EASTERN WEST VIRGINIA COMMUNITY AND TECHNICAL COLLEGE
REGULATION NO. – 6.12

TITLE: **Server Virtualization**

DEFINITION: The purpose of this regulation is to establish server virtualization policy and standards for the college's network servers. Virtualization is a key component of an effort designed to increase efficiency and security while decreasing the complexity and overall cost of ownership. The implementation of virtualization technology offers tangible benefits that can be easily measured and quickly realized. Cost savings are a direct result of increased resource utilization, reduction in physical footprint, and reduced support overhead through enhanced provisioning abilities and centralized management. In addition, a virtualized environment provides a cost- effective medium for disaster recovery planning.

EFFECTIVE DATE: March 22, 2017

SCOPE: The Technology Services Unit of Eastern has a responsibility to ensure the effective use of virtualization for the effective utilization of college resources and the protection of college information.

REGULATION STATEMENT:

Virtualization and hypervisor technology are not new concepts. Mainframes, for example, have been utilizing virtual machines for many years. Running a hypervisor or a virtualization technology on an Intel or x86-based server platform, however, is a newer development. Until recently, the benefits of a virtualized environment were constrained to mainframe environments and the general mindset for maintaining and provisioning hardware in an x86-based server environment called for adding servers per applications on a nearly one-for-one basis. Administrators would often deploy one physical server to dedicate to each individual application performing at least one important task. This problem is further compounded when, as is typically the case, enterprise applications require multiple physical servers for their various components (e.g., the application itself, middleware, database server).

The consequence of current information technology practice is gross resource under- utilization as most applications do not require constant machine utilization, but rather only for relatively short bursts at various intervals (e.g., specific times of day, weekly). Applications need to reside on a server robust enough to handle the times of peak utilization, regardless of how short the duration might be of the peak utilization. In addition to resource underutilization, current practices result in other inefficiencies, costs, and challenges including but not limited to:

- Large network infrastructure and physical space footprint;
- Logistical and time difficulties ordering, purchasing, and setting up of new servers;
- Planning of legacy application migration;
- Scalability of existing and new hardware; and
- Planning for disaster recovery.

Reducing or eliminating servers can result in reducing complexities in these other areas with the potential for tremendous cost savings.

Virtualization technologies provide solutions that can help mitigate all of the problems previously mentioned. It does so by increasing the efficiency of existing resources, increasing the ability to scale existing infrastructure, and substantially reducing the time and effort involved in provisioning new servers while reducing the overall physical footprint of the server environment.

Industry research consistently reveals that servers in a distributed computing environment sit mostly idle. Forrester analysts state that Windows servers typically run at 8 percent to 12 percent of their full capacity and UNIX servers use only 25 percent to 30 percent. IBM stated that when they conducted baseline testing, they observed CPU utilization rates of 3 percent to 7 percent. IT departments that virtualize their environments generally see an average CPU utilization in the 40 percent to 80 percent range, depending on the setup and the type of applications that are virtualized.

Legacy application migration to new hardware platforms is a point of contention for IT support staffs. Changes in hardware technology due to innovation and the need to upgrade or scale to gain more performance make it difficult for staff to maintain applications and operation systems throughout the various and relatively short hardware life cycles. Porting applications to the latest hardware platforms can be difficult, or even impossible, because of lack of backwards compatibility and support. Virtualization provides a solution for this problem because it utilizes industry standard hardware in its virtualized environment to ensure backwards compatibility. The virtualization layer itself provides a

buffer between the actual physical hardware, so as far as a server running inside as a virtual machine is concerned, it is unaware that it has been migrated and is now running on a new hardware platform.

Another substantial benefit that virtualization provides is ease of server provisioning. The development, testing and deployment of applications across environments can be a relatively demanding proposition. Typically, a server needs to be setup physically before an application begins a development and testing process. Once complete, the application is moved to another server for production deployment. The original server setup for development and/or testing may then need to be physically removed or reconfigured for some other purpose. Because servers can simply be created and deleted logically as necessary, the use of virtualization for provisioning, in this scenario, provides significant costs savings by greatly reducing the time and effort involved. Servers can be created and deployed for use literally in minutes instead of days or weeks.

New projects implementing the use of virtualization technologies are to adhere to the policy and standards contained in this policy. If virtualization is being considered for a server, it is recommended that a baseline be performed and that a cost/benefit analysis be conducted. Information obtained from the baseline and cost/benefit analysis should be evaluated before virtualization is used.

DEFINITIONS:

Hypervisor: A piece of computer software, firmware, or hardware that creates and runs virtual machines. A computer on which a **hypervisor** runs one or more virtual machines is called a host machine, and each virtual machine is called a guest machine.

Virtual: A server that does not physical existing as such but made by software to appear to do so.

Virtualization: In computing, **virtualization** refers to the act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, operating systems, storage devices, and computer network resources.

ENFORCEMENT: Any person found to be in violation of this regulation will be subject to appropriate disciplinary actions as defined by current college policy.

DR. CHARLES TERRELL, PRESIDENT

3/24/17
DATE

Approved by Technology Committee 12/1/2016

Approved by IET 2/6/17

Approved by President's Cabinet 2/28/17

14 day comment period 3/9/17 – 3/22/17