the planning, installation, and maintenance of university communications pathways and cabling	**Major Operational Activities** • Responsible for installing, monitoring, troubleshooting, and maintaining the campus data and video networks • Provides Tier 2 support for Mason's wired and wireless networks	**Major Operational Activities** • Provides services, repair, and billing support for all university telecommunications services
Major FY2013 Projects • Network Access Control System for Residence Halls Selection & Evaluation • EDUROAM: Integration of Mason's wireless network with the worldwide federated identity system	**Major FY2013 Projects** • Load Balancer Replacement & Repair Project • "MASON-SECURE" Wireless Network (Further Development) • Wireless Service Set Identifier (SSID) Restructuring • Wireless Network Deployment Project • Wireless Capacity Upgrades Project • Firewall Redesign/Replacement • Management Network Redesign	**Major FY2013 Projects** • Network & Infrastructure Construction Related Upgrades	**Major FY2013 Projects** • Uninterruptible Power Supply (UPS) Enhancements	**Major FY2013 Projects** • Harris PBX Decommissioning Project • Prince William PBX Retirement Project • Session Initiation Protocol (SIP) Trunking/Primary Rate Interface (PRI) Replacement

ACCOMPLISHMENTS

A continuing strength for the institution is TSD's efforts to ensure a solid, high-performing network infrastructure despite budget constraints and outdated hardware. Mason is a founding member of both Internet 2 and MARIA (supporting National LambdaRail). Its inter-campus fiber network provides the institution with a significant advantage in making high-capacity bandwidth available to the campuses at a low cost of ownership. Mason's Fairfax, Arlington and Prince William campuses are connected via metro-area optical fiber ring. The commodity internet service is provided over 2 Gigabit circuits, with 4 Gigabit commit rates and a separate network for residence halls. In addition, the institution maintains connections to major national research and education networks through a 10 Gigabit Ethernet connection that should, eventually, be upgraded. Despite its solid foundation, Mason's data network needs to be upgraded. This past fiscal year, the institution experienced outages in its data network due to failed hardware and a network core in need of replacement—a significant concern given the institution's heavy reliance on the data network as its primary physical network supporting operations ranging from information security and administrative functions to building controls, security locks, and use of enterprise and learning management systems.

On a daily basis, the NET department oversees more than 500 managed devices supporting over 50,000 ports and a network with over 20,000 active nodes. In addition, the department maintains 38 routers, 20 firewalls, and 22 security gateways and supports over 70 discrete virtual networks and Mason's wireless network. Initiated in 2004, the wireless network is now ubiquitous and expected to be available at all times. Despite support staffing that has grown only slightly in the past five years, Mason's wireless network capacity and size has greatly increased boasting nearly 2,500 wireless access points that often support in excess of 12,000 endpoints on a typical weekday. As with maintaining Mason's data network, TSD is challenged to both ensure and expand the wireless network's availability, capacity and security. Mason will remain behind in providing wireless service to faculty, staff, and students unless operations supporting the service—and the infrastructure itself—are prioritized by the institution going forward.

Also significant is NET's concerted effort to transform the institution's voice network through increased employment of Voice over Internet Protocol (VoIP) and the phase out of time-division multiplexing (TDM) technology. Simultaneously, NET is using Multi-Protocol Label Switching (MPLS), a technology that enables the creation of virtual private networks) to maintain security and performance of Mason's voice network. NET will continue implementing open standards and Session Initiation Protocol (SIP) as opportunities allow and as long as overall performance is not compromised. Presently, the department supports 5,938 IP phones.

In recognition of its effort on behalf of Mason, NET was awarded Avaya's *2013 Customer Innovation Award for Sustained Excellence*. A description of the award follows:

> **Avaya Customer Innovation Award for Sustained Excellence**: In June of this fiscal year, Avaya and the International Avaya Users' Group (IAUG) awarded George Mason University its *2013*

Customer Innovation Award for Sustained Excellence. Avaya awards highlight visionary companies and organizations that creatively utilize the Avaya infrastructure for developing communication solutions that enable the use of new applications and technologies and significantly enhance the customer experience, reliability, and efficiency of operational and resource management. The press release can be found online at the following web address: **http://www.avaya.com/usa/about-avaya/newsroom/news-releases/2013/pr-130605**.

Major Projects

In addition to its daily responsibilities, NET staff participated in 13 major projects during FY2013. The projects contribute significantly to the enhancement, security, and reliability of Mason's data, wireless, and voice infrastructure. Summaries of the projects are provided below. The department looks forward to continuing to provide management, implementation, and research support for projects presently active and those newly initiated in the year to come.

- **Load Balancer Replacement & Repair:** In Fall 2012, TSD and ITSO reviewed Mason's core infrastructure and assessed its current load balancers. It was determined that a replacement was necessary to improve load balancing even though present load balancers were still vendor-supported. NET reviewed the capabilities of products on the market and looked at new features and requirements that would improve load balancing and optimize use of resources, throughput, and response time for a broad range of stakeholders (e.g., Human Resources, Banner Financial group, Database Application Support, Enterprise Systems Management, and students). As a result, a decision was made in Spring 2013 to utilize the F5 load balancers for Banner and related administrative systems after Office 365 faculty and staff email deployed. The F5 balancers were purchased for the Office 365 project and help provide real-time visibility into the health of Mason's network with respect to processes, scalability, and security. In the interim, NET completed substantial work on fixing and updating the configurations on the current load balancers. A successful testing of the failover functionality took place June 2013.

- **Harris PBX Decommissioning:** The Avaya PBX system, located at Harris Theater, was installed approximately fifteen years ago. It supports faxes, queues, voice mail applications, other telephony services, and nearly 8,000 lines. Since its installation, the system has required a series of upgrades and enhancements. Its increasingly outdated hardware demands substantial physical space and expense to maintain. In order to downsize and decommission the outdated system, a project was initiated and a team began by evaluating the system's design, assessing the risk of relocating its associated applications, and identifying the steps required for migrating routing services and end-user data to a new platform. The team selected the CS 1000E platform. When completed this summer, the transition will include all faculty, staff, and resident students who use voice services provided through the PBX system. Digital users have been transitioned already to VoIP and their associated features and functions are managed from the CS 1000E. These users (and departments) received new telephones and training. Migration of users from analog and digital to VoIP has started

and will continue through Fall 2013. The project is scheduled to be completed by FY2014, at which point the PBX hardware will be decommissioned.

- **Prince William PBX Retirement:** The Prince William PBX system was retired successfully and all phones moved onto the Fairfax CS 1000E platform. The 1010 Gateway at Prince William is being configured as a backup call server for the new platform. NET looks forward to completing the transition, which will require extensive cleanup and/or reconfiguration of the call routing database. In addition, NET will need to purchase and install a 48 volt DC battery stack for the Occoquan core; all phones on the Prince William campus will need to be reprogrammed to use the 1010 Gateway as a backup call server.

- **Wireless Network's "MASON-SECURE":** The new "MASON-SECURE" network was released into production near in Spring 2012. This wireless network offers quicker and more convenient logins using the international standard 802.1x protocol. All client data is encrypted, making this a more secure option for connecting to university resources or the Internet. The original "MASON" wireless network remains available for systems that do not yet support 802.1x. In the first week of September 2012, MASON-SECURE usage peaked at 7,489 devices. Network usage rose to 22,500 unique devices by Spring 2013—just one year later.

- **Wireless Service Set Identifier (SSID) Restructuring:** TSD currently uses multiple SSIDs to provide wireless coverage in areas. Within the scope of this project, these SSIDs will be password protected and a new SSID (Mason-WiFi-Information) will be created as an "open" network. Systems and devices that are not configured will connect initially to the "open" network. This network will provide limited access to a set of wireless information pages designed to assist the user to configure their device for the proper network. To date, the Planning Phases of this project have been completed and "Mason-WiFi-Information" portal pages created. NET also conducted tests of the new SSID and communicated project goals to the general population. The team looks forward to completing the project by the FY2014 school year.

- **Wireless Network Deployment 2013:** TSD is deploying a centrally managed wireless LAN system that provides convenient, secure, and authenticated access. The system currently covers 99% of the university's floor space (100% of residence halls, 99% of academic/administration buildings). In previous fiscal years, TSD completed the wireless installations for Prince William and Arlington campuses. They also redeveloped the wireless SSID and upgraded wireless coverage in Mason's residence halls. This fiscal year, TSD completed the installation of 132 new access points in student apartments and deployed "MASON-SECURE." Deployment of a new control system for wireless to increase capacity and capability was also managed. Installations are complete in the Field House, Buchanan House, Carty House, and Parking Services Office. This summer installations are planned for the Baker House, Grad House, Heating and Cooling, and the Warehouse. NET is in the planning stage for deploying wireless to all buildings with planned renovations and all new construction. Further wireless improvements will be tracked in the Wireless Capacity Upgrade Project.

- **Wireless Capacity Upgrades 2013:** With the ever-increasing demand for wireless access, this timely project complements TSD's wireless network deployment efforts. As TSD works to provide the centrally managed wireless LAN system, this project focuses on providing a reliable, consistent, and convenient wireless data network service to targeted areas on Mason campuses—specifically Mason's Residence Halls, classrooms, and select outdoor areas. The project's phases will focus first on the Johnson Center, Innovation Hall, Enterprise Hall, Engineering and Arts Buildings, and the Aquia Neighborhood. Phase Two includes the remainder of the Aquia Core buildings, the Shenandoah Neighborhood, and the Arlington Campus. Phase Three targets Research Hall, the Rappahannock Neighborhood, and Prince William Campus. Phase Four includes the Planetary Core. This summer NET will engage in the planning, purchasing, and installing of equipment for the Johnson Center, Robinson Hall, Enterprise Hall, Engineering Building, and Arts Building. Testing in Commonwealth Hall and Dominion Hall will be conducted to determine how to best improve signal and reliability.

- **Session Initiation Protocol (SIP) Trunking/Primary Rate Interface (PRI) Replacement:** Consultants presented NET with proposed designs for a limited pilot and a full deployment of SIP trunking to the public switched telephone network (PSTN). The proposals made a strong case for reducing annual operating costs despite the integrated requirement to install and manage Session Border Controllers (SBCs) for security purposes. With staff support planned for the 2014 fiscal year, NET moved ahead on a purchase order this past May. Discussions with an Avaya SBC consultant began in June. NET is also exploring whether there will be additional SBC licensing needs.

- **Network & Infrastructure Construction Related Upgrades:** NET continued to install and configure network equipment as needed this fiscal year. Specifically, Exploratory Hall construction is nearing completion and network equipment has been installed and configured in the hall. Equipment has been installed and configured in the Arlington Foundation Building, and equipment removed from Truland. A new VPN arrangement was designed and implemented for research personnel, primarily the Krasnow Institute, to provide access for research partners from other institutions to specific Mason servers and resources. Construction projects also include both temporary and permanent circuit moves to support the West Campus Connector road, requirements development for the Potomac Science Center at Belmont Bay, moves from Truland to the Foundation Building in Arlington, the new Prince William Life Sciences Lab building, and the renovation and re-occupation of the Commerce building.

