

ITS439: Virtualization Technology Fundamentals

Credit Hours: 3

Contact Hours: This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

Faculty Information



Faculty contact information and office hours can be found on the faculty profile page.

Course Description and Outcomes



Course Description:

This course provides students with an introduction to the concept of virtualization. Virtualization is achieved through the use of both hardware and software in a manner that gives the perception that a physical environment exists when, in fact, it may not. Students will understand how operating systems in a computer utilize virtual memory to provide applications with the ability to run better and faster without adding more physical memory. Students will explore the concept of server virtualization, which similarly gives the appearance and benefit of having multiple processors running simultaneously. Students will evaluate the present status and future direction of virtualization. Actual virtualization software will be used to provide students with a real-world experience. This course aligns with the VMware Data Center Virtualization Fundamentals certification.

Course Overview:

ITS439 is one of the courses in computer technology at CSU-Global where students learn about the basics of virtualization technology. This course was designed for students with no prior knowledge of virtualization technology. In this course, students are introduced to the basic concepts of computer virtualization. Students will begin the course by learning about mainframes and then move onward to information regarding the latest computing technologies. Students are introduced to the current software offerings, which provide the virtualization layer.

Students also learn to create virtual machines and will be installing Windows on a virtual machine, managing CPUs for a virtual machine, managing memory for a virtual machine, managing storage for a virtual machine, managing networking for a virtual machine, copying a virtual machine, and managing additional devices in a virtual machine. Finally, students will also learn the importance of availability and will understand applications in a virtual machine.

In full, this course teaches virtualization technology using a hands-on approach. Students are able to gain mastery of these skills by performing the practical exercises within the modules. After the successful completion of this course, students will be able to install and manage virtual machines that are used in the workplace. The course, thus, prepares students for entry-level IT roles in server administration and virtualization.

Course Learning Outcomes:

1. Discuss various concepts and uses of desktop and server virtualization in the workplace.
2. Compare and contrast desktop and server virtualization.
3. Evaluate the implementation and use of virtualization software.
4. Analyze business requirements in forming a recommendation of a virtualization solution.
5. Discuss emerging virtualization trends and their impact on the workplace.

Participation & Attendance



Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

Course Materials



Required:

Portnoy, M. (2012). *Virtualization essentials* (1st ed.). New York, NY: Sybex Publishers. ISBN-13: 978-1118176719

For this course, students must have access to the downloadable software, as outlined below:

VMware Workstation 11.1.2 - <https://portal.csuglobal.edu/student/microsoft-imagine>

Windows Server 2012 r2 Essentials- <https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2012-r2-essentials>

Students must have access to a computer or laptop throughout the entire course in order to complete the course activities.

NOTE: All non-textbook required readings and materials necessary to complete assignments, discussions, and/or supplemental or required exercises are provided within the course itself. Please read through each course module carefully.

Course Schedule



Due Dates

The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- Discussion Boards: The original post must be completed by Thursday at 11:59 p.m. MT and Peer Responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- Opening Exercises: Take the opening exercise before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The opening exercises will not affect your final grade.
- Mastery Exercises: Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- Critical Thinking: Assignments are due Sunday at 11:59 p.m. MT.

