



# **WVNET Strategic Plan**

## **2016-2021**

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## Organizational History

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From co-location to cloud computing and disaster recovery services, West Virginia Network (WVNET)'s secure, robust Morgantown Datacenter combines the efficiency of partnering with a single provider with deep technical expertise and a broad portfolio of services.

### WVNET Quick Facts

- Founded in 1975
- Internet2 Level 3 member
- HDI-certified on-site 24/7 Help Desk

### A History of Excellence and Innovation

*Founded in 1975, WVNET operates one of America's longest-running education & research network and is a trusted network provider in West Virginia.*

WVNET is the West Virginia Network, a dynamic service organization providing telecommunications and computing services within West Virginia. WVNET was created in 1975 to provide centralized computing facilities and wide-area network communications linking its "central site" computing resources in Morgantown with the campus computing systems at most of the colleges and universities throughout the state. Since then, we have grown to include PK-12 schools, government, and non-profit agencies as well. It is our highest priority to provide high quality services with an understanding and informative Help Desk.

Our driving principles are to:

- Enhance West Virginia's access to national networks such as Internet2.
- Reduce the cost of technology through aggregate purchasing. On behalf of our clients, WVNET negotiates volume purchase prices for software, hardware and network services.
- Provide high levels of data security.



### WVNET's Partnership with Internet2

In 2011, WVNET began its partnership with Internet2. Internet2 is an exceptional community of U.S. and international leaders in research, academia, industry and government who create and

collaborate via innovative technologies. Internet2 networking is an incredibly exciting tool for researchers, technologists and many others interested in developing new technologies, policies and business models for the next generation. WVNET's membership reflects the organization's ongoing commitment to help fuel the next phase of Internet development within the state.



### WVNET and The Quilt

In 2012, The Quilt, the national coalition of advanced regional networks for research and education, welcomed WVNET as a member. WVNET joined 29 other regional and state networks from around the country participating in The Quilt.

Participants in The Quilt provide advanced network services and applications to over 200 universities and thousands of other educational institutions.

### WVNET's Partnership with 3ROX, OARnet, and PennREN

In 2012, WVNET joined the Three Rivers Optical Exchange (3ROX) and partnered with the Ohio Academic Resources Network (OARnet). In 2015, WVNET also formed a partnership with the Pennsylvania Statewide Research, Education, and Community Network (PennREN). These high-performance Internet and Internet2 hubs are operated and managed by the Pittsburgh Supercomputing Center (PSC), the Ohio Department of Higher Education, and the Keystone Initiative for Network Based Education and Research (KINBER). These partnerships provide our clients with significant bandwidth, shortest possible routes, as well as redundant access to expanded research and education resources.

### WVNET Membership with MULTI-STATE INFORMATION SHARING & ANALYSIS CENTER (MS-ISAC) and Research and Education Network Information Sharing and Analysis (REN-ISAC)

The MS-ISAC is the focal point for cyber threat prevention, protection, response and recovery for the nation's state, local, tribal and territorial (SLTT) governments. The MS-ISAC 24x7 cybersecurity operations center provides real-time network monitoring, early cyber threat warnings and advisories, vulnerability identification, and mitigation and incident response.

REN-ISAC is a private community of trusted members sharing sensitive information regarding cyber security threat, incidents, response, and protection.

Membership is open to colleges and universities, teaching hospitals, research and education network providers, and government-funded research organizations.

Read more about WVNET at: [www.wvnet.edu](http://www.wvnet.edu)

## Safeguarding Critical Data and Infrastructure

In addition to our partnership with research and Internet networks, we have created secure datacenters (our primary facility is located in Morgantown, WV, with a disaster recovery site located in Charleston, WV) with state-of-the-art technology.

### Network Highlights

- High speed redundant Internet connections from multiple service providers that make the Datacenter carrier-neutral.
- Currently providing Internet and Internet2 capacity that exceeds 40 Gbps.
- Fully diverse and redundant network paths that are proactively monitored and tested on a regular basis.
- Dedicated in-state network engineers available for problem resolution 24/7.

### Datacenter Highlights

- Round-the-clock security on multiple levels.
- Automated fire detection and alarm systems.
- Precision air conditioning system to maintain the optimal temperature and humidity of the datacenter.
- Multiple hardware sets for enterprise level redundancy, both on-site and at our disaster recovery site.
- On-site Help Desk availability 24/7 to swiftly resolve and attend customer calls, with access to 2<sup>nd</sup> tier support staff for after-hours problem resolution.



- **CERTIFIED** Our Help Desk is HDI Team Certified, which verifies that they possess the knowledge of best and common practices necessary to successfully manage the operational and tactical components of the Help Desk

<http://www.thinkhdi.com/certification/support-center-certification.aspx> .

### Physical and Premises Security

- Our Datacenter is staffed 24/7 and secured by multiple access doors. Only authorized individuals are allowed access. The Datacenter is under 24/7 video surveillance and physical access and equipment ingress and egress are logged.

- All employees must swipe their Employee Identification Card (EIC) when entering and exiting the building. Employees must also swipe their EIC when accessing the Data Center and other secure areas of the building.

## Mission

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In response to legislative initiatives and customer needs, WVNET delivers effective, reliable, and efficient communications, applications, and technology services to West Virginia higher and public education, state agencies, government, and non-profit organizations.

## Values

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- Education: self-actualization, workforce development, and the foundation for sustained economic development through accessible workforce training, distance learning, and shared educational resources.
- Customer focus: prizing customers' trust, understanding their needs, and adopting their priorities and maintaining timely, efficient, and transparent communication at all times.
- Professionalism: integrity, excellence, personal and professional ethics as well as personal and professional growth.
- Collaboration: respect for differing opinions and priorities, establishment of mutually rewarding partnerships, and responsibility and accountability to our customers.
- Leadership: equity, accountability, creativity, adaptability, dedication, and imagination.
- Innovation: creative solutions, develop opportunities, eliminate obstacles.
- Results: action over activity, function over features, development over change.

