



Course 10215A:

# Implementing and Managing Microsoft Server Virtualization

Length:	5 Days
Language(s):	English
Audience(s):	IT Professionals
Level:	300
Technology:	Windows Server 2008
Type:	Course
Delivery Method:	Instructor-led (classroom)

## About this Course

This five-day, instructor-led course will provide you with the knowledge and skills to deploy and manage a server virtualization environment using Microsoft technologies. The course provides details on how to deploy and manage Hyper-V and Remote Desktop Services on Windows Server 2008 R2. The course also provides details on how to manage a server virtualization environment by using System Center products such as System Center Virtual Machine Manager (VMM) 2008, SCVMM 2008 R2, System Center Operations Manager 2007 R2, System Center Data Protection Manager 2007 R2, and System Center Configuration Manager 2007 R2. This course does not require previous server virtualization experience, but does require that students have significant experience in managing Windows Server 2008 or Windows Server 2008 R2.

## Audience Profile

The primary audience for this course is Microsoft Windows Server 2008 system administrators who will manage and implement Server Virtualization technologies within their network.

The students for this course are responsible for virtualizing their current servers, or have been requested or directed by their information technology (IT) management to research and/or implement server virtualization in the existing environment. They should have a minimum of 1.5 years of experience working with Microsoft Windows Server 2008 as a server administrator. Prior experience with virtualization is not expected. However, familiarity with virtualization concepts and management tools is highly recommended.



## At Course Completion

After completing this course, students will be able to:

- Describe server, desktop, and application virtualization.
- Describe how you use Microsoft System Center is to manage the virtual infrastructure.
- Evaluate a network environment for server virtualization.
- Plan for the implementation of the Hyper-V server role.
- Install the Hyper-V Server Role.
- Manage Hyper-V settings and virtual networks.
- Create and configure virtual machines.
- Manage virtual machine snapshots.
- Managing and maintaining the Virtual Machine Connection Tool.
- Create and configure virtual machines.
- Manage virtual machine snapshots.
- Managing and maintaining the Virtual Machine Connection Tool.
- Create a new virtual machine using SCVMM 2008 R2.
- Convert a physical server to a virtual machine.
- Convert and migrate virtual machines.
- Clone virtual machines.
- Describe common management tasks and property configuration settings for virtual machines managed by VMM 2008.
- Describe when and how to use virtual machine checkpoints.
- Overview of the VMM Library.
- Manage profiles and templates.
- Design fault tolerance for the VMM library.
- Configure VMM user roles.
- Install and configure the VMM Self-Service Portal.
- Describe the Windows Server 2008 R2 Failover Cluster feature.
- Implement failover clustering with Hyper-V and VMM 2008 R2.
- Describe how to use the Offline Virtual Machine Servicing Tool to maintain updates for virtual machines.
- Configure Windows Server Update Services (WSUS) and the Offline Virtual Machine Servicing Tool.
- Monitor and manage jobs in VMM 2008 R2s.
- Configure System Center Operations Manager integration.
- Configure Performance and Resource Optimization (PRO).
- Describe backup and restore options for virtual machines and the VMM database.



- Implementing Data Protection Manager for backing up the VMM infrastructure.
- Understand the use and role of Remote Desktop Services (RDS).
- Implement the Remote Desktop Session Host.
- Implement the Remote Desktop Connection Broker.
- Implement the Remote Desktop Virtualization Host.
- Configure the Remote Desktop Gateway.
- Configure Remote Desktop Web Access.
- Configure Remote Desktop Licensing.

## Pre-requisites

Before attending this course, students must:

- Perform server administrator tasks responsible for building and maintaining a virtualization infrastructure.
- Work or consult for a midsize to enterprise-size organization.
- Have a basic understanding of server virtualization concepts related to Microsoft or other third-party virtualization technologies.
- Support production, development, testing, high availability, business continuity, staging, classroom, or hosting environments based upon Windows Server 2008 technology.
- Understand a Windows-based network, including Active Directory directory service.
- Understand storage technologies, such as Storage Area Network (SAN) including Internet small computer system interface (iSCSI), Fiber Channel, and Direct Attached Storage (DAS).
- Understand Windows Server 2008 failover clustering.



