Configuring and Deploying a Private Cloud (20247)

Duration: 5 days

Who should attend?

This course is intended for cloud administrators who will be responsible for designing, installing and configuring a cloud infrastructure. The secondary audience includes datacenter administrators who are responsible for designing, installing and configuring the infrastructure for an on premise, Microsoft Private Cloud. In addition, the secondary audience includes people who need to learn the required material in order to take the Microsoft exam 70-247: Configuring and Deploying a Cloud with Microsoft System Center.

Prerequisites

This course describes cloud configuration and deployment with System Center 2012 R2. Because this is an extensive technical domain that includes several individual products and technologies, it is strongly recommended administrators have prerequisite knowledge in the following areas:

1. **Windows Server 2012 R2 operating system.**
2. **Active Directory Domain Services (AD DS).**
3. **Working knowledge of previous versions of System Center products.**
4. **Microsoft SharePoint.**
5. **Windows Server 2012 R2 Hyper-V.**
6. **Microsoft Windows Azure.**
7. **Microsoft Windows Azure Pack.**
8. **Networking and storage experience.**
9. **Familiarity with cloud management processes.**
10. **Previous work with IT Infrastructure Library (ITIL).**
11. **Previous work with Microsoft Operations Framework (MOF).**

Course Objectives

After completing this course students will be able to:

1. **Plan for a hybrid cloud.**
2. **Configure and deploy a private cloud with Microsoft System Center 2012 R2 Virtual Machine Manager.**
3. **Extend and maintain the cloud infrastructure.**
4. **Configure application delivery for a cloud.**
5. **Create private cloud building blocks.**
6. **Deploy and access private clouds.**

7. Monitor the cloud infrastructure.
8. Extend and customize monitoring of the cloud infrastructure.
9. Implement service management for the cloud.
10. Configure high availability, disaster recovery and protection for a cloud.
11. Automate and standardize the cloud.
12. Configure a multi-tenant cloud.

Follow On Courses

1. Monitoring and Operating a Private Cloud (20246)
2. Designing and Implementing a Server Infrastructure (20413)
3. Implementing an Advanced Server Infrastructure (20414)

Course Content

This course equips students with the skills they require to configure and deploy a cloud using Microsoft System Center 2012 R2. Using hands-on labs, students learn the following:

1. Produce a high-level design that accounts for requirements for cloud environments.
2. Configure and deploy the cloud fabric.
3. Configure a PXE server, an update server, and a software update baseline.
4. Configure Microsoft Server Application Virtualization (App-V) so that it can be used to sequence and deploy an application virtually.
5. Build the core components necessary for delivering services on the fabric.
6. Allocate resources to a cloud and grant access to a cloud.
7. Understand how to monitor clouds using Operations Manager.
8. Understand the tools necessary to extend and customize Operations Manager for cloud environments.
9. Set up, configure, and integrate the core components of Service Manager into a cloud fabric.
10. Configure a service catalog, and then publish it to the Self-Service Portal.
11. Gain the knowledge necessary to deploy and configure Data Protection Manager in a cloud.
12. Deploy and configure Orchestrator in a cloud, and then integrate it with other System Center components.

Course Outline

Module 1: Planning for the Cloud

Planning a hybrid cloud involves understanding these tools and technologies so that you can use them to create an internal infrastructure that will support cloud computing within your organization. In this module, you will learn the basics about Microsoft's private and public cloud offerings, and about Microsoft cloud services.

Lessons

1. Understanding Cloud Models
2. Benefits of Deploying a Private Cloud
3. Designing a Private Cloud Infrastructure
4. Overview of Windows Server 2012 R2 Hyper-V

5. Overview of System Center 2012 R2 components
6. Deploying Hyper-V Clustering with VMM

Lab: Preparing the Private Cloud Infrastructure

1. Deploying the Virtual Machine Manager Agent
2. Creating a Hyper-V Host Cluster Using VMM

After completing this module, students will be able to:

1. Describe the cloud models.
2. Describe the benefits for deploying a private cloud.
3. Design the hybrid cloud infrastructure.
4. Describe Windows Server 2012 R2 Hyper-V
5. Describe the Microsoft System Center 2012 R2 components.
6. Deploy Hyper-V host clustering with Microsoft System Center 2012 R2 - Virtual Machine Manager (VMM).