Week #	Readings	Assignments
1	<ul style="list-style-type: none"> • Chapter 1 in <i>Virtualization Essentials</i> • The function and importance of server virtualization management tools. (2016, August 20). <i>ICT Monitor Worldwide</i>. • Wexler, S. (2012). The importance of storage virtualization. <i>Network Computing – Online</i>. 	<ul style="list-style-type: none"> • Discussion (25 points) • Opening Exercise (0 points) • Mastery Exercise (10 points) • Critical Thinking (60 points) • Portfolio Project Milestone (30 points)
2	<ul style="list-style-type: none"> • Chapter 2 in <i>Virtualization Essentials</i> • Lewis, M., & Padmanabhan, P. (2010). Best approach to virtual desktops: Client- or server-side hypervisors? <i>Network World</i>, 27(18), 32, 34. • Wang, Z. (2012). <i>Securing virtualization: Techniques and applications</i> (Doctoral Dissertation). 	<ul style="list-style-type: none"> • Discussion (25 points) • Opening Exercise (0 points) • Mastery Exercise (10 points) • Critical Thinking (60 points) • Portfolio Project Milestone (30 points)
3	<ul style="list-style-type: none"> • Chapters 3 and 4 in <i>Virtualization Essentials</i> • Quinn, G. (2016, December 17). An Overview of the U.S. Patent Process. Retrieved November 09, 2017 • Vaghani, S. (2015, March 23). Four Patents That Changed Enterprise Storage. Retrieved November 09, 2017 	<ul style="list-style-type: none"> • Discussion (25 points) • Opening Exercise (0 points) • Mastery Exercise (10 points) • Critical Thinking (60 points) • Portfolio Project Milestone (30 points)
4	<ul style="list-style-type: none"> • Chapters 5 and 6 in <i>Virtualization Essentials</i> • Goldszmidt, J. (2014). <i>A look into virtual machine malleability</i> (Doctoral Dissertation). (1563380824). • International Business Machines Corporation; "Optimization of virtual machine sizing and consolidation" in patent application approval process. (2014). <i>Politics & Government Week</i>, 2814. 	<ul style="list-style-type: none"> • Discussion (25 points) • Opening Exercise (0 points) • Mastery Exercise (10 points) • Critical Thinking (60 points) • Portfolio Project Milestone (30 points)
5	<ul style="list-style-type: none"> • Chapters 7 and 8 in <i>Virtualization Essentials</i> • Computer companies; patent issued for system and method for improving memory usage in virtual machines (USPTO 9256469). (2016). <i>Computer Weekly News</i>, 2559. • Patents; researchers submit patent application, "information processing device and resource 	<ul style="list-style-type: none"> • Discussion (25 points) • Opening Exercise (0 points) • Mastery Exercise (10 points) • Critical Thinking (65 points) • Portfolio Project Milestone (30 points)

	allocation method", for approval (USPTO 20160004554). (2016). <i>Politics & Government Week</i> , 8800.	
6	<ul style="list-style-type: none"> Chapters 9 and 10 in <i>Virtualization Essentials</i> Patents; researchers submit patent application, "Automatically managing the storage of a virtual machine," for approval (USPTO 20160320979). (2016). <i>Computer Weekly News</i>, 1301. Patents; researchers submit patent application, "Information processing device and resource allocation method," for approval (USPTO 20160004554). (2016). <i>Politics & Government Week</i>, 8800. 	<ul style="list-style-type: none"> Discussion (25 points) Opening Exercise (0 points) Mastery Exercise (10 points) Critical Thinking (65 points) Portfolio Project Milestone (30 points)
7	<ul style="list-style-type: none"> Chapters 11 and 12 in <i>Virtualization Essentials</i> Andres, L., Whitney, J. A., Bryant, R., Patchin, P., Brudno, M., De Lara, E., & ... Adin, S. (2011). SnowFlock: Virtual machine cloning as a first-class Cloud primitive. <i>ACM Transactions on Computer Systems</i>, 29(1), 1-45. Fujitsu limited; patent issued for cloning virtual machines based on identical hardware configuration. (2014). <i>Computer Weekly News</i>, 1969. 	<ul style="list-style-type: none"> Discussion (25 points) Opening Exercise (0 points) Mastery Exercise (10 points)
8	<ul style="list-style-type: none"> Chapters 13 and 14 in <i>Virtualization Essentials</i> Kimura, N., Yamada, A., Seshake, H., & Nishizono, T. (2006). High-availability server platform for IP communication services. <i>Electronics & Communications In Japan, Part 1: Communications</i>, 89(6), 41-50. Microsoft announces general availability of virtual server 2005. (2004, September 13). <i>PR Newswire</i>. 	<ul style="list-style-type: none"> Discussion (25 points) Opening Exercise (0 points) Mastery Exercise (10 points) Portfolio (170 points)

Assignment Details



This course includes the following assignments/projects:

Module 1

CRITICAL THINKING ASSIGNMENT

Lab-Virtualization Application Installation (60 points)

Since this course focuses on the topic of virtualization and understanding how to apply/utilize virtualization technological principles, only one Critical Thinking Assignment option is offered throughout the weeks. The assignment is a lab and is required for completion during Weeks 1 to 6.

