Who We Are

WSU Spokane ITS is one team composed of many fields of expertise designed to handle the many challenges of today’s higher education information technology environment. ITS is composed of the Technical Support Center, the Systems group, Network Engineering, Audiovisual Engineering, the Multimedia group, Special Projects, and ITS Administration. We are a dynamic participant and business partner, actively pursuing new opportunities to provide our customers with high-level service to help them succeed. This means we are often found in the various classrooms, laboratories, auditoriums, and departments all around campus in support of WSU Spokane’s vision of creating and maintaining a premier health sciences campus.

Mission Statement

Our organization, through collaborative and progressive leadership, uses its information technology resources to support the strategic mission of the campus by facilitating excellence in teaching and learning, ensuring excellence in service delivery, and supporting state-of-the-art research and discovery.
The true mark of a great information technology organization is how well it helps others succeed. WSU Spokane ITS continues to utilize emerging technologies to provide new opportunities for professional scholarship, learning, and outreach. Our leadership drives campus strategy and collaboration, both inter-professionally and across institutional boundaries. These partnership efforts provide opportunities to generate business value for reinvestment into academic and technical innovation.

Our primary focus is to support — and advance — the work of the WSU Spokane community with innovations to help researchers achieve breakthrough discoveries, to provide next-generation teaching and learning tools to help faculty innovate and students engage, and to help campus departments and staff work more efficiently.

Over the past year, ITS updated critical systems to support the campus network and systems infrastructures and introduced technology innovations to the newest building on campus — the Pharmaceutical and Biomedical Sciences building. Our engineers and technicians rose to the challenge to completely design and install these technologies — a first for WSU Spokane ITS.

ITS also incorporated several changes during 2013 to embrace a new operational model called IT as a Service (ITaaS). These changes have enabled us to become much more nimble and deliver faster service. Through ITaaS, we will leverage the power of technology to further the missions of each college and department on campus with increased agility, responsiveness, and innovative resources. ITS is a customer-focused and progressive service department that places greater emphasis on the needs and outcomes required by our customers to best serve the WSU Spokane community — now and in the future.
Transitioning to IT as a Service

Information Technology Services incorporated several changes during 2013 to embrace a new operational model to provide IT as a Service (ITaaS). These changes have enabled ITS to become much more agile and deliver faster service to our customers. ITaaS allows us to run much like a business, acting and operating as a distinct business entity. At its core, ITaaS is a competitive business model where an enterprise IT organization views its customers as having many options for IT services and the IT organization has to compete against those other options in order to be the provider. Options for providers other than an internal IT organization may include outsourcing companies and public cloud providers.

Under the ITaaS model, ITS now has a business-centric focus and places great emphasis on the needs and the outcomes required by our customers. The benefits of this new operational model include the standardization and simplification of services delivered by ITS, improved financial transparency and more direct association of costs to consumption, and increased ITS operational efficiency resulting from the need to compare the price of internally produced services to those available from external providers.

ITaaS starts at the top with a crystal-clear understanding of business needs; it also starts at the bottom with a set of virtualized resources and pre-configured and certified building blocks that can be combined and deployed at the click of a button. These resources can be deployed and managed in a highly automated fashion, allowing for elasticity and on-demand self-service. With this top-down view and bottom-up technology capability, ITS can quickly and reliably respond to the changing needs of our customers with optimized yet highly standardized solutions. With ITaaS, technology solutions can be deployed as needed, when needed, and billed only for what is used.

IT Influence Grows as Virtualization Matures

CIOs are leveraging virtualization and other innovative technologies to transform their departments into business-driven service organizations. Those who have deployed an ITaaS model report a higher ROI, increased agility and responsiveness, and more resources to put towards innovation — ensuring IT’s place at the head of tomorrow’s businesses.
Implementation of Best Practices at Core of ITaaS

Best practices for IT service management have been implemented along with this new business model to yield the following characteristics to our organization:

- We apply the principles of value creation, managing service assets, and applying service structures within the context of our service strategy.

- Financial management, return on investment, and demand management are all critical aspects of our service portfolio management process with minimal upfront IT investment, regular, predictable expenses, and scalability.

- We utilize a service lifecycle to design, transition, operate, and continually improve our services from initial idea inception throughout the lifecycle until final product retirement as part of an overall portfolio of offerings to our customers.

Some of the changes made within ITS included the adoption of such practices as:

- New technology models founded on the use of private, public, and hybrid clouds; employing controls, trust and compliance up and down the stack; introducing infrastructure standardization and automation wherever possible; implementing a well-defined change management strategy.

- New consumption models leveraging self-service catalogs; providing IT financial transparency for costs and pricing; offering consumerized IT – such as bring your own device (BYoD) – to meet the needs of our customers. All of which simplify and encourage consumption of services.

- New operational models which imply a revised organization, with new business and technical skills and roles; creation of more horizontal, service-oriented processes; explicit IT alignment with lines-of-business.

ITS has substantially reinvented itself through ITaaS as a nimble, innovative service provider instead of its former cost-centric technology services group. The resulting solution has driven our transformation through the enterprise and helped us evolve from a tactical role to a strategic one that has great potential for delivering a competitive advantage.
A Critical Resource for Connectivity

The network is vital for communication, storage of information, and sharing of resources — thus nearly every electronic device on campus is connected via the network. ITS is faced with the continual challenge of maintaining the viability of the network, providing a secure network, and enhancing functionality. Additionally, ITS must create a system that will enable the campus to cope with network failures when disaster strikes.

In 2013, ITS hired a Network Engineer, Jason Minton, to better focus on these challenges and to set standards for optimizing network services. As one of his first tasks, Jason performed a comprehensive network analysis. This analysis revealed the connectivity between the campus buildings, such as what networks are carried between the buildings and what transports are used to get those networks to the buildings from a logical standpoint.

