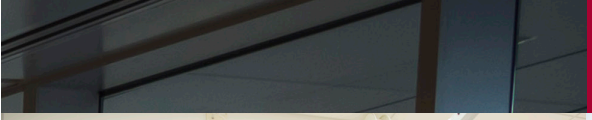
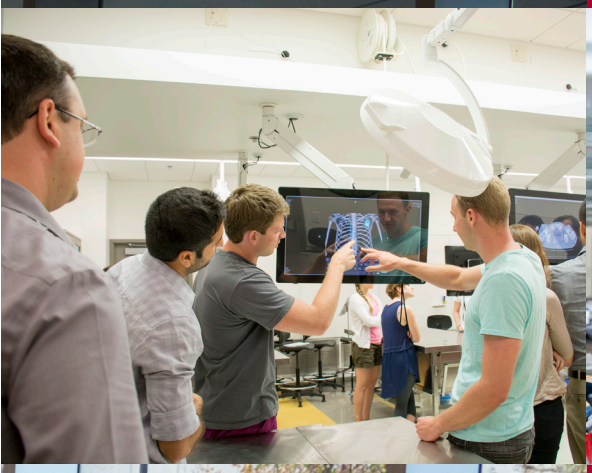
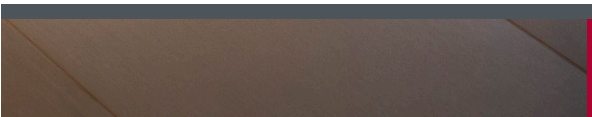




2014 Annual Report

WASHINGTON STATE UNIVERSITY SPOKANE

INFORMATION TECHNOLOGY SERVICES



WSU Spokane Information Technology Services (WSUS ITS)
spokane.wsu.edu/services2/IT/

WSUS ITS Service Catalog
spokane.wsu.edu/services2/IT/services/

WSUS ITS Technical Support Center
(509) 358-7748
spok.it.help@wsu.edu

Who We Are

WSU Spokane ITS is one team composed of numerous 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, 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.

OUR 5 STRATEGIC GOALS

CONNECT.	Provide state-of-the-art infrastructure to facilitate excellence in teaching, research, and operation.
CULTIVATE.	Promote a world-class teaching and learning environment.
CARE.	Create a first-rate, customer-focused culture.
CONSERVE.	Champion environmentally responsible use of technology.
COLLABORATE.	Grow and develop partnerships and alliances to advance campus initiatives.

From the Desk of the Campus CIO

It's a pleasure to present the WSU Spokane ITS Annual Report for 2014. As you browse through the following pages, you will get better acquainted with both the variety of responsibilities that ITS has for its campus community, as well as learn about the major projects completed during the year.

This year, we continued to build on our growth from 2013 when we transitioned to the IT as a Service organizational model. This transition led to many new and enhanced IT services in our efforts to cultivate innovation, provide benefit to our customers, and plan for the future.

We also used the invaluable input from our customer service survey completed by campus students, faculty, and staff to help us make better decisions to meet their needs. There are no shortages of opportunities or challenges to constantly adapt and be better at what we do.

More and more, IT is interwoven into the daily activities and future accomplishments of the WSU Spokane Health Sciences campus and its community of students, faculty, and staff. ITS is involved in nearly every aspect of the campus—from teaching and learning, to research, to online security. We are also engaged in capital projects as new buildings are erected or we work to redesign the technical infrastructure of existing buildings to help keep the campus moving forward.

IT is infused in our day-to-day lives in a way that seems almost invisible. Yet, IT resources are constantly working in the background as we interact with one another, learn, teach, discover, connect, do our jobs, and contribute to the global community. It is our honor to provide these services to support WSU Spokane in its endeavor to prepare our future generations of health care professionals and as it fosters world-class research to promote healthier people and communities.

Saleh Elgiadi, Campus Chief Information Officer
Washington State University Spokane

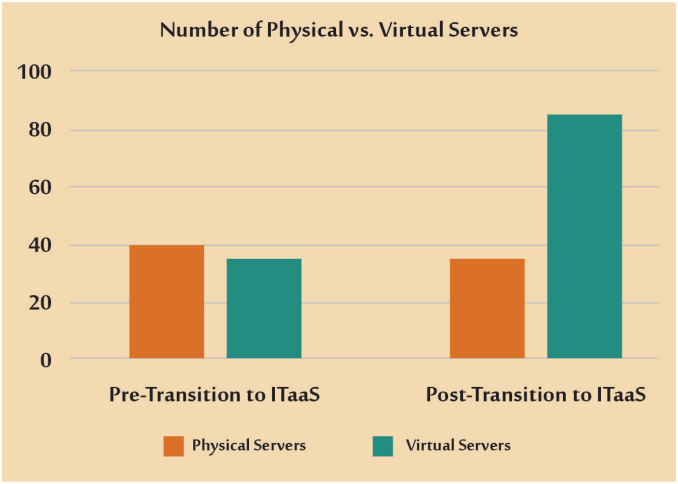
Providing Value-Added Services

IT AS A SERVICE (ITAAS) ORGANIZATIONAL MODEL

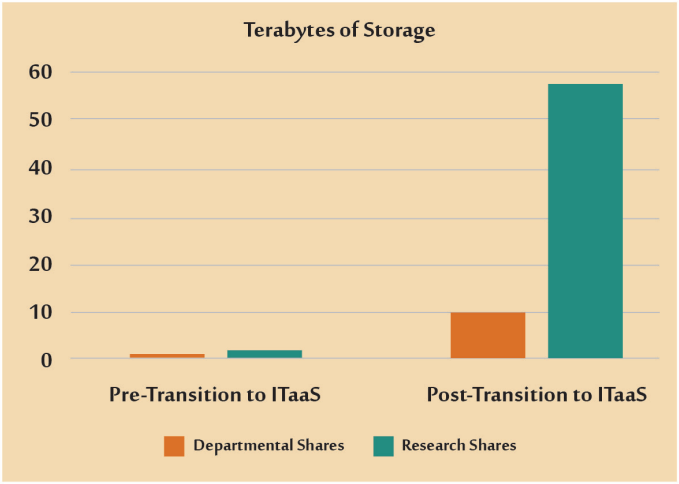
As ITS has shifted to an ITaaS model, it has worked to realign its structure and staff to support the operations of a sophisticated service provider. IT operations are no longer solely focused on designing, building, running, and supporting technology stacks. Under this new model, ITS needed to develop capabilities and accountability around marketing and selling IT services; connecting and communicating with consumers of the services; managing the packaging, pricing, and lifecycle of IT services; and effectively integrating those services into a broader framework of business capabilities.