## Organizational Goals

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In order to execute WVNET's mission in a manner consistent with its vision and values, WVNET has established a set of results-oriented goals as a structure for organizing its outcome-oriented activities. These overarching goals are listed below. (The numbers of the goals are for ease of reference, and do not reflect any relative priority.)

1. Leadership for the state in identifying and implementing appropriate technologies to improve services.
2. Full realization of economies of scale in the acquisition and operation of technology-related equipment and services.
3. Reliable and predictable computing and communications infrastructure and services at economical and stable pricing.
4. Managed technology services -- balancing the innovation necessary with emerging capabilities while maintaining the reliability essential for mission-critical functions.
5. A skilled and motivated staff with a high retention rate.
6. Expanded customer base in the public and non-profit sectors.
7. Assets and resources protected from unauthorized access with increased security and the utilization of up to date security practices.
8. Enterprise support services that deliver a quality customer experience through award winning help desk personnel.
9. An organization with goals, procedures, and processes that best serve the needs of our customers and the state.

## The Future

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WVNET's next five years will focus on creating opportunities to bring our constituents together. We will continue to host and organize state wide meetings, work groups, events and conferences like the West Virginia State Technology Conference and the West Virginia Higher Education Technology Conference, when called upon to do so. These efforts will advance our focus on bringing people together to explore needs, encourage dialogue, engender ideas and problem solving, and foster cooperative efforts to maximize efficiencies and cost savings. Our role is to apply our networking strategies to steward relationships that lead to further collaboration and partnerships with WVNET and beyond. To that end, we rely on the West Virginia Higher Education Policy Commission and other state organizations to keep us informed and/or to include us on list-serves, meeting notifications, etc. Communication is key to the success of all of these endeavors.

WVNET employees agree that great customer service begins with a relationship of trust and it is sustained by the reliability of the service rendered. To uphold these high standards, we rely on customer feedback and our responsiveness to that feedback. We are committed to regular, effective, and open communications between our staff and customers, our staff and management, our staff and our quality management teams, and our senior management and the Computer Advisory Board as well as the West Virginia Higher Education Policy Commission.

We continue to strive to maintain transparency in all of our transactions. Problem resolutions are archived and searchable in the Oz Problem Tracking System. All financial audits are publicly available on the HEPC's website. All service rates are published on WVNET's website. Rate changes and/or new rate structures are vetted with current customers, whenever possible, before they are implemented. New service rates are carefully vetted by the quality management team overseeing that service area. WVNET's internal committee structure dually function as quality control teams. These teams include the following:

- Customer Advocacy Committee
- Blackboard Oversight Committee
- DegreeWorks Oversight Committee
- Building Security Committee
- Grant Writing Committee
- WVNET Internal Policy Committee
- Information Security
- Conference Committee
- Cyber Development Committee
- Marketing Committee.



In addition, Collaborative Meetings (Service Areas, Managers, Senior Management) take place weekly to discuss updates, reports on special projects, and to set milestones, when necessary, for the completion of those projects. As a service agency, much of WVNET's business is repeat business and as such is not subject to a specific timeline and/or milestone beyond routine software upgrades, patches, and regular security audits. Timelines tend to be mutable, ongoing, and/or term, based on the limited scope of work or statements of work that are defined by our customers. Many times timelines and milestones are predicated by semester schedules, fiscal year budgets, and the availability of new releases and upgrades for software hosting. This vast amount of work is divided among eight service delivery areas, which include the following:

- Business Office
- Help Desk/Network Operations
- Building/Facility
- Media Services
- Applications
- Networking
- Systems
- Distance Learning & Educational Services.

Organizational goals, actions, and outcomes relating to services and customer relations are provided in detail within the context of the different service areas in the pages that follow.

# Business Office

WVNET acts as a central point to purchase technology for the institutions. WVNET bids, awards, and administers shared contracts in order to allow the efficient purchase of needed items through leveraging the combined demand of the institutions and through professional after-award contract management. This is not only beneficial in the sense that each institution does not have to take the time to do this, but it also encourages the institutions to standardize on similar hardware and software to achieve volume discounts and to facilitate central support. WVNET also issues individual bids for institutions facing unique situations.

Goals	Actions	Outcomes
<p>Centralize invoice management.</p>	<ul style="list-style-type: none"> <li>• Distribute invoices to consortia members for shared services.</li> <li>• Maintain customer invoice records.</li> <li>• Distribute passthrough invoices for state wide contracts.</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient management of business transactions.</li> </ul>
<p>Enhance procurement operations to ensure that WVNET’s customers receive the best price on the highest quality products.</p>	<ul style="list-style-type: none"> <li>• Continue to purchase software through open-end contracts with Microsoft, Blackboard, Ellucian, Oracle, and others.</li> <li>• Establish a broad range of centralized open-end and other contracts to provide our customer base the best channels possible for their technology needs.</li> <li>• Negotiate open-end master contracts for new products based on state initiatives and customer needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Affordable costs for software and services for participating customers through an economy of scale.</li> <li>• Improved contract management.</li> <li>• Greater standardization of procurement processes for shared services.</li> </ul>

<p>Analysis and continuous improvement of internal controls and processes.</p>	<ul style="list-style-type: none"> <li>• Analyze and review procedures in accounting cycles to make necessary improvements.</li> <li>• Document all procedures.</li> <li>• Work with other service areas to analyze costs and streamline billing processes and documents (MOUs).</li> <li>• Periodic checks to determine whether internal controls are sufficient.</li> </ul>	<ul style="list-style-type: none"> <li>• Improved productivity and efficiency of billing processes.</li> <li>• Improved compliance and reproducibility of procedures.</li> <li>• Improved interdepartmental process flows.</li> <li>• Improved communication about the important role that individual service areas have in multi-departmental processes.</li> </ul>
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## Help Desk/Network Operations

The WVNET Help Desk and Network Operations Center strives to develop and operate a professional, 24-hour-a-day, technology savvy Help Desk, that is efficient in meeting our customers' needs. WVNET already has an exceptional team with a strong customer service orientation.