Many different types of networks make up the campus infrastructure, such as data center network services, the virtualization environment, wireless network services, name services, print queues, active directory authentication, and more. Each of these exists in a different logical network. The network infrastructure had not been previously documented, which made it difficult to manage, maintain, and plan for future enhancements. By creating detailed documentation and diagrams of the network architecture, the networking team was able to provide a list of observations and recommendations to introduce stability and to work towards a more deterministic campus LAN. This initial analysis was critical for improving the day-to-day support of the network and for making plans for future needs for additional services and enhanced functionality.

Jason also identified the need for network design specification documents to set standards for configuring and provisioning network services. Through the creation of these documents, a vital need was fulfilled for providing guidance as the campus grows and network services become even more complex. By putting these design standards into place, our Network team has increased their efficiencies for supporting the network. And just as importantly, these guidelines now enable them to have an eye toward the future to accommodate growth.

Several major network infrastructure projects were completed during the year under Jason’s leadership and he was promoted to Network and Telecommunications Engineering Manager.

Network Engineering and Installation for SPBS

Undoubtedly, the biggest achievement for the Network team in 2013 was the planning and installation of the network infrastructure for the new Pharmaceutical and Bio-medical Sciences building. ITS provided a full end-to-end network engineering plan and installation to accommodate this project — a first for WSU Spokane ITS. Additionally, this project laid the groundwork for future network engineering of all new buildings on the Spokane campus.

The Network team was faced with a number of challenges to complete this project. But due to the ITS leadership foresight to create the network design standards prior to beginning the project, a critical hurdle had been avoided. If no standards had been in place, the Network team would have been faced with many unanswered questions. For example, when you provision a VLAN, what do you name this VLAN; when you provision a network, how do you address this network; or when you address the layers of the network, what pieces of equipment should be placed within these different layers?

Other difficult questions prior to developing the network engineering plan for SPBS revolved around power: how do you feed power to the network devices; which UPS battery backups should be installed to provide uninterruptable power during failures; and what leg do you connect to generator back up power? To answer those questions, it was necessary to consult with the power utility company and electrical engineers to be certain front-end best practices were being exploited. The Network team also needed to work cohesively with multiple vendors to coordinate the cable plant installation and perform the installation of 32 devices installed with multiple connections, both logical and physical.

New technologies were launched in the SPBS project including the Cisco Catalyst 4500, which had a big impact by introducing a technology called VSS distribution. VSS (virtual switching system) increases operational efficiency by simplifying the network. Physically, it uses two chassis — but from a logical standpoint, it’s seen as one. So that enables the virtual switch to be centrally managed as a single entity, reducing switch management overhead by at least 50 percent. And because the configuration includes two physical chassis, VSS boosts nonstop communications, providing instantaneous failover and redundancy at that distribution layer. This is critical because the distribution layer is what connects it to the core network services.

The new VSS technology also eliminated the antiquated Spanning Tree Protocol. That outdated convention didn’t
allow ITS to utilize all uplinks to route around failures, which led to significant convergence time. VSS introduces high availability by reducing that time to one hundredths of a second — making it effectively unnoticeable in the event of an outage. Another advantage of VSS is true loop-free topology. Failures are more likely to occur in loops and tracking the root of the problem is difficult. But with VSS, the network is simplified, more efficient, and less prone to failure.

In addition to its high availability, VSS yields more deterministic coverage. Typically, when you have multiple connections without VSS, traffic is not distributed evenly — there's no balance or symmetry. The new VSS installation delivers an unparalleled level of symmetry as far as traffic flows. And the key benefit of that is the maximization of our investment (i.e. if we purchased four 10Gig connections, we would want the traffic distributed uniformly to give our customers an overall better experience).

Flexibility is another key strength of the new VSS technology. Configurations can be either 1Gig or 10Gig and they can be either copper or fiber. That allows us to accommodate the new 10Gig connections in addition to the 1Gig legacy connections. On existing network distribution points, we were very limited in terms of modularity. We strongly believe that you need the ability to adapt using an expeditious approach — and VSS gives us that potential.

Another new technology that was deployed at SPBS were the new Cisco 3850X switches, which are the next generation of enterprise class stackable access layer switches. This technology provides full convergence between wired and wireless networks on a single platform. These switches enhance productivity by enabling applications such as IP telephony, wireless, and video for a true borderless network experience. One of the big advantages of these switches is the visibility they provide into our wireless structure in the access layer. The value of that in particular comes into play when hosting a wireless controller. If something detrimental is happening to the wireless system, it can be limited to that particular device. Also, you can limit code deployment and push to a specific subset of access points. So there’s more granularity and more visibility into the application layer perspective.

The 3850X platform also has WireShark built into it, which is a packet capturing system for network analysis. WireShark analyzes wired traffic and wireless traffic. It supports multiple protocols and presents information in a text-based user interface. It can be accessed via a web browser from any location, thus providing instant access and instant network analysis without having to deploy additional equipment.

Looking back on the SPBS project, Jason said it created a whole new way of doing business for ITS — engineering from the inside out. Before that project, ITS leaned heavily on value-added resellers to do the engineering and the installations. The new business model had huge benefits: a better understanding of how the network behaves on a day-to-day basis, a stronger knowledge of our customer base, and cost savings. Pools of hours that were purchased for professional services have now become much smaller.

According to Jason, “Now when we have any new buildings going up, we’ll engineer the network infrastructure and coordinate the installations ourselves. And if there’s a specific technology that’s new to the mix, we’ll purchase a pool of hours from the vendor to receive support and training for just that specific technology or solicit help for that specialty if needed.”

Older buildings on the WSU Spokane campus will soon be upgraded to take advantage of the new network technologies that were deployed in SPBS. Early in 2014, ITS leadership will identify which buildings will be fitted first. Then the Network team will work on a support initiative to identify the age of the existing network equipment so they can determine what equipment requires upgrading first.