This need for broader skills and inter-related services represents a major shift from the traditional siloed IT structure in which separate IT units focused on single technology areas. Now ITS staff is working across those functions in a collaborative environment to deliver flexible and scalable services tailored to the customers we serve.

Following is a summary of changes and new or enhanced services provided by ITS as a result of ITaaS.



Transitioning to ITaaS has resulted in a 15% decrease in physical servers and a 153% increase in virtual servers.



Transitioning to ITaaS has resulted in a 160% increase in departmental storage shares and a 475% increase in research storage shares.

Systems Infrastructure Support

The Systems Infrastructure Support team began leveraging its virtual and enterprise storage environment by offering both virtual machine resources to replace old physical servers and scalable enterprise storage to reduce network attached storage sprawl and to improve performance, resiliency, capacity, security, and scalability to customers on the WSU Spokane campus. These initiatives have resulted in a reduction of physical server growth, allowing us to maximize space, reduce power and cooling consumption, and lower overall operational support costs.

Network Engineering

ITaaS has changed the way the Network team conducts business both operationally and strategically, allowing them to be much more proactive and agile. In this services-oriented model, network services have been commoditized. The commoditization of network services has assisted in providing faster provisioning of network services and it also expedites problem resolution for the WSU Spokane campus network. Focusing on the services the network provides (data, voice, video, wireless, and security) helps to simplify how the network is monitored and supported. That enables the support staff to quickly isolate the fault when a problem presents itself and get it resolved.

Strategically, ITaaS allows the network engineering team to focus on a small piece of the network, rather than the whole sum. This helps the engineer make improvements with an eye towards uptime, capacity, and functionality of the services within.

Audiovisual Engineering

The following strategies were employed in the classroom in support of the ITaaS initiative by the Audiovisual Engineering unit:

- Developed user-friendly touch control panel design that enables users to easily turn on and use classroom technology.
- Added Smartboards in two common areas (PBS and SAC) for anyone to use at any time. Training is available to learn how to use these collaboration tools.
- Added autotracking cameras in several classrooms and conference rooms. This eliminates the need to frame a camera shot, as the camera is able to automatically frame a shot of the speaker.
- Added Tegrity Lecture Capture capability to all campus classrooms, so users can record their classes on-the-fly.

Education Technology

A new unit was created within ITS to teach faculty and staff how to use university-provided technology inside and outside the classroom. The Education Technology team has designed and equipped an Innovation Center in SAC 313 with the same technology as our classrooms for this purpose. The space will be used for formal group training sessions as well as one-on-one and Q & A drop-in sessions on classroom technologies such as Blackboard, Tegrity, Turnitin, Qualtrics, and Smartboards. The Innovation Center provides a good venue for faculty to test and train on new technologies they would like to use in teaching and has a relaxed bistro-like feel to it with moveable furniture for flexible seating arrangements.

Technical Support Center

Changes evident in the Technical Support Center (TSC) include improved coordination and communication through collaborative relations between ITS units. This has provided consistency and less redundancy in our efforts to support the campus and our customers.

This collaborative approach has created learning opportunities for lower-level technicians in the TSC to be mentored by techs with more advanced skillsets. This has the added value of reducing workloads in other ITS units that, in turn, allows those units to focus on more advanced/complicated projects.

Strategic Big Brother of the IT Help Desk

TECHNICAL SUPPORT CENTER

The Technical Support Center (TSC) is the single point of contact for IT services and support for faculty, staff, and students on the WSU Spokane campus. To many, the TSC is thought of simply as an IT Help Desk. But it actually operates as a Service Desk, which is a strategic big brother of the Help Desk. A Service Desk can do everything the Help Desk does, but it also allows for planning, structuring, and providing the delivery of a wide variety of IT services. Instead of merely reacting to problems as they arise, the Service Desk allows for a more strategic approach to IT service management and acts as a single point of contact for all IT activities.

The Giva ticketing system, fully implemented in 2013, which allows all IT issues to be logged, tracked, and reported on, has been integrated with our knowledgebase, change management, and asset management systems in addition to our service catalog. When a ticket gets assigned, it is now tied to a particular category of service that's within our service catalog. This provides for better tracking of issues related to specific services.

TSC technicians have been cross-trained to support all of the services provided by the support center, whether it be specific to troubleshooting computer hardware or software issues; recommending, purchasing, and installing new computer equipment and software tools; or providing support with the multimedia and videoconferencing technology in classrooms and meeting rooms. A specialized technician also provides support for campus facility operations and security systems (HVAC, surveillance, and parking systems).

The TSC was relocated at the end of the year to the third floor of the Spokane Academic Center (Room 309). The new space was designed for better communication and collaboration between the technicians. Two large displays were mounted on the walls of the TSC: one to display the incoming help desk tickets along with charts and graphs to provide status updates and workflow performance and another to monitor and measure the performance of the campus IT infrastructure. This latter display will signal alarms at the first sign of trouble and aid with troubleshooting any network, wireless, systems, or power issues campus-wide.

The Student Computer Lab was also relocated to the 3rd floor adjacent to the TSC (Room 311). The old computer lab had consisted of tabletops with desktop computers and hard chairs. In contrast, the new computer lab is designed to be a more inviting, casual space for individuals as well as group collaboration. There is a lounge area with soft furniture and bistro-style tables and

chairs so students can work on laptops and tablets along with a few desktop computers for students that don't have mobile devices. The space includes a mobile Smartboard for student collaboration. The Student Help Desk is part of the TSC, supports the lab, and provides assistance to students by students during the semester Monday through Thursday from 1:00 pm to 8:00 pm and Friday from 1:00 pm to 5:00 pm.

Several staffing changes were made in the TSC during the latter part of 2014. With Angela Earley taking on the management of the new Education Technology unit, Larry Hoffman was brought on as the new director of the TSC and Matthew Blythe was promoted to TSC Manager to oversee the day-to-day activities and manage the team of technicians. David Noble joined the Audiovisual Engineering unit, Karla Ealy-Marroquin joined the Education Technology unit and Danilo da Silva joined the Systems Infrastructure team. Two new hires were on-boarded, Erin Brown and Aaron Quam, and are now part of the TSC team.

The TSC team is ready to help address any computer or technical concerns that arise on campus. Whether help is needed to remove a virus from a computer, to log onto the wireless network, or to resolve issues with classroom technology, you can contact the team at our support center for assistance.