WVNET's highly regarded Help Desk staff responds to a variety of requests from users statewide. Many Help Desk operations are little more than regional call centers in distant cities, relaying on scripts and one-size-fits-all responses to allow entry-level personnel to deal with calls. The WVNET Help Desk is staffed by experienced professionals who are allowed to focus on resolving problems successfully rather than on minimizing the time for each call, as is commonly emphasized in commercial Help Desk operations.

WVNET's Help Desk leverages the specialized skills of the WVNET technical staff to offer a level of service that is not fiscally possible for most of the institutions. For instance, the individual institutions cannot afford to hire the same level of expertise in many areas such as Oracle, Banner, communications, and operating systems, just for their own needs. WVNET can provide these capabilities from a central location and is able to provide a single point to log statewide problems, trace problems until they are resolved, and provide the expertise to resolve these problems.

Goals	Actions	Outcomes
Better efficiencies for the state through Help Desk services.	<ul style="list-style-type: none"> <li>• Marketing our Help Desk functions to both public and private institutions, as well as PK-12.</li> <li>• Train regularly and develop proficiency in products and initiatives that are customer base are using.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced unit-cost for institutions by not having to maintain a professional Help Desk on-site.</li> <li>• More motivated staff that is constantly staying current on new initiatives being integrated with our customers.</li> <li>• Increased customer awareness of all the services the Help Desk can provide.</li> </ul>
A culture of online-based remote support.	<ul style="list-style-type: none"> <li>• Leverage tools such as LogMeIn rescue.</li> <li>• Market our online support capabilities to customers.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased customer satisfaction scores increasing.</li> <li>• Customers have multiple channels to receive support.</li> </ul>

	<ul style="list-style-type: none"> <li>• Train staff on proper usage and develop confidence in their support skills with customers.</li> <li>• Conduct regular customer surveys.</li> </ul>	<ul style="list-style-type: none"> <li>• Customer training takes place through WVNET Help Desk being able to fix problems directly on the PC, educating the customer for self-help on possible future incidents.</li> </ul>
Integrated PC Support Services	<ul style="list-style-type: none"> <li>• Train for staff on desktop support best practices and how to's.</li> <li>• Market that the Help Desk can provide this service to customers.</li> </ul>	<ul style="list-style-type: none"> <li>• Customers have another channel to be able to work with WVNET.</li> <li>• Employee knowledge and confidence grows on account of learning new skills and using them regularly.</li> </ul>
Remote 24-hour server and network monitoring	<ul style="list-style-type: none"> <li>• Be the first point-of-contact for all server related issues, as well as essential state networking.</li> </ul>	<ul style="list-style-type: none"> <li>• Quick efficient resolution of server and network problems by WVNET due to quick recognition and notification of the proper parties by the Network Operations Center staff.</li> </ul>
HDI Award Winning Status	<ul style="list-style-type: none"> <li>• Keep staff trained and certified with HDI Support Analyst Training</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in customer confidence.</li> <li>• Increase in staff confidence due to continued training and support.</li> </ul>

# Building/Facility

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Currently, the metal building that WVNET is housed in was constructed in 1969. It was, at the time, deemed to be a temporary home for WVNET. In the mid 1980's, WVNET's current data center was built to replace the original computer room that was on the premise which was turned into office space.

The original office space and converted office space have been virtually unchanged since that time. Office spaces that were meant to house staff back in that time frame, have now been turned into multiple people spaces that can cramp the work space of each individual. Problems with a leaking roof above our office space caused budgeted money to be spent on repair of the entire roof, resealing it completely. Without centralized HVAC, people are left to use circa early 1980's individual heating/air conditioning units that routinely have maintenance issues, with parts not able to be easily located to fix the problems.

Over the course of the last 35 years, WVNET's then-current data center has turned into a legacy computer room, with certain facility issues causing us to spend budgeted monies on necessary repairs to keep critical state infrastructure safe.

Some of the issues have been structural concerns such as roof leaks, allowing water to drip directly into the computer room. An inadequate plumbing system under the white space has caused water issues near critical electrical power on the main floor of the computer room. Other issues include lack of adequate fire suppression for the data center (water or chemical), and antiquated power supplication within the data center.

Not only is critical power an issue within the data center, but redundant power based outside of the data center is in need of updating as well. Though we have a 500kW generator sitting off an Automatic Transfer Switch (ATS) controlling it and the Uninterruptible Power Supply (UPS) within the data center walls, improvement could be made. The ATS itself serves as a single point of failure (SPOC), leaving us vulnerable, as well as only having one generator, in which if it malfunctions, we are left to minimal battery time to shut down critical state infrastructure. Referencing the notion of N+1, or parallel redundancy, WVNET would like to have redundant power within our generators, our UPS's, as well as our ATS, to ensure the greatest uptime reliability as is possible for our customers', as well as our critical infrastructure.