- **Uninterruptible Power Supply (UPS) Enhancements:** Campus power outages often cause network problems and the ITU is challenged to guarantee reliability—even with UPSs—given the large number of devices spread across all campus buildings. NET is addressing the issue by adding remote monitoring capability to the power supplies that support critical devices (e.g., switches supporting payroll processing and routers) and by engaging an outside firm to perform regular checks on the battery status of the most critical units.

- **Firewall Redesign/Replacement:** In a cross-departmental collaboration with Information Technology Security Office, DAS and ESM, NET is engaging in the redesign of Mason's network security architecture. The redesign entails the replacement of the Juniper firewalls, which have been in use approximately seven years. This major effort required three new Palo Alto next-generation firewalls to be acquired as lifecycle replacements for the Juniper devices. Prior to deployment, staff training will be scheduled. In addition, the cross-functional team was charged to provide input on server and application security requirements. To date, new firewalls are installed and configured in "Tap Mode," where they can run in parallel with the existing firewalls without impeding any traffic. This serves as a training platform and a base for configuration development. An expert consultant has been brought in to assist with the planning process; networks will be migrated onto the new firewalls in phases over the next several months.

- **Management Network Redesign:** The Cisco "long-range Ethernet" presently supporting out-of-band management for the data network is no longer sold by Cisco. NET is moving to a new paradigm of "virtual out-of-band" management as a means of improving the department's monitoring capability by providing a more accurate picture of client network availability. It is also expected to increase network uptime by reducing the likelihood of loops caused by configuration or patching errors. For emergency access, a backup system consisting of inexpensive switches and terminal servers will provide true out-of-band support to critical devices.

- **EDUROAM:** NET launched a project to participate in the EDUROAM world-wide federated identity system, which can enable students, faculty, and staff to use wireless network services at participating institutions around the world. Log files are being collected now as part of the process to join the system.

CHALLENGES

NET leadership identified specific fiscal year challenges impacting both the daily activities and requirements of the department, as well as standard business management of the institution and ITU. These challenges are listed below.

- **Information Security & Mobility:** Increasing concerns about information security have prompted NET to redesign the university's data network so that access between subnets can be controlled more tightly. To that end, network engineers deployed MPLS technology ("Multi-Protocol Label Switching") to allow the configuration of many virtual private networks running over one physical network. Access from one virtual network to another can be controlled by one or more firewall clusters, providing tighter control over network security. NET now supports more than 70 discrete virtual networks, each having a defined purpose and unique security rules for access. Nearly all of the voice equipment now runs over this converged network, as do security cameras, locks, and building automation controls. Unlike the older static subnet design, the virtual networks can easily be spanned across buildings and even campuses. While this makes it much simpler and cheaper to support distributed workgroups, it also complicates

network support because internet protocol (IP) addresses are no longer dependent on physical location. The trend toward combining many different functions in a new building (e.g. residence hall, diner, and office space) means that some buildings contain ten or more virtual networks. Every connected device must be configured for the correct virtual network or it will not communicate correctly. The complexity of supporting this growth is compounded by wireless devices. Since 2004, NET has deployed nearly 2,500 wireless access points that frequently support in excess of 12,000 endpoints on a typical weekday. Since wireless devices are mobile by design, it is now even more difficult to locate specific endpoints when necessary. Mobile users expect instant access to all services, anywhere, all of the time. It takes a lot of infrastructure to make that work.

- **Career & Knowledge Management:** In some areas within the department, established salaries at Mason are below the average pay for commercial or federal employees in similar positions. As IT demands increase at Mason, as do responsibilities for providing secure and high functioning networks, NET leadership anticipates the need to review salaries and compensation for staff positions and for experience accrued while at Mason. In addition, leadership will need to consider the implications for current staff with respect to career growth, maintaining a strong departmental knowledge base, and internal recruitment for open positions.

- **Inventory Management:** NET must track nearly 900 barcodes on its annual inventory. These assets are spread across all campuses and remote sites, with more than 300 telecom rooms containing equipment. The department continues to struggle with how to ensure that newly purchased equipment is entered into the Traq database with accurate descriptions and reasonable "useful life" periods. An additional challenge includes keeping track of the barcodes once equipment is deployed. As interim support, NET has designated an IT Asset Manager tasked with ensuring that NET equipment is recorded properly in Traq. The position will also lead annual inventory efforts and maintain a paper trail of equipment that has been returned to the manufacturer or identified as surplus.

- **Staff & Equipment Consolidation:** NET staff are located in Northeast Module II, University Hall, and Aquia. This separation makes assembling NET teams for meetings and work projects inefficient. The department also does not have dedicated space to store equipment. Presently, NET utilizes several larger telecom rooms around the Fairfax campus, portions of Aquia 113 for longer term storage, and the Receiving warehouse as a temporary storage solution.

- **Uptime/Availability:** Nearly every IT application and Mason's increasingly wide array of business functions depends on the data network leaving little time for network maintenance activities. Presently, NET maintains a longstanding practice of reserving the second and fourth Sundays each month (from approximately 7:00AM-10:00AM) as maintenance windows. Sometimes, however, changes to this schedule are necessary and/or it is not possible to complete all required activities in the three-hour window. In general, only emergency maintenance is

performed outside of the designated windows. To help avoid additional downtime, NET continues to explore design approaches that allow the department to perform needed maintenance activities without impacting services (i.e., redundant designs).

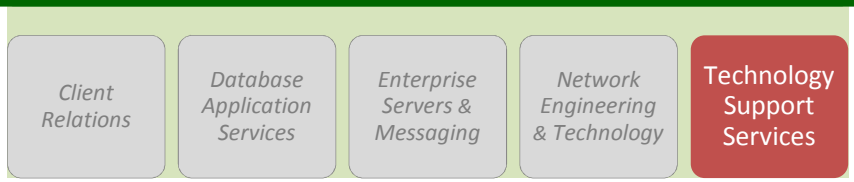
- **VoIP Conversion**: The most complex and visible project related to voice systems is the "Harris Decommissioning" effort, where the university's original PBX (housed in the Harris Theater building) will be removed from service. To date, NET has already integrated a new voice mail system (Avaya Call Pilot), new conference bridge, new music on-hold unit, and a separate Automated Call Distribution (ACD) system with the IP-based CS 1000E call server. As Life safety lines are moved to analog gateways that connect to the CS 1000E, NET will need to still consider critical points—such as the need for a direct connection to the PSTN (bypassing the university's data network) and the state's fire code requirement for eight hours of battery backup. Once all lines and services have been removed from the Harris system, Mason will be left with two call servers: the CS 1000E and the Arlington PBX. As a next step, NET will either replace the Arlington system with a second CS 1000E or eliminate and move all phones to the Fairfax system. The preferred strategy will be determined next year after university leadership finalizes the institution's financial goals, priorities, and strategic plans. Once Mason has fully migrated to the IP-based system, TSD can and should assess whether the university would be best served by continuing to maintain a premises-based telecom system or by moving to a hosted solution.

OPPORTUNITIES

NET recently re-competed its long-term inter-campus dark fiber network contract. As a result, the department is looking forward to rerouting Mason's fiber optic network to incorporate one of the top colocation data centers in the country while reducing its annual cost of service. This move will position the university to maintain a low cost of access while still taking advantage of a wide array of services that include managed hosting, cloud services, and data center expansion space. The contract is for ten years with four optional one-year renewals.

TSS DEPARTMENT REPORT

John Kettlewell, Director



Technology Support Services (TSS) is a customer facing and customer service focused department providing first and second tier technical support for the Mason community. The department is organized into four groups: ITU Support Center, TSS Desktop, TSS Logistics, and Data Center Operations. These groups provide support for the various university technologies including microcomputers, mobile devices, system monitoring, maintenance, software, and backups. TSS staff also lead or participate in critical projects and the research of technologies and methods that will improve support services and delivery. Table 4, on the following two pages, summarizes the major operational activities and projects that each TSS group engaged in this fiscal year.

ACCOMPLISHMENTS

Over the course of the year, TSS staff actively lead and engaged in department and division-based projects while performing routine operational and reporting activities. A summary of department accomplishments is provided below followed by the achievements of individual TSS groups.

TSS Operational Activities

TSS teams provide an array of support services for Mason's faculty, staff, and students who use voice and data technologies. The support services provided by TSS cover VoIP; desktop and mobile computing devices; the data center; the help desk; software distribution and imaging; break/fix support for computer hardware and peripherals; and disconnection and connection of computers, phones, and other technology equipment for new construction or relocations. Select TSS operational activities are listed below:

- **Help Desk Services**
  - Telephone, chat, email, and remote assistance
  - Service Catalog and self-help
  - "GetWired" and ResTech Programs supporting students

Table 4 *TSS fiscal year activities and projects*

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

ITU Support Center	Desktop Support Group	TSS Logistics	Data Center Operations
Major FY2013 Projects • ITU Support Center Website Redesign • Information Technology Service Management (ITSM) Project • Office 365 Email Migration for Faculty and Staff • Password Expiration Enforcement • Mason-Secure Implementation • MasonLive Upgrades 1 and 2 • Rogue Router Project: Residential Technicians coordinated with Housing and Networking • Service Desk Express: Incorporated classroom and learning technologies • IT Services Catalog: Completed the first review cycle • Social Media: Established presence on Twitter and Reddit • Presented *Lessons Learned* from Office 365 Migration for a HDI WebCast	**Major FY2013 Projects** • Software Distribution and Imaging Architecture • SCCM 2007 Implementation: Assisted the Division of Instructional Technology transition to SCCM • SCCM 2012 Transition: Prep for transition to SCCM 2012 with guidance from Microsoft • MS Outlook 2010: Deployment for faculty and staff email • Mountain Lion: Created self-service OS upgrades for Mac OS X • "Mason" Desktop: Created universal image through DELL for Equipment Trust Fund (ETF) desktop refresh and Patriot Computers • Smithsonian Conservation Biology Institute (SCBI): Setup, imaged, and networked all computers and printers on site • Equipment Moves/Relocation: Conducted equipment moves on both Fairfax and Arlington campuses, including relocating Truland Building occupants to Foundation Building and the Office of Education to Founders Hall • *Capital Connections*: Assisted in setting up and configuring a broadcast studio in Founders Hall • Biological Research Laboratory: Assisted configuration of servers and N-Computing devices for the research containment units • Virtual Desktop Infrastructure (VDI) • SEP 12 (Symantec Anti-Virus) Testing and Implementation • Mobile Device Management • MESA: Began work on a reporting process for owners of MESA shares to complete reviews • Office 365 Email Migration for Faculty and Staff	**Major FY2013 Projects** • George Mason University Fairfax Campus Green Books Project • New Building Openings and Departmental Relocations • New Construction Projects • Life Safety Dial Tone • Prince William Decommission Project • Patriot Center Cable 17 Service • Dial Tone for President of the United States • Fenwick Library Duct Bank Relocation • West Campus Duct Bank Relocation • Telecom migrations to VoIP and new PBX • Harris Decommission: Rack Migrations	**Major FY2013 Projects** • Air Containment and Flow Analysis: Installation of an air containment system and air flow analysis to determine efficiency • Compellent Storage Installation (SAN in Data Center) • Data Center Rack Expansion: Two new racks of equipment added • Netbotz 550 Deployment: Expanded equipment rack monitoring using two units to provide additional ports for environmental sensors • Netbotz 450 Installation: Units installed at the Prince William Campus Disaster Recovery site and at the Harris Building telecom room • Primary Uninterruptible Power Supply (UPS): Battery replacement • Redundancy: Secondary electrical connections installed providing redundant power to all Research hosted equipment

- **Desktop and Logistics Support Services**
  - Mobile Devices Website supporting their use with Mason's infrastructure
  - Break\Fix Support of computer hardware and their peripherals
  - Parts ordering, replacement, and warranty repairs
  - Software distribution and imaging
  - Telecom support and inventory management

- **Data Center Services**
  - Departmental colocation services provided
  - Space and services provided for Research Computing
  - Monitoring and support of the Mason's technology infrastructure 24/7/365

TSS Reporting Activities

TSS members provide regular reports on varied activities, services, and support carried out by its members. Below is a partial list of routine reports:

- **Daily Operational Reports:** This report provides a log of shift activities maintained by operators in the Data Center.