The TSC hours of operation have been expanded this year with technicians available to answer questions and provide support Monday through Thursday from 7:30 am to 8:00 pm, Friday from 7:30 am to 5:00 pm, and now on Saturday as well from 8:00 am to 5:00 pm. On Saturdays, in addition to staffing the TSC and supporting events, technicians are proactively checking classrooms to test and evaluate the equipment to make sure everything is functioning properly.

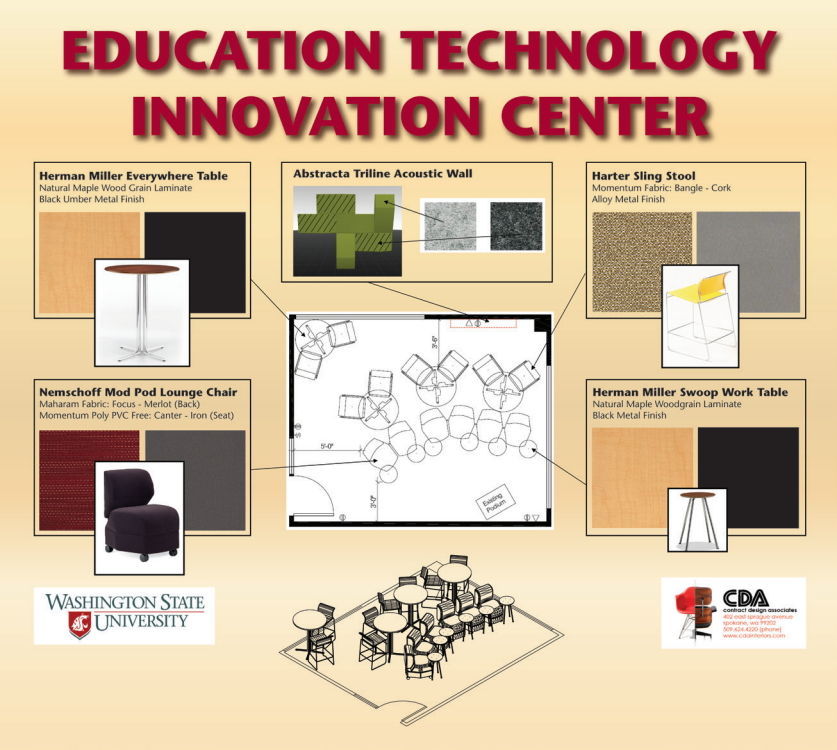
For all IT related services and support including classroom and videoconference support, please contact us at spok.it.help@wsu.edu or 358-7748.

Facilitating Excellence in Teaching and Learning

NEW EDUCATION TECHNOLOGY TEAM FORMED

One of the goals outlined in the WSU Spokane ITS strategic plan is to facilitate excellence in teaching and learning. The need to focus on this goal has become greater as the campus continues to grow, especially with hybrid classes becoming more common. Additionally, the teaching tools used by faculty have become more technical with new tools being introduced at a rapid rate. To meet this challenge, ITS formed an Education Technology team in fall of 2014.

The team, headed by Angela Earley, is focused on the goal of teaching and supporting faculty, staff, and students on the education technologies used in and out of the classrooms on the WSU Spokane campus. According to Angela, "ITS has always been very proactive about teaching the faculty to use the classrooms and how to operate the equipment, but there's so much more to it. Rather than telling the faculty, here are the tools to use in your course, the Educational Technology team will work with the faculty to explore and learn new technologies that will perform better for their particular course and keep their students engaged with learning."



Innovation Center

In order to more effectively share and explore these education technologies, the Ed Tech team designed a new trialing and training center to be located in SAC 313. This Innovation Center, scheduled to open in early February 2015, will be equipped with all the software and equipment found in the classrooms on the Spokane campus. The furniture being purchased for the center is modular in design to easily accommodate different room set-ups and teaching styles. The space will provide a relaxed, bistro-style environment for experimentation and learning about existing and new classroom technologies.

Formalized small-group workshops, collaborative training, one-on-one instruction, and consultation will be offered in this unique environment. Faculty will also be encouraged to bring their own devices to learn how to use them in their classrooms. They may also schedule a personalized training session in their own classroom, if desired. The Ed Tech team is also interested in helping faculty explore new technologies that can further enhance their students' learning experience. Please contact the Education Technology team through the TSC at spok.it.help@wsu.edu or 358-7748 to register for classes or to schedule an appointment.

Training workshops are scheduled to commence in early 2015, including Blackboard for early adopters. The need for this training is especially important with the transition from Angel to Blackboard and the many tools that can be used within Blackboard. Other upcoming training will include Tegrity (for recording classes), Explorance Blue (the new course evaluation software used University-wide), Turnitin (for turning in assignments), iThenticate (used by research students), Qualtrics (survey software), and Smartboards (interactive flat panel displays). Training will be scheduled the week before each semester to meet the needs of faculty and help them gear up to get their classes started. This will include refresher training, training for new faculty on campus, and training on new technologies. Then as the semester progresses and assignments are coming in, additional training will mirror the needs within the classrooms and the technologies associated with those needs.

The intent of the Ed Tech team is to help with the professional development of faculty and staff on campus. Therefore, training workshops will be integrated within Skillsoft so they can plan and manage their training and education credits can be maintained and viewed by supervisors.

Please check the Education Technology training schedule at http://spokane.wsu.edu/services2/IT/training.html to view current course offerings and find more information about course registration.

Ed Tech Fair

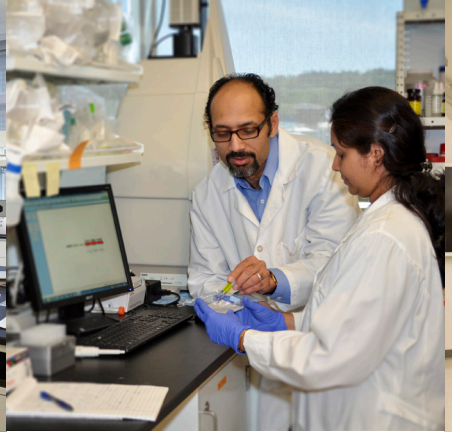
The Education Technology team organized an Ed Tech Fair that was held in the fall which included vendor participation as well as WSU Spokane entities such as the campus library and, of course, ITS. Vendors showing and demonstrating their latest technology devices and software included Microsoft, Apple, Turnitin, and Poll Everywhere. In addition to the Ed Tech team, other teams from ITS contributed their knowledge at the fair. The Audiovisual team set up a Smartboard to demonstrate its capabilities and how it can be used to collaborate and engage students in the classroom. The Systems team presented some up-and-coming services that would soon be deployed on campus such as Cloud Storage and Unified Communications. Scheduled training workshops included Blackboard, Tegrity, and Turnitin. The Ed Tech Fair was an opportunity for faculty and staff to provide feedback to the ITS department to express their needs for training and technologies on campus.