Network Core Upgrades

In addition to the SPBS project, the Network team needed to provide solutions for current network needs while planning and providing for future campus growth. Upgrades to the network core were necessary to augment capacity, reliability, and availability. These changes included the introduction of additional supervisor modules into our core network switches.
Jason explains that “supervisor modules are the brains of the chassis and they control all line cards and all function.” Prior to the upgrade, each chassis had just a single supervisor module with throughput of 720 gigabytes of switch fabric in an active-standby configuration. By introducing an additional supervisor module in each chassis, capacity grew to 1.44 terabytes of switch fabric in an active-active configuration. With this solution, the redundancy relationship could now be described as one-to-one in the VSS chassis, in addition to a one-plus-one relationship across the VSS chassis. This doubled our capacity, which sets us up for the foreseeable future and takes us into the next 5-7 years at least.

With the one-to-one inter-chassis and the one-plus-one intra-chassis relationships, we’ve introduced an extremely high level of core resiliency. It has a remarkable high rate of availability. This is a configuration that’s typical among services providers, such as co-location data centers and providers of that type of high-level service. These provide for instantaneous, deterministic, and automatic recovery if any of the supervisors fail. The completion of this project resulted in an exceptionally high level of network resiliency and scalability.

**Network Data Center Module**

Another primary network engineering task for 2013 was to provide a true network data center module. Previously, there were a multitude of systems services that existed across many different areas on the network. All our critical data center systems were geographically disparate — strung across multiple switches and multiple devices. There was no real centralized location for systems services such as active directory, print queues, virtualization, network file sharing, audio/visual, and a plethora of systems centric network services. So the solution was to create a data center services module and move all critical systems vital for WSU Spokane into this module. In the old model, connections were done across one switch. But with the new solution we can connect over two switches plus we can now accommodate fiber or copper, 10Gig or 1Gig — making it a very versatile environment.

Ultimately, the network services team will be restructuring all services into specific modules, including a WAN module, remote connectivity module, etc. That restructuring will enable them to make changes within modules without effecting the rest of the modules and also allow them to manage each one more efficiently.

**Network Monitoring and Management System**

Evaluating and configuring a network monitoring and management system (NMMS) was another big project that ITS launched near the end of 2013. The NMMS allows an intimate “real time” view into the network and network services and promotes a better organizational understanding of how the network is constructed and how it operates. With thousands of network connections and many different types of connections located within the WSU Spokane campus, management of the network environment is extremely difficult without this type of tool.

Previously, ITS had many unanswered questions when faced with network failures such as: how do I know that something is broken; how do I know when it was broken; how do I know where it is broken; and how do I know what equipment and which customers are affected by the outage? It also was difficult to make strategic decisions about network upgrades without any true measures or trending data about network performance and reliability.

When configuring the new NMMS, nearly 1,200 health sensors were placed in strategic locations throughout the buildings and on network devices to collect data and signal alerts when network service disruptions are encountered or potential problems are detected within the network environment. These sensors measure bandwidth utilization, physical link connectivity, power, fans, temperature and other environmental factors, to name a few. This, in turn, creates a proactive approach to problem isolation, expedites trouble resolution and root cause analysis, and facilitates in identification of potential issues before they become an even bigger obstacle.

The functionality of the NMMS will be rolled out in early 2014 (update: NMMS was launched February 2014) and the Systems group will also be working on their implementation to deploy sensors within the systems environment.

The Network team and the Systems group will both utilize the NMMS, along with Technical Support Center (TSC) personnel providing front-line support. The TSC will moni-
tor how the network is performing day-to-day and be able to provide detailed information to respective escalation groups within ITS when problems are detected so issues can be resolved more quickly and efficiently. ITS personnel also will be using the NMMS app on their mobile devices to be ever vigilant when problems arise — even when they are away from their desktops.

Moving forward, new systems and devices will have sensors added so they can be snapped into the NMMS. Additionally, temporary sensors can be deployed to monitor devices that are having intermittent issues which can be hard to troubleshoot. That way, when the problem presents itself again, the root cause of the problem can be quickly identified and corrected.

Jason sees the Network services team as being akin to firefighters. If you’re not out fighting the fire, you’re back at the station polishing the engine, so to speak — doing all the preventative maintenance and monitoring. In this regard, the NMMS provides his team with all the tools necessary to keep the network running smoothly on the WSU Spokane campus.

Projected plans for the Network team in 2014 revolve around security with the anticipated hiring of a Network Security Engineer (update: Dan Laughlin joined our team in March 2014), installation of new campus firewalls, and a major overhaul of the network security architecture.

Other planned network updates for 2014 include:

- Diversified Network Edge for greater resiliency and redundancy at the edge.
- Increased bandwidth from K20 and Idaho Research Optical Network (IRON).
- Completion of direct point-to-point connection from Spokane to Pullman.
- Become an Internet 2 POP service provider for increased research presence and collaboration with other higher-education research institutions. This high-speed transit from site-to-site will facilitate the exchange of big data.

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**Voice Mail In Your Inbox**

Unified messaging from Cisco Unity has been integrated with Microsoft Exchange to enable the delivery of voice messages from a user’s VoIP phone into their MS Outlook Inbox. Voice mails come attached as WAV files. Outlook has a built-in preview plug-in so you can listen to the messages without opening any other program. This feature allows users to listen to the message from a computer, mobile phone, or other mobile device. At this time, users will still need to clear new messages from the phone using the traditional method even though the message may have been deleted from Outlook. However, when ITS upgrades to Version 10 of the Cisco Call Manager, the VoIP phone system and Outlook will be fully integrated so deleted voice mails in Outlook also will be deleted from the phone.

**Single Number Reach**

Single Number Reach (SNR) allows users to have a mobile phone ring when the primary VoIP line is ringing. This is a custom add-on feature that can be enabled by ITS, as many of the settings and functionality depend on your personal preferences and cellular device.

For more information, or to request either of these custom features, please contact the Technical Support Center at 509-358-7748 or spok.it.help@wsu.edu.
The core wireless network was upgraded during 2013 from wireless service module controllers to an independent Cisco 5508 wireless controller network appliance – with a second 5508-HA (high availability) controller as the redundant controller if ever the primary 5508 failed. These new controllers provide scalable, flexible, and high-performance wireless to deliver reliable performance and zero service-loss for mission-critical wireless.