It is with these facts in mind, that our goals for the facilities include the following:

Goals	Actions	Outcomes
New Office Building for staff.	<ul style="list-style-type: none"> <li>• Procure the funds using state law and purchasing rules to erect a new office space.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in staff morale.</li> <li>• Decrease in monies spent on building repairs.</li> <li>• Newer facilities provide customer</li> </ul>

		confidence that they are working with a first-rate organization.
New State-of-the-Art Data Center.	<ul style="list-style-type: none"> <li>• Procure the funds using state law and purchasing rules to erect a new data center.</li> </ul>	<ul style="list-style-type: none"> <li>• Customer confidence in WVNET’s ability to take care of their critical data, processes, and equipment with newer infrastructure to support it.</li> <li>• Updated power supplication taking advantage of Power Dispersion Units and multiple points of redundant power between servers and racks.</li> <li>• Fire suppression to save both computers and people in the case of an emergency.</li> </ul>
Upgraded power infrastructure.	<ul style="list-style-type: none"> <li>• Procure the funds using state law and purchasing rules to upgrade our power infrastructure.</li> <li>• Work with knowledgeable engineers about how best to create redundancy in our supporting power.</li> <li>• Increase the capacity of our IT load by purchasing an Uninterruptible Power Supply with greater kW capacity.</li> <li>• Review green energy guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Customer confidence that their mission critical data and processes will be maintained with 99% uptime.</li> <li>• Increased UPS capacity with multiple UPS's. This allows us to have an A&amp;B feed for redundant power purposes to all of our equipment.</li> <li>• Increase in our ability to take in business for our data center with being able to support more high density racks with larger kW.</li> </ul>

		<ul style="list-style-type: none"><li>• Sufficiently reduced maintenance costs would be reduced significantly with newer infrastructure.</li><li>• Implement sustainable energy solutions and practices.</li></ul>
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# Media Services

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WVNET’s Media Services group leverages both creative and technical talents to create media and software applications. The group provides creative support for WVNET’s initiatives including two annual state-wide conferences.

Media Services creates applications, web sites and other media for customers. Most of the applications are hosted at WVNET and sold as Software as a Service subscription.

Media Services supports web hosting, for which they design, create, modify, migrate and troubleshoot web sites. They provide one-on-one training to customers who take administrative responsibility for web sites.

Media Services contributes to WVNET’s marketing efforts by creating presentations, updating and enhancing WVNET’s display, obtaining and distributing promotional items, and creating marketing materials for the web and social media.

WVNET’s Distance Learning initiatives, Blackboard support and WVROCKS, are supported by the Media Services group. Team members provide administration, design, troubleshooting, training, and marketing of these services.

Endpoints	Actions	Outcomes
An affordable web hosting platform.	<ul style="list-style-type: none"> <li>• Research and select a content management system and plugins for web sites.</li> <li>• Customize Wordpress plugins to provide functionality needed by customers.</li> <li>• Research and add new templates.</li> <li>• Build a library of web designs.</li> <li>• Add more web-designers as demand for web services increases.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased web hosting and design revenue.</li> <li>• Increased web hosting and design staff.</li> <li>• Improved web hosting and design.</li> </ul>

<p>Increased web hosting customer base.</p>	<ul style="list-style-type: none"> <li>• Hire a full-time web designer.</li> <li>• Support existing customers and sites.</li> <li>• Advertise WVNET web hosting capabilities.</li> <li>• Work with WVDE, Higher Ed and WV government to provide better, more cost-effective web hosting.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased revenue to offset expansion costs.</li> </ul>
<p>WVNET Web site that serves as a marketing tool for web hosting.</p>	<ul style="list-style-type: none"> <li>• Update the WVNET web site to use state-of-the-art technologies.</li> <li>• Add new content to the site regularly via a content specialist.</li> </ul>	<ul style="list-style-type: none"> <li>• WVNET's web site will be a strong example of our capabilities in web design and hosting.</li> <li>• Our attractive web site will help to secure more web design/hosting customers.</li> </ul>
<p>A Section 508 system of tests for web site accessibility.</p>	<ul style="list-style-type: none"> <li>• Research and choose accessibility testing tools.</li> <li>• Learn the necessary modifications to establish accessibility standards.</li> <li>• Assure that WVNET web site complies with all section 508 accessibility standards.</li> <li>• Promote this service through WVNET web site and social media.</li> </ul>	<ul style="list-style-type: none"> <li>• WVNET will offer accessibility auditing and assistance.</li> <li>• WVNET will be able to diagnose accessibility problems with web sites and help to correct them.</li> <li>• WVNET will publish guides and articles to educate the public about section 508 accessibility standards.</li> </ul>
<p>More custom applications for our customer base.</p>	<ul style="list-style-type: none"> <li>• Continue to support and grow existing applications.</li> </ul>	<ul style="list-style-type: none"> <li>• Institutions will increasingly look to WVNET for custom applications with excellent support.</li> </ul>

	<ul style="list-style-type: none"> <li>• Create new applications based on customer demand.</li> <li>• Promote and market applications.</li> </ul>	<ul style="list-style-type: none"> <li>• More application users will provide revenue needed to keep prices low.</li> </ul>
More mobile applications to supplement and/or replace our web applications.	<ul style="list-style-type: none"> <li>• Create application programming interfaces to existing web applications, allowing access by mobile applications.</li> <li>• Build mobile application frameworks from which a variety of applications can be built.</li> <li>• Create mobile applications, including a basic shell for the mobile conference application.</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile applications will be another source of revenue.</li> <li>• Mobile applications will supplement the capabilities of our web-based applications such as OZ and the Conference Management System.</li> </ul>
Improved conference services.	<ul style="list-style-type: none"> <li>• Collaborate with people at other institutions.</li> <li>• Study other conferences and look for new ideas.</li> <li>• Evaluate customer surveys and try to incorporate their ideas.</li> <li>• Brain storm to invent new concepts.</li> </ul>	<ul style="list-style-type: none"> <li>• The number of conference participants will grow.</li> <li>• Increased revenue from participants will allow for better speakers, social events and other offerings.</li> <li>• Involving people from other institutions will increase our experience level.</li> </ul>
Social media as a tool for news releases and announcements.	<ul style="list-style-type: none"> <li>• Hire a full-time content specialist to create content and post it to the WVNET</li> </ul>	<ul style="list-style-type: none"> <li>• More/better content will attract people to subscribe and follow our feeds.</li> </ul>