Education Technology Team Members

Angela Earley, Assistant Director of the ITS department, operates the Education Technology unit and manages its team.

Erik Blackerby, a recent addition to the ITS department in support of Education Technology, is the Blackboard Administrator on campus. He has over 17 years of experience in higher education and working with technology. Previously, Erik served as an LMS Administrator and Technology Trainer at Gonzaga University. His background includes audio, video, and multimedia production as well as web development and training in various software applications such as Blackboard Learn LMS, Web CMS, and Adobe Creative Suite.

Karla Ealy-Marroquin, formerly with the TSC staff, also supports the Education Technology team. She has a BA in Radio-Television production from EWU. Karla started working for the WSU College of Nursing in 1995 (then ICNE) working with videoconference classes. When the College of Nursing moved to the WSU Spokane campus, she joined the campus Classroom Support team. Now that her focus is on Education Technology, Karla is using her technical experience to help train and support faculty using the classrooms and technology on campus, specializing in lecture capture.


Engaging in Development and Testing of New Services

SYSTEMS INFRASTRUCTURE SUPPORT

This 'behind-the-scenes' group has been busy developing and testing new services for much of 2014. These efforts have been aided by the acquisition of two new team members, Billy Burnham and Travis Williams, and the addition of the Audiovisual Engineering team into the Systems Infrastructure Support group.

New Private Cloud Storage Services

One of these new services is the Syncplicity Cloud Storage solution, with global deployment slated for early 2015. Syncplicity is an enterprise version of a dropbox-like solution for on-premise storage used to synchronize, access, and share files from anywhere on any device. The advantages to this solution are:

1. **Security** – Storing confidential or sensitive information in our private cloud is often more secure than storing it locally on a desktop. With our online storage service, data is never in the hands of outside entities (like public cloud providers) and it is encrypted both during transmission and while at rest, ensuring no unauthorized users can access the files. Additionally, the University's Active Directory is leveraged for role-based access and security.

2. **Accessibility** – From tablets to smartphones and laptops to desktops, we're using more devices on a daily basis than ever before—and moving files between each of these devices can be cumbersome and complex. Not so with our online storage services. You can access your account from any Internet connection, whether you're on a mobile browser or your work computer.

3. **Syncing** – Syncing ensures your files are automatically updated across all of your devices. This way, the latest version of a file you saved on your desktop is available on your smartphone.

4. **Sharing** – Whether you want to share a single photo or an entire folder with hundreds of documents, online storage services allow you to easily share files with just a few clicks.

5. **Collaboration** – Online storage services are also ideal for collaboration purposes. They allow multiple people to edit and collaborate on a single file or document. You don't have to worry about tracking the latest version or who has made what changes.

6. **Protection** – Cloud storage serves as an added layer of data protection for your important and irreplaceable files. Backups are kept in a secure location that is physically removed from the originals.

WSU Spokane customers will each receive 5GB of cloud storage at no charge. Additional space may be requested for a competitive cost-recovery charge.

Unified Communications

Another service that has been in the development and testing phase is Unified Communications (UC). UC is the integration of real-time, enterprise, communication services such as instant messaging (chat), presence information, voice, mobility features, audio, web and video conferencing, fixed-mobile convergence, desktop sharing, data sharing, and call control. WSU Spokane will be adding Microsoft Lync in full production to the list in early 2015 which will allow this to be possible. This will enable staff and faculty to engage in collaborative discussions, meetings, and presentations right from their own desktops (video conferencing requires a webcam, not included). They will also have the ability to invite guests outside of the University to participate in web conferencing.

Other projects completed by the Systems Infrastructure Support team included:

- **Microsoft Endpoint Protection Migration**
  This migration to a new enterprise anti-virus solution provides a global view and management of anti-virus clients running across the entire campus and allows ITS to catch computer viruses before they spread.

- **Windows XP/Server 2003 EOL Migration**
  This migration from the 120 XP machines on campus enabled us to be in compliance with Microsoft's security updates and desktop/server security. Additionally, 30 servers in the data center required server upgrades from version 2003 to the latest version. All but three of those servers have been upgraded in 2014.

- **Campus Share Migration**
  This project was focused at moving our departmental shares off of legacy equipment and on to newer, faster, and more resilient systems. Users now experience a much faster file share browsing experience as well as improved file recovery support.

- **Physical to Virtual Server Migration**
  The Systems team is actively migrating existing systems and 99% of all new systems are deployed in the virtual environment. This provides streamlined operations and administration as well as reduced power/space consumption and increased data center efficiency in alignment with our goal of environmentally responsible use of technology.

- **Digital Signage**
  A full migration from an outdated and unsupportable signage solution to a full-featured enterprise solution. This allows the Office of Communications to properly display important campus information in multiple formats across all buildings. WSU Spokane currently has 10 signs across campus which are centrally managed by the Office of Communications and supported by ITS. Projected for 2015: Interactive/touch screen capabilities and a kiosk in the Academic Center to display bus routes, campus directory, and events.

- **RedCap**
  ITS has championed the deployment of RedCap, giving researchers the ability to securely catalog and share their project resources and documentation. RedCap is a research collection database accessed via a secure web application for building and managing online surveys and databases. While it can be used to collect virtually any type of data, it is specifically geared to support data capture for research studies. The RedCap consortium is composed of 1,254 active institutional partners in 87 countries who utilize and support RedCap in various ways. This solution serves the Health Sciences mission as a whole.

- **Eagle-i**
  ITS sponsored this project to assist with cataloging physical resources required for specific types of research. The software allows researchers to collect and share information about research resources, giving any scientist, anywhere, access to one of the largest collections of information about Core Facilities, iPS cell lines, and other valuable, unique or rare scientific resources in the world. Our role is to manage the physical network of resources, heavily used by the College of Pharmacy, to facilitate translational science research. There are currently over 40 academic and not-for-profit research institutions represented in Eagle-i which is funded by Harvard Catalyst at Harvard Medical School. This solution also serves the Health Sciences mission as a whole.

