



Western Technical College

10150146 Virtualization and Cloud Security

Course Outcome Summary

Course Information

Description	Students are introduced to virtualization and storage management concepts using VMware server virtualization products. This hands-on training course explores installation, configuration, and management of VMware® vSphere™, which consists of VMware ESXi/ESX™ and VMware vCenter™ Server.
Career Cluster	Information Technology
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	90

Textbooks

MindTap for Hands-On Virtual Computing, 2nd Edition. Copyright 2018. Simpson, Ted and Jason Novak. Publisher: Cengage Learning. **ISBN-13:** 978-1-337-28922-1. Required.

Course Competencies

1. Evaluate the role of Virtualization in a network.

Assessment Strategies

1.1. Written Objective Test

Criteria

You will know you are successful when

- 1.1. you identify physical reasons for implementing virtualization in a network
- 1.2. you describe the advantages of a virtualized network
- 1.3. you describe the disadvantages of a virtualized network
- 1.4. you identify virtualization budget and sustainability constraints

Learning Objectives

- 1.a. Identify benefits and drawbacks of virtualization
- 1.b. Determine the feasibility of virtualization
- 1.c. Describe the role of virtualization in a network
- 1.d. Describe sustainability as it pertains to virtualization.
- 1.e. Examine the role of a virtual switch in a hypervisor

2. Evaluate types of hypervisors across operating system platforms.

Assessment Strategies

2.1. Written Objective Test

Criteria

You will know you are successful when

- 2.1. you identify various platforms available for hypervisor implementations
- 2.2. you describe advantages and disadvantages of various hypervisor platforms
- 2.3. you evaluate benefits of various hypervisor platforms on networks
- 2.4. you identify host operating systems for hypervisors
- 2.5. you identify advantages and disadvantages of cloud based virtualization
- 2.6. you explore hardware requirements for various hypervisors
- 2.7. you estimate hypervisor system requirements for various virtual machine configurations

Learning Objectives

- 2.a. Identify types of hypervisors
- 2.b. Differentiate between type 1 and type 2 hyper-visors
- 2.c. Differentiate between hardware requirements for physical and virtual machines
- 2.d. Examine physical needs of a virtualized datacenter
- 2.e. Explore the difference between open source and commercial hypervisors

3. Implement an open source hypervisor.

Assessment Strategies

3.1. Skill Demonstration

Criteria

You will know you are successful when

- 3.1. you install an open source hypervisor
- 3.2. you install a Windows server class virtual machine
- 3.3. you install a Windows class client
- 3.4. you configure network connectivity between virtual computers
- 3.5. you configure a virtual machine from a pre-configured base virtual machine
- 3.6. you configure a virtual switch using an open source hypervisor

Learning Objectives

- 3.a. Identify the characteristics of an open source hypervisor
- 3.b. Describe the benefits of an open source hypervisor in a network
- 3.c. Identify the operating systems that can be run as virtual machines in open source hypervisors
- 3.d. Describe the role of virtualized networking in an open source hypervisor
- 3.e. Assess the value of an open source virtual switch

4. Implement VMware hypervisor.

Assessment Strategies

4.1. Skill Demonstration

Criteria

You will know you are successful when

- 4.1. you list current versions of VMware
- 4.2. you describe versions and compatibility between VMware versions
- 4.3. you install a Windows server class virtual machine
- 4.4. you install a Windows class client
- 4.5. you configure network connectivity between virtual computers
- 4.6. you configure SAN storage
- 4.7. you configure NAS storage
- 4.8. you configure a virtual machine from a pre-configured base virtual machine
- 4.9. you configure a datacenter using VMware
- 4.10. you configure a virtual switch using VMware

Learning Objectives

- 4.a. Identify the characteristics of VMware hypervisor
- 4.b. Describe the benefits of a VMware hypervisor
- 4.c. Identify the constraints of running Windows operating systems in VMware
- 4.d. Differentiate between SAN and NAS storage within VMware
- 4.e. Identify the purpose of a datacenter in VMware
- 4.f. Describe the role of virtualized networking in VMware
- 4.g. Assess the value of a VMware virtual switch