- **ITU Change Review Board (CRB) Status Meeting Notes:** This report is generated by the Data Center and based on information shared at the daily CRB meeting where system and/or infrastructure changes are reviewed for approval and other activities within TSD are discussed and documented.

- **Service Level Agreements:** These agreements are created with departments or organizations for delivery of services and support by various TSS groups as required. This includes colocation and/or research customers in the data center.

- **ITU Support Center Statistical Report:** This report summarizes calls, incidents, surveys, walkup services, and email activities of the ITU Support Center.

- **Help Desk Institute (HDI) Customer Satisfaction Index Report:** The HDI report is based on the HDI Customer Service Index (CSI) tool to measure customer satisfaction. Customers who have had an incident opened and then closed by a TSS group can complete a survey based on a five point scale. The survey measures the customer's level of satisfaction in five categories: Skill, Courtesy, Timeliness, Quality, and Overall Satisfaction. TSS utilizes the survey results to evaluate its performance against internal department goals and compare this performance to companies within the industry. The tool is integrated with TSS's incident management system Service Desk Express (SDE). Additional information on the tool and survey process is provided in Appendix C.

- **Other Statistical Support Reports:**
  - Number of Incidents Opened: incidents opened in Service Desk Express by group within a specific time frame
  - Number of Incidents Closed: incidents closed in Service Desk Express by group within a specific time frame
  - Aging Reports: Length of time incidents have been "open" by group
  - Top Ten Category for All Closed Incidents: Lists top ten closed incidents based on the number closed within a defined time frame

Incidents & Customer Satisfaction Index

In addition to various projects and reporting responsibilities, TSS opened a total of 42,613 incidents and closed 42,876 incidents this fiscal year. Table 5 provides an overview of the incidents opened and closed by individual teams within the TSS department. A total of 4,126 surveys were submitted by Mason community members using the HDI Customer Satisfaction Index Tool. Once again, 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 4.90 for "Courtesy," 4.84 for "Knowledge," 4.78 for "Timeliness," 4.84 for "Quality," and 4.80 for "Overall Satisfaction."

On the following page, Table 6 displays TSS customer satisfaction ratings for each of the five categories as performed by each TSS support area.

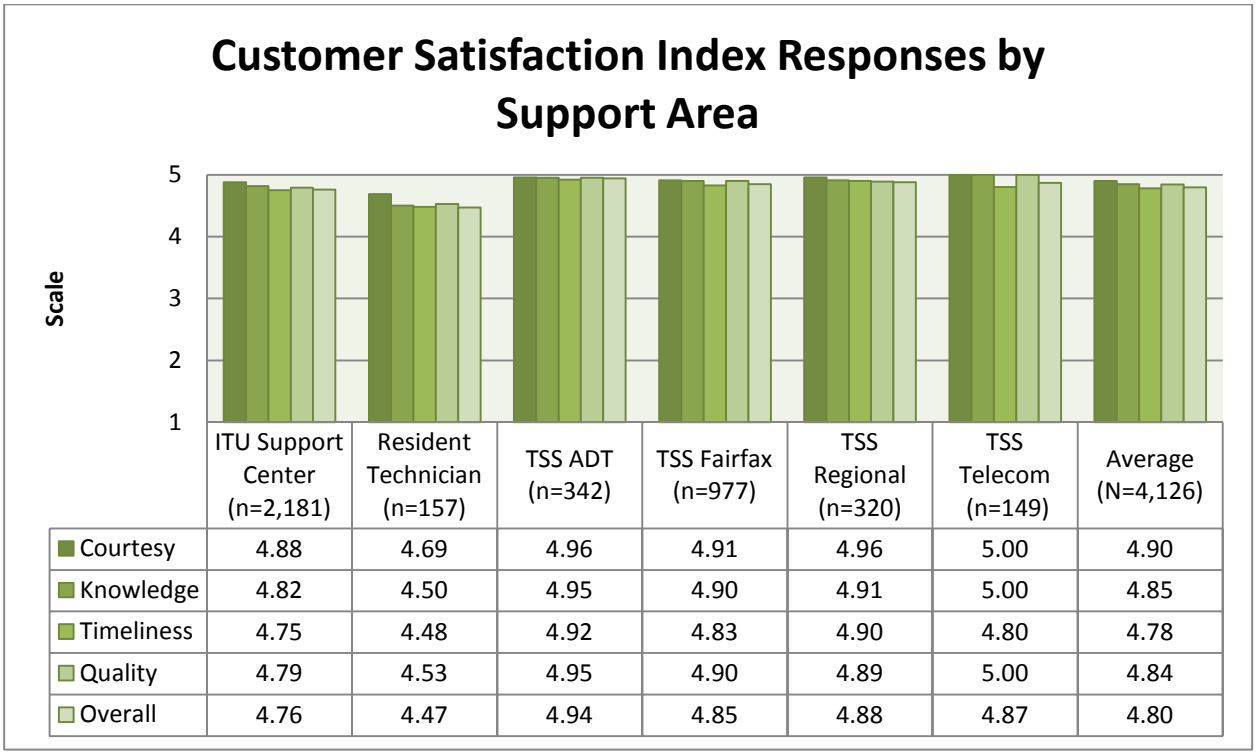
Table 5 *Incidents opened and closed by TSS*

TSS Group	Incident Status	
	Opened	**Closed**
Operations	19	13
RT-Aquia	466	489
RT-Rappahannock	409	373
RT-Shenandoah	328	258
Support Center	30,053	30,520
ADT Desktop	1,838	1,771
ADT Escalation	39	43
TSS Desktop Fairfax	5,723	5,693
TSS Desktop Regional	2,158	2,132
Logistics	1,580	1,584
Total	**42,613**	**42,876**

Major Projects

In addition to its operational and reporting activities, the department led seven (7) major departmental projects this year and provided expertise and resources to projects sponsored by departments both within and external to TSD. Descriptions of the department's major fiscal year initiatives are provided below along with a list of projects that TSS staff members support presently.

Table 6 *Customer satisfaction index responses by support area*



	ITU Support Center (n=2,181)	Resident Technician (n=157)	TSS ADT (n=342)	TSS Fairfax (n=977)	TSS Regional (n=320)	TSS Telecom (n=149)	Average (N=4,126)
Courtesy	4.88	4.69	4.96	4.91	4.96	5.00	4.90
Knowledge	4.82	4.50	4.95	4.90	4.91	5.00	4.85
Timeliness	4.75	4.48	4.92	4.83	4.90	4.80	4.78
Quality	4.79	4.53	4.95	4.90	4.89	5.00	4.84
Overall	4.76	4.47	4.94	4.85	4.88	4.87	4.80

- **Software Distribution and Imaging Architecture:** The TSS and the Division of Instructional Technology (DoIT) have nearly completed a project that impacts the performance and availability of classroom and lab computer systems. To date, the project team has developed a common set of functional processes and technical infrastructure requirements. It also made recommendations for the use of Altiris, Ghost, and Microsoft System Center Configuration Manager (SCCM) for both software distribution and computer imaging services. An infrastructure was developed that enabled the campus network to support multicast and unicast based imaging of desktops for offices, classrooms, and labs on all Mason campuses. Building upon this foundation, the project team is planning to extend the use of the SCCM platform to provide software distribution and imaging services. To date, professional service procurement has been approved and the team is working on a detailed statement of work (SOW) and engagement schedule with Microsoft. Project team members racked the new servers for the upgrade in the Data Center and placed orders for the last few networking items needed to complete the build. With an updated version and better design, the platform will deliver more features to current customers and offer SCCM's central management efficiencies to new customers. With the help of TSS—who provided administration of the SCCM platform and direct desktop hardware support—DoIT used SCCM successfully this year to image 1,192 PC systems and 58 Macintosh computers located in Mason's classrooms and computer and specialty labs (i.e., 332 University lab PC computers, 753 University classroom PC computers, 26 classroom Macintosh computers, 97 specialty lab PC computers, 32 specialty Macintosh computers). This

coming fiscal year, TSS looks forward to using the new testing environment and working with Microsoft for any additional design and migration related needs.

- **ITU Support Center Website Redesign:** TSS staff participated in this project to revise the ITU Support Center website with the dual purpose of (1) making information about technology searchable and more easily accessible and (2) ensuring the site aligns with George Mason University web standards as defined in Mason's *Visual Identity Guide for Web Design*. This project benefits students, faculty, and staff who use the Mason web pages to access ITU related information, to obtain ITU support, and to request ITU provided services. As a result of the project, an Information Technology Services Catalog was released in February 2012 that provides descriptive information on nearly 100 IT services. Site modifications were made based on customer feedback. A procedure for adding, updating, and archiving was finalized along with a list of issues to be addressed in the future. This project was completed in October 2012.

- **Mobile Device Management:** The use of mobile devices at Mason has increased dramatically. The Information Technology Unit needs a way to manage and make sure that these devices are secure across the network. Users also need a way to have content delivered to their mobile devices. The goals of the project include (1) identifying the various management and service options available that can be applied on mobile devices, (2) selecting an appropriate mobile device management solution to deliver these options, and (3) developing a formal *Bring Your Own Device* policy. In September, a Mobile Support Specialist was hired. The project team formed a working group to evaluate different types of solutions: Wireless Network segmentation, Mobile Device Management software, and policies that define tablet and Smart phone usage. The team is working with the IT Security Office to identify security requirements and is drafting a report for executive management that outlines the various management and service options available for mobile devices. Final steps in this project include selecting a vendor and conducting a pilot program.

- **Management for OS X:** The focus of this project is to bring management of the Macintosh (Mac) platform in alignment with management of the Windows platform. This project supports those ITU departments that provide device and application support to Mac users at Mason. Currently an onsite technician visit is required to service a customer's Mac. Implementing a centralized management platform would assist in automating routine services—such as software patches—to large groups of Macs. In February, the JAMF software was upgraded to a full management suite version. This upgrade allowed for the purchase of 100 licenses, which will be used to pilot the management platform with a large number of Mac computers residing in select departments. Outputs resulting from this project include (1) a model to distribute software to Macs through a policy or a self-service store, (2) a comprehensive hardware and software inventory of managed Macs on campus, and (3) a list of additional management improvements possible through the platform. The benefits include improving Mac security through simple security policies, pushing Apple and third-party updates to Macs, imaging Macs over Mason's

network, upgrading Operating Systems over Mason's network, and managing FileVault 2 encryption settings with an enterprise tool.