- **HPC and Storage for Genomics**
  With the emergence of the genomics core, ITS has provided high-speed compute and storage resources to enable this project. Using existing hardware with enhancements, the System Infrastructure group has created a highly efficient environment for campus researchers. This infrastructure will grow into a fully developed HPC cluster when grant funding has been captured.

- **Anatomy Lab Virtualization**
  This provides all three anatomy labs in the Pharmaceutical & Biomedical Sciences building with a virtual work station at each table (15 stations per lab) that can be managed centrally.

- **Automated Videoconferencing Scheduling**
  Leveraging the upgraded VC infrastructure, ITS was able to collaborate with Student Affairs to automate academic resource scheduling. The changes made to this complex scheduling process resulted in a simplified, streamlined process that is highly accurate and efficient.

- **RealPresence Desktop Video**
  ITS has deployed, on a limited basis depending on use-case, managed desktop video software from anywhere. This feature integrates with AMS videoconferencing. One of the uses of this feature would allow a guest lecturer to lecture off-site via his or her own personal computer. This is achieved by downloading and installing an application onto their computer that's completed in just four easy steps.

- **Access Control**
  New access control systems have been installed on campus to support secure 24/7 access to buildings and interior spaces requiring physical security. This badge-based solution uses a card or fob for access and replaces the old Marlok key system. The new system allows for integration with the security environment and is better at tracking incidents.

- **AIMS Parking Service**
  This service provides account tracking and parking pass purchasing online. It has been migrated to be hosted by the vendor for increased efficiency and accessibility for the WSU Spokane campus users.

Focusing on Strategic Planning for New Projects

NETWORK ENGINEERING

The Network Engineering team works to keep WSU Spokane connected by providing a viable, robust, and secure network while enhancing functionality. With the addition of a Network Security Engineer in 2014, Dan Laughlin, the team is now able to focus more strategic efforts to maintain and strengthen the overall security posture of the campus as well. Network security projects concentrated on the planning of new campus firewalls and a major overhaul of the network security architecture. This added resource also provided a real balance between operations and IT delivery, allowing the team to continually work on network optimization.

Network Monitoring and Management System (NMMS)

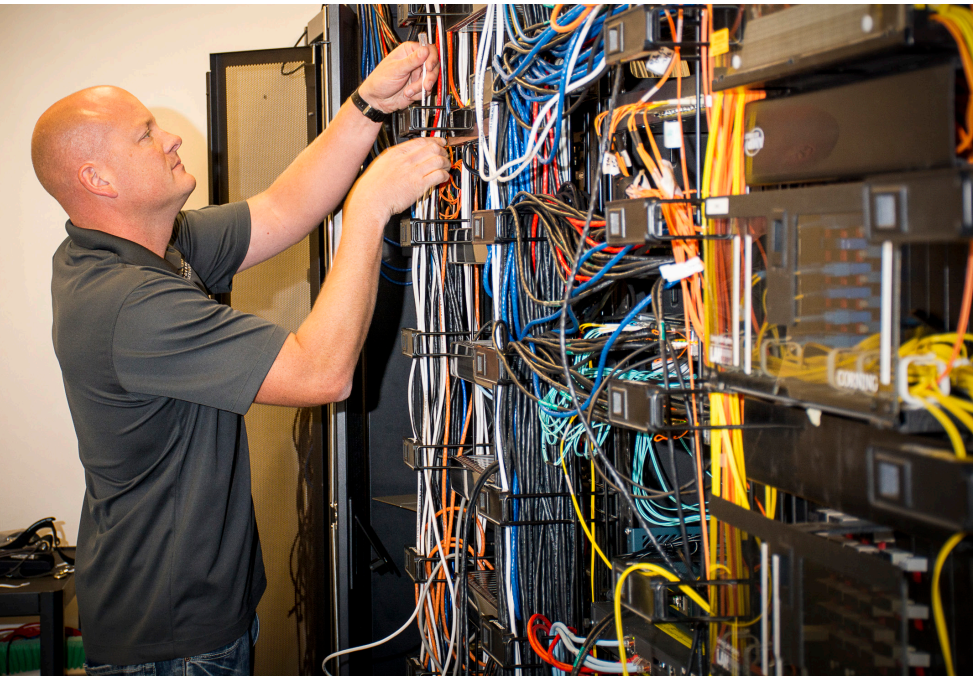
This project, initiated in late 2013, was fully implemented in 2014 across each system throughout campus. The NMMS is a web-based tool which allows an intimate 'real-time' view into the network and network services and promotes a better organizational understanding of how the network is constructed and 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. NMMS also has an app for mobile devices so Network team members can stay abreast of issues even when they are away from their desktops.

Over 1600 sensors have been installed throughout the campus on network and systems devices to monitor anything that might halt production or have the most negative impact if it fails. These sensors send out alerts via email to the Network Operations team and other systems team members to make sure repairs or improvements can be made at the first sign of trouble. For the network side, the team monitors environments, such as temperature, fan speed, CPU utilization, memory utilization, link status, and bandwidth utilization. Network Engineering Manager, Jason Minton explains, "NMMS allows ITS to take a proactive approach by detecting potential trouble, finding the root cause, and expediting trouble resolution before it has an impact on the campus community. It also enables ITS to make strategic decisions about network upgrades by providing true measures and trending data about network performance and reliability."

The NMMS allows for unlimited sensors, so when new equipment or systems come online and new buildings are added to the campus, additional sensors will be deployed. Plus, temporary sensors can be installed to monitor devices with intermittent issues that 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.

Wireless Network

Wireless network upgrades continued into 2014 as the transition was made from a single controller to upgraded dual controllers. This introduced high availability (HA) for our wireless connections to create a fail-safe environment. All wireless access points (AP's) were tied to the single controller prior to the transition/upgrade. If the controller were lost, all AP's would fail and we would lose the wireless. With the new dual controllers, a redundant wireless network was created—now if one controller were to fail, the other would keep the AP's up and running smoothly.



Additionally, the upgrade to newer AP's was completed to provide better coverage and performance throughout the campus. We currently have 167 AP's installed in building interiors and 4 located outdoors. The Network team also implemented management software which is used to provide a better picture of the accessibility of wireless on campus and where and how it's being used. Traffic is monitored to identify peak areas so the technicians can add, move, or adjust the range of AP's to ensure adequate coverage. Additionally, proof-of-concepts are being executed to evaluate more powerful management software to provide even better controls on how the bandwidth is being used.