For this Critical Thinking Assignment, you will need to download VMware software.

In this hands-on activity, you will install a new VMware workstation software on your computer. Your installation should include only the product installation file (.exe). No additional files are required.

To complete this downloading requirement, please do the following:

- Download VMware to a folder on your computer. Save a screenshot of the folder showing the installation file.
- Double-click the installation file to start the installation. Choose the default options presented to you. Save a screenshot of each installation screen.
- After the installation is completed, launch the VMware Workstation from Windows start menu. After the VMWare Workstation has opened, go to the home screen. Save a screenshot of the home screen.

Deliverable: After you have completed these steps, submit one Microsoft® (MS) Word document that contains all screen shots. Then, after you have uploaded these screenshots into a document, complete a 1-page writing assignment in the same document, below the screenshots. Within your paper, analyze any system configuration changes in the Windows environment which occurred/resulted from this installation, and list the steps taken to revise these changes.

Your paper should be at least 1 page in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

PORTFOLIO PROJECT MILESTONE

Importance of Virtualization (30 points)

For this course, which is different than in other courses, there is only one Portfolio Project option. Throughout each week of this course, except for during Week 7, students will be completing Portfolio Project Milestones, which will be awarded points. Each of these Portfolio Project Milestones is worth 30 points.

Recently, Oza Corporation, a local Denver-based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department's yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support the additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Deliverable: Within the initial submission of your Project Milestone, for Week 1, describe the importance of virtualization. Discuss the reasons why the organization should consider virtualization. Your paper should be at least 2 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Module 2

CRITICAL THINKING ASSIGNMENT

Lab-Installing a Virtual Machine (60 points)

Since this course focuses on the topic of virtualization and understanding how to apply/utilize virtualization technological principles, only one Critical Thinking Assignment option is offered throughout the weeks. The assignment is a lab and is required for completion during Weeks 1 to 6.

For this Critical Thinking Assignment, you will need to download the ISO copy of Windows 2012 Server R2 Essentials. You can download the ISO version from the Microsoft website located at the following link: <https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2012-r2-essentials>

In this hands-on activity, you will install a new Virtual Machine on the VMware Workstation. To complete this downloading requirement, please do the following:

- Download Windows 2012 r2 Essentials ISO copy to a folder on your computer. Then, save a screenshot of the folder showing the installation file.
- Launch the VMware Workstation from your computer. On the home screen, click on “Create a New Virtual Machine.” On the New Virtual Machine Wizard, select the “Typical (recommended)” option. Save a screenshot of the screen.
- On the “Guest Operating System Installation” screen, select the “Installer disk image file (ISO)” option. Browse to the location on your computer where Windows 2012 r2 was downloaded and select the file. Save a screenshot of the screen.
- On the “Easy install information,” select “Windows Server 2012 R2 Standard” as the version of Windows to install. Save a screenshot of the screen.
- On the “Name the Virtual Machine” page, please provide a friendly name that you want to use for this virtual machine. For example: Smith–Windows 2012 server. Also, specify the location on your computer where the virtual machine should be stored. Save a screenshot of the screen.
- On the “Specify Disk Capacity” page, select the default settings. Save a screenshot of the screen.
- On the “Ready to Create the Virtual Machine,” save a screenshot of the screen. Click on finish to create the virtual machine.
- At this point, VMWare should start the virtual machine and display the Windows 2012 setup page in a Windows Server 2012 tab. Save a screenshot of the Windows Server 2012 screen showing the installation process.
- Wait until VMware completes the Windows Server 2012 installation. When the installation is complete, save a screenshot of the screen.

Deliverable: After you have completed these steps, submit one Microsoft® (MS) Word document that contains all screen shots, which are clearly labeled. Then, write a short entry discussing any lessons learned and issues you encountered, as well as how these issues were solved during this exercise.