- **Virtual Desktop Infrastructure (VDI):** Various virtual desktop technologies have been deployed in the Mason environment for a number of years. However, there is no centralized structure to support a campus-wide offering of such services. By leveraging the efficiency of centralized deployment and management of desktops, TSS can assist the ITU in providing a better user experience for many types of computing needs such as instructor consoles, classroom and lab computers, mobile devices, and mobile and teleworking remote users. The structure will also provide better protection of sensitive data. To date, much of the initial research for this project has been completed as a partnership between TSD and DoIT. The team has had several meetings with Dell, Cisco, and VMware integrators to determine the best solution for Mason. VDI has a large up-front cost and the project group is reviewing and researching the return on investment for deployment of a VDI solution.

- **Information Technology Service Management (ITSM) Project:** The ITSM Project consists of four phases within a three-year roadmap and targets the assessment and process improvement requirements for various IT services offered by the ITU. The project team will address gaps identified in the processes required to deliver or perform various IT services and provide recommendations and/or direct support to increase the level of maturity of these processes based on the ITIL framework. In addition, the team will identify new roles (and positions) that, if established, would help the unit achieve process improvements and maintain steady growth to maturity. A final result of the project is the selection of an ITSM application solution to complement this effort and replace the Service Desk Express (SDE) application.

- **Office 365 Email Migration for Faculty and Staff:** This is a significant project for the ITU given its impact on Mason's employee email system. Under EMS project leadership, TSS played a significant role in the processes established for local mail migrations, support documentation, and direct support services for end users.

TSS staff also provided significant support to the division and unit-sponsored projects listed below:

- Password Expiration Enforcement
- SEP 12 (Symantec Anti-Virus) Testing and Implementation
- MASON-SECURE Implementation
- Telecom migrations to VoIP and new PBX
- New building openings and departmental relocations
- Oracle Calendar Migration
- MasonLive Upgrades 1 and 2

CHALLENGES

TSS leadership identified the challenges below as impacting daily activities and operations this fiscal year.

- **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, the TSS support position at the Mason-Smithsonian site in Front Royal is still on hold with funds pending.

- **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 would encourage a review of technology purchases and the extent to which recommendations or guidelines can assist in improving the customer experience and better allocating limited department resources.

- **Software Distribution & Licensing:** TSS staff work was delayed this year 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.

- **Service Desk Express (SDE):** SDE will need to be replaced with a centralized 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.

- **Password Reset Process:** 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

A significant opportunity identified by TSS leadership lies in the restructuring of Mason's Information Technology Unit. TSS considers this review an opportunity for the organization and its respective departments to assess business practices and whether or not the structure and processes in use are appropriate for attaining the strategic goals of the institution and ITU. The review also provides an

opportunity to further improve IT service management and related processes, and to embrace Information Technology Management principles. In addition to the opportunities noted above, TSS leadership identified the following opportunities going forward.

- **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 TSD resources to support.

- **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.

- **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 functions or similar. 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.

- **Mason Enterprise Services Architecture (MESA) Migration**: TSS will continue to encourage departments and users not attached to the MESA to migrate to this service system. MESA migration makes additional services available for disaster recovery of data and allows TSS to provide desktop management across the network (e.g., using System Center Configuration Manager for software distribution, patching, and imaging).

- **Promote and Increase Research and Other Colocations in the Aquia Data Center**: TSS looks forward to sharing the benefits and services of the Aquia Data Center with Mason departments and research groups. The team provides support for locating to the data center through move information and guidance based on a customer's technology requirements.

ITU SUPPORT CENTER (SC)

The **ITU Support Center (http://itservices.gmu.edu)** is a central point of contact for the Mason community to request IT support or information. Its mission is to provide professional and friendly service in support of excellence in learning, teaching, and research. The ITU SC provides many avenues for support including walk-in, phone, email, chat, and remote assistance. If an issue cannot be resolved within the ITU Support Center, it is referred to the appropriate resource within the Information Technology Unit for resolution. All requests for service are recorded in Service Desk Express (SDE). The ITU Support Center provides support to Housing and IT&E in the use of SDE (i.e., training, report generation, and assistance with automating service requests).

Overseen by the ITU Support Center Manager, the ResTech program—staffed by students living on campus—provides information and technical assistance during the school year to students residing at Mason. Prior to students moving into Mason housing, ResTechs are trained in the various policies and procedures related to technology use at Mason. The group must also become familiar with the Mason technologies and systems required for them to perform their jobs and provide support. On the first "move-in" weekend, the ResTechs participate in the "Get Wired" program that helps incoming students connect personal devices to the Mason network. This fiscal year, 29 students participated in the ResTech program.

Incidents & Customer Satisfaction Index

The ITU Support Center—including Resident Technicians—opened 31,256 incidents and closed a total of 31,640 incidents. With respect to customer satisfaction, performance of the team exceeded goals established internally by the TSS department. A total of 2,338 surveys were submitted for services performed. Table 7 displays the number of incidents opened and closed by the ITU SC team and Resident Technicians, respectively. On a five point scale of customer satisfaction (5 = "Very Satisfied"), the ITU SC staff and Resident Technicians received an average score of 4.79 for "Courtesy," 4.66 for "Knowledge," 4.62 for "Timeliness," 4.66 for "Quality," and 4.62 for "Overall Satisfaction." Table 8 provides additional detail on customer satisfaction ratings for each individual group.

Table 7 *Incidents opened and closed by Support Center and Resident Technicians*

ITU Support Center	Opened	Closed
Support Center	30,053	30,520
Resident Technicians (All Neighborhoods)	1,203	1,120

Table 8 *Customer satisfaction ratings for Support Center and Resident Technicians*

TSS Group	Courtesy	Knowledge	Timeliness	Quality	Overall	Surveys
Support Center	4.88	4.82	4.75	4.79	4.76	2,181
ResTechs	4.69	4.50	4.48	4.53	4.47	157
Group Average	**4.79**	**4.66**	**4.62**	**4.66**	**4.62**	**2,338**

Major Projects

In addition to its operational and reporting activities, the ITU SC led and supported a number of projects this year, including those listed below:

- MS Office 365 Migration for faculty and staff
- ResTechs coordinated with Housing and Networking to develop and execute the **"Rogue Router" Project**. This project identified and helped eliminate student routers that were causing major problems in the Residence Halls (over 50 were identified). It also provided the ITU SC with an opportunity to educate students about problems created by the devices.
- The ITU SC worked this year to incorporate classroom and learning technologies into the Service Desk Express. This effort required staff to identify new workflows since reported incidents have previously been identified by classroom or lab, not by customer.
- ITU SC completed the first review cycle of the IT Services Catalog.
- The ITU SC established a social media presence on Twitter and Reddit.
- Team members presented *Lessons Learned* from Office 365 Migration for a HDI WebCast.

TSS DESKTOP

TSS Desktop provides hardware and software support for microcomputers, mobile devices, VoIP telephones, printers, and various peripherals. There are three primary desktop teams: Fairfax, Regional, and Advanced Desktop Technology. Fairfax Desktop supports the main Mason campus and nearby locations. Regional Desktop supports Arlington, Prince William, Loudoun, the Center for Innovative Technology (CIT) in Herndon, and the Mason-Smithsonian site in Front Royal. Advanced Desktop Technology is a technical team that works on specific technology challenges and projects targeting the support of end user devices. ADT performs desktop support activities on the Fairfax campus. Request for the Desktop Support Group services are made through the ITU Support Center.

Incidents & Customer Satisfaction Index

This year the TSS Desktop team opened 9,758 incidents and closed a total of 9,666 incidents. Table 9 provides a breakdown of the number of incidents opened and closed by each individual support group.

Table 9 *Incidents opened and closed by TSS Desktop groups*

TSS Desktop Group	Opened	Closed
Fairfax Desktop Fairfax Desktop	5,723	5,693
Regional Desktop	2,158	2,132
Advanced Desktop Technologies	1,877	1,841

With respect to customer satisfaction, performance of the team exceeded goals established internally by the TSS department. A total of 1,639 surveys were submitted for services performed by TSS Desktop

and Advanced Desktop Technologies teams. On a five point scale of customer satisfaction (5 = "Very Satisfied"), staff received an average score of 4.94 for "Courtesy," 4.92 for "Knowledge," 4.88 for "Timeliness," 4.91 for "Quality," and 4.89 for "Overall Satisfaction." On the following page, Table 10 provides customer satisfaction ratings and number of surveys submitted for each individual group.

Table 10 *Customer satisfaction ratings for TSS Desktop groups*

TSS Desktop Group	Courtesy	Knowledge	Timeliness	Quality	Overall	Surveys
Regional Desktop	4.96	4.91	4.90	4.89	4.88	320
Fairfax Desktop	4.91	4.90	4.83	4.90	4.85	977
Advanced Desktop Technologies	4.96	4.95	4.92	4.95	4.94	342

Equipment Related Moves

TSS Desktop staff also relocated 1,546 pieces of equipment across Mason campuses and ensured that moved equipment worked properly. Equipment handled by Desktop ranges from personal computers and networked printers to university copiers, phones, and servers. Table 11 below provides a breakdown of the type and quantity of equipment moved this year.

Table 11 *Equipment related moves completed FY2013*

Equipment Type	Quantity
Personal Computers	627
Printers Network	74
Printer Local	74
Copier – University	5
Servers	1
Cable Television	1
Phone	726
Phone Analog, TTY, Fax, Credit	38

Major Projects

In addition to the accomplishments noted above, TSS Desktop staff led and supported a number of critical projects this year, including those listed below:

- MS Office Migration for faculty and staff
- Assisted the Division of Instructional Technology transition to SCCM 2007
- Prepared for transition to SCCM 2012 with guidance from a Microsoft consultation
- Participated in major SCCM deployments of software and updates for security and the deployment of MS Outlook 2010 for faculty and staff email
- Created Self Service OS upgrades for Mac OS X (Mountain Lion)

- Created a universal "Mason" desktop image through DELL for Equipment Trust Fund (ETF) desktop refresh and for computers sold by Patriot Computers
- Setup, imaged, and networked all computers and printers at the Smithsonian Conservation Biology Institute (SCBI) located on the Front Royal Campus
- Conducted equipment moves on both Fairfax and Arlington campuses including the relocation of Truland Building occupants to Foundation Building and the Office of Education to Founders Hall
- Assisted in setting up and configuring a broadcast studio in Founders Hall for *Capitol Connections*
- Assisted the Biological Research Laboratory with configuration of their servers and N-Computing devices for the research containment units at the Prince William campus
- Began work on a reporting process for owners of MESA shares to complete periodic reviews of their shares—work also includes related policies, procedures, and guidelines

TSS LOGISTICS

TSS Logistics works closely with Telecom Admin—staff members in TSD's Network Engineering & Technologies department—to provide support in the field for Mason's telephone systems and overall operational and project support. TSS Logistics is also responsible for (1) equipment purchasing, (2) parts ordering for computers, (3) software distribution, (4) TSS equipment and vehicle management, and (5) building management of the Rivanna module where TSS 's Fairfax Desktop team is based.

Incidents & Customer Satisfaction Index

This year the TSS Logistics team opened 1,580 incidents and closed a total of 1,584 incidents. With respect to customer satisfaction, performance of the team exceeded goals established internally by the TSS department. A total of 149 surveys were submitted for services performed by the team. On a five point scale of customer satisfaction (5 = "Very Satisfied"), staff received a score of 5.00 for "Courtesy," 5.00 for "Knowledge," 4.80 for "Timeliness," 5.00 for "Quality," and 4.87 for "Overall Satisfaction."