## Course Outline

### Module 1: Evaluating and Planning for Virtualization

Describe virtualization as it relates to server, desktop, and application environments. Students also will learn how to plan for critical decision points related to hardware requirements, storage, availability, and security.

#### Lessons

- Overview of Microsoft Virtualization
- Overview of Microsoft Virtualization
- Evaluating the Current Environment for Virtualization
- Evaluating the Current Environment for Virtualization

#### Lab: Evaluating the Network Environment for Virtualization

- Planning for the Hyper-V Server Role
- Assessing the Computing Environment by Using the MAP Toolkit

#### After completing this module, students will be able to:

- Describe the challenges that traditional network environments face, which organizations can address by using virtualization technologies.
- Describe virtualization technology.
- Identify options available for server virtualization.
- Identify options available for desktop and presentation virtualization.
- Identify options available for application virtualization.
- Determine the most appropriate virtualization solution based upon organizational requirements.
- Describe management tasks for a virtual environment.
- Describe the components that make up the Microsoft System Center solution.
- Describe how you can use System Center Virtual Machine Manager to manage virtual environments.
- Describe how you can use System Center Data Protection Manager to backup and recover a virtual environment.
- Describe how you can use System Center Operations Manager to monitor and respond to performance issues that relate to the virtual environment.
- Describe how you can use System Center Operations Manager to manage and maintain both physical and virtual systems.
- Describe management tasks for a virtual environment.



- Describe the components that make up the Microsoft System Center solution.
- Describe how you can use System Center Virtual Machine Manager to manage virtual environments.
- Describe how you can use System Center Data Protection Manager to backup and recover a virtual environment.
- Describe how you can use System Center Operations Manager to monitor and respond to performance issues that relate to the virtual environment.
- Describe how you can use System Center Operations Manager to manage and maintain both physical and virtual systems.
- Describe the Hyper-V Server Role.
- Describe requirements and limits for the Hyper-V Server Role.
- Describe planning considerations for Hyper-V disks and storage.
- Describe options for storage configuration in Hyper-V.
- Describe options for providing high availability for Hyper-V.

## Module 2: Installing and Configuring the Hyper-V Server Role

After completing this module, you will be able to install the Hyper-V server role, and configure host and virtual network settings.

### Lessons

- Installing the Hyper-V Server Role
- Configuring Hyper-V Settings and Virtual Networks

### Lab: Installing and Configuring the Hyper-V Server Role

- Installing the Hyper-V Role
- Determining Virtual Network Configuration Settings Based On Organizational Requirements
- Configuring Virtual Network Settings Using Virtual Network Manager

In this exercise, you will:

- Configure virtual networks based on the design in Exercise 2
- Installing Remote Management Tools

### After completing this module, students will be able to:

- Describe the prerequisites for installing Hyper-V.
- Describe the process for installing Hyper-V on a Windows Server 2008 R2 host.
- Identify the management tools that you can use to manage the Hyper-V server role.
- Install and configure Hyper-V management for remote administration.



- Installing the Hyper-V Server Role on a Server Core Installation of Windows Server 2008 R2.
- Modify the default folders for virtual machines and virtual hard disks.
- Configure Hyper-V user settings.
- Determine when to use external, internal, or private virtual machine networks.
- Use Virtual Network Manager to configure virtual networks.
- Configure Hyper-V to support VLANs.

## Module 3: Creating and Configuring Virtual Hard Disks and Virtual Machines

After completing this module, you will be able to determine and configure the most appropriate virtual hard disk(s) to use in a virtual machine. Students also will be able to create and configure virtual machines.