Another addition was Cisco Prime Infrastructure which provides sophisticated toolsets to more effectively manage and monitor our wireless infrastructure. It’s through the Cisco Prime dashboard or ‘single pane of glass’ that Network Services can run reports, watch wireless traffic, and manage access points (AP’s). This facilitates fast and efficient troubleshooting and it supports integrated Cisco best practices in the form of templates and workflows that simplify the provisioning and configuration of services and device instrumentation to reduce errors and speed deployments.

Campus-wide upgrades to wireless AP’s, which began in 2012, continued with the addition of new Cisco 2602i AP’s. Prior to the upgrade, there were just under 80 AP’s on campus. Including the 40 that were added to SPBS in 2013, we now have 175 AP’s located throughout campus to optimize wireless service and accommodate all wireless devices used by students, faculty, and staff. This number includes two outdoor access points located at each end of the central campus corridor. An additional AP will be added in the garden area between the Pharmaceutical and Biomedical Sciences building and the Nursing building summer 2014.

On our busier days, it’s not uncommon to have 1,300 wireless clients at one time. The Cisco Prime Infrastructure aids in monitoring the wireless traffic and when it indicates there are too many devices sharing the same bandwidth in overly populated areas, more AP’s will be deployed. Approximately 20 older AP’s are remaining to be upgraded in 2014 and other future projects include research of new technologies to monitor campus-owned mobile devices.
Housing, Maintaining, and Managing Mission-Critical Data and Services

The efforts of the Systems Infrastructure Support team are crucial to the core IT infrastructure resources and facilities that support the WSU Spokane campus, including data center operations; administrative, academic, and research-based systems; email, Internet and network access; campus wireless; websites; and the infrastructures for campus distance education, video conferencing, security surveillance, parking, and facilities operations systems support.

Day-to-day support includes handling the break/fix requests that are received by the Technical Support Center (TSC) specific to identity access to shares, general security update maintenance, systems security scans, and antivirus updates. A lead systems engineer is focused on the design and building of our virtual environment, storage environment, cloud services, enterprise cost recovery print services, and facilitating our move from legacy systems to a more centralized ‘service-based’ system.

To better serve the campus community, several organizational changes occurred within this group in 2013. Most notably, Bryan Valley transitioned into the role as Systems Infrastructure Support Manager in July. Bryan felt strongly that the Systems group needed to quickly adopt the ITS strategic goals to operate more as a service center and he worked to disperse the day-to-day workload and knowledge shared by all members of the staff. Cross training was an important aspect for the development of the new structure, as was the sharing of ‘tribal knowledge,’ the adoption of ITS change management processes, and the creation of support documentation for standardizing processes and provisioning services. Bryan took a collaborative team approach to the reorganization and reassigned staff to create clearly defined roles within the group. This allowed each member to be more focused on specific tasks and to become more proactive rather than reactive by utilizing the newly created knowledge base and documentation.

Projects completed under Bryan’s direction during the year included:

**SCCM Implementation**

Microsoft System Center Configuration Manager (SCCM) was implemented in 2013 to monitor and manage computer objects, operating systems, and machines. SCCM is used primarily as a tool for the TSC to visually and virtually see all the computers on campus to:

- See what versions of software they are running;
- Provide remote software installations and patches;
- See the status of antivirus software on each machine;
- Get preventative and preemptive alerts of possible infections and to clean up the infections remotely; and
- Provide a software store for our campus customers to purchase and upgrade our enterprise software licenses.

Other features of SCCM are being investigated for possible deployment in 2014, such as user access gateways to provide a tightly integrated, easy to use, and secure solution for remote access to computing resources.

**Converged Architecture (Vblock) Deployment**

The Systems group successfully deployed their new centralized virtual environment, VCE Vblock, including the high-availability and redundant disaster recovery (DR) solution located in Pullman. The Vblock converged architecture system is a seamless integration of best-in-class computing, networking, and storage technologies from industry leaders Cisco, EMC, and VMware. It delivers an
extremely high-powered solution for cloud computing services, along with the extraordinary efficiency and business agility of virtualization in a centralized environment.

With today’s virtualization technology, we save space, lower power consumption and cooling requirements, and reduce equipment and server administration costs. One hundred virtual machines were deployed at the end of December and the system has plenty of capacity for expansion. The goal is to have 80% of the physical server infrastructure moved to the virtual environment.

Through collaborative and progressive IT leadership in Spokane and Pullman, the WSU Spokane replication and DR system is up and running in the Pullman data center with the point-to-point connection to that site to be complete summer 2014. A layer 2 VPN tunnel between the two campuses will provide the connection to enable the DR system to be on the same network as WSU Spokane. That will alleviate the issue of traversing commodity internet and worrying about firewall routes and rules. Once the two systems are connected, if we experience an outage on the WSU Spokane campus, we will have the ability to recover any data that's lost from the DR system in Pullman. The VPN tunnel will also give us the future potential to engage in an active-active systems environment. During an outage in an active-active environment, we would be able to actually run off the system in Pullman without any interruption in service.

Isilon Storage Solution Installed with Syncplicity for Secure File Sharing

The new EMC Isilon scaled-out network attached storage (NAS) solution is up and running, though not in full production as yet. The Isilon solution provides a powerful, simple, and efficient way to consolidate and manage enterprise data, research data, and applications. The Isilon cluster creates a unified pool of highly efficient storage with a proven 80% storage utilization rate. That means less physical storage is required to house the same amount of data — reducing capital and operating costs.

Syncplicity is the technology that ties into the Isilon storage environment to provide a flexible, scalable, and secure approach to share and sync user files without any extra steps. It creates a hybrid cloud/local storage solution. The authentication and access management is done through a cloud portal, with physical file shares being located in the campus data center — secure and encrypted.

The Systems group will create personalized ‘dropboxes’ for private, cloud-based synchronous storage and data sharing — allowing user access from anywhere through the virtual private network (VPN) or SCCM. It will enable users to work on documents that reside on their office PC hard drives and synchronize them to their folders in the private cloud, thus providing automatic document backup. Additionally, the Syncplicity app can be installed on all mobile devices to actively and securely share and edit documents from anywhere — and sync them across all user devices.