Phone Moves & Use

This fiscal year, TSS Logistics conducted Voice over Internet Protocol (VoIP) training for Mason community members. This training supported the significant work undertaken by TSS Logistics staff related to phone moves and use. TSS also moved 949 phones and conducted extended assessments on phone equipment at the Prince William Campus, SPACS, the Commerce building, and COLA's move into Research Hall. Moved phones required assessments of closets and network switches to confirm proper equipment was installed and configured. Closets that could not accommodate customer requests were re-wired. Testing was conducted and documented. If necessary, updates and corrections were made to ensure a phone move project could be completed on-time. New construction projects generally required additional time to either gather information (e.g., jacks, rooms and networks) and/or ensure that lines for elevators and life safety lines were available.

This year, TSS Logistics catalogued, installed and—where necessary—refreshed a total of 1,988 telecom decommissioned phones and 555 daily phones. With respect to phone inventory and check-in, TSS Logistics helped ensure that all phone orders were delivered to the warehouse where they were inventoried and entered into the team's database. Catalogued phones were delivered to Blue Ridge core and organized by project. Prior to being put into service, the team programmed the phones and placed notations into the database. Decommissioned phones were collected, sorted, and boxed for either reuse or surplus.

Major Projects & Additional Significant Activities

In addition to the accomplishments noted above, TSS Logistics staff participated in a number of critical projects this year and undertook numerous smaller projects often aligned with their daily operational activities. A list of these projects is provided below:

- George Mason University Fairfax Campus Green Books Project
- New construction projects
- Life Safety Dial Tone
- Prince William Decommission Project
- Patriot Center Cable 17 Service
- Dial Tone for President of the United States
- Fenwick Library Duct Bank Relocation
- West Campus Duct Bank Relocation
- Harris Decommission—Rack migrations

DATA CENTER OPERATIONS (DCO)

The **Data Center Operations** team provides operational support for Mason's enterprise network (24/7/365). Services include monitoring academic and administrative systems, network availabilities, Cable TV, and the data center's room environment. DCO is responsible for initiating system backups, managing and processing backup media, the coordination of all system and network maintenance activities, coordination of file restoration, and proactive fault management to ensure that system outages are detected, corrected, or escalated to the appropriate support personnel.

The team provides and manages physical space within the Aquia Data Center for colocation services of departmental servers and other appliances, and services for Research Computing. It also supports the disaster recovery rack for Old Dominion University in the colocation section of the data center. Additional responsibilities include those listed below:

- Monitoring and maintaining 24x7 access control to the facility that houses Mason's critical IT infrastructure

- Logging operation activities and completing SDE tickets as required for incidents
- Monitoring and coordinating outages to key components used to maintain the data center's environmental conditions
- Monitoring key enterprise systems and network components
- Responding to outages and requesting support
- Coordinating both systems and facilities maintenance activities impacting the data center
- Providing daily system status reports
- Leading the daily ITU Change Review Board Status meetings, recapping the previous 24 hours and conducting the change management process for TSD

Major Projects & Significant Activities

In addition to the accomplishments noted above, DCO staff participated in a number of critical projects this year and undertook numerous smaller projects often aligned with their daily operational activities. Below is a partial list of this year's projects and activities:

- Installed an air containment system and conducted an airflow analysis to determine efficiency
- Installed Compellent Storage Center SAN in data center
- Moved two new racks of equipment into the data center (TSD Telecom)
- Expanded equipment rack monitoring using two new Netbotz 550 units to provide additional ports for environmental sensors
- Installed two Netbotz 450 units at the Prince William Campus Disaster Recovery site and at the Harris Building telecom room, allowing the installation of sensors that provide remote monitoring of the temperature, humidity, and dew points
- Replaced batteries in Primary Uninterruptible Power Supply (UPS)
- Installed secondary electrical connections to provide redundant power to all Research hosted equipment

New Colocation & Research Clients

Seven new customers moved into the data center to take advantage of its available services and security. In addition, Old Dominion University added more disaster recovery equipment to the data center prior to the start of Fall Semester 2012. The following list provides additional detail on the colocations and clients moving to the Aquia Data Center:

- College of Science School of System Biology moved with two racks of equipment
- Capitol Connections moved with 10u spaces of equipment
- Library moved with two racks of equipment
- Division of Instructional Technologies—Computing services moved with one rack of equipment
- Office of Research Computing (Cluster) moved with two racks of equipment
- Admissions moved with one rack of equipment
- Facilities Energy Management moved with one rack of equipment

TECHNOLOGY SYSTEMS DIVISION

Accolades & Scholarship

This year TSD received four awards and honors, including the **Avaya Customer Innovation Award for Sustained Excellence**. Staff held 17 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 30 TSD employees received advanced certifications and 84 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 provides information related to the professional activities and awards of TSD staff.

Statewide, Regional, National and International Affiliations

4-VA (**http://www.4-va.org/)** is a consortium of four universities in the Commonwealth of Virginia: George Mason University, James Madison University, the University of Virginia, and Virginia Polytechnic Institute and State University. 4-VA's mission is to promote inter-university collaborations that leverage the strengths of each partner university in order to accomplish much more than any individual university could achieve alone.4-VA strives to decrease the cost of delivering instruction; significantly expand access for all Virginians to programs preparing them for rewarding careers; increase research competitiveness; and enhance the success rate of students in Science, Technology, Engineering, and Mathematics (STEM) courses and programs.

Association of Collegiate Computing Services (ACCS, **http://www.accsva.org/**) of Virginia is a state-level organization that supports the sharing of information among technology professionals in Virginia's colleges and universities.

The **Association of Writers & Writing Programs** (AWP, **https://www.awpwriter.org/**) provides support, advocacy, resources, and community to nearly 50,000 writers, 500 college and university creative writing programs, and 125 writers' conferences and centers. Our mission is to foster literary achievement; advance the art of writing as essential to a good education; and serve the makers, teachers, students, and readers of contemporary writing.

E&I Cooperative Purchasing (**https://www.eandi.org/**) is the not-for-profit buying cooperative established in 1934 by members of the National Association of Educational Procurement (NAEP) to provide goods and services to members at the best possible value. The Cooperative is owned by its membership of nearly 3,000 colleges, universities, K-12, hospitals, medical research institutions and hospital purchasing organizations located throughout the United States.

EDUCAUSE (**http://www.educause.edu/**) is a nonprofit association whose mission is to advance higher education by promoting the intelligent use of information technology.

The **EDUCAUSE Center for Applied Research** (ECAR, **http://www.educause.edu/ecar/**) provides subscribers with timely research and analysis to help higher education leaders make better decisions about IT. George Mason University is a subscriber.

HDI (**http://www.thinkhdi.com/**) is a global membership, training, and certification association for technical service and support professionals. HDI's curriculum and resources address the needs of technical service and support professionals throughout their careers and the various maturity levels of their support operations. Formerly known as the Help Desk Institute, the company was rebranded in 2005 to HDI as a means to acknowledge the expanding role of the support center and the maturing service management industry. HDI is vendor-neutral in its efforts to facilitate open, independent networking and information sharing within the association's global network. TSD staff memberships include HDI Capital Area Local Chapter and HDI Higher Education Forum.

The **IBM Cloud Academy** (**http://www.ibm.com/solutions/education/cloudacademy/us/en/**) enables thought leaders and technical experts to participate, engage, and advance cloud computing projects. George Mason University is a charter member.

InCommon (**http://www.incommon.org/**) seeks to create and support a common trust framework for United States education and research. This includes trustworthy shared management of access to online resources in support of education and research in the United States. To achieve its mission, InCommon facilitates development of a community-based common trust fabric sufficient to enable participants to make appropriate decisions about the release of identity information and the control of access to protected online resources. InCommon is intended to enable production-level end-user access to a wide variety of protected resources.

The **InCommon Federation** (**http://www.incommon.org/federation/**) is the U.S. education and research identity federation, providing a common framework for trusted shared management of access to online resources. Through InCommon, Identity Providers can give their users single sign-on convenience and privacy protection, while online Service Providers control access to their protected resources.

Internet2 (**http://www.internet2.edu/**) is a community of United States and international leaders in research, academia, industry and government who create and collaborate via innovative technologies. Together, the organization advances national and global research and education. TSD membership includes staff participation in the Internet2 Middleware Group and Internet2 Identity and Access Management Group.

The **Mid-Atlantic Research Infrastructure Alliance** (MARIA, **http://www.marialliance.net/**) is an alliance of institutions in Virginia established to promote the development of shared advanced network and other cyber infrastructure resources to serve the Commonwealth and the Mid-Atlantic region. MARIA was established to facilitate the development, and implementation, of emerging technologies critical for research competitiveness and economic development and to make available high-performance optical network services in support of the member's research, education, healthcare and public service missions. MARIA is also a part of a national community of research optical networks, and provides connectivity to the national and international research and education networks.

The **National Writers Association** (**http://www.nationalwriters.com/**) exists to enhance the future of writers by fostering continuing education through awarding scholarships and providing no or low cost workshops and seminars. A non-profit organization, we provide education and an ethical resource for writers at all levels of experience.

Project Management Institute (PMI, **http://www.pmi.org/**) in a not-for-profit membership organization offers a range of services to the project management profession such as the development of standards, research, education, publication, networking-opportunities in local chapters, hosting conferences and training seminars, and maintaining multiple credentials in project management.

SCHEV Digital Resources Committee (**http://openva.org/**). The State Council of Higher Education for Virginia (SCHEV) is the Commonwealth's coordinating body for higher education. SCHEV was established by the Governor and General Assembly in 1956. It's mission is "to promote the development of an educationally and economically sound, vigorous, progressive, and coordinated system of higher education" in Virginia. The Open and Digital Learning Resources Conference is an initiative of the Office of Governor of the Commonwealth of Virginia, the State Council of Higher Education for Virginia (SCHEV), the Virginia Community College System. George Mason University is a partner institution.

The **Southeastern Universities Research Association** (SURA, **http://www.sura.org/**) works to advance information technology to advance research. The SURA Information Technology Committee encourages collaborative IT projects that benefit member institutions.

Virginia Software Summit (**http://virginiasoftwaresummit.org**) is a statewide forum for instructional technology professionals. It is held annually and provides an opportunity for leaders in IT to discuss issues including licensing negotiation, software management, tracking and reporting software use, the emergence of cloud computing, and how continued economic pressure adds complexity to an already challenging software management environment for platform vendors, application vendors and higher education software consumers.