### Lessons

- Creating and Configuring Virtual Hard Disks
- Creating and Configuring Virtual Machines
- Managing Virtual Machine Snapshots
- Working with the Virtual Machine Connection Application

### Lab: Creating Virtual Hard Disks and Virtual Machines

- Creating Appropriate Virtual Hard Disks, Based On Organizational Requirements
- Creating New Virtual Machines Using the Virtual Machine Wizard
- Modifying Virtual Machine Settings
- Creating and Modifying Virtual Machine Snapshots

### After completing this module, students will be able to:

- Describe storage options for virtual machines.
- Prepare the host computer to attach physical disks to a virtual machine.
- Configure storage based on Internet Small Computer System Interface (iSCSI).
- Describe the types of virtual hard disks.
- Describe the use and benefits of pass-through disks.
- Create a new virtual hard disk using the new Virtual Hard Disk Wizard.
- Edit and inspect virtual hard disks.
- Describe considerations for creating new virtual machines.
- Create a new virtual machine using the new Virtual Machine Wizard.



- Configure virtual machine settings.
- Describe the Hyper-V integration services.
- Import and export virtual machines.
- Describe the file formats that you use for virtual machines.
- Migrate legacy virtual machines to Hyper-V.
- Describe what a virtual machine snapshot is and how you use it. Be sure to include information on the file format.
- Describe considerations for using snapshots, including storage sizing and requirements.
- Creating and managing virtual machine snapshots.
- This lesson will begin by describing a snapshot and the scenarios in which you use snapshots in the enterprise environment.
- This lesson also describes the concept of a virtual machine snapshot. -This lesson focuses on the management aspects of applying, and deleting, and reverting snapshots. This lesson will also discuss how to configure the snapshot storage location.
- Describe the Virtual Machine Connection Tool.
- List the considerations for using the virtual machine connection tool.
- Discuss connecting to remote virtual machines from a domain and to a virtual machine in a remote domain.

## Module 4: Integrating System Center Virtual Machine Manager with Microsoft Hyper-V Server 2008 R2

After completing this module, students will be able to plan for, and deploy, System Center Virtual Machine Manager with their Hyper-V solution.

### Lessons

- Planning for Integration of System Center Virtual Machine Manager
- Installing the VMM Server and Administrator Console
- Managing Hosts and Host Groups

### Lab: Planning and Deploying VMM 2008 R2

- Planning for the Implementation of SCVMM 2008 R2, Based Upon Organizational Requirements
- Installing and Configuring SCVMM Server and Administration Console Components



**After completing this module, students will be able to:**

- Creating and Managing Host Groups
- Describe the VMM.
- Describe VMM 2008 R2 components.
- Describe system requirements for installing VMM 2008 R2 components.
- Plan for the management of hosts and host groups.
- Plan for the implementation of the VMM database.
- Plan for the implementation of the VMM Library.
- Describe considerations for installing the VMM Server and Administrator console, including domain requirements, account requirements, and other requirements.
- Describe the process for installing the VMM Server.
- Use the VMM Configuration Analyzer to identify configuration issues.
- Describe the installation and features of the VMM administrator console.
- Describe common post-installation tasks.
- Describe the Windows PowerShell - VMM command shell.
- Describe reasons for using host groups.
- Create and modify the properties of host groups.
- Describe the types of hosts that you can add to VMM 2008.
- Configure default virtual machine paths.
- Describe the process for adding hosts in an Active Directory directory service domain.
- Describe the process for adding hosts located in a perimeter network.
- Describe the management options for a host.

## **Module 5: Creating and Deploying Virtual Machines Using System Center Virtual Machine Manager 2008 R2**

After completing this module, students will be able to use VMM 2008 R2 to create and deploy virtual machines.

