

Networking 101

West Virginia Network (WVNET)

WVNET Significant Accomplishments 2016

At a time when the budget is tight and you need to stretch every dollar, it's good to know there is a place that accomplishes a lot with modest resources. That place is WVNET! We are able to deliver quality work with only a small fraction of the personnel and expense found in big companies. We aggregate resources and share the cost, giving our customers a huge savings from what they would pay private companies. Perhaps most importantly, we honestly care if you get quality service and succeed! Our mission is to enhance education through technology in West Virginia, and we take that very seriously!

Actions speak louder than words. Take a look at this list of Significant Accomplishments from 2016. These are just the more visible things that we did...there were many more! WVNET is home for a talented and skilled family of computer savvy West Virginians who produce results in many areas. We hope you have benefited from some of our efforts. If not, perhaps we can help you in 2017!



PK-12 Services

WVNET was awarded a contract by the West Virginia Department of Education to provide Internet, Internet 2, Domain Name System, Listserv and web hosting to PK-12 schools in West Virginia. We are pleased to have been chosen for this contract and will provide the best services possible.

K-12 Web Hosting

WVNET now offers free web hosting to K-12 schools in West Virginia. Our web support team has worked with schools to migrate and update over 200 sites to our servers. We have received a lot of great feedback from schools who find our platform easy to use and update. We work with schools every day to provide the best web support possible.



WVCTCS Web Site

The West Virginia Community and Technical College System web site has been hosted at WVNET for many years. In 2016 we worked with the WVCTCS to convert their site to our WordPress platform, providing a more modern and mobile-friendly site that is easier to update.

WVROCKS

The West Virginia Remote Online Collaborative Knowledge System (WVROCKS) has been around for five years. It was the brainchild of WVNET director Judge Dan O'Hanlon and has grown quickly under the management of Dr. Roxann Humbert and Dr. Mary Stewart at WVNET. This year WVROCKS achieved its highest enrollments thus far for the Fall 2016 Session at 728. Retention, completion, and pass rates continue to exceed national rates for online learning by as much as thirty percent. In addition, WVROCKS, BridgeValley C&TC, Southern C&TC, and Mountwest C&TC collaborated on a pilot to offer Board of Governors (BOG) Degree courses in addition to Regents Bachelor of Arts Degree courses during the second session of the Fall 2016 term.



Video Endpoints Installed for WVROCKS

Thanks to funds from a U.S. Department of Agriculture Distance Learning and Telemedicine grant which was awarded to WVNET in 2014, we obtained video communications equipment for institutions using WVROCKS. During 2016 we deployed 13 video endpoints at these schools, providing increased opportunities for hybrid and synchronous courses, faculty and staff training, and meetings. Our distance learning capabilities continue to grow along with the success of WVROCKS.

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WVNET SIGNIFICANT ACCOMPLISHMENTS 2016
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Forklift — Inventory Management for WVIRC

WVNET's Media Services team developed an on-line application to manage educational materials for the West Virginia Instructional Research Center which serves deaf and blind students throughout the state. This project has been in the works for many months as we shaped it to meet the needs of the WVIRC. Those efforts have resulted in a beautiful and useful application that will help to streamline this service for special needs students.



PSTACHIO Expansion

With the success of version 1, WVNET release an updated version of PSTACHIO which is now in use by all Regional Educational Service Agencies (RESAs) in West Virginia. This web-based software provides a powerful and intuitive interface to a complex database for the purpose of tracking information about Public Service Training. Not only does PSTACHIO track and maintain training data, but it also prints certificates and cards to specification for students who have completed courses.

WV Center for Nursing—Online Application and Website

WVNET worked with the West Virginia Center for Nursing to develop a new online application and web site. The application helps the WVCN schedule nursing students into experiences at hospitals as part of their education process. It is a fairly complicated process that was made easier by WVNET's app. The web site describes the center and provides data and resources.



OZ Problem Management

WVNET's OZ system is constantly growing to meet the needs of Information Technology and Maintenance Departments in the West Virginia education system. OZ receives service requests from school faculty and staff and routes them to the appropriate service people at an institution. As work is done OZ keeps an information trail of what happened, and can produce numerous reports and invoices as a result. This year we developed some OZ interfaces with other products such as SLACK and GOOGLE, email updates, a new dynamic work order tracking component, and new themes.