Awards and Honors

- **Avaya Customer Innovation Award for Sustained Excellence**: In June of this fiscal year, Avaya and the International Avaya Users' Group (IAUG) awarded George Mason University its *2013 Customer Innovation Award for Sustained Excellence.* Avaya awards highlight visionary companies and organizations that creatively utilize the Avaya infrastructure for developing communication solutions that enable the use of new applications and technologies and significantly enhance the customer experience, reliability, and efficiency of operational and resource management. The press release can be found online at the following web address: **http://www.avaya.com/usa/about-avaya/newsroom/news-releases/2013/pr-130605**.
- Chauteh, Patrick. HDI Capital Area Support Analyst of the Year Nomination
- Orf, Katherine. Phi Kappa Phi Honor Society
- Robinson, David. Phi Kappa Phi Honor Society; Golden Key International Honour Society

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 certifications this fiscal year:

- Byong Kook: A+, Security+, CCNA, CCNA Security
- Chad Britt: Dell Online Self Dispatch
- Dave McGarry: Dell Online Self Dispatch
- Dave Reilly: MCITP, MCTS, Security+, Dell Online Self Dispatch
- David Robertson: Information Technology Infrastructure Library Foundation
- David Robinson: Information Technology Infrastructure Library Foundation
- Emilio Goncalves: Dell Online Self Dispatch
- Jackie Thomas: Information Technology Infrastructure Library Foundation
- Karen Gardner: MCP
- Katherine Orf: eLearning Certificate
- Kathering Orf: Masters of Education in Instruction Design and Development
- Kenny Stewart: Dell Online Self Dispatch
- Kristen Jennette: Dell Online Self Dispatch
- Leon Truong: CCNA
- Mark Craft: MCP
- Mike Baccaglini: Dell Online Self Dispatch
- Mike Briggs: Dell Online Self Dispatch
- Mike Rothgeb: Dell Online Self Dispatch

- Richard Jackson: graduate certificate in software project management
- Shawn Jennette: MCP, Dell Online Self Dispatch
- Stephanie Werhane: HTML
- Chase Gleason: CCNA, CCNA Security
- Tommy Dang: CCNP (recertified)

Caught In the Act Awards

This year TSD employees received 84 Caught In the Act (CITA) Awards. Many of the employees were nominated more than once. 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:

Alex Yun
Aly Lo
Anita Kalyana
Anthony Wilson
Arnold Dixon
Ben Waters
Brian Mancuso
Byung Kook
Cassie Carter
Chad Britt
Chase Gleason
Cheng Cheu
Daniel Seals
Dave McGarry
Debby Penny
Dennis Royal
Dennis Savonarola
Dmitri Chebotarov
Ejaz Abbasi
Elizabeth Redwine
Emilio Goncalves
Gabe Hamilton
Howard Davis
Jed Frye
Jesse Kirkpatrick
John Arnett
John Gerhard,
Juan Carlos Blandon
Juan Laguna
Judy Kratzer
Karen Gardner
Kate Orf
Kathy Bonafede
Kenneth Suarez
Kenny Stewart
Larry Marca
Leon Truong
Lisa Carr
Liz Boyen
Mark Sadler
Marley Withrow
Marques Wilson
Matt Murphy
Matthew Scott
Mike Briggs
Mike Quigley
Mike Rothgeb
Mohammed Boukhira
Mukarram Shahzad
Nisha Sharma
Patrick Chauteh
Paul Matner
Qian Xu
Rashid Hashem
Richard Jackson
Richard Mitchell
Rob Mayo
Scott Smith
Shawn Blackwell
Stephanie Klare
Stephanie Werhane
Taran Triola
Teresa Gibbons
Tommy Dang
Tony Gould
Trong Ho

Councils, Committees

- John Hanks: Fairfax County Information Technology Policy Advisory Committee; Fairfax Federation of Citizens Association appointee

Presentations and Publications

- Pitt, Sharon and Davia, Gowen, Ghezzo, Harris, Horne, Potter, Vandenberg, and Xiong. 2013. "Cloud Computing Services and Architecture for Education," International Journal of Cloud Computing (IJCC), v. 2, no. 2/3.
- Pitt, Sharon and Gate Rhodes. 2012. "The Knowledge Network," Campus Televideo Technology Seminar. Atlantic City, NJ.
- Pitt, Sharon and S. Kehoe, G. Rhodes, R. Wood. 2012. "Building an IPTV Network from the Ground Up: A Consortium Approach," EDUCAUSE Annual Meeting. Denver, CO.
- Pitt, Sharon and M. Burnett, R. Kunkle, S. Workman. 2012. "Women in Technology: Strategies and Best Practices to Attract Young Women into IT Programs and Careers," EDUCAUSE Annual Meeting. Denver, CO.
- Pitt, Sharon and A. Cabrera, P. Stearns, K. Eby, G. McDaniel, J. Muir. 2012. "What are the implications?" Forum on the Future of Higher Education. Fairfax, VA.

Teaching

- Ben Allen: Network Implementation Laboratory (ECE 467), George Mason University; Telecommunications 515: Internet Protocol Routing, George Mason University; Telecommunications 514: Basic Switching, George Mason University
- Tommy Dang: CompTIA® A+, Northern Virginia Community College; CompTIA® Network+, Northern Virginia Community College
- David Robinson: Visiting Professor, DeVry University; Assistant Professor, Northern Virginia Community College
- Telecommunications 515, Internet Protocol Routing, Spring 2013 and Telecommunications 514, Basic Switching, Summer 2013.

Appendix A

Governance Charter & Membership Information

Current Banner Governance Structure

Current Banner Governance Structure was created as a result of an assessment with the help from Bearing Point back in 2007. Additional Banner Governance documents are available at **https://docushare.gmu.edu/dsweb/View/Collection-3992**. The following committees were created:

Committee	Organization Structure	Current members
Portfolio Governance Council (PGC)	The committee will be chaired by the Executive Director of TSD; a vice chair will be elected annually by the PGC for terms of one year. The chair or vice chair will provide administrative support, including the duties of a recording secretary	Chair: Sharon Pitt (Interim Deputy CIO/Interim Executive Director, Technology Systems Division); Vice chair: TBD; Secretary: TBD *Members: Guilbert Brown, Diana Cline, Angela Detlev, Tom Shifflett, Wayne Sigler, Kris Smith*
Portfolio Evaluation Committee (PEC)	The committee will have a chair, vice chair and recording secretary. The Database Application Services Director will serve as chair while the vice chair and recording secretary will be elected annually by the PEC for terms of one year. The vice chair and recording secretary will belong to functional areas and the vice chair will represent the PEC at PGC meetings. Sub-committees will be created when necessary by the PEC. The chair will ask for volunteers and will appoint a chair of the sub-committee. The sub-committee will share any findings with the full committee members to form a decision.	Chair: Tom Shifflett (Director, TSD/Database Application Services) Vice Chair: Angela Detlev (Director, Institutional Reporting, Institutional Research & Reporting) Secretary: Rhonda Baumgartner (Applications Analyst, FAST, Fiscal Services) *Members: Kathy Adcock, Barbara Clark, John Szkutak, Derek Kan, Mark Kraner, Jieping Li, Kimberly Maze, Jane Moore, Patrick Quinn, David Robinson, Laurie Miller, Joy Taylor, Ahmad Taheri, Sue Tinsman, Michelle Workman, Kathy Zimmerman, Brian Selinsky, Barbara Yablonski*
Project Coordination Sub-Committee (PCS)	The PCS will be appointed by the Portfolio Evaluation Committee and will serve at the pleasure of the PEC. The PCS will elect its chair from members belonging to the functional areas annually by simple majority vote. Working groups will be created when necessary. The chair will ask for volunteers and will appoint a lead for the working group. The working group will report its findings to the full sub-committee. The chair of the PCS will report on its activities to the PEC at its regularly scheduled meetings.	Chair: Francesca Brunner-Kennedy (Application Analyst, FAST, Fiscal Services) Vice Chair: TBD; Secretary: Elizabeth Redwine (Banner/PatriotWeb Liaison, ITU Support Center, TSD - Technology Support Services) *Members: Kathy Adcock, Zakir Alam, Jeanette, Blanchard, Diana Cline, Angela Detlev, Christopher Gay, Shira Goodfellow, Jeanne Haught, Derek Kan, Hossin Kord, Anthony Marinelli, Kimberly Maze, Laurie Miller, Jane Moore, , Tom Shifflett, Barbara Yablonski, Kathy Zimmerman*

Architecture Standards Committee (ASC)	The committee will have a chair, vice chair and recording secretary. The Executive Director of the Technology Service Division (TSD) will appoint a chair. The chair will appoint a vice chair and recording secretary from among the members of the Architecture Standards Committee. Sub-Committees will be created when necessary by the Architecture Standards Committee. The chair will ask for volunteers and will appoint a chair of the sub-committee. The sub-committee will share any findings with the full committee members to form a decision.	Chair: Tom Shifflett (Director, TSD/Database Application Services) Vice Chair: Andrew Krell (Manager, TSD/DAS Application Integration Secretary: Chris Gay (Manager, TSD/DAS Data Mart Support) *Members: Kathy Adcock, Rhonda Baumgartner, Karen Gardner, Tracy Holt, Derek Kan, Andrew Krell, Bob Peraino, Brian Selinsky, Carol Westbrook, Michelle, Barbara Yablonski, Kara Zirkle*

The following processes and systems were created and deployed:

Process and System	Location
Banner Governance Documents	https://docushare.gmu.edu/dsweb/View/Collection-3992
Serena Business Manager (Team Track)	https://sbm.gmu.edu/tmtrack/tmtrack.dll?
Project Management Framework	http://pmo.gmu.edu/pmframework/index.cfm
Enterprise Project Management Online (EPMO)	https://epmo.gmu.edu/default.aspx
DAS Request Process	https://docushare.gmu.edu/dsweb/Get/Document-36270/DAS%20Service%20Request%20Procedures%20Manual-V.30.doc

Architecture Standards Committee Charter

(Revised Fall 2013)

Purpose: The Architecture Standards Committee (ASC) is intended to provide consistent standards and criteria to support technology selection and use decisions about all TSD (Technology Services Division) supported applications, departmental applications hosted at the ITU data center and departmental applications that require integration with TSD supported administrative applications. It will define a technical framework in which distributed programming and software implementation can be performed by approved Banner Functional Office (BFO) individuals. The committee will also establish standards that will be used as a guide for developing requirements and specifications used in the evaluation and selection of third party software/hardware including security and accessibility standards. The ASC will review all software acquisitions (including software and web site development projects) in excess of $1,999 for all university units for compliance with university security and accessibility standards as well as standards required for any application that has a requirement to integrate with Banner or be hosted in the ITU data center.

Roles and Responsibilities:

The specific duties of the Architecture Standards Committee will include the following:

- Establish, publish and maintain technology architecture standards;
- Establish, publish and maintain software development, testing and quality assurance standards and procedures;
- Establish, publish and maintain procedures for coordinating maintenance and upgrades to third party applications, databases, servers and networks;
- Verify compliance of system acquisition, development and integration requests with technical architecture and standards;
- Verify adherence of in-house software with software development, testing and quality assurance standards and procedures;
- Evaluate standard variance requests and, based on established Banner Architecture Committee technology architecture standards, submit approval/denial recommendations to the appropriate governance bodies;
- Coordinate with ITU teams responsible for infrastructure in regard to optimal configuration, capacity and readiness to support new or upgraded/modified applications;
- As requested, provide input into project cost estimation efforts;
- Provide architecture standards information to the Project Governance Council (PGC) and Portfolio Evaluation Committee (PEC) and other appropriate governance bodies;
- Assess periodically technology architecture standards;
- Assess periodically the procedures for coordinating maintenance and upgrades to third party applications, databases, servers and networks;
- Assess periodically the software development, testing, quality assurance standards;

- Review compliance of existing systems with technical architecture and standards and recommend modifications where necessary; and,
- Recommend modifications to current ITU business practices based on an understanding of architectural technologies.