Migration of our existing share and file server environments still needs to be performed after reorganization of our data structure before Isilon and Syncplicity can be fully deployed. Additionally, a formalized approach needs to be developed for establishing quotas and distributing the shared environment to the various campus colleges, researchers, and departments. Those groups will be able to manage their own shared environments amongst their colleagues and if additional storage is required, they will have the option of purchasing more space as needed, on a cost-recovery basis through our service center. The process for completion of the Isilon/Syncplicity solutions will involve testing within the IT department by the end of May 2014 with a campus-wide roll out in late summer 2014.

Videoconferencing Infrastructure Revamped

A proof-of-concept project was successful in determining the feasibility of revitalizing and redesigning the video conferencing infrastructure to increase capacity and to support redundancy. This was accomplished through the deployment of multiple cluster signaling devices to control the video connections and routing of video. The cluster has nearly doubled our capacity and it will have multiple solutions using a video border proxy.

The proxy grants authenticated, secure access for outside/off-network participants to easily and securely connect into the videoconference. The new infrastructure will allow us to be more flexible in supporting outreach with research groups, guest lecturers from outside organizations, and high-level administrative meetings.
The video conferencing performance also will be enhanced with higher quality video/audio while maintaining high availability.

Major Upgrades to Surveillance System

A complete overhaul of the campus security surveillance system was begun in 2013 by moving from a single-server distribution to an enterprise-system distribution. With this multiple-server environment, the management, video archival, and distribution functions are all split amongst multiple servers for higher availability, higher quality, and increased throughput. The system also includes a second video archiver, allowing us to scale out for future needs.

The surveillance system upgrade also included the deployment of over 25 interior cameras throughout the campus buildings. Prior to this, surveillance cameras were only installed on the exteriors of the buildings. This installation was a real team effort, with several members of ITS working across departments with Security and Facilities Operations staff. New higher-resolution parking lot cameras were also installed which will help with the recognition of vehicle license plates. After the installation, the cameras were configured with the Genetec SecurityCenter which provides a unified platform to merge video surveillance and access control.

Additionally, ITS changed the few existing cameras to a different camera manufacturer based on both total cost of ownership (purchase cost plus cost of running the cameras) and reduced bandwidth needs. The new IP-based cameras (IP = Internet Protocol, meaning network managed) record in a compressed H.264 format versus the older IP model that recorded in uncompressed MJPEG. That allows them to consume about 30% less bandwidth to transfer the data on the network at the same quality and same resolution because they’re using a different algorithm for their encoding and compression. They also require much less digital storage because they don’t incur such a large storage volume as the previous cameras. This will allow the campus to have more cameras without needing to utilize more storage space or bandwidth. With our older cameras it takes 1 terabit (1,000,000 bytes) per camera to keep the data for 30 days. That will drop to 700 gigabytes (700,000 bytes) per camera or better, saving a significant amount of space for a 60-camera system.

Fifteen of the new style cameras will be installed in SPBS in the first quarter of 2014. Their performance will be evaluated and used to help determine additional upgrade strategy.

Looking Ahead to 2014

A big focus for the systems team moving forward is researching computing capabilities to support genomics research efforts. Other plans include an organizational change with the hiring of a new Computer Systems Administrator in early 2014 to provide general services, while focusing on Microsoft Lync communication services, SharePoint, and other collaborative tools revolving around our VoIP and conferencing solutions; Internet information servers (IIS) and web support; and backup support for our virtual storage environment.

Deployment of a power management utility to perform unattended automatic and systematic shutdown services and greatly reduce risk of equipment damage or lost data in the event of a power outage is also in motion.

UPS Upgrades Completed

Several upgrades to the network and datacenter UPS’s were performed in 2013 to address vulnerabilities with our backup battery power in the event of power outages. A detailed audit was performed, UPS units and batteries that had reached end of life were replaced, and systems and procedures were implemented to manage and monitor the UPS’s.

After a major power outage event in 2012, it was discovered that our datacenter UPS batteries were only capable of providing enough power to keep servers and storage devices up and running for about 45 minutes. Additionally, some modules in the power conditioner had failed and needed replacing. This event prompted ITS to take preventive measures to assure the UPS’s were serviced regularly and managed to allow enough time for a systematic shutdown of nonessential devices during a power outage so the vital systems could remain running as long as possible. Without enough backup power and the procedures in place to perform a safe shutdown of the devices, equipment and data are put at risk.

Simple Network Management Protocol (SNMP) cards were installed in the network UPS’s that are located in the communications closets throughout campus to remotely manage each individual UPS. This allows for email alerts to be sent automatically from any UPS when it goes into ‘battery’ mode, when it passes or fails its weekly test, or when the battery needs to be replaced.

Additionally, ITS has deployed Intelligent Power Management (IPM) software and Power Distribution Units (PDU’s) in the datacenter that provide advanced technologies to optimize the distribution and use of electrical power and allows administrators to monitor hardware, isolate problems, and resolve them quickly when they occur. These technologies also monitor the temperature of the datacenter and measure power consumption — saving money in the long term as a result of reduced electric bills, reduced downtime, and prolonged hardware life.
ITS Meets the Challenge to Design and Install New Audiovisual Technology

Audiovisual technology is indispensable on today’s college campuses for delivering information to students to instill greater interest and retention of subject matter. But with the high costs of these new technologies, thoughtful planning and design are more important than ever. That’s one of the reasons ITS took on the challenge to design and install the new audiovisual technology in the Pharmaceutical and Biomedical Sciences building.

The new camera system enables close-up views of every speaker in a videoconference or classroom setting, regardless of their location or the number of people in the room. With fully automated camera pan, tilt, and zoom motions, it resolves the common problem of not being able to see the speaker clearly or to see their facial expressions. This allows for richer communication, deeper engagement, and more effective learning and meetings. A wide-panning radius also gives users the flexibility to move freely about the room with confidence that the cameras will always keep them clearly in view.