CRAMS — WVNET's Conference Registration and Management System

CRAMS was first developed at WVNET during our mainframe years, and has undergone numerous upgrades during more than two decades of use. This system helps us to manage two yearly statewide conferences – the WV Statewide Technology Conference and the WV Higher Education Technology Conference. CRAMS provides many services including online registration, proposal management, scheduling and session management, badges, program management and more! We have also developed mobile friendly websites that interface with CRAMS to provide services for conference attendees. In 2016 we provided portions of CRAMS to the West Virginia Community College Association conference.



Gatekeeper — Attendance Tracking Application

Our Gatekeeper application keeps track of when students arrive or leave school. It was originally built to work with fingerprint scanners to identify students. In 2016 we made numerous updates to Gatekeeper, mostly providing more settings and controls for administrators. The application will also accept input from other devices such as bar code and RFID readers.

DDoS Protection

In recent years Distributed Denial of Service (DDoS) attacks have been increasing. Hackers will create a flood of internet traffic to a certain location, causing it to be overwhelmed and unable to function properly. One such attack against a popular DNS provider caused outages for popular services including Spotify, Twitter, Github and Paypal. WVNET occasionally receives DDOS attacks, and this is a serious problem. In 2016 we contracted with a vendor for DDoS protection service. This service will help WVNET and its customers mitigate DDoS attacks by sending incoming traffic to the vendor where it will be scrubbed of the unwanted / offending content. The vendor forwards legitimate content back to WVNET.



WVNET SIGNIFICANT ACCOMPLISHMENTS 2016
(continued)

Electronic Bids Application

Since WVNET maintains a large number of state-wide contracts, we have been using our own online bid management system for years. The system shows open RFP's and RFQ's, accepts questions and displays answers, and holds information about winning bids. In the past year we completely rebuilt the application to include some new capabilities. Most notably vendors can now submit their bid electronically. Submitted bids are encrypted and cannot be accessed or viewed by anyone until the bid opening date. We are hoping that electronic bid submission will eliminate much of the overhead in submitting and handling paper bids.



WVNET's Social Media Team

Comprised mostly of student interns, our social media team did a lot to connect WVNET with people in West Virginia and the world. The team maintained a constant feed of information on Facebook, Twitter and Instagram, most notably at the two statewide conferences. The social feeds from the conference provided a lot of supplemental insight that added greatly to the experience.

DegreeWorks

Significant milestones were achieved in optimizing the use of DegreeWorks - the student success/retention software. The Transfer Equivalency Self-Service Module for DegreeWorks was purchased and introduced to schools during a statewide meeting in June. The DegreeWorks upgrade necessary for implementation of the self-service module will launch in January 2017. In preparation for this upgrade, the latest version of the DegreeWorks scribing component, essential for coding course catalogs, has been demonstrated to schools via a workshop and conference calls.



Blackboard Hosting and Support

In response to the ever changing budgetary needs of our Blackboard Learning Management Software hosted institutions, WVNET was able to extend services without raising prices by eliminating hardware resources and services that schools were not using and replacing them with services that schools desperately needed like web conferencing and streaming media within course shells. Training opportunities were also expanded to on demand, synchronous webinars, and on-site training.

Early Warning Building Block

WVNET Systems Programmer Jonathan Lynch developed an Early Warning System building block. This tool allows instructors, deans, and advisers to get a high-level view of how their students are doing in order to identify individuals who may be struggling and could benefit from some extra attention. Decades of research shows that if you can reach out to these students and give them the help they need, retention rates go way up.



BigBlueButton Meeting Rooms

WVNET Systems Programmer Jonathan Lynch developed a web interface for creating BigBlueButton meeting rooms. BigBlueButton is a virtual meeting platform similar to WebEx. Previously, rooms could only be created through Blackboard, which meant that all participants needed to have a Blackboard account. Now we can create our own rooms outside of Blackboard at any time, providing us and our customers a low-cost fully-featured alternative to WebEx.

WVOASIS

WVNET Application Programmer Roman Chuby developed the WVOASIS to Banner payroll interface that loads over 20,000 reconcilable payroll accounting lines each month for WVNET hosted and supported institutions. WVOASIS is the financial system used by state agencies and institutions in West Virginia. WVNET has been a key player in interfacing OASIS to Banner, which is the financial system used by West Virginia higher education.



WVNET SIGNIFICANT ACCOMPLISHMENTS 2016
(continued)

eTranscripts

BridgeValley Community & Technical College and Eastern West Virginia Community & Technical College, in partnership with National Student Clearinghouse, a leader in transcript exchange services, began offering electronic delivery of student transcripts in April 2016. The Ellucian eTranscripts solution provides an official, certified, electronic transcript through a fast, secure and environmentally friendly delivery method.