Organization Structure:

The committee will have a chair, vice chair and recording secretary. The Executive Director of the Technology Service Division (TSD) will appoint a chair. The chair will appoint a vice chair and recording secretary from among the members of the Architecture Standards Committee.

Sub-Committees will be created when necessary by the Architecture Standards Committee. The chair will ask for volunteers and will appoint a chair of the sub-committee. The sub-committee will share any findings with the full committee members to form a decision.

Procedural Rules:

- The Architecture Standards Committee will set its own schedule for meeting times and frequency;
- Sub-committee working meetings will be arranged by the chair of the sub-committee;
- Sub-committees will report information back to the Architecture Standards Committee;
- The chair will create an agenda for the meetings and distribute at least one business day prior to the meeting; and,
- Each member of the Architecture Standards Committee will represent one vote when deciding items.
- Issues that cannot be resolved within the Architecture Standards Committee will be escalated to the Deputy CIO/Executive Director of TSD.

Critical Success Factors:

The following items will need to be in place so that the Architecture Standards Committee can perform its duties and be successful:

- Adequate empowerment by the Banner Functional Office (BFO) IT Project Governance Council;
- Well established policies and procedures;
- Mechanisms for effective collaboration between the committee and key stakeholders.
- Commitment of members to attend meetings and follow through in a timely manner with any action items assigned at meetings;
- Communication by the Architecture Standards Committee to the Project Governance Council (PGC) and Portfolio Evaluation Committee (PEC) concerning software and hardware architecture standards and procedures;
- Ability to take into consideration other people's point of view and understand the needs of the BFO and ITU; and,
- A centralized location for Architecture Standards Committee documents.

Membership:

Composition: The Deputy CIO/Executive Director of TSD will ensure that the Architecture Standards Committee has a balanced and equitable representation of members across ITU stakeholders. In addition to the chair, the membership of the committee should encompass the following representation:

- Database Application Services (DAS) will actively participate in the meetings and will have voting/decision rights.
  - One member of the Architecture Standards Committee will be from the Database Support group.
  - Two to three member of the Architecture Standards Committee will be from other DAS groups.
- Enterprise Servers and Messaging (ESM) will actively participate in the meetings and will have voting/decision rights.
  - One member of the Architecture Standards Committee will be from the Systems Engineering group.
  - One member of the Architecture Standards Committee will be from the Server Support group.
- Network Engineering and Technology (NET) will actively participate in the meetings and will have voting/decision rights.
  - One member of the Architecture Standards Committee will be from the Network Engineering and Technology (NET). This person should have network security, firewall and load balancer knowledge.
- Technology Support Services (TSS) will actively participate in the meetings and will have voting/decision rights.
  - One member of the Architecture Standards Committee will be from Desktop Support.
- A Program Evaluation Committee member who could also be a member of DAS will be necessary to ensure that the committee has an understanding of the Banner Functional Offices priorities. The member will actively participate in the meeting and will have voting/decision rights.
- A BFO technical representative, to be appointed by the PEC, with technical/architecture ability is necessary to represent decentralized IT capabilities across the university and will have voting/decision rights
- A committee member from the IT Security & Project Management Unit will be necessary to assist with the development of ASC security standards. The Director, IT Security member will provide information but will have no voting or decision-making rights.
- A committee member from the Equity and Diversity Unit will be necessary to assist with the development of the ASC accessibility standards. The IT Accessibility Coordinator member will provide information that is necessary to represent IT Accessibility capabilities across the university and will have voting/decision rights.
- A Project Management Office (PMO) Committee member will be necessary to ensure communication between the governance bodies. The PMO member will provide information but will have no voting or decision making rights.

- Internal Audit and Management Services Department will be represented on the committee to provide information, but will have no voting or decision making rights.

The composition of the Architecture Standards Committee will include members from the ITU that have the following skills:

- Ability to understand architecture technology and standards and implication of changing these policies on current Mason business practices;
- Ability to see other people's point of view and understand the needs of other units;
- Ability to attend all meetings, or send a representative that has the authority to act for the member, and complete tasks that they have committed to on time;
- Ability to understand the technological cost information supplied by the PEC; and,
- Ability to communicate the work of the group in a positive manner.

Term:

All members will serve on the Architecture Standards Committee at the pleasure of the Deputy CIO/Executive Director of TSD.

Current Faculty Senate Technology Policy Committee Membership

(FSTPC) advises the Vice President of Information Technology and other administrators in four key IT areas: (1) investing in and implementing computer-based technologies that impact educational techniques; (2) developing of new computer-based educational techniques and research capacities; (3) creating of a technology budget that reflects the FTSPC's recommendations and faculty position regarding allocations to programs and/or individuals; and (4) reviewing and maintaining an equitable intellectual property rights policy for faculty. Membership of the committee consists of the following persons:

- Stanley Zoltek (COS – 2014), Chair
- Alok Berry (VSE – 2014)
- Gerald Hanweck (SOM – 2015)
- Goodlet McDaniel (CHHS – 2015)
- Dieter Pfoser (COS – 2015)
- Pallab Sanyal (SOM – 2014)
- Catherine Sausville (COS-2015)

Appendix B

Summary of Key Fiscal Year Initiatives

TSD leadership identified ten (10) key initiatives as critical to the growth and development of IT related business and service management this fiscal year. These key initiatives were identified in the executive summary. Additional information on the initiatives is provided in this appendix as well as in the department specific sections of this annual report.

Our 10 Key Initiatives

ITSM Assessment
Business Intelligence Reporting Tool
Office 365 Email & Calendar
Mason's Wireless Network
Information Security Support
COEUS Grants Management
Harris PBX Decommissioning
Software Distribution & Imaging
Data Mart Support
Flexible Work Resource

Information Technology Service Management (ITSM) Assessment: This initiative involved an extensive assessment of TSD's information technology service management (ITSM). Processes and functional areas assessed include (1) service desk, (2) incident management, (3) problem management, (4) change management, (5) configuration management, (6) catalog management, (7) and service level management. An onsite consultation with Plexent, Inc. was conducted in January along with follow-up interviews with over 20 stakeholders and subject matter experts. Using the information gathered, the consulting company provided TSD with an analysis of its IT management maturity and identified critical growth areas. The report also included a detailed long-range plan for further improving resource efficiencies and asset allocation. A cross-functional team was created to review and implement recommendations and a position secured to support this implementation. TSD will seek to fill the new position of Service Process Coordinator this coming fiscal year.

COEUS Grants Management Software: In conjunction with the Office of Sponsored Programs (OSP), DAS completed its work to implement COEUS—a Grants Management System. COEUS provides a university-wide system that supports an integrated and electronic approach to developing and routing grant proposals, collecting pre-award and post-award financial data, reporting grants and financial data, and submitting and receiving information from granting agencies and organizations. The COEUS proposal development and institute proposal modules make it possible to prepare proposals, route them internally to obtain proper approvals, and submit them to sponsors electronically. Its award module stores detailed information on awards, reporting requirements, terms and conditions, and the required approvals.

Flexible Work Project: TSD and Human Resources worked collaboratively this year to design and develop a comprehensive website detailing Mason's flexible work options. Using the resources and tools on this site, supervisors, current flexible work users, prospective users, telecom coordinators, and others who support flexible work at Mason can determine if flexible work options are appropriate for their

work situations and learn how to implement and manage flexible work arrangements. The website launched this spring (2013) and is available at **http://flexwork.gmu.edu**.

Harris PBX Decommissioning: The ITU installed the Avaya PBX system approximately fifteen years ago. Located at Harris Theater, the system supports faxes, queues, voice mail applications, other telephony services, and nearly 8,000 lines. Since its installation, the system has required a series of upgrades and enhancements. Its increasingly outdated hardware demands substantial physical space and expense to maintain. In order to downsize and decommission the outdated system, TSD launched an initiative to evaluate the system's design, assess the risk of relocating its associated applications, and identify the steps required for migrating routing services and end-user data to a new platform. The project team selected the CS 1000E to be this new platform. TSD is transitioning all faculty, staff, and resident students using voice services provided through the PBX system to the CS 1000E platform. In parallel, the division is migrating users from digital and analog to VoIP. TSD completed its migration of digital to VoIP, providing users (including departments) with new telephones and training. All associated features and functions are now managed through the CS 1000E. TSD anticipates completing its migration of analog users to VoIP during fall 2013 and concluding the entire project in FY2014, which includes decommissioning the PBX hardware.

Business Intelligence Tool Selection & Implementation: TSD continued to focus on identifying and implementing a new Business Intelligence (BI) Reporting Tool for Mason. A key event catalyzing this initiative was Oracle's announcement that it would no longer support Oracle Discoverer—Mason' s primary reporting tool. This loss of support was coupled with a substantial need at Mason for a robust BI tool to meet the data and statistical analysis needs of stakeholders, addressing a growing need for analytic reporting, and supporting future plans for the Enterprise Data Warehouse. In FY2011, a focus group formed to evaluate and recommend BI solutions to replace Discoverer. In March 2012, the committee completed its requirements and published a Request for Proposals (RFP). An Evaluation Committee reviewed RFP responses and unanimously selected MicroStrategy as Mason's new Business Intelligence and reporting software. Committee members cited the following reasons for their selection:

- Look & Feel/User-Friendliness/Overall Product Design
- Excellence in dashboards and visualization
- MicroStrategy has built its entire BI platform in-house, organically grown
- Most platform-independent
- Integrated forecasting tool
- Local vendor with good technical support
- Highly rated/ranked product by external reviewers:
  - Cited by Forrester: "Clients cite lower long-term cost of BI ownership due to a reduction in the number of cubes or reports they have to build."
  - Cited by Gartner: "Customers have a high level of satisfaction with product functionality."

Starting in March of this year, the project refocused on software implementation and report migration (from Oracle Discoverer). A BI support team will help functional office representatives prepare for report migration. The team is utilizing an AGILE project methodology approach. [3]

Office 365 Email & Calendar: Work continued this year on TSD's Office 365 initiative, which consists of three main objectives: (1) to develop a set of requirements for a new email messaging system that would replace the current email system (MEMO) 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 same system that Mason employees would be using, thus allowing for students and employees to use the same software for their email systems. In fall 2011, TSD formed a cross-functional team to begin the process of selecting a new email and calendaring system. The team reviewed Mason's current email and calendar systems, identified requirements for a new system, and investigated solutions. Team membership consisted of faculty, staff, administration, and members of the ITU. The chair of the Faculty Senate Technology Policy Committee participated on this team. The Mason community provided input and feedback through a variety of venues, including open town hall meetings and online surveys. In spring 2012, the team completed its review of solutions and executive leadership selected Microsoft Office 365 as the new email and calendar system. The three projects below were initiated to implement Office 365.