Your paper should be at least 1 page in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global’s APA requirements.

Note: Do not make any other changes to the VMware Workstation, as you will use this for hands-on projects in upcoming modules.

PORTFOLIO PROJECT MILESTONE

Architecture of a Popular Hypervisor (30 points)

For this course, which is different than in other courses, there is only one Portfolio Project option. Throughout each week of this course, except for during Week 7, students will be completing Portfolio Project Milestones, which will be awarded points. Each of these Portfolio Project Milestones is worth 30 points.

Recently, Oza Corporation, a local Denver-based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department's yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Deliverable: Within the initial submission of your Project Milestone, for Week 2, search the internet and the course text and locate one of the popular hypervisors. Describe the architecture of a popular hypervisor. Your paper should be at least 2 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Module 3

CRITICAL THINKING ASSIGNMENT

Lab-Exploring a Virtual Machine Environment (60 points)

Since this is a course that is focused on the topic of virtualization and understanding how to apply/utilize virtualization technological principles, only one Critical Thinking Assignment option is offered throughout the weeks. The assignment is a lab and is required for completion during Weeks 1 to 6.

For this hands-on activity, you will need to work inside the Windows 2012 Server virtual machine, which you installed during the Module 2 Critical Thinking Assignment.

To complete this requirement, you must do the following:

- Launch the VMware Workstation from your computer. Start the Windows 2012 Server virtual machine. Save a screenshot of the screen.
- Login to the Windows 2012 Server. Save a screenshot of the Windows 2012 Server desktop.
- Open the Windows control panel and go to Systems page, displaying the system information. Save a screenshot of the screen.
- Open Windows Explorer, and open the "This PC" or "My Computer" screen showing the system "folders" and "devices and drives." Save a screenshot of the screen.
- Open the Network Adapter settings. The Network adapter can be accessed from the control panel, Network and Internet, Network and Sharing Center, or Change Adapter settings. Save a screenshot of the screen.

Deliverable: After you have completed these steps, submit one Microsoft® (MS) Word document that contains all screen shots, which are clearly labeled. Then, write a short paragraph discussing any lessons learned, issues you encountered, and how they were solved during this exercise.

Your paper should be at least 1 page in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Note: Do not make any other changes to the VMware Workstation, as you will use this for hands-on projects in upcoming modules.

PORTFOLIO PROJECT MILESTONE Virtual Machine Solution (30 points)

For this course, which is different than in other courses, there is only one Portfolio Project option. Throughout each week of this course, except for during Week 7, students will be completing Portfolio Project Milestones, which will be awarded points. Each of these Portfolio Project Milestones is worth 30 points.

Recently, Oza Corporation, a local Denver-based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department's yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Deliverable: Within the initial submission of your Project Milestone, for Week 3, search the internet and the course text, and recommend a virtual machine solution. Provide the rationale for your choice. Your paper should be at least 2 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Module 4

CRITICAL THINKING ASSIGNMENT

Lab-Exploring Virtual Machine Settings (60 points)

Since this course focuses on the topic of virtualization and understanding how to apply/utilize virtualization technological principles, only one Critical Thinking Assignment option is offered throughout the weeks. The assignment is a lab and is required for completion during Weeks 1 to 6.

For this hands-on activity, you will need to work inside the Windows 2012 Server virtual machine, which you installed during the Module 2 Critical Thinking Assignment.

To complete this requirement, you must do the following:

- Launch the VMware Workstation from your computer. Make sure the Windows Server 2012 virtual machine is not running. If it is running, power it off. On the left pane of VMware, single click on the Windows Server 2012 virtual to show the settings on the main window. Save a screenshot of the screen.
- Right click on the Windows Server 2012 virtual machine and click Settings. Under the Hardware tab, click on the memory device. Save a screenshot of the screen.
- Under the Hardware tab, click on the processors device. Save a screenshot of the screen.
- Under the Hardware tab, click on the hard disk device. Save a screenshot of the screen.
- Under the Hardware tab, click on the network device. Save a screenshot of the screen.
- Under the Hardware tab, click on the USB controller device. Save a screenshot of the screen.