	<p>web site and social media feeds.</p>	<ul style="list-style-type: none"> <li>• Awareness of WVNET activities will expose customers to our service offerings.</li> </ul>
<p>A modernized WVNET Newsletter.</p>	<ul style="list-style-type: none"> <li>• Publish the newsletter as an on-going weblog that connects with our web site and social media.</li> <li>• Hire a dedicated content specialist who is proficient in technology and journalism.</li> <li>• Content specialist will add new content to WVNET's web site, social media feeds and newsletter.</li> </ul>	<ul style="list-style-type: none"> <li>• Newsletter content will be more timely since it will be updated throughout the month.</li> <li>• Content will be searchable, helping people to find relevant articles in our web site and feeds.</li> </ul>
<p>Marketing support for WVNET.</p>	<ul style="list-style-type: none"> <li>• Hire a dedicated marketing specialist.</li> <li>• Create a marketing team including representatives from WVNET's various groups to build strategies for promoting WVNET services.</li> <li>• Secure a marketing budget to finance cost of items needed.</li> <li>• Update displays and presentations on a regular basis.</li> <li>• Schedule representation at conferences and institutions.</li> </ul>	<ul style="list-style-type: none"> <li>• Promoting WVNET will bring more customers.</li> <li>• Increased revenue will allow us to offer better services at a low cost.</li> </ul>

## Applications

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WVNET's Application's Team (APP) provides centralized applications support to the schools. The APP team provides first-level support for Oracle, Banner, and DegreeWorks, for example, and installs and tests new versions of both applications prior to releasing them to the schools. In addition, the APP team aids each school in its local installations with advice and, in some cases, with onsite visits to perform the actual installation. This results in a great reduction in the need for highly skilled personnel at each of the institutions and helps to ensure that the institutions are running the same versions of software.

The APPs team also offers centrally maintained, shared interfaces and modifications to vendor code for any of its shared systems. This means that the code is designed in such a way that every institution uses the same code base. Any time that changes are needed to the interfaces or to vendor software, the code can be changed and tested at a single location by a single team of people. For example, the Apps team provides support for the interfaces between Banner Financial and the state's wvOASIS system.

The APPs team supplies database administrator services to the schools. We also support Oracle and offer consulting on the use of SQL Server. In the past, we have supported several additional databases, but has undertaken a major effort to reduce the total number of database systems used by its customers.

WVNET supports Argos as a reporting tool for the institutions informational needs. WVNET has experience in writing reports and address informational needs of higher education. WVNET aspires to support Analytics, specifically Blackboard Analytics, as a composite data source for data bases decisions on campuses.

Goals	Actions	Outcomes
Banner maintenance services.	<ul style="list-style-type: none"> <li>• Updates to Banner Software.</li> <li>• Systems resources for continued banner operations.</li> <li>• Expand the depth and knowledge base of the support staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Customers continue to use banner with all of the features available.</li> </ul>
Provide services to maintain DegreeWorks	<ul style="list-style-type: none"> <li>• Research the latest updates, changes, patches, features and functions.</li> <li>• Monitor, maintain and update the Degreeworks Software.</li> </ul>	<ul style="list-style-type: none"> <li>• Customers utilized DegreeWorks with all of the features available.</li> </ul>

	<ul style="list-style-type: none"> <li>• Systems resources for continued DegreeWorks operations.</li> <li>• Expand the depth and knowledge base of the support staff.</li> <li>• Incorporate training as new releases are deployed, creating a supportable environment.</li> <li>• Collaborate with institutions and software vendors on projects and initiatives related to student success and retention.</li> </ul>	
<p>Optimize Banner and DegreeWorks resources.</p>	<ul style="list-style-type: none"> <li>• Move the operations of oracle databases, and software operations from AIX to Linux.</li> <li>• Separate operational resources such that each institution has their own separate environment.</li> <li>• Provide operational systems that may include a complete disaster recovery of all operational software systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Robust system of operation.</li> </ul>
<p>Analyze our reporting software for effectiveness in meeting customer needs.</p> <p>Maintain and update reporting software.</p>	<ul style="list-style-type: none"> <li>• Support Argos as a central reporting systems for all institutions.</li> <li>• Support Analytics systems to ensure the information resources</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional Administration, Faculty, Staff and Students have information to insure success.</li> </ul>

	and analytics to institutional data based reporting is provided.	
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# Networking

WVNET’s main networking objective is provide reliable Internet and state resource access. WVNET connects with two different upstream providers for commodity Internet and Internet2 service. This provides highly fault-tolerant access to external systems. WVNET also maintains two points-of-presence (PoP) in the state, Morgantown and Charleston, to add site redundancy. Within these PoPs, there are multiple chassis providing hardware redundancy as well. With the rapid movement towards cloud environments, some of which WVNET hosts, customers must have reliable access to those hosted assets.

WVNET has designed the network to provide this high level of reliability. WVNET has equipment located in Columbus and Pittsburgh in well-known co-location where there are multiple providers. We are using a ring topology to connect between our PoPs in Columbus, Pittsburgh, Morgantown, and Charleston. This allows that if any one leg of the ring were to go down, the system will not fail.

<b>Goals</b>	<b>Actions</b>	<b>Outcomes</b>
Maintain infrastructure to facilitate current and future bandwidth needs	<ul style="list-style-type: none"> <li>• Use any means necessary to meet reasonable bandwidth increases quickly.</li> <li>• For large bandwidth increases, have the resources to meet these requests within a reasonable time frame.</li> <li>• Proactively upgrade bandwidth to stay below the recommended 75% usage guideline.</li> </ul>	<ul style="list-style-type: none"> <li>• Fulfilling requests in the appropriate time frame ensures customer satisfaction.</li> <li>• Bandwidth-on-demand for our customers while not maxing out current resources.</li> </ul>
Keep infrastructure on current technology	<ul style="list-style-type: none"> <li>• Replace equipment before it is out of its effective life cycle.</li> <li>• Update software to maintain features and fix possible security issues.</li> <li>• Research current and upcoming.</li> </ul>	<ul style="list-style-type: none"> <li>• A state of the art, reliable network to facilitate current and future customer demands.</li> </ul>