The campus wireless network names were changed at the end of 2014 in order to stay consistent with WSU Spokane branding initiatives to eliminate the name Riverpoint. This allowed for wireless connections for both WSU and EWU constituents, making it easier for everyone to log in using their respective network ID's. Another wireless connection was added for Eduroam partners visiting WSU Spokane from other universities. This allows them to have instant access to VPN back to their own universities, check their email, etc. without having to ask someone for log in information for the guest wireless. In turn, WSU faculty and staff can use Eduroam when travelling to other institutions, providing they are also partnering with Eduroam.

Bandwidth Upgrade/ Internet Edge Architecture

Funding was approved in 2014 to increase network bandwidth capacity, allowing the Network team to move forward on completing the planning and design for the campus Internet edge architecture. Internet edge is the network infrastructure that provides connectivity to the Internet and acts as the gateway for the enterprise to the rest of the cyber space. The old architecture had a lot of inherent flaws. For example, if we lost one of the links to an Internet provider, we lost Internet connectivity for the entire campus. Furthermore, the old architecture did not allow us to facilitate a direct connection to the Pullman campus.

This project involves working with vendors to purchase additional circuits to keep up with our growing campus and the ever-increasing amounts of data that need to traverse those circuits. In 2014, we increased our bandwidth to 600 megabytes. Currently, the campus is using about 350 megabytes of bandwidth at our peak (this amount is not sustained, but lasts for approximately a 20 minute window). Our average utilization is around 225 megabytes. That enables us to scale very quickly to increase capacity as needed. This upgrade will ensure adequate bandwidth well into the future.

For the new architecture, all systems are being designed in pairs for HA. This is accomplished by introducing two edge routers with our three Internet providers: K20, Zayo, and IRON. It is very fault tolerant with two connections from each provider into each edge router. So if a connection is lost on one path, we will still have connectivity through the other paths.

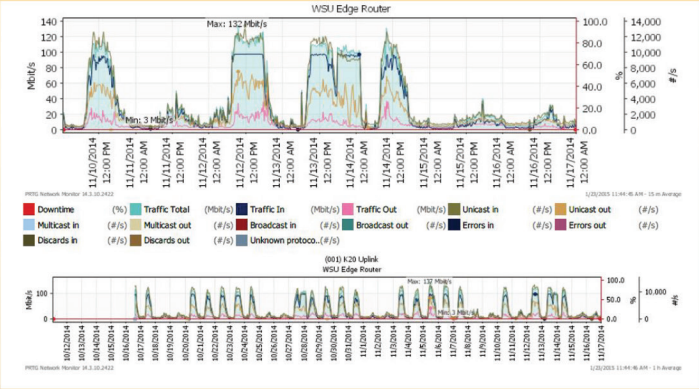
There is also a protocol that will run between the edge routers, so they will be aware of which routes are available across both devices. This will eliminate one of the limitations we have now. "Currently, we just have static routing, which means the edge router can't influence traffic to automatically route away from a problem with one of our Internet providers. The routing protocol is intelligent in that it utilizes metrics to find the best route by looking at the load on the circuits. That way if a circuit is nearing capacity, it can switch over to another circuit that has more available capacity," said Jason. After IP provisioning and testing the integrity of the new

continued on page 16

BANDWIDTH AWARENESS

Judicious use of the Internet on campus is vital during the day when classes are in session to allow them to run smoothly.

Bandwidth usage for non-academic purposes can have a negative impact on critical academic systems, such as videoconferencing. The chart and table below illustrate how these negative effects can result in dropping of videoconferencing services, as was evidenced last November.



This chart depicts bandwidth utilization over a 1 week period. The items to pay particular attention to are the peaks. The peaks being >100Mbps.

The campus had 100Mbps total bandwidth available at that time. Once the 100Mbps was exceeded, traffic needing to be serviced was dropped due to the circuit being busy. This means critical traffic (such as videoconferencing) was also dropped.

Channel	Average	Percentile (95th)	Total
Total	0.20 Mbit/s	1 Mbit/s	15,044,992 KByte
Other	< 0.01 Mbit/s	< 0.01 Mbit/s	49,795 KByte
HTTP	< 0.01 Mbit/s	< 0.01 Mbit/s	54,592 KByte
DHCP	< 0.01 Mbit/s	0 Mbit/s	12,497 KByte
DNS	< 0.01 Mbit/s	< 0.01 Mbit/s	13,727 KByte
Ident	0 Mbit/s	0 Mbit/s	0 KByte
IMAP	< 0.01 Mbit/s	0 Mbit/s	11 KByte
IRC	< 0.01 Mbit/s	0 Mbit/s	18 KByte
POP3	< 0.01 Mbit/s	0 Mbit/s	14 KByte
RDP	< 0.01 Mbit/s	< 0.01 Mbit/s	244 KByte
SMTP	< 0.01 Mbit/s	< 0.01 Mbit/s	70 KByte
SNMP	0 Mbit/s	0 Mbit/s	0 KByte
SSH	< 0.01 Mbit/s	< 0.01 Mbit/s	575,876 KByte
Telnet	< 0.01 Mbit/s	< 0.01 Mbit/s	2,798 KByte
VNC	< 0.01 Mbit/s	< 0.01 Mbit/s	112 KByte
ICMP	< 0.01 Mbit/s	< 0.01 Mbit/s	95,158 KByte
Other/UDP	0.11 Mbit/s	0.21 Mbit/s	7,948,203 KByte
OtherTCP	0.02 Mbit/s	0.02 Mbit/s	1,373,742 KByte
HTTPS	< 0.01 Mbit/s	< 0.01 Mbit/s	2,927 KByte
FTP (Control)	< 0.01 Mbit/s	< 0.01 Mbit/s	49 KByte
AIM	< 0.01 Mbit/s	0 Mbit/s	18 KByte
NetBIOS	0.07 Mbit/s	0.39 Mbit/s	4,914,461 KByte
Citrix	< 0.01 Mbit/s	0 Mbit/s	682 KByte

This table displays the type of data traversing the campus Internet link over this one week period. The item that stands out (and is highlighted) is the channel titled 'other udp.' Other udp is usually indicative of traffic such as streaming media (i.e. Netflix, YouTube, Internet radio). Over half of the total data captured during this period was from this category.