Deliverable: After you have completed these steps, submit one Microsoft® (MS) Word document that contains all screen shots. Then, write a short paper entry in which you discuss any lessons learned and the issues you encountered, as well as how these issues were solved during this exercise.

Your paper should be at least 1 page in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Note: Do not make any other changes to the VMware Workstation, as you will use this for hands-on projects in upcoming modules.

PORTFOLIO PROJECT MILESTONE

Virtual Machine Configurations (30 points)

For this course, which is different than in other courses, there is only one Portfolio Project option. Throughout each week of this course, except for during Week 7, students will be completing Portfolio Project Milestones, which will be awarded points. Each of these Portfolio Project Milestones is worth 30 points.

Recently, Oza Corporation, a local Denver-based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department's yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Deliverable: Within the initial submission of your Project Milestone, for Week 4, search the internet and the course text, and recommend a virtual machine configuration(s). Provide the rationale for your choice. Your paper should be at least 2 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Module 5

CRITICAL THINKING ASSIGNMENT

Lab-Configure Virtual Machine CPU and Memory (65 points)

Since this is a course that is focused on the topic of virtualization and understanding how to apply/utilize virtualization technological principles, only one Critical Thinking Assignment option is offered throughout the weeks. The assignment is a lab and is required for completion during Weeks 1 to 6.

For this hands-on activity, you will need to work inside the Windows Server 2012 virtual machine environment that you created in Module 2 and configure the VMware settings of the virtual machine. The objective is to change the virtual machine CPU and Memory settings and verify the changes in the virtual machine environment.

To complete this requirement, you must do the following:

- Launch the VMware Workstation from your computer. Power on the Windows Server 2012 virtual machine. Log into Windows Server 2012 VM. Open Windows Control panel and go to the Systems page, displaying the “view basic information about your computer” page. Save a screenshot of the screen.
- Power off the Windows Server 2012 VM. Right click on the Windows Server 2012 VM and click Settings. Under the Hardware tab, click on the Memory device. On the main pane, increase the memory of the virtual machine by 1GB. Save a screenshot of the screen.
- Under the Hardware tab, click on the processors device. On the main pane, increase the number of processors to 2 and the number of cores per processor to 2. Save a screenshot of the screen.
- Power on the Windows Server 2012 VM. Open Windows Control panel and go to Systems page, displaying the “view basic information about your computer” page. Save a screenshot of the screen.

Deliverable: After you have completed the steps above, please submit one Microsoft® (MS) Word document that contains all screen shots. Write a short entry that discusses any lessons learned, as well as any issues that you encountered and how these issues were solved during this exercise.

Your paper should be at least 1 page in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global’s APA requirements.

PORTFOLIO PROJECT MILESTONE

Architecture of a Popular Hypervisor (30 points)

For this course, which is different than in other courses, there is only one Portfolio Project option. Throughout each week of this course, except for during Week 7, students will be completing Portfolio Project Milestones, which will be awarded points. Each of these Portfolio Project Milestones is worth 30 points.

Recently, Oza Corporation, a local Denver-based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department’s yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Deliverable: Within the initial submission of your Project Milestone, for Week 5, search the internet and the course text, and recommend the best approach for deploying applications in a virtual environment. Provide the rationale for your choice. Your paper should be at least 2 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Module 6

CRITICAL THINKING ASSIGNMENT

Lab-Configure Virtual Machine Storage and Networking (65 points)

Since this course focuses on the topic of virtualization and understanding how to apply/utilize virtualization technological principles, only one Critical Thinking Assignment option is offered throughout the weeks. The assignment is a lab and is required for completion during Weeks 1 to 6.

For this hands-on activity you will need to work inside the Windows Server 2012 virtual machine environment, which you created in the Module 2 Critical Thinking Assignment and during other weeks, when you configured the VMware settings of the virtual machine. The objective of this Critical Thinking Assignment is to change the virtual machine storage and networking settings, and verify the changes in the virtual machine environment.