5. Implement Windows Hyper-V hypervisor.

Assessment Strategies

- 5.1. Skill Demonstration

Criteria

You will know you are successful when

- 5.1. you list available hyper-V compatibility
- 5.2. you configure Hyper-V on a Windows server machine
- 5.3. you install a Windows server class virtual machine
- 5.4. you install a Windows class client
- 5.5. you configure network connectivity between virtual computes
- 5.6. you configure a SAN on a Windows network
- 5.7. you configure a NAS on a Windows network
- 5.8. you configure a virtual machine from a base pre-configured virtual machine
- 5.9. you configure a datacenter using Hyper-V
- 5.10. you configure a virtual switch using Hyper-V

Learning Objectives

- 5.a. Identify the characteristics of a Hyper-V hypervisor
- 5.b. Describe the benefits of Hyper-V in a Windows network
- 5.c. Identify the constraints of running Windows operating systems in Hyper-V
- 5.d. Differentiate between SAN and NAS storage within Hyper-V
- 5.e. Identify the purpose of a datacenter in Hyper-V
- 5.f. Describe the role of virtualized networking in Hyper-V
- 5.g. Assess the value of a Hyper-V virtual switch

6. Create a virtualized Windows domain environment.

Assessment Strategies

- 6.1. Skill Demonstration

Criteria

You will know you are successful when

- 6.1. you configure a Windows domain on an open source hypervisor
- 6.2. you configure a Windows domain on a VMware hypervisor
- 6.3. you configure a Windows domain on a Hyper-V hypervisor
- 6.4. you configure a Windows domain controller, member server, and client as part of the domain
- 6.5. you configure a Windows server in the cloud as part of the domain

Learning Objectives

- 6.a. Determine the value of running a Windows domain in a virtual network
- 6.b. Differentiate between running a physical and virtual Windows server

7. Design a backup strategy for a hypervisor platform.

Assessment Strategies

- 7.1. Skill Demonstration

Criteria

You will know you are successful when

- 7.1. you configure backup software for a hypervisor
- 7.2. you restore a virtual machine from backup media
- 7.3. you describe options for backing up and restoring virtual machines

- 7.4. you explore various backup options for virtualized machines
- 7.5. you explore various virtual environments for virtualized datacenters

Learning Objectives

- 7.a. Differentiate between physical and virtual backups
- 7.b. Differentiate between backup software options for virtual machines
- 7.c. Explore backup software for hypervisor platforms

8. Implement virtual machine and storage migrations

Assessment Strategies

- 8.1. Skill Demonstration

Criteria

You will know you are successful when

- 8.1. you configure a virtual machine migration using VMware
- 8.2. you configure a virtual machine migration using Hyper-V
- 8.3. you configure a physical to virtual machine migration using VMware
- 8.4. you configure a physical to virtual machine migration using Hyper-V
- 8.5. you configure virtual storage migration using VMware
- 8.6. you configure virtual storage migration using Hyper-V

Learning Objectives

- 8.a. Differentiate between virtual machine installations on various hypervisors
- 8.b. Describe the purpose of virtual machine migrations
- 8.c. Describe the purpose of virtual storage migrations
- 8.d. Determine the value of physical to virtual machine conversions

9. Explore cloud computing.

Assessment Strategies

- 9.1. Skill Demonstration

Criteria

You will know you are successful when

- 9.1. you configure a windows server in the cloud
- 9.2. you configure a datacenter in the cloud

Learning Objectives

- 9.a. Identify the characteristics of a cloud based virtual machine
- 9.b. Examine the benefits and drawbacks of virtual machines in the cloud
- 9.c. Assess a budget based on local versus cloud virtual machines
- 9.d. Describe the role of a datacenter in the cloud