- **Office 365 Employee Calendar Implementation:** In November of this year, the TSD began extensive work with the calendaring portion of Office 365 for Mason's faculty and staff. The original Office 365 implementation project consisted of the TSD releasing both email and calendar portions at the same time. During initial testing, the project team realized that both the implementer and the version of the Sumatra software selected were not sufficient to effectively migrate the more than 2,000 Oracle Corporate Time Calendar users to Office 365. Redirecting, the division began working directly with a new vendor, CalMover, to develop a comprehensive plan for a migration that relied on CalMover software and services. The project team prepared and submitted a sole source justification. Due to timing and resources at Mason, leadership separated the calendar migration from the remainder of the email migration to Office 365. The Office 365 calendar system is still scheduled to replace the Oracle Corporate Time calendar system. The project includes a university-wide upgrade to Office 365 Wave 15 in September 2013 and the migration of calendar entries from Oracle to Office 365 in October.

- **Office 365 Employee Email Implementation:** Executive leadership selected Office 365 to replace Mason's MEMO email system and Oracle calendar system. Office 365 is a more robust, integrated software package built on the Microsoft Exchange platform and hosted at Microsoft. This project included the implementation of the email portion and the migration

[3] The AGILE approach allows project participants to complete a project in incremental, iterative steps with numerous opportunities for feedback and refinement. Using AGILE project methodology, functional office stakeholders are helping to develop and review report requirements, prioritize reports for migration, and provide user acceptance testing (UAT) of developed reports.

from MEMO. The project launched officially this past November with a meeting between TSD and B2B Technologies, Mason's implementation partner. During the late fall/early winter, the technical infrastructure for the authentication (long term) and migration (temporary) was built and configured. Results of user testing showed that there would be additional time required to remediate the email errors and the calendar migration results were such that leadership separated the email and calendar portions of the project into two unique projects. As of April 2013, TSD completed the migration from MEMO to Office 365 (Wave 14). This project includes an additional upgrade by Microsoft to the Outlook Web Application (Wave 15). This upgrade is scheduled for fall 2013.

- **Office 365 Student Email Implementation:** The goal of this project is to upgrade the MasonLive student email system from Microsoft's Live@EDU platform to its Office 365 platform. When complete, students and employees will use the same software for their email systems. In fall 2010, Mason migrated to Microsoft's Live@EDU email platform. In 2012, Microsoft announced that it would upgrade all Live@EDU customers to the Office 365 platform. The project team began planning work in February of this fiscal year to understand impacts on student and employee email systems. The initial upgrade date was set for April by Microsoft; however, the project team delayed this date until they could complete the employee email migration and explore platform differences in depth. Given the different infrastructure of Office 365, the project team considered multiple issues including account creation, email address format, accounts on both systems, authentication for students, global address list management, and others. As of August 2013, TSD completed the student email system upgrade to Office 365 (Wave 14). This project includes an upgrade by Microsoft to the Outlook Web Application (Wave 15). The upgrade is scheduled for fall 2013.

Software Distribution and Imaging Architecture: The TSD and its sister organization, the Division of Instructional Technology (DoIT), have nearly completed a key initiative that impacts the performance and availability of classroom and lab computer systems. The project team developed a common set of functional processes and technical infrastructure requirements. It also made recommendations for the use of Altiris, Ghost, and Microsoft System Center Configuration Manager (SCCM) and, ultimately, selected SCCM for both software distribution and computer imaging services at Mason. The project team will extend the use of the SCCM platform to provide software distribution and imaging services. To date, professional service procurement has been approved and the team is working on a detailed statement of work (SOW) and engagement schedule with Microsoft. Project team members racked the new servers for the upgrade in the Data Center and placed orders for the last few networking items needed to complete the build. With an updated version and better design, the platform will deliver more features to current customers and offer SCCM's central management efficiencies to new customers. With the help of TSD—who provided administration of the SCCM platform and direct desktop hardware support—DoIT used SCCM successfully this year to image 1,192 PC systems and 58 Macintosh computers located in Mason's classrooms and computer and specialty labs (i.e., 332

University lab PC computers, 753 University classroom PC computers, 26 classroom Macintosh computers, 97 specialty lab PC computers, 32 specialty Macintosh computers).

Improving & Expanding Mason's Wireless Network: TSD continued its work to deploy a centrally managed wireless LAN system that provides convenient, secure, and authenticated access. The system currently covers 99% of the university's floor space (100% of residence halls, 99% of academic/administration buildings). To date, TSD completed the wireless installations for Prince William and Arlington campuses, redeveloped the wireless Service Set Identifier (SSID), and upgraded the wireless coverage in Mason's residence halls. TSD also installed 132 new access points in student apartments, deployed MASON-SECURE, and put a new control system for wireless into production to increase capacity and capability. The division is in the planning stage for adding wireless to all buildings with intended renovations. With respect to wireless access, TSD focused additional efforts toward providing a reliable, consistent, and convenient wireless data network service to targeted areas on Mason campuses. Targeted areas include residence halls and classrooms, with added coverage for outdoor areas to improve roaming and user experience. This summer TSD will continue to engage in the planning, purchasing, and installation of needed equipment. It will also conduct focused testing to determine how to best improve signal and reliability.

Account, Identity & Password Management: TSD strengthened information security at Mason through a continued focus on account, identity, and password management. This year's achievements include significant strides made toward (1) replacing an outdated account management system (AMS), (2) identifying account management specifications used at the institution, and (c) improving identity and password management within Mason's Patriot website. Details of the division's accomplishments related to each of these areas are provided below:

- *Account Management Evaluation, Selection & Implementation*
  Mason's Account Management System (AMS) provides identity management for access to select university IT resources. The university's current AMS is 20 years old and runs on an unsupported software package. The project required that a team document the electronic identity lifecycle process and identify new AMS system requirements. The team focused on documenting the existing system—targeting tasks performed by the "Accounts Database" system—and provided a set of specifications to the project team involved in AMS evaluation and selection. Mason's new AMS must allow for expansion of business requirements in subsequent project phases. In January, an AMS survey of four Virginia universities was conducted and a high level cost estimation completed. Survey results revealed that all four universities used in-house developed systems. Coupled with the cost estimation, the team evaluated an open source solution called CIFER. CIFER is designed to address the unique identity management needs present in educational environments. The team determined that CIFER, paired with in-house development, would provide the needed flexibility and responsiveness required in the university environment.

- *Banner to Account Management System*
  For this project, a cross-section of institutional stakeholders created a committee to establish guidelines for the provisioning and de-provisioning of user accounts. The guidelines were for both IT and non-IT services and dependent on employee roles or classes. TSD is supporting the articulation of how to define and manage this information; resulting in better management of the creation and removal of employee, student, and others accounts on Mason's technical resources. The team will also help define tasks and identify key departments whose involvement would benefit the project. In addition, the team is also developing the technical specifications of selection criteria for employees.

- *Patriot Pass Identity and Password Management*
  This year, information security was strengthened by increasing the identity and password management of Mason's Patriot website. This project required the implementation of the Oracle Waveset Identity Management (IdM) solution for the provisioning of Enterprise LDAP Directory, White Pages LDAP Directory, MESA, Kerberos, Banner, Active Directory, Mason Unix, and Volgenau School of Engineering computer systems. In addition, TSD enhanced the Strong Password management (Patriot Pass) site (**http://password.gmu.edu**) and integrated LDAP authentication for back office applications (e.g., INB, ePrint, Discoverer) using native Banner authentication capabilities.

Data Marts - Refactoring and Release: TSD continued its work this fiscal year on critical projects related to data marts. Two major efforts in particular targeted the refactoring of Mason's Admissions Data Mart (ADM) and the release and review of a new data mart for the Office of Sponsored Programs. Descriptions of these two efforts are provided below.

- *Admissions Data Mart Refactoring*
  This year TSD began its work to transform the current ADM, which was taken from Virginia Tech back in 2004, and fully redesign the database and rewrite the Extract, Transfer, Load (ETL) code to meet Mason Enterprise Data Warehouse (EDW) standards and future objectives. Working alongside TSD is the Admissions Office, the Office of the Provost, the Office of Institutional Research and Reporting, and a number of academic units and departments at Mason. The project team completed the following major goals of the project's first phase: combining Undergraduate and Graduate Admissions, migrating from SQL Loader to direct inserts, redesigning underlying data mart database, refactoring ETL code, rewriting ADM reports, integrating EDW common audit logging standards, and integrating EDW common extraction routine. TSD looks forward to completing the next phase of this project, which will implement security and validity checks and allow stakeholders to enjoy significantly enhanced and flexible reporting.

- *Sponsored Program Data Mart: Release Two*
  The Sponsored Program Data Mart (SPDM) is a comprehensive data repository that allows the Office of Sponsored Programs to track and monitor the proposal process (Proposal

Development, Institutional Proposals, and Awards). The data marts initial release addressed process components related to Institutional Proposals. This first release is in production presently and security was implemented at the end of this fiscal year. This second release focuses on those requirements related to Proposal Development and Awards. Stakeholders will begin gathering requirements and reviewing information related to Proposal Development in fall 2013.

Appendix C

HDI Customer Survey Process & Reporting

In September 2007, the Technology Support Services (TSS) division began using the HDI Customer Service Index (CSI) tool to measure customer satisfaction. This tool allows TSS to benchmark their performance goals established by the TSS department as well as other companies in the industry. It is integrated with the incident management system Service Desk Express (SDE). When an incident is closed within SDE, it sends an email to CSI with specific information about the incident. If the customer has not received a survey in the past 30 day, CSI will send the survey to the customer. There are five required questions, however more can be added. Many of the features of CSI are configurable, such as the frequency of the surveys, excluding some customers from getting the survey, allowing the customer to opt-out from getting any more surveys and adding customizable elements.

Access:

To request a CSI account, contact the ITU Support Center Manager. To access the CSI tool, go to: **https://www.thinkhdi-csi.com/Default.aspx**. Also provided on this site is the SDE User Guide and a Frequently Asked Questions page.

Participants:

The use of CSI has expanded beyond TSS. The following groups are currently participating:

- ITU Support Center
- OHRL IT SUPPORT
- ResTechs
- Telecom Admin
- TSS ADT
- TSS Fairfax
- TSS Regional
- TSS Telecom

Alerts:

If a survey is returned with certain criteria selected, it will trigger an email notification to the manager of the group. The default settings for these alerts are as follows; however, each manager has the ability to change them for their group:

- If the customer indicates, dissatisfied or very dissatisfied on any question
- If the customer provides a comment
- If the “Please have the support center contact me” box is checked

Reports:
CSI provides standard reports that can be scheduled to run weekly or monthly. There are also Ad Hoc reporting capabilities.

ITU Support Center Practices

Alerts
When an alert is received by the ITU Support Center Manager, it is reviewed and the following actions are taken:

- If it is a positive response, it is forwarded to the ITU Support Center team with a comment to the analyst who received it.
- If it is a negative response, it is reviewed for further action or process improvement, which includes:
    - rectifying the issue if possible (i.e. sometimes the comment is the problem still exists),
    - following up with the analyst who closed the incident, and
    - following up with the customer.
- If it includes positive feedback about a technician from another group, it is forwarded to the technician and their manager with a comment.
- If it includes negative feedback about a technician from another group, it is forwarded to the manager of the group.
- If it includes appropriate feedback about a process improvement or another suggestion, it is sent to the manager.

Reports
On a monthly basis, the ITU Support Center Manager generates and distributes the following customized reports:

- Survey – OHRL – Report for Agents
- Survey – Telecom – Report for Agents
- Survey – SC – Report for Agents
- Survey – SC – Report per Month
- Survey – TSS Fairfax – Report for Agents
- Survey – TSS – Report per Month