To complete this requirement, you must do the following:

- Launch the VMware Workstation from your computer. Power on the Windows Server 2012 virtual machine. Log into Windows Server 2012 VM. Open Windows Control panel and go to the systems page, displaying the "view basic information about your computer" page. Save a screenshot of the screen.
- Power off the Windows Server 2012 VM. Right click on the Windows Server 2012 VM and click Settings. Under the Hardware tab, click on the Hard Disk device. On the main pane, click on Expand button. Increase the maximum disk space by 2 GB. Save a screenshot of the screen.
- Under the Hardware tab, click on the Network Adapter device. On the main pane, click on the Bridge option. Leave the checkbox unchecked. Save a screenshot of the screen.
- Power on the Windows Server 2012 VM. Open Windows Explorer, open the "This PC" or "My Computer" screen showing the system "folders" and "devices and drives." Save a screenshot of the screen.
- Open the Network Adapter settings. The Network adapter can be accessed from the Control panel, Network and Internet, Network and Sharing Center, Change Adapter settings. Save a screenshot of the screen.

Deliverable: After you have completed these steps, submit one Microsoft® (MS) Word document that contains all screen shots. Then, write a short paper entry in which you discuss any lessons learned and the issues that you encountered, as well as how these issues were solved during this exercise.

Your paper should be at least 1 page in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

PORTFOLIO PROJECT MILESTONE

Design Layout of the Data Center (30 points)

For this course, which is different than in other courses, there is only one Portfolio Project option. Throughout each week of this course, except for during Week 7, students will be completing Portfolio Project Milestones, which will be awarded points. Each of these Portfolio Project Milestones is worth 30 points.

Recently, Oza Corporation, a local Denver based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department's yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Deliverable: Within the initial submission of your Project Milestone, for Week 6, using Microsoft Visio or any open source design tool (such as Dia), propose a design layout of the data center infrastructure environment using server virtualization. Insert the design into a word document. Your paper should be at least 2 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Module 8

FINAL PORTFOLIO PROJECT

Enterprise Virtualization Implementation Proposal (170 points)

Recently, Oza Corporation, a local Denver based mobile phone service provider, announced plans to expand its business operations on a national basis within the United States. The Oza data center is based in Denver, Colorado and currently houses the following physical hardware:

- Six web servers
- Five database servers
- 15 file servers
- Seven application servers
- Gigabit Ethernet network
- Several network routers and switches
- Telephony equipment

There are currently 25 employees working in the Oza IT Department. These employees comprise database administrators, systems administrators, help desk support engineers, software developers, and managers. The IT Department's yearly operational cost is \$3.5 million.

The Chief Information Officer of Oza Corporation is concerned that the building space in the existing data center is inadequate to support additional server hardware required for the proposed business expansion and thus, she asks you to provide a recommendation for addressing the data center limitation.

Your proposal should include the following criteria and the reasoning behind your choices:

- A description of the importance of virtualization

- A description of the architecture of a popular hypervisor
- Recommendations for a virtual machine solution
- Recommendations for virtual machine configurations
- Recommendations for the best approach to deploy applications in a virtual environment
- Proposal for a design layout of the data center infrastructure environment through the use of server virtualization

Deliverable:

Your paper should be 8-10 pages in length; include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references. References must be formatted in accordance with CSU-Global's APA requirements.

Course Policies



Course Grading

20% Discussion Participation
 0% Opening Exercises
 8% Mastery Exercises
 37% Critical Thinking Assignments
 35% Final Portfolio Project

Grading Scale and Policies

A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

In-Classroom Policies

For information on late work and incomplete grade policies, please refer to our [In-Classroom Student Policies and Guidelines](#) or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

Academic Integrity

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /re-purposing your own work (see *CSU-Global Guide to Writing and APA Requirements* for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

Citing Sources with APA Style

All students are expected to follow the *CSU-Global Guide to Writing and APA Requirements* when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the "APA Guide & Resources" link. A link to this document should also be provided within most assignment descriptions in your course.

Disability Services Statement

CSU–Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom.

If you have concerns about something that has been said, please let your instructor know.