Another change was made along the way to replace the conference room control systems with touch control panels. After assessment of the new Polycom Touch Control panel, we determined it was easier to use with a highly intuitive interface and much more cost effective. This decision saved $5,000 per conference room for a total savings of $30,000.

Using ceiling microphones instead of tabletop microphones in the auditorium saved another $30,000. This change also provided improved reliability and simplified troubleshooting. Furthermore, as Daren explains, “Had we not been designing the project ourselves, these changes would have resulted in additional design costs.”

The auditorium camera system and 83 microphones work in tandem with the utilization of “push-to-talk” (PTT) logic. PTT buttons are located on the tables throughout the auditorium. When a PTT button is pressed, it calls the corresponding camera preset and unmutes the ceiling microphone nearest to the button. The quality of the Polycom ceiling microphones is superior to tabletop microphones. But keeping the electronics off the tabletops has an additional benefit. If someone spills coffee on a PTT button, it will cost $4 to fix it rather than replacing a $400 microphone.

Other audiovisual enhancements to the SPBS building included installation of Smart Podiums and Smart Boards.
in the auditorium, classrooms, and teaching labs. The Smart Podium interactive pen displays allow professors to annotate their presentations and other digital content to engage the students better and create a more dynamic learning environment. They can open presentations, documents, applications, websites, and multimedia files and write notes over them in multiple digital ink colors, then save for distribution or later reference. They also can download the Smart Notebook software onto their own computers to build their presentations with the Smart Ink technology prior to the classroom session, then upload their presentation onto the classroom computer via a thumb drive and from the soon to be released WSUS private cloud storage.

The 70” interactive flat panel Smart Boards allow students to get even more engaged by collaborating simultaneously to write on digital content using Smart Pens or even with their fingers. The Smart technology is very intuitive and has a very precise touch experience. Also, the surface of the Smart Boards have very little to no glare, ensuring that every student, no matter where they are seated, can see the display clearly.

The Smart Podiums and Smart Boards use Smart Ink technology for annotation, which interacts with most applications. However, the touch screens also can use MS Ink in a Microsoft Word document or PowerPoint slide. The MS Ink can be a better option if users want to convert the digital ink to text and insert it into the document or slide. Making digital “sticky notes” to place on documents and presentations is another creative way to use the Smart technology.

Another type of touch screen monitor was selected for installation in the anatomy labs. Forty-eight 27” Planar touch screen monitors were installed from ceiling mounted monitor arms. The monitors feature an edge-to-edge glass surface with wide viewing angles and a built-in HD webcam. Each is attached to their own computing device, which is network enabled, so they can work independently. But they also are linked via software to the Smart Boards mounted at the front of the labs. That way the instructors can push content out to all the student monitors in the lab and students also can share their content with the rest of their lab mates.

Finally, through our testing, we demonstrated the idea of projecting video directly on whiteboard painted walls. Although there were no cost savings, we feel there is huge value for users to be able to take a dry erase marker and makes notes directly onto their projected image. While some professors are comfortable with the Smart Board technology, some prefer a low-tech solution to annotate their presentations.

Throughout the design of this building, our goals were to enhance functionality, improve reliability, and decrease cost. In these ways, ITS was very successful in completing this project.

New audiovisual technology plans for 2014 include:

- A/V upgrades to several classrooms: SAC 20, SAC 45, SAC 345, and SAC 347.
- Bring Your Own Device (BYOD) support for classrooms and conference rooms with two approaches (wired and wireless) to offer flexibility for individual users' wants and needs.

Keeping the project in-house allowed us to manage the planning phase and make changes along the way to cut costs, simplify the design, or improve efficiency.

Daren Noe, Audiovisual Engineering Manager

Benjamin Benschneider, courtesy NBBJ
The Technical Support Center (TSC) is the main point of contact for IT support to the WSU Spokane faculty, staff, and students. Technicians are available to answer questions and provide support Monday through Friday from 8 am to 5 pm. Additionally, the Student Help Desk is staffed from 1 to 7 pm Monday through Thursday and from 1 to 5 pm on Fridays.

The TSC technicians are trained to offer their expertise in many areas ranging from everyday problems such as resetting forgotten passwords, troubleshooting desktop hardware and software issues, recommending, purchasing, and installing new computer equipment and software tools, supporting the multimedia technology in the classrooms and conference rooms, and providing support for the learning management system.

A specialized technician also provides support to the Facilities Operations and Campus Security groups to perform management and maintenance of technologies within those departments such as the surveillance system, HVAC systems, lighting systems, power management, and parking machines.

The TSC also provided support to other groups within ITS during 2013 with the new SPBS building to help set up the network infrastructure, install new technologies and equipment in the auditorium, classrooms, labs, and conference rooms, and install phones and PCs for the building’s faculty and staff.
Virtual Desktops for Classrooms

The TSC has begun rolling out virtual desktops for the classrooms — making those machines easier to use, more efficient, and more secure. With desktop virtualization, the components of the desktop, including the operating system, applications and user data, are virtualized and centralized in the data center. Virtual desktops provide users what they need — when they need it.

Applications and upgrades are deployed faster because they are managed as a centralized service rather than needing to be applied to individual computers. Performance and availability increase and operations become automated, resulting in IT that’s easier to implement and less costly to own and manage. The technology also allows for multiple operating systems and applications to be run on a single computer. Plus, as explained by TSC manager Angela Earley, “from a user’s standpoint, the desktop is much more simplified and it’s no longer necessary to freeze a machine to remove the data that was downloaded onto the machine by a previous user.”

For classrooms that are shared by both WSU and EWU, a folder was placed on the desktops for EWU faculty that contains shortcuts to their virtual connection to the Cheney campus and gives them access to the software and data they need. This creates a cleaner looking desktop and makes it less complicated for all faculty to use the classroom machines. The anticipated completion of this project is spring 2014.