West Virginia Higher Education Technology Conference 2016

This annual conference for statewide higher education technology was a great success. It hosted 31 exhibitors and 58 informative sessions. Opening speaker Nicholas David Bowman, Ph.D., Associate Professor of Communication Studies at WVU discussed how to use social media to foster student engagement. Presenters from numerous West Virginia institutions delivered sessions on topics including career and professional development, e-learning and distant learning, student success, big data, "green" computing, web development, security and network management, enterprise resource planning and social media. There was also a "Poster Session." Karen Rhodes from Hewlett Packard Enterprise was the closing speaker who talked about the power of curiosity and how it drives us to learn. Dr. Monica Brooks, Associate Vice-President for Libraries and Online Learning at Marshall University, accepted this year's Outstanding Service Award.

West Virginia Statewide Technology Conference 2016

The 12th annual conference of its kind, the WVSTC attracted over 400 attendees who enjoyed 131+ concurrent sessions, 74 exhibitors, 1 STEM Playground and 2 amazing speakers. Opening speaker Kelly Reddin, Global Master Trainer, Lego Education, talked about the importance of creativity in an interactive session using Lego blocks. Closing speaker Brent Frey, Apple, Inc., discussed change and how everyone can code. He introduced participants to the Swift programming language which was developed by Apple and is being offered to schools. Technology Integration Specialists (TIS) candidates were given an added bonus to their training – The Coopers Rock Professional Learning Expedition. Next year's West Virginia Statewide Technology Conference will be held July 18-20, 2017 at The Waterfront Place Hotel in Morgantown, WV.



Banner XE Progress

Banner XE is the next generation of Banner, offering a web-based interface for accessing Banner's functions. WVNET has been creating test instances of Banner XE and has deployed these to six institutions. These instances help schools to use and learn the new system, finding any problem areas, before using Banner XE in production.

Neil Bolyard Financial Aid Award

Dianne Sisler was recipient of the Neal E. Bolyard Meritorious Service Award. The West Virginia Association of Student Financial Aid Administrators (WVASFAA) presents this award to a member who has made an outstanding contribution. Diane is closely involved with schools throughout West Virginia in the acquisition of financial aid for students in need. Many thanks and congratulations Dianne!



Upgraded Virus and Spam Filtering

Our email filtering service helps customers to avoid malicious and annoying email by detecting and flagging or removing it before it is delivered. This year we migrated our virus and spam filtering from the BarricadeMX platform to the DefenderMX platform. This upgrade provides additional filtering capabilities, log analysis, trend insight, and proactive monitoring for our customers, features that keep us ahead of the growingly complex array of email scams.

WVNET SIGNIFICANT ACCOMPLISHMENTS 2016
(continued)

Domain Name System Upgrade

WVNET provides Domain Name System (DNS) service to many institutions in West Virginia. DNS takes a domain name such as "wvnet.edu" and translates it to a numeric internet address, directing internet communications to the correct computers. This year we improved our DNS service by migrating to Infoblox appliances—dedicated pairs of computers that provide high availability by sharing work. Infoblox is a state-of-the-art platform for this function.

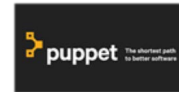


Virtual Infrastructure

Most of WVNET's services and supporting processes run on virtual machines (VM) – sophisticated programs that simulate a real computer in software. We can have many VM's on a single physical computer, which optimizes performance of each system, reduces hardware problems, simplifies upgrades, and greatly reduces costs. The result is better and more affordable computing services for our customers. In 2016 we updated our virtual Infrastructure to VMWare ESXi 6.0 which provides multiple improvements over previous versions. ESXi 6.0 uses a common configuration for all supporting hardware, which reduces the potential for issues that may arise from different hardware and simplifies issue troubleshooting.

Improved System Security and Maintenance

Many security problems can result from not keeping a system up-to-date. This is true on every computer from your smart phone to a super computer. WVNET's vast array of servers run many configurations of services that need to be monitored and kept up-to-date. In 2016 we improved our ability to maintain updates by continuing our implementation of a program called Puppet. This program accesses each of our servers and ensures that they conform to a set of baseline best practices by adjusting configurations and installing updates. We also use Puppet to deploy new applications through automation. There are many security threats brought by hackers from all around the world. WVNET and our customers are often targets for hacking attempts. Programs like Puppet help us maintain strong defenses and monitoring to proactively avoid attacks while providing the best possible server infrastructure.



Version Control

In 2016 we adopted version control software for configuration change tracking and management. We created a local repository server that is used by all staff at WVNET to update systems. Having a local repository ensures that the best and correct updates are consistently being applied to our systems. WVNET's application developers also use version control to coordinate updates and manage software changes. To improve this process WVNET implemented our own instance of GitLab – open source software to collaborate on code.