For more information about bandwidth usage or other Network needs, contact us through the Technical Support Center at 509-358-7748 | spok.it.help@wsu.edu

Enhancing Audiovisual and Videoconferencing Technology

AUDIOVISUAL ENGINEERING

Audiovisual technology is the backbone of most classrooms and conference rooms at WSU Spokane. On the Spokane campus there are 52 classrooms with audiovisual presentation technology, with 26 of them having full videoconferencing capabilities. There are also 22 conference rooms with videoconferencing capabilities. The task of keeping all 74 technology spaces functional is arduous, but it is an even larger challenge to keep up with the rapid technology advancements in the computer/mobile device industry. The Audiovisual team continually strives to meet these challenges. AV team manager, Daren Noe, says, "We are constantly evaluating the latest technology standards and determining the best way to accommodate new technology in the classrooms."

To help ease the heavy demands on this team, another technician, Dave Noble, was added in July. The three-person engineering team handles all preventive maintenance, equipment failures, system design and programming, and also tests and evaluates new technologies. This extra staffing is a real benefit by allowing the two technicians to do the lion's share of the day-to-day maintenance, which frees Daren up to focus more on testing new products, programming control systems, and managing projects.

Classroom Technology Upgrades

Even though most of the classrooms on campus are less than 10 years old, a lot has changed with technology in those years. The most significant is with our end-of-life analog videoconferencing endpoints. These old endpoints are still functional, but their quality is inferior and the manufacturers no longer support them. Even though they are still functional, we are taking a proactive approach of replacing a handful of them every year, so the burden can be spread over several budget years. In 2014, we were able to replace five of our analog videoconferencing endpoints with new Polycom Group Series endpoints, including new HD cameras and audio mixers. Part of this rejuvenation project includes new classroom audiovisual source switchers and new state-of-the art touch control panels. The new source switchers allow digital HDMI connectivity for laptops, which has quickly become the new laptop standard. The new 10" touch control panels are much smaller than the old 15" panels they replaced.

Control Systems

The Audiovisual Engineering team maintains and designs all the touch control panel design on campus. This means the team constantly evaluates the panel design with the goal of making it as simple as possible for the end user. "My philosophy is to give the user complete functionality while using the fewest buttons (or button pushes) as possible," Daren noted. The Audiovisual Engineering team is committed to improving their AMX control system programming. In 2014, the AV Engineering team participated in 128 hours of formal AMX certification training and two of the technicians hold AMX installer certification and AMX designer certification.

Innovate Washington

WSU Spokane took over complete ownership of the Innovate Washington building in 2014, which resulted in the need to design and install presentation systems in three IW classrooms. All three classrooms have complete presentation systems with podiums, AMX control systems, document cameras, video projectors, and both HDMI and VGA connectivity for laptop presentation, and assisted listening systems for hearing impaired students.

"These three classrooms have been without adequate presentation systems since the departure of Pullman's AMS department over 7 years ago. It is gratifying to finally offer the faculty and students a quality audiovisual experience in these classrooms," Daren expressed.

The addition of these classrooms increases the total number of AV classrooms on campus to 55.

Lecture Capture

The Information Technology Services department currently supports two lecture capture solutions that give users the ability to record presentations: MediaSite for recording videoconferences and Tegrity for office and classroom use. The Audiovisual Engineering team just completed installing six new computers that will facilitate recording videoconferences using Tegrity software. The first benefit is users now only have to use a single record platform (Tegrity) for all recording, rather than two separate solutions. The second benefit is Tegrity is a university-licensed service for all WSU faculty. Currently only a few classrooms have the ability to produce Tegrity recordings. The goal for the Audiovisual Engineering team is to offer Tegrity lecture capture capabilities in all 55 classrooms in 2015.

Collaboration

The Audiovisual Engineering team is currently collaborating with Eastern Washington University to upgrade the control systems in the 17 classrooms in the SCLS (Phase 1) building to the campus AMX standard. AMX offers a more flexible and quality-control solution than the existing Extron systems. Part of this project also includes upgrading the audiovisual systems to allow for HDMI connectivity and HD connectivity to the projector.

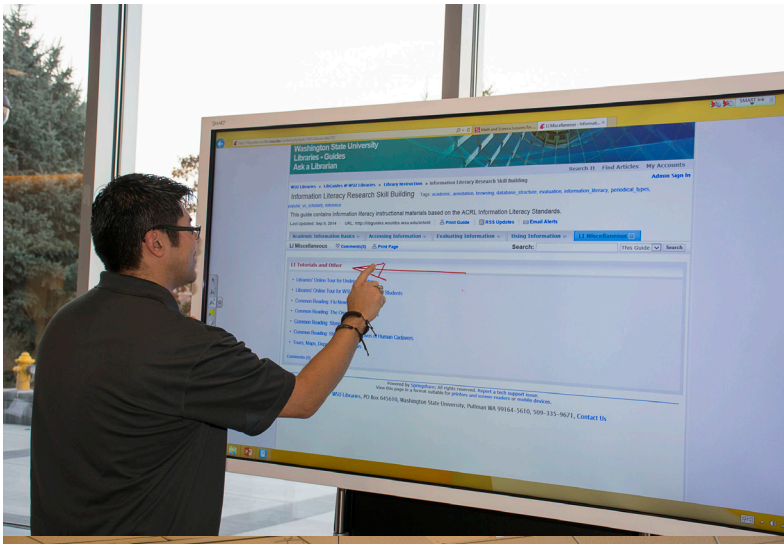
Other Achievements

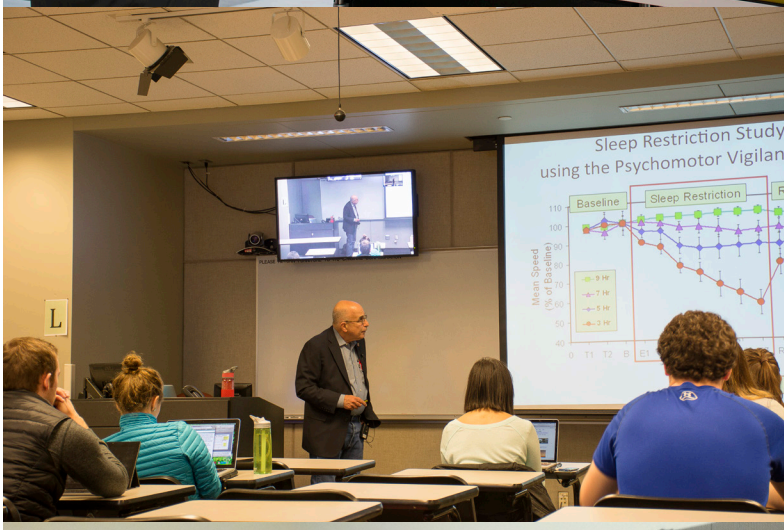
Here are some other achievements completed by the Audiovisual Engineering team in 2014:

The team has participated in the creation of an official Audiovisual Design Standards guide that outlines standards for design in all types of spaces on campus. The benefit of this document is it standardizes all design practices so contractors, designers, financial planners, and technicians can all be on the same page when working on an audiovisual project. Second, it provides a written record of our design and installation practices, including cable types, cable labeling, color coding, and network requirements for classrooms and conference rooms.