### **Lessons**

- Creating a New Virtual Machine Using VMM 2008 R2
- Converting a Physical Server to a Virtual Machine
- Converting and Migrating Virtual Machines



### Lab: Creating and Deploying Virtual Machines

- Creating a New Virtual Machine
- Deploying a New Virtual Machine from the VMM Library
- Converting a VMware-Based Virtual Machine to a Hyper-V Based Virtual Machine

#### After completing this module, students will be able to:

- Describe supported operating systems and hardware capabilities for virtual machines.
- Identify sources that you can use for new virtual machines.
- Describe placement options when creating a new virtual machine.
- Describe how you use ratings to determine appropriate placement.
- Describe how to customize placement ratings for a specific virtual machine.
- Deploy stored virtual machines from a VMM Library.
- Describe considerations and methods for determining physical-to-virtual (P2V) machine conversion candidates.
- Describe requirements for physical source computers.
- Perform a P2V conversion.
- Identify the difference between converting and migrating a virtual machine.
- Describe requirements for performing a V2V conversion.
- Describe the options you have when performing a V2V conversion.
- Describe the considerations and the process for migrating a virtual machine.
- Describe scenarios for cloning an existing virtual machine.
- Describe considerations for cloning a virtual machine.
- Describe the process and decision points for cloning a virtual machine.

## Module 6: Managing Virtual Machines Using Virtual Machine Manager 2008

This module explains how to perform various management tasks on virtual machines stored within the VMM infrastructure.

#### Lessons

- Overview of VMM Management Tasks
- Creating and Managing Checkpoints



### **Lab: Managing Virtual Machines Using VMM 2008 R2**

- Modifying Virtual Machine Properties
- Managing Virtual Machine Checkpoints

#### **After completing this module, students will be able to:**

- Describe common actions for operating and managing virtual machines.
- Perform actions used to operate a virtual machine.
- Perform actions used to deploy, migrate, and store virtual machines.
- Perform actions used to manage configurations, disks, and checkpoints.
- Describe virtual machine property options.
- Perform actions to configure virtual machine property options.
- Describe considerations for using checkpoints.
- Create and modify a VMM checkpoint.
- Manage VMM checkpoints.

## **Module 7: Configuring and Managing the VMM Library**

This module explains how to configure and manage resources in the VMM Library.

### **Lessons**

- Overview of the VMM Library
- Managing Profiles and Templates
- Designing Fault Tolerance for the VMM Library

### **Lab: Configuring and Managing the VMM Library**

- Adding a Library Server and Library Resources
- Creating a Hardware Profile
- Creating a Guest Operating-System Profile
- Creating a Virtual Machine Template
- Configuring highly available file servers for Virtual Machine Library Using DFS

#### **After completing this module, students will be able to:**

- Describe what the VMM Library is and the types of resources that are stored within the library.
- Add a Library Server and assign library groups.



- Add library shares to a library server.
- Add file-based resources to the library.
- Describe hardware profiles and benefits of their usage.
- Describe guest operating system profiles and benefits of their usage.
- Show how to create a hardware and guest operating-system profile.
- Describe the benefits for creating and using virtual machine templates.
- Describe the components that make up a virtual machine template.
- Create a virtual machine template.
- Describe options for providing fault tolerance for the VMM Library.
- Compare and evaluate the differences between the options.
- List the considerations for supporting highly available Library Servers.

## Module 8: Configuring User Roles and the Virtual Machine Manager Self-Service Portal

This module explains how to configure and manage user roles and the Virtual Machine Manager Self-Service Portal.

### Lessons

- Configuring User Roles
- Installing and Configuring the VMM Self-Service Portal

### Lab: Configuring the VMM Self-Service Portal

- Preparing the Host Group and User Role Requirements
- Implementing the Self-Service Portal

### After completing this module, students will be able to:

- Describe the concept of role-based security in VMM 2008 R2.
- Describe the role types that are available in VMM 2008 R2.
- Describe the objects that you can delegate by using Role-based security.
- Describe the process for creating a user role in VMM 2008.
- Create user roles in VMM 2008 R2.
- Determine the most appropriate role-based security configuration based upon organizational requirements.
- Describe considerations for implementing the VMM Self-Service Portal.