Office 365 Support

Many institutions in West Virginia have migrated to Office 365 as their source for office applications. WVNET has significant expertise in the platform, and in 2016 we assisted many customers with their Office 365 needs from initial tenant configuration to upgrades of synchronous tools.



HelpDesk

Need Help? Call Now!
304-293-5192

Help Desk and Support

This is very important! When you need information technology services it goes beyond the hardware and software. If you have a question or a problem you need a friendly and helpful forum to work with you. WVNET has long recognized the importance of customer support, and we maintain the highest standards to make that available. In 2016 our 24x7 helpdesk assisted more than 10,000 callers. Supporters in each of our departments additionally provided second and third level support through our OZ ticketing system and face-to-face. Many customers completed our satisfaction survey, and we achieved a 96% satisfaction rating. If you need help, WVNET is the place to call!

(Guest article by WVNET Manager Media Services Mike Karolchik)



Happy New Year from the Director...

New Year's is always a time of fresh ideas and experiences for me. This year, I am beginning the New Year at an Internet2 Conference. One person from each state is represented as the government builds out a new internet. It's fiber and high speed all the way.

It connects the research universities with resources like supercomputers. The challenge is to make it better than the current internet. There are times when that seems more like the Wild, Wild West before the Marshalls and Texas Rangers made it a safer place to live and work.

One of the main things we are focusing on is how to make this a much safer internet. Currently, there is too much malware, ransomware and DDOS attacks that try to shut down the entire system. And, way too much hacking.

Overcoming these problems is an enormous challenge, but we are hard at it. Wish us luck and please have a safe and Happy New Year!

CUSTOMER SATISFACTION SURVEY

Spring semester is under way at all the institutions of higher learning across the State of West Virginia. Secondary education in every county is back in full swing as well. Professors, teachers, administrators, and students alike are all back from their holiday break and ready to continue the education of West Virginia's youth. WVNET was working the whole time, in the background, making sure that educational needs that we provide work the same or even better based on upgrades and improvements as you return. We use your downtime as our time to improve services for our customers. We wish all our educators a fantastic spring semester and hope that you continue to educate our youth for a better tomorrow in the State of West Virginia.



Each month, WVNET recognizes a customer who took the time to fill out our Customer Satisfaction Service Survey to let us know how we are doing. We thank everyone who takes that extra few minutes to give us advice, kudos, or criticisms that will help us improve our service.

This month we would like to congratulate our winner, *Misty Ellis from Charleston Correctional Center*. While the Correctional Center is not directly a customer of ours, they fall into our agreement with the West Virginia Office of Technology to provide after-hours Help Desk support for their customers and public employees. We've enjoyed this relationship and making sure that public employees who don't work "day hours" are still getting their services met with our award winning help desk.

Misty noted that Network Operations Center employee Mike McDonald was, "very helpful." We appreciate that very much and are glad that you had a positive experience with our Help Desk. WVNET's Help Desk can assist with a variety of issues, and for those we can't, we can usually point you in the proper direction.

As always, at the end of every month, we will draw a winner and contact them by email and then send WVNET memorabilia in appreciation. Please complete our survey by looking within the incident email of any interaction that you have had with us. All comments are taken seriously and help to improve what we do on a daily basis. Thank you *Misty*, and thanks again to all our customers who continue to shape and improve WVNET.

(Guest article by WVNET staff member Booker Walton, III, pictured.)

WVNET WELCOMES NEW EMPLOYEES CHAD DENIKE AND BOB BURTON



WVNET welcomes Chad DeNike (*pictured at left*) and Bob Burton (*pictured at right*) who have joined WVNET's systems group. **Chad DeNike** previously worked in tech support for the West Virginia Department of Energy, the FBI and other companies. He has a strong background in Linux, Unix and SAN technologies. On his own time Chad enjoys do-it-yourself projects from solar power and micro computers to welding and working on jeeps. He is also a black belt in Tae Kwon Do. **Bob Burton** worked at West Virginia University and has valuable experience in Linux/Unix systems administration. He enjoys backpacking and camping, and provides leadership to our local Boy Scouts. Welcome to the family, Chad and Bob!



ANOTHER MALWARE ATTACK FOR ANDROID USERS

Hackers have created Android malware that uses compromised smartphones to attack routers.

Kaspersky Lab has discovered a new form of Android malware that uses compromised devices to attack and take over WiFi routers, which they've designated the Switcher Trojan. Switcher is distributed via fake versions of popular apps but doesn't attack the infected smartphone directly.