	<p>technologies so we know what to have in place for our customers to use.</p> <ul style="list-style-type: none"> <li>• Interface with vendors to monitor equipment and end of life/support schedules.</li> </ul>	
<p>Extended middle mile Broadband to all areas of West Virginia</p>	<ul style="list-style-type: none"> <li>• Work with State of WV to deploy Broadband to all areas of state.</li> </ul>	<ul style="list-style-type: none"> <li>• All telecommunication vendors will then have access to all areas of the state to provide affordable broadband to state residents.</li> <li>• All Higher Ed schools would have high bandwidth access between each other and to Internet2 for research.</li> <li>• All PK12 schools would have high bandwidth access for future education needs.</li> <li>• All state government offices would have high bandwidth access for future needs.</li> </ul>
<p>Implement a new syslog solution</p>	<ul style="list-style-type: none"> <li>• Build a solution that can handle the large amount of logs our equipment generates.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to better see how systems are functioning, enabling more proactive measures to issues.</li> <li>• Help customers detect and investigate any issues or</li> </ul>

		<p>unauthorized access into their networks.</p>
<p>Implement a new traffic monitoring solution</p>	<ul style="list-style-type: none"> <li>• Build out a Cacti system to replace the older, harder to maintain MRTG system currently in use.</li> </ul>	<ul style="list-style-type: none"> <li>• Easier system to use and maintain.</li> <li>• Better granularity for traffic monitoring.</li> <li>• Will provide WVNET and customers a better sense of what is actually being used bandwidth wise so users know when to upgrade bandwidth.</li> </ul>
<p>Redundancy for disaster recovery</p>	<ul style="list-style-type: none"> <li>• Implement the configuration necessary to allow most services to continue functioning if a major point of presence (Morgantown or Charleston) were to go down.</li> </ul>	<ul style="list-style-type: none"> <li>• In the event that one of our major points of presence were to go completely offline, customers would still be able to access the Internet and many major services.</li> </ul>
<p>IPv6 announcement and main web site availability</p>	<ul style="list-style-type: none"> <li>• Start announcing our reserved IPv6 address space to our providers.</li> <li>• Implement IPv6 in our core infrastructure.</li> <li>• Create the path to make our main web site available via IPv6.</li> </ul>	<ul style="list-style-type: none"> <li>• Puts WVNET in place to build out IPv6 to our customers as IPv4 space dries up.</li> </ul>

# Systems Hosting and Administration

WVNET provides shared computing resources for those customers who do not find it financially advantageous to pay for the hardware, software, and staff necessary to support their server and application needs.

WVNET currently has the capability to provide platform as a service (PaaS) through our virtual computing infrastructure that is geographically diverse. This allows our customers to utilize enterprise class hardware and software to meet their computing needs and increase their return on investment. Customers do not have to maintain, support, or refresh their computing needs therefore reducing their overall IT budget.

WVNET employs a staff of experts in multiple technology fields to provided advanced support for customers who do not have the local resources available to meet their needs. WVNET experts supply this support whether it be managing the system in its entirety, or simply responding to a one time troubleshooting request.

Goals	Actions	Outcomes
Automate deployment of virtual machines through customer interface.	<ul style="list-style-type: none"> <li>• Develop a form to request virtual machine creation.</li> <li>• Automate virtual machine deployment utilizing tools to provision the virtual machine without user interaction.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced the amount of effort required for virtual machine deployment.</li> <li>• Increase the rate at which a new server can be deployed for a customer.</li> </ul>
Provide a hybrid datacenter.	<ul style="list-style-type: none"> <li>• Work with existing vendors to develop hosting options for customers.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide customers with additional options for virtual machine hosting.</li> <li>• Provide an alternative cost options for systems that may be utilized for short term services.</li> <li>• Increase WVNET's ability to offer software and platforms as a service.</li> </ul>

<p>Increase services at disaster recovery site.</p>	<ul style="list-style-type: none"> <li>• Increase the resources available in our disaster recovery site.</li> <li>• Migrate current applications to hardware agnostics resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the resources available to our customers.</li> <li>• Offer primary services from our disaster recovery site.</li> </ul>
<p>System deployment through automation.</p>	<ul style="list-style-type: none"> <li>• Utilize automation resources to ensure consistency of platforms.</li> <li>• Utilize version control software to establish change management.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to deploy additional services based upon an established base deployment.</li> <li>• Increase security by ensuring that all systems have the same levels of software patches.</li> </ul>
<p>Backup services for customers.</p>	<ul style="list-style-type: none"> <li>• Work with our customers to develop a backup plan to utilize WVNET storage.</li> <li>• Work with our vendors to determine current technologies available to provide backup services.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide customers with a location to store their off-site backups.</li> <li>• Provide customer with additional service level agreements based upon backup requirements.</li> </ul>
<p>Windows administration services.</p>	<ul style="list-style-type: none"> <li>• Provide additional services for Windows administration.</li> <li>• Work with our customers to develop a partnership for offering services.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the number of customer who utilize WVNET service.</li> <li>• Provide a first level contact for those customers who require additional support services.</li> </ul>

Systems security plan.	<ul style="list-style-type: none"><li>• Develop a plan for periodic security assessment.</li><li>• Implement external penetration testing plans.</li></ul>	<ul style="list-style-type: none"><li>• Increase security for our customers and their resources.</li><li>• Provide reports on security assessment and testing results.</li></ul>
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## Distance Learning and Educational Services

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The primary goal for this service area is to support distance learning initiatives and educational services under the guidance of the West Virginia Higher Education Policy Commission, the Council for Community & Technical Colleges, WVNET, the West Virginia Virtual Learning Network (WVVLN), the West Virginia Department of Education, West Virginia's Remote Online Collaborative Knowledge System (WVROCKS), and other statewide consortia. The Distance Learning and Educational Services (DLES) team provides graphic user interface (GUI) tier two and three support for fifteen instances of Blackboard, the statewide learning management system (LMS). Although Blackboard hosting crosses into every other service area at WVNET, the primary responsibility for oversight resides with this team. The Blackboard oversight committee meets regularly to address bugs, fixes, integration, software updates, customer relations, hosting costs, as well as research and development of customized applications like Big Blue Button web-conferencing and Medial streaming services.