Migrating from Microsoft XP and Upgrading PC’s for Staff and Faculty

Another task for the TSC has been to upgrade campus PC’s to Windows 7 Professional. This has been an important focus for the technicians, as Microsoft will no longer support XP after April 2014. The migration process has been automated through the use of a new tool called PCmover which moves all the programs, files, and settings from the old environment to the new one. What used to take up to a couple of days can now be accomplished in a matter of hours — and PCmover doesn’t leave anything behind in the process.

Some users have not been able to make the transition because their equipment doesn’t support the new operating system. So the TSC has assisted with making recommendations to replace the older equipment. New computer equipment recommendations are not restricted by set standards for software or equipment.

Our technicians will customize orders according to the specific needs and budgets of the user’s department or college. According to Angela, “Not everyone needs the same type of equipment because someone might just need basic word processing and spreadsheet capabilities, while another might need higher-powered equipment for statistical computing and specialized software for research.” Migrating to Windows 8 also is an option, depending on each user’s needs.

Upcoming Changes

The TSC will continue implementing features of the new help desk ticketing system and install two large display monitors on the walls of the TSC in early 2014. One will be used to monitor and measure the performance of the campus IT infrastructure such as the network, wireless network, and power. It also will display any alarms to signal at the first sign of trouble and to aid with troubleshooting. The other will display the incoming help desk tickets along with charts and graphs to provide status updates and workflow performance.

Another change for the TSC planned for late summer/early fall 2014 is a move to SAC 309. The computer lab will also move at that time to SAC 311.
Multimedia Team Continues to Provide Effective Solutions to Engage Audiences

Highly-effective media projects deliver content in a way that engages the audience and promotes better comprehension. WSU Spokane faculty, researchers, students, campus communicators, and even other higher-education institutions relied on the multimedia team to produce professional-quality videos, interactive media productions, graphic design projects, photography, and large-format printed materials.

Ongoing video production and editing projects for the year included the Chancellor’s Breakfast Series and College of Nursing’s “Graduate Success Story,” which are both aired on the WSU Spokane YouTube channel. The team also video tapes, edits, and packages the WSU Health Sciences Updates which are aired on Comcast Cable Channel 17 as well as YouTube. Additionally, they produced a video editorial authored by the Dean of Nursing, Dr. Patricia Butterfield, to appeal to congress in defense of funding for scientific and medical research during the budget sequestration. The video was placed online alongside other video editorials from some of our nation’s most prestigious research universities.

http://www.scienceworksforus.org/economy/america-s-research-community-speaks-out

Another project was an interactive media production titled “Early Return to Work” for Denise Smart with the College of Nursing. This project was funded by The Patient-Centered Outcomes Research Institute and made in conjunction with Washington State Department of Labor & Industries. The project consists of a 3-part series of training videos for new employee orientation, management, and for injured employees. It also includes a flow-chart poster and a tool kit. This project is slated to be complete by end of June 2014.
Other highlights included the videotaping of the dedication for the new Pharmaceutical Biomedical Sciences building and the art dedication in SPBS, Cascade, by Kana Tanaka as seen on YouTube: http://www.youtube.com/watch?v=SV9oAPXyF-0

WSU Spokane’s YouTube Channel: https://www.youtube.com/user/GoWSUSpokane
In late 2012, Information Technology Services was tasked by the WSU Spokane Chancellor to oversee the redesign of the campus website. Saleh Elgiadi led the web project team, which included Elijah Brophy from ITS and several staff members from the Communications department. After evaluating several local web design firms and narrowing the search, the team developed and sent out requests for proposals. After reviewing the submissions, the team ultimately chose to work with Klundt Hosmer.

When Klundt Hosmer began the project, they sent out a survey to our stakeholders to help guide the design process. Then they developed the overall look and feel for the site based on our specifications and targeted audiences. The WSU Spokane website needed to serve as a communication and recruitment tool as well as a daily resource for students and faculty. The targeted audiences included current and prospective students, faculty, staff, the healthcare community and community-at-large, as well as current and potential donors.

The scope of work was to create template designs to fit within WSU’s graphic identity standards and also take into consideration the newly designed websites of the campus colleges. The campus website also needed to provide a seamless user experience as visitors navigated from one component site to another and to find the information they were seeking as fast as possible.

It was important to develop a site that highlighted the campus programs, without overstepping the programs from presenting the material themselves on their own websites. We also needed to showcase all the programs equally and to highlight the fact that WSU Spokane is a health sciences campus. Another priority for the redesign project was to develop a better site for prospective students via the Admissions section and to be on-trend with that particular audience.

The menu structure for the new site was distilled to a point where it has just what it needs to keep it from being overwhelming with too many topics. We focused our efforts on the navigation to keep it straightforward and to make it quick and easy to use. The goal for the organization of the website was to keep the structure simple, but still allow visitors to find the detailed information they needed with no more than three clicks.

After the design templates were developed for the various pages, Elijah Brophy converted them into web programming (CSS and HTML) to be hosted by WSU’s University Publishing on its custom-built content management system. These then were reviewed by Klundt Hosmer to make sure they met with their design criteria and to make sure the pages looked exactly the way they were expected to look. Throughout the process, screenshots were provided to the web project team, our stakeholders, and the campus cabinet members in order to provide feedback. The design and programming phase was completed in summer 2013.

Each college and department then was responsible for providing their own content or for checking the old website to ensure their information was still accurate. New content then was uploaded by Cori Medeiros from the Communications department or ported over from the old website. Two part-time students also were employed by ITS to assist with this process.

The ITS section was newly developed and it resides under the Services tab. It includes content that was written by our technical writer, Devin Parker, who also worked closely with Saleh Elgiadi to develop an extensive Service Catalog. The catalog describes each of the services provided by ITS, who those services are available to, what the benefits and features are for the various services, how to request the services, and what costs (if any) are associated with the services. The Service Catalog was uploaded to the new website along with technical help documents for students, faculty, and staff, information about ongoing and past ITS projects, and, of course, our contact information.