Once infected via the fake apps, Switcher attacks the WiFi network that the phone is using with brute-force methods. Once the router is compromised, Switcher changes the router's DNS settings to a DNS server that leaves the users of the router vulnerable to malware attacks. This is a new trend of malware that doesn't attack the user directly. Instead, it turns the user into an accomplice as he connects from one WiFi router to the next.

So far, the attacks have mostly occurred in China distributed by a fake app for the popular Chinese search engine Baidu, or via an app popular in China for enabling users to share information about WiFi networks.

It used to be safe advice to say one should only download apps from the Google Play Store. If you do that, Switcher and other devious Trojans won't – or shouldn't – be a problem to you. However, in recent months, Google Play hasn't been immune from malicious apps. All Android users should consider running antivirus software as a precaution.

To check for infection, if your router's DNS address is pointing to any one of the following IP addresses, then you have a problem:

**101.200.147.153
112.33.13.11
120.76.249.59**

(Guest article by WVNET staff members Steven White and Randall Long)

BROWSER AUTO FORM COMPLETION PROFILES CAN ASSIST PHISHING ATTACKERS

Browser can remember what you've entered in forms on web pages. After you've entered something into a form on a web page (such as a search box), the next time you visit that page, your previous entry should be available to re-use.

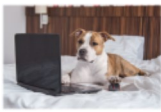
Now one can create entire Autofill profiles. Autofill profiles are a recent addition to modern-day browsers. This feature works by allowing the user to create a profile that holds different details about himself that he usually enters inside web forms. When the user has to fill in a form in the future, he can simply select an autofill profile and his browser will enter the preset information in all form fields, sparing the user the time he would have needed to type in 10, 20 or more fields.

However, these auto complete profiles can be used by attackers to collect information from users via hidden fields, which the browser automatically fills with preset personal information from the autofill profile and which the user unknowingly sends to the attacker when he submits a form.

Finnish web developer Viljami Kuosmanen published a demo ([available here](#)) that shows how an attacker could take advantage of browsers that support autofill profiles. According to tests, the only browsers that support autofill profiles are Google Chrome, Safari, and Opera. Browsers like Edge, Vivaldi, and Firefox don't support this feature, but Mozilla is currently working on it.

The good news is that users can turn off the autofill profiles. The bad news is that this feature comes turned on by default. Hopefully, browser vendors will stop this attack vector by disabling autofill behavior for hidden form fields. [Continued on next page...](#)

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(Continued...Browser Auto Form Completion Profiles Can Assist Phishing Attackers)

Until that time:

How to Turn off Autofill in Chrome

Open Chrome.
At the top right, click **Settings**.
At the bottom, click **Show advanced settings**.
Under **Passwords and forms**, uncheck **Enable Autofill to fill out web forms in a single click**.

How to Disable Autocomplete in Apple Safari

Open your Safari browser.
Click on **Safari** in the program menu and select **Preferences** in the drop-down menu.
Click on the **Autofill** tab in the **Preferences** window.
Click on each of the check boxes next to the autofill options to deselect them, turning off the autocomplete for each option.

How to turn off the auto-filling of online forms in Opera

Open your Opera browser.
Click on the **Opera** button.
Go to **Settings > Privacy & security**.
In the right pane, scroll to the **Autofill**.
Uncheck **Enable auto-filling of forms on webpages**.

(Guest article by WVNET staff members Steven White and Randall Long)

ASSISTIVE TECHNOLOGY SHOWCASE — WIRELESS ALERT SYSTEMS



Assistive Technology Showcase — The BallotCall Alert System is a wireless alert system with a large button switch. The button can be mounted at an accessible height on a post and bracket — along with a sign that reads, "Ring bell for voting assistance." You can mount the button temporarily outside a polling place, and set the receiver near poll workers to notify them when a person with a disability needs curbside voting assistance. Not just an assistive device for voting, the wireless alert system has a multitude of uses in many places for those with assistive needs. Check out alert systems for other settings, too. For more information, visit www.inclusionsolutions.com or call 866-232-5487.

(Guest article by WVNET staff member Fran Barnes.)

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Dan O'Hanlon swears in the Mayor of Huntington, Stephen T. Williams *(Williams on left, O'Hanlon on right).*
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Despite his mastery of the character, this cosplayer did not get the leading role in Hamilton. Fortunately, he went on to serve the greater good in West Virginia. Who is this 'unmasked' man? Email your response to: newslettereditor@wvnet.edu