The DLES team coordinates the shared training needs of the institutions and state agencies WVNET serves. Because these institutions and agencies run the same software in most cases and have limited funds to train the experts they need to support these products, we have adopted the "train the trainer" model to disseminate subject matter expertise on the products the DLES supports, thus saving these institutions and the state substantial amounts of money. Often this training is held concurrently during statewide conferences. Our stand alone training.wvnet.edu instance of Blackboard facilitates online, on demand, training for educational services and state organizations including WVNET staff. The DLES staff assists employees in other WVNET service areas with the development of training materials to be delivered online and face to face. With the use of WebEx and other conferencing solutions, the DLES staff can also offer synchronous training from a distance.

Instructional design constitutes the bulk of work beyond training and GUI administration support. Part of this support is to develop a standardized course template based on the Quality Matters Rubric (QM), the industry standard for quality course design for online learning. The DLES teaches and distributes this template to all institutions and agencies during training. The template is also available on demand through training.wvnet.edu. As part of our commitment to our Blackboard hosted institutions, the DLES team schedules instructional design clinics on site to train faculty one on one and assist with course design based on best practices.

Because the DLES team works so closely with the GUI administration of our educational platforms and services, we have the most opportunity to speak with our constituents face to face through training and consultation, thus maintaining customer satisfaction. These close relationships with our customers enables us to promote best practices in software use and secure transmission of student information and data and to convey legislative updates on the same (i.e FERPA, COPPA, CIPPA). We liaise between the customer and the learning platform and can identify the

customer’s needs in the process, research a solution, and work within our direct report and oversight structure to apply the solution. Often these discussions lead to the negotiation of a statewide contract to provide a cost effective solution for all of our customers.

Members of the DLES team serve on WVNET standing committees such as the Conference Committee, the Grant Writing Committee, the Blackboard Oversight Committee, and the WVVLN to promote opportunities for educational advancement through technology and distance learning. Relationships define the work of the DLES.

<b>Goals</b>	<b>Actions</b>	<b>Outcomes</b>
Blackboard GUI support.	<ul style="list-style-type: none"> <li>● Research the latest updates, changes, patches, features, and functions.</li> <li>● Document known issues.</li> <li>● Test upgrades, changes, patches, features and functions prior to rollout.</li> <li>● Maintain Tier 2 &amp; 3 after hours call rotation for support tickets.</li> </ul>	<ul style="list-style-type: none"> <li>● Stable platform.</li> <li>● Increased platform knowledge and expertise for WVNET GUI administrators.</li> <li>● Expert 24/7 support for all GUI support tickets.</li> </ul>
Blackboard managed hosting.	<ul style="list-style-type: none"> <li>● Maintain regular contact with clients through customer satisfaction calls.</li> <li>● Discuss problems, issues, concerns, and solutions.</li> <li>● Assess customer’s needs.</li> <li>● Propose solutions to the Blackboard Oversight Committee.</li> <li>● Review and evaluate hosting costs, annually.</li> <li>● Determine the best hosting tier of service for each institution.</li> </ul>	<ul style="list-style-type: none"> <li>● Sustainable hosting model.</li> <li>● Continued excellence in customer relations.</li> <li>● Continued collaboration across service areas to resolve issues and build customized solutions.</li> <li>● Consistency in the quality of service and support across all instances of Blackboard.</li> </ul>

	<ul style="list-style-type: none"> <li>● Research, develop, and implement custom applications for features and functions that meet customers' institutional needs.</li> <li>● Coordinate leave schedules for essential staff with other service areas to ensure the best support during mission critical times (i.e. semester start).</li> </ul>	
Blackboard cross-training program for WVNET NOC staff.	<ul style="list-style-type: none"> <li>● Attend Blackboard Webinars, conferences, and regional meetings for staff training.</li> <li>● Create Blackboard training materials and post them online on training.wvnet.edu.</li> <li>● Research software updates, changes, plugins, building blocks and customizable solutions.</li> <li>● Create release notes on known issues, features, and functions.</li> <li>● Schedule regular training sessions for network operators.</li> </ul>	<ul style="list-style-type: none"> <li>● Increase the knowledge, skills, and abilities of support staff.</li> <li>● Circumvent unnecessary strain on WVNET's budget, time, and resources.</li> <li>● Remain current on software trends, and vulnerabilities.</li> <li>● Anticipate and test potential threats before they occur.</li> </ul>
Best practices in distance learning	<ul style="list-style-type: none"> <li>● Share/Maintain/Update the QM Template.</li> <li>● Instructional design.</li> <li>● Discuss best practices during faculty and staff training.</li> <li>● Include Section 508 accessibility</li> </ul>	<ul style="list-style-type: none"> <li>● Reduced support calls for Blackboard GUI technical issues.</li> <li>● Increased accessibility for all users.</li> <li>● More secure transmission of student information.</li> </ul>