A new projector monitoring software was deployed called Projector Global. This software first allows technicians to remotely control all the projectors on campus from any computer, via the campus network. The team currently has 29 projectors connected to the network, with the goal of 100% network connectivity of all projectors in 2015.

DisplayNote, a new wireless presentation technology, was also deployed in classrooms for laptops, tablets, and smartphones. DisplayNote allows users to present to the classroom projector via the wireless network so they no longer have to be tethered at a podium. This technology also allows students to connect to the session with their laptop, tablet, or smartphone to collaborate and also capture images from the presentation. Daren states, “While I understand the importance of traditional laptop connectivity, document cameras, and computers in podiums, I believe wireless presentation and collaboration is even more paramount in today’s classrooms.”





ITS TECH ROADSHOW

ITS technical staff went 'on the road' in an effort to keep customers apprised about new technologies on campus and recent changes in the ITS department.

The Tech Roadshow also allows for one-on-one question and answer sessions with our customers and gives them an opportunity to provide feedback on how we can continue to improve our services.

Look for us soon in a campus location near you.

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circuits, this project is targeted for completion in April 2015.

Network Security

The Network Security engineer completed the firewall discovery and engineering plan in 2014 which included recommendations for new network security infrastructure. Major architectural changes are being made, including the implementation of new firewalls outside the network core. This means we would still have the firewalls in place if we lost the network core, creating HA from edge to core. In addition to more protection, these changes will provide better performance as well. This project will extend into 2015.

A network tap was purchased in 2014 which allows the Network team to install security monitoring on-the-fly without effecting production. The immediate benefit of the network tap is to expedite troubleshooting. But it also allows us to implement other new technologies into the network infrastructure without introducing downtime.

Other Network Projects

- **Standards Set for Remote Sites**
  The Network team was involved with moving one of the WSU Spokane entities to a new location off-campus and questions arose, such as what type of infrastructure needs to be installed and what type of connectivity should be implemented to connect back to campus. An engineering plan was created to set the standards for remote sites moving forward.

- **Power Consumption Study**
  During construction of the Pharmaceutical & Biomedical Sciences building, the Network team performed an engineering plan that included a means to evaluate the power usage for network equipment located in the building and what it requires in terms of cooling. This project was extended to all buildings on campus during 2014 and the information was shared with Facilities Operations. This will allow them to accommodate the network equipment better when planning new buildings or making changes to existing buildings. The information will also allow for better planning if they want to add a generator in order to size it appropriately.

- **Yakima Network Upgrade**
  The network was upgraded for the College of Nursing's Yakima location to increase their connectivity from a 1.5 megabyte to a 10 megabyte connection. Voice over IP was also deployed for cost savings.

In summary, 2014 was a year of strategic planning and gearing up for projects that will be implemented in 2015.

OUR IT LIAISON TEAM

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 Campus CIO, Saleh Elgiadi, at *elgiadi@wsu.edu* or 509-324-7316.

Angela Earley
Asst. Director, Education Technology
509-358-7971
earley@wsu.edu

- Administration
- Vice-Provost – Regional Programs
- Capital Planning & Development
- Communications & Public Affairs
- Facilities Operations
- Finance & Budget
- Human Resource Services
- Office of Research
- Student Affairs
- WSUS Office of Development
- WSUS Athletics
- Health Policy & Administration
- Nutrition & Exercise Physiology
- Pharmacotherapy
- Speech & Hearing Sciences
- Small Business Development Center

Bryan Valley
Systems Infrastructure Support Manager
509-358-7688
bryan.valley@wsu.edu

- Library
- Engineering & Technology Management
- Medical Sciences
- Vet Med
- Nursing
- Area Health Education Center (AHEC) Extension/ Child & Family Research Unit (CAFRU)

Daren Noe
Audiovisual Engineering Manager
509-358-7922
dnoe@wsu.edu

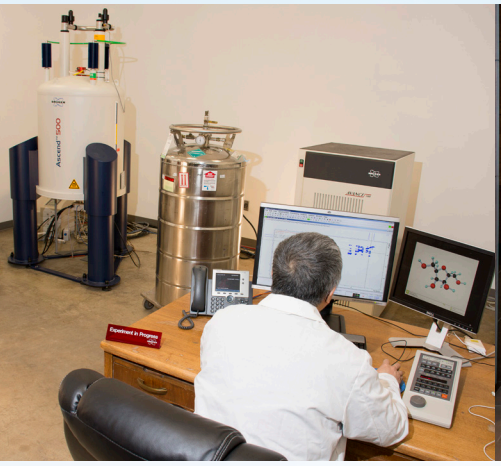
- Mathematics, Engineering, Science Achievement (MESA)
- Criminal Justice
- Education

Jason Minton
Network & Telecommunications Manager
509-324-7473
jason.minton@wsu.edu

- Institute for Shock Physics/ Applied Sciences Lab (ASL)
- Sleep & Performance Research Center

ANNUAL REPORT TEAM

Project Manager	Saleh Elgiadi
Copywriting/Design	Bonnie Cooper
Photography	Cori Medeiros
Proofreading	Karla Ealy-Marroquin



INFORMATION TECHNOLOGY SERVICES

its

spokane.wsu.edu/services/IT

spok.it.help@wsu.edu | 509-358-7748

SPECIAL THANKS TO THE ITS TEAM

Mike Bergam
Kenny Bisagno
Erik Blackerby
Matthew Blythe
Bart Brazier
Dale Brown
Erin Brown
Billy Burnham
Rick Clapp
Bonnie Cooper
Danilo da Silva
Loretta Duncan
Karla Ealy-Marroquin
Angela Earley
Russell Guidry
Larry Hoffman
Dan Laughlin
Jason Minton
David Noble
Daren Noe
Aaron Quam
Brady Ratsch
Chris Rode
Sicco Rood
Bryan Valley
Kevin Wilkinson
Travis Williams

WASHINGTON STATE UNIVERSITY SPOKANE