- Describe the overall process for implementing the Self-Service Portal.
- Describe system requirements for the VMM Self-Service Portal.
- Install the SCVMM Self-Service Portal.
- Configure user access to the SCVMM Self-Service Portal.
- Describe security best practices for the SCVMM Self-Service Portal.

## Module 9: Implementing High Availability for Server Virtualization

This module explains how to configure high availability for server virtualization.

### Lessons

- Overview of Failover Clustering
- Implementing Failover Clustering with Hyper-V
- Implementing High Availability with VMM 2008 R2

### Lab: Implementing High Availability for Server Virtualization

- Installing and Configuring the Failover Clustering Feature
- Configuring Live Migration
- Integrating Failover Clustering with VMM 2008 R2

### After completing this module, students will be able to:

- Describe options for providing high availability for virtualization.
- Describe what a Failover Cluster is and how it provides high availability for virtual machines.
- Describe new Failover Cluster functionality available in Windows Server 2008 R2.
- Describe considerations for a Failover Cluster design.
- Determine appropriate Quorum configurations for Failover Clusters.
- Describe how Failover Clusters work with Hyper-V.
- Describe best practices for implementing Failover clustering with Hyper-V.
- Describe requirements for using Hyper-V with failover clustering.
- Describe the overall process for implementing Hyper-V and failover clustering.
- Implement failover clustering with Hyper-V.
- Describe Live Migration.
- Describe the overall process for implementing Live Migration.
- Perform Live Migration using Hyper-V.
- Describe planning considerations for implementing high availability with SCVMM 2008 R2.



- Describe the overall process for configuring host clusters to support high availability.
- Describe how to manage host clusters.
- Implement clustering using VMM 2008.

## Module 10: Maintaining Software Updates Using the Offline Virtual Machine Servicing Tool

This module explains how to maintain software updates using the Offline Virtual Machine Servicing Tool.

### Lessons

- Overview of the Offline Virtual Machine Servicing Tool
- Configuring WSUS and the Offline Virtual Machine Servicing Tool

### Lab: Maintaining Software Updates Using the Offline Virtual Machine Servicing Tool

- Configuring Infrastructure Prerequisites to Support the Offline Virtual Machine Servicing Tool
- Installing and Configuring the Offline Virtual Machine Servicing Tool

### After completing this module, students will be able to:

- Describe methods for maintaining software updates.
- Describe how the Offline Virtual Machine Servicing Tool works.
- Describe infrastructure requirements for the Offline Virtual Machine Servicing Tool.
- Describe tasks required to prepare the virtual machines for offline software-update management.
- Describe the process for configuration WSUS to support virtual machine servicing.
- Configure WSUS to support virtual machine servicing.
- Describe the process for installing and configuring the Offline Virtual Machine Servicing Tool.
- Install and configure the Offline Virtual Machine Servicing Tool.

## Module 11: Monitoring and Reporting Virtualization

This module explains how to use the monitoring tools included with VMM 2008 and integrate System Center Operations Manager to provide extended monitoring, reporting, and troubleshooting capabilities.



### Lessons

- Monitoring Jobs in VMM 2008 R2
- Integrating System Center Operations Manager with VMM 2008 R2
- Configuring Performance and Resource Optimization

### Lab: Integrating System Center Operations Manager with VMM 2008

- Configuring System Center Operations Manager for VMM 2008 Integration
- Configuring PRO

### After completing this module, students will be able to:

- Describe the VMM jobs feature.
- Describe the methods used to view job status.
- Cancel and restart jobs.
- Filter job status.
- Track changes using Jobs view.
- Perform management tasks related to job status in VMM.
- Identify reporting needs for specific virtual environment scenarios.
- Describe features provided by integrating System Center Operations Manager.
- Describe prerequisites for integrating Operations Manager.
- Describe the process for integrating Operations Manager with VMM 2008 R2.
- Enable reporting in VMM 2008 R2.
- Describe Performance and Resource Optimization (PRO).
- Plan for the implementation of PRO.
- Enable PRO integration.
- View and implement PRO Tips.