	<p>information during faculty and staff training.</p> <ul style="list-style-type: none"> <li>● Offer FERPA, CIPPA, COPPA training to faculty and staff.</li> </ul>	
WVVLN liaison.	<ul style="list-style-type: none"> <li>● Maintain ex-officio membership.</li> <li>● Attend statewide meetings.</li> <li>● Participate in conference calls.</li> <li>● Network with members.</li> <li>● Convey institutions' respective needs to WVNET's Procurement Officer.</li> </ul>	<ul style="list-style-type: none"> <li>● Sustainable relationships with institutions of higher education.</li> <li>● Build stakeholder base and buy in for statewide initiatives.</li> <li>● Expanded network of contacts for shared services and costs to achieve an economy of scale.</li> <li>● Increased opportunities to build customized solutions to fulfill the needs of educational institutions.</li> </ul>
Statewide Director of e-Learning collaboration.	<ul style="list-style-type: none"> <li>● Meet regularly with the Director of e-learning to coordinate joint initiatives.</li> <li>● Consult on QM training and QM template reviews and revisions.</li> <li>● Model QM tenets instructional design in all training and online course builds.</li> </ul>	<ul style="list-style-type: none"> <li>● Increase opportunities for collaboration and cost sharing for statewide initiatives.</li> <li>● Consistent quality in online course design.</li> </ul>
DLES staff development and growth.	<ul style="list-style-type: none"> <li>● Revise on-site training policies.</li> <li>● Improve and increase access to affordable training.</li> <li>● Implement on-site training program.</li> </ul>	<ul style="list-style-type: none"> <li>● Increased staff knowledge and productivity.</li> <li>● Increased staff efficiency.</li> </ul>

	<ul style="list-style-type: none"> <li>● Develop guidelines for WVNET hosted off-site training.</li> <li>● Develop guidelines for off-site training for staff professional development.</li> <li>● Create database for employee training/certifications, KSA's.</li> <li>● Offer cross training activities.</li> <li>● Schedule cross training activities.</li> <li>● Work with the DLES team of instructional designers to create "home grown" training materials for software and services in other areas to offer to customers.</li> </ul>	<ul style="list-style-type: none"> <li>● Increased depth of knowledge across service areas.</li> <li>● Maintain excellent customer service.</li> <li>● Reduced reliance on costly vendor training materials.</li> <li>● Improved staff motivation, success, and longevity.</li> </ul>
<p>WVROCKS automated processes.</p>	<ul style="list-style-type: none"> <li>● Work with Applications to create an Argos dashboard to access enrollment data in real time.</li> <li>● Maintain an archive of data files in a secure location with limited access permissions.</li> <li>● Work with Systems programmers to write a custom report to query login and activity within all session courses.</li> <li>● Work with Media services team to create a custom web application to field help desk call.</li> </ul>	<ul style="list-style-type: none"> <li>● Access to real time data for accuracy.</li> <li>● Streamlined billing processes.</li> <li>● Real time record of enrollment additions and withdrawal dates.</li> <li>● Higher student retention.</li> <li>● Up to date global reports on student and instructor activity.</li> <li>● Fast and efficient resolution for WVROCKS, content errors and technical issues.</li> </ul>

		<ul style="list-style-type: none"> <li>• Reduced strain on administrative staff.</li> </ul>
<p>WVROCKS Administrative Support.</p>	<ul style="list-style-type: none"> <li>• Maintain Associate Director status and perform duties as assigned by the WVROCKS Director.</li> <li>• Liaise with RBA coordinators regarding students at risk.</li> <li>• Liaise with Student Service personnel at participating institutions.</li> <li>• Create training materials for WVROCKS instructors and students.</li> <li>• Administer training and orientation to WVROCKS faculty and students via face to face and webinars.</li> <li>• Create new session courses and copy content.</li> <li>• Communicate regularly with instructors and students regarding dates, deadlines, and issues.</li> <li>• Administer the WVROCKS instance of Blackboard.</li> <li>• Oversee "in-house" revision and instructional design of courses.</li> <li>• Query raw data for grade reports and retention.</li> </ul>	<ul style="list-style-type: none"> <li>• Inter-departmental collaboration and communication to affect improvement in operation, procedure, and efficiency.</li> <li>• Higher student retention.</li> <li>• Technically savvy instructional staff and students.</li> <li>• Instructors have excellent knowledge of WVROCKS policies and procedures.</li> <li>• Accurate institutional research data.</li> <li>• Quality Matters compliance assurance.</li> <li>• Accurate personnel files for compliance audits and payroll.</li> </ul>

	<ul style="list-style-type: none"> <li>• Correspond with faculty regarding personnel forms.</li> <li>• Maintain WVROCKS instructor personnel files.</li> </ul>	
New WVROCKS website.	<ul style="list-style-type: none"> <li>• Collaborate with the Director, HEPC Marketing, RBA Coordinators and key staff to develop a design.</li> <li>• Work with the Media Services Web Team to build a new website.</li> <li>• Conduct a stakeholder preview of the website for comments and suggestions for revision.</li> <li>• Launch the website.</li> </ul>	<ul style="list-style-type: none"> <li>• Centralized location for disseminating information to general public.</li> <li>• Marketing support for participating institutions.</li> <li>• Recruitment support for the RBA program.</li> <li>• Higher enrollments.</li> </ul>

## **Addendum A**

### **WVNET Member Institutions**

#### **Public Institutions**

Bluefield State College  
Concord University  
Fairmont State University  
Glennville State College  
Marshall University  
Potomac State College of WVU  
Shepherd University  
West Liberty University  
WV School of Osteopathic Medicine  
West Virginia State University  
West Virginia University  
WVU Institute of Technology  
WVNET (central site)  
Community and Technical Colleges  
Blue Ridge Community and Technical College  
Eastern West Virginia Community and Technical College  
Jackson County Center of WVU at Parkersburg  
Bridge Valley Community and Technical College  
Mountwest Community and Technical College  
New River Community and Technical College  
Pierpont Community and Technical College  
Southern West Virginia Community and Technical College  
West Virginia Northern Community College  
West Virginia University at Parkersburg

#### **Private Institutions**

Alderson-Broadus College  
Appalachian Bible College  
Bethany College  
The College of West Virginia  
Davis & Elkins College  
Ohio Valley College  
Salem-Teikyo University  
The University of Charleston  
West Virginia Wesleyan College  
Wheeling Jesuit University

#### **State Government**

West Virginia Department of Health and Human Resources  
K-12 Schools