With the guidance of Klundt Hosmer and a unified team effort, we were able to deploy an engaging new website that appeals to our target audiences with a fresh, contemporary look at the end of 2013.

http://spokane.wsu.edu/services2/IT/

**Continuity of Operations**

With a growing reliance on technology, business continuity and disaster recovery (BC/DR) planning has become essential for maintaining reliable IT systems and infrastructures in the event of an emergency. ITS has focused on developing a formalized Continuity of Operations Plan (COOP) for multi-tiered failover and recovery procedures to be executed during or following a crisis on the WSU Spokane campus. The objectives for the COOP are:

- Provide for continued performance of essential IT services under all circumstances.
• Ensure survivability of critical equipment and data.
• Achieve orderly response and recovery from incident.
• Assure clear succession of key IT leadership.
• Effect clear and comprehensive communication among IT team and campus administration.
• Ensure survivability of IT services in the most severe events.

The COOP incorporates the critical functions, essential personnel, and response/recovery actions of the ITS department as they apply to any major emergency impacting WSU Spokane that would cause the cessation of classes, operations, services, or other campus functions.

The business continuity aspect of the plan involves taking steps to ensure that unexpected events have a minimal impact on the campus’ ability to keep operations intact. The focus is on continuity, not crises — proactive, not reactive. The key objective of continuity planning is to shield the campus from vulnerabilities that might impact business in a significant way.

Disaster recovery assumes that something has happened to disrupt mission-critical IT services, requiring systems and infrastructures to be restored through a series of procedures to recover normal operations. Business continuity, with thoughtful planning, helps avoid this by keeping essential functions up even when something unexpected happens.

Many different disaster scenarios needed to be encompassed in this comprehensive plan such as a major power outage, flood, fire, weather-related event, gas explosion, pandemic, or even an active shooter scenario where the campus security and local police would need to coordinate with ITS on surveillance and access controls.

Many of the strategies identified depend on and require funding separate from operational budgets; though several strategies that can be encompassed within the ITS operational budget have already been implemented to mitigate the impact of major disaster events. These include:

• Lecture capture strategies to enable students to attend classes from home and/or make up missed classes.

• Technologies that enable faculty to teach from a home computer or remote site and broadcast live to students at home or in the classroom.

• Utilization of Learning Management System to enable teaching and learning online.

• Employ web conferencing for online classes and meetings.

• Reliance of redundant data center systems and infrastructures to enable researchers, staff, and faculty to have continued access to their data — even from remote locations.

Thorough testing of the COOP for each disaster scenario will be completed in 2014-2015 to make sure the outcomes meet with the fundamental objectives of the plan. The COOP will be a very dynamic document and changed as needed to make sure the best procedures continue to be followed as new IT equipment and infrastructures are deployed.

Qualtrics Campus-Wide Site License Supports Online Data Collection and Analysis

The Office of Research and Information Technology Services have acquired a campus-wide site license for Qualtrics web-based survey and data collection tool. Qualtrics enables users to create a variety of online surveys, collect and store data, and create reports. It can be used by all WSU Spokane faculty and staff to support teaching, research, and departmental needs.

Each academic area should have a staff or faculty member designated to act as administrator to coordinate and distribute user log-in information within their colleges or departments. If your area does not have a designated administrator, please contact the TSC at 509-358-7748 or spok.it.help@wsu.edu for help with creating an account.

Qualtrics was selected by WSU Spokane because it combines exceptional ease of use with an advanced set of features. Some of the new capabilities include the following:

• A wizard to help build surveys, requiring no prior training.

• Dozens of sample surveys on various topics to customize for your own use.

• Integrated graphics and statistical tools.

• Ability to download data into Excel or SPSS with the full syntax retained.

Qualtrics Survey University has resources to help you design and create surveys with online tutorials and numerous research articles. There also are over 300 sample surveys that can be used “out of the box” or questions can be selected, copied, and pasted into your own custom survey.

http://www.qualtrics.com/university/researchsuite/
Members from our leadership staff have been assigned as liaisons for campus colleges and/or departments as detailed below. If you have questions about our IT Liaison program or are interested in dedicating an IT Liaison to your department, please contact our Executive Director, Saleh Elgiadi, at elgiadi@wsu.edu or 509-324-7316.

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**Library**  
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Medical Education (WWAMI)  
Nursing  
Area Health Education Center (AHEC) Extension/Child & Family Research Unit (CAFRU)

**Mathematics, Engineering, Science Achievement (MESA)**  
Criminal Justice Education

**Innovate Washington**

**Mike Bergam**  
Kenny Bisagno  
Matthew Blythe  
Bart Brazier  
Elijah Brophy  
Dale Brown  
Rick Clapp  
Bonnie Cooper  
Danilo da Silva  
Loretta Duncan  
Karla Ealy-Marroquin  
Angela Earley  
Russell Guidry  
Larry Hoffman  
Mike Lynch  
Susan Lyons  
David Nobel  
Daren Noe  
Brady Ratsch  
Jerry Reynolds  
Chris Rode  
Sicco Rood  
Kathy Thistle  
Bryan Valley  
Kevin Wilkinson

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**SPECIAL THANKS TO THE ITS TEAM**
In an on-going effort to share information about the latest technologies, the ITS leadership team initiated a new program — Monday Morning Tech Talks. WSU Spokane colleges and departments have the opportunity to schedule a Tech Talk to discuss their specific technology wants and needs and to learn about upcoming technology developments on campus.

Thus far, the Tech Talks have been an effective avenue for the discussion of IT strategies that could benefit individual groups and they also created a dialogue for campus-wide IT initiatives. Many of these strategies have been implemented (or are in the planning stages) as a result.

A universal request that emerged from the Tech Talks included the development of training classes, for groups or for individuals, to learn classroom technology and computer software applications. Another popular request was for published resources that are available 24/7, such as tutorials and help documents. Additionally, valuable feedback was provided for improving the IT services for all campus constituents.

We are available to schedule a Tech Talk with you on Monday mornings from 9-10:30. Request a Tech Talk if your department is interested in signing up for this opportunity so we can work with you to schedule a visit soon.

This program will continue indefinitely! We encourage you to schedule your Tech Talk today!