## Module 12: Backup and Restore Strategies for Virtual Machines

This module explains how to configure and manage resources in the VMM Library.

### Lessons

- Overview of Backup and Restore Options for Virtual Machines and the VMM Database
- Implementing Data Protection Manager for Backing Up the VMM Infrastructure



## Lab: Using Data Protection Manager to Back Up the VMM 2008 Infrastructure

After completing this module, students will be able to:

- Describe options for backing up virtual machines.
- Use the SCVMM Administrator console to back up the VMM database.
- Describe the process and tools used to restore the VMM database.
- Describe the features of Data Protection Manager 2007 SP1.
- Describe the prerequisites for installing and implementing Data Protection Manager 2007 SP1.
- Describe the process for installing and configuring Data Protection Manager 2007 SP1.
- Describe the process for configuring backup processes for SCVMM 2008 and Data Protection Manager 2007 SP1.

## Module 13: Desktop Virtualization Using Remote Desktop Services

This module explains how to describe and implement the core role services included in the Remote Desktop Services server Role.

### Lessons

- Overview of Remote Desktop Services
- Implementing the Remote Desktop Session Host
- Implementing Remote Desktop Connection Broker
- Implementing the Remote Desktop Connection Virtualization Host

### Lab: Implementing Remote Desktop Services

- Installing the Remote Desktop Session Host
- Installing and configuring the Remote Desktop Session Host
- Installing the Remote Desktop Connection Broker
- Configuring the Remote Desktop Connection Broker
- Installing and Configuring the Remote Desktop Virtualization Host
- Deploying an Application Using RemoteApp

After completing this module, students will be able to:

- Describe the benefits of Remote Desktop Services.
- Describe the Role Services included with the Remote Desktop Services sever role.



- Describe updates to the client experience with Remote Desktop Services.
- Describe RD Licensing.
- Describe the prerequisites for installing and implementing the RD Session Host.
- Describe common configuration and management tasks for the RD Session Host.
- Describe how to secure an RD Session Host.
- What is the RDS Broker Role?
- Describe the prerequisites for installing and implementing the RDS Connection Broker.
- Describe common configuration and management tasks for the RDS Connection Broker.
- Deploying RemoteApp to a Windows 7 Client Start menu.
- Describe the virtual desktop infrastructure concept and how the Remote Desktop Virtualization host works.
- Describe the prerequisites for installing and implementing the RD Virtualization Host.

## Module 14: Extending Remote Desktop Services Outside the Organization

This module explains how to implement and configure the Remote Desktop Gateway and Remote Desktop Web Access.

### Lessons

- Configuring the Remote Desktop Gateway
- Configuring Remote Desktop Web Access

### Lab: Integrating Remote Desktop Web Access into the Desktop Virtualization Infrastructure

- Installing Remote Desktop Gateway
- Installing Remote Desktop Web Access
- Configuring Remote Desktop Web Access
- Integrating RemoteApp and Desktop Connection with Remote Desktop Web Access

### After completing this module, students will be able to:

- Describe how the Remote Desktop Gateway works.
- Describe how to secure the Remote Desktop Gateway.
- Use Authorization Policies with Remote Desktop gateway.
- Describe how to configure the Remote Desktop Gateway.
- Describe how to use network access protocol (NAP) remediation with Remote Desktop Gateway.



- Use certificates for Remote Desktop Gateway.
- Describe the prerequisites for installing and implementing Remote Desktop Web Access.
- Describe how to implement RemoteApp and Desktop connection with RD Web Access.
- Describe how to secure Remote Desktop Web Access.
- Configure Single Sign-on for Remote Desktop Web Access.
- Integrate RemoteApp and Remote Desktop Web Access.