Module 2: Configuring and Deploying the Private Cloud with Microsoft System Center 2012 R2 Virtual Machine Manager

Creating a private cloud infrastructure is an important part of the cloud computing concept. Private cloud infrastructure is a collection of various components such as hardware, software, configurations, profiles, instances, and connectivity that together run within your own or a service provider data center. In order to build a private cloud infrastructure, you will need to learn about the software and technologies that are available to help you achieve this goal. In this module, you will learn how to build a private cloud infrastructure by using Microsoft System Center 2012 R2 Virtual Machine Manager (VMM).

Lessons

1. Overview of VMM Architecture and Components
2. Configuring Advanced Networking in VMM
3. Installing and Upgrading VMM
4. Configuring VMM Security and Roles
5. Understanding Host Groups

Lab: Configuring and Deploying the Private Cloud Infrastructure

1. Reviewing and Configuring Hosts
2. Configuring Host Groups
3. Configuring User Roles and Run As Accounts
4. Configuring the Library
5. Preparing the Private Cloud Infrastructure
6. Deploying a New Virtual Machine

After completing this module, students will be able to:

1. Describe VMM architecture and components.
2. Configure advanced networking in VMM.
3. Install and upgrade VMM.
4. Configure VMM security and roles.
5. Understand host groups.

Module 3: Extending and Maintaining the Cloud Infrastructure

Maintaining the infrastructure in Microsoft System Center 2012 R2 - Virtual Machine Manager (VMM) includes tasks such as adding new Windows Server Hyper-V host servers, and ensuring that the infrastructure components contain the latest approved

software updates. VMM provides support for converting a physical server without an operating system into a fully managed Hyper-V host. VMM also integrates functionality provided by the Windows Server 2008 R2 feature Windows Server Update Services (WSUS), to ensure that all servers are compliant with the latest update baseline requirements. In this module, you will learn about integrating features provided by Windows Deployment Services (Windows DS) and WSUS to help extend and manage the VMM private cloud infrastructure.

Lessons

1. **Overview of the PXE and Update Server Roles**
2. **Deploying Bare-Metal Hyper-V Host Servers**
3. **Configuring the Update Server Role**
4. **Creating and Using an Update Baseline**

Lab: Maintaining the Cloud Infrastructure

1. **Configuring a PXE Server in VMM**
2. **Configuring a Host Profile**
3. **Configuring an Update Server Role in VMM**
4. **Configuring a Software Update Baseline in VMM**

After completing this module, students will be able to:

1. **Describe how VMM integrates with WDS and WSUS to provide Pre-Boot execution environment (PXE) Server role and Update Server roles.**
2. **Deploy bare-metal Hyper-V host servers.**
3. **Configure the Update Server role.**
4. **Create and remediate a software update compliance baseline.**

Module 4: Configuring Application Delivery

Private clouds benefit from using virtual resources that make new workload deployments easier. Microsoft System Center 2012 R2 - Virtual Machine Manager (VMM) allows you to use web deployment packages, Microsoft Server Application Virtualization (Server App-V), and other methods to simplify the process for deploying services and applications to your private cloud. These methods enable you to deploy, resize, and update many of the applications deployed to your private cloud. In this module, you will learn how to use the Microsoft Web Deployment Tool and Server App-V to dynamically deploy applications in your private cloud.

Lessons

1. **Dynamic Application Deployment Overview**
2. **Web Deployment Packages**
3. **Server Application Virtualization Overview**
4. **Configuring Server App-V Components**
5. **Sequencing and Deploying Virtual Applications**

Lab: Configuring Virtual Application Delivery

1. **Configuring the Server App-V Sequencer**
2. **Configuring the Server App-V Agent**
3. **Sequencing an application**
4. **Testing the Server App-V package deployment**

After completing this module, students will be able to:

1. **Describe dynamic application deployment.**
2. **Create web deployment packages by using the Web Deployment Tool.**
3. **Describe Server App-V.**

4. Configure Server App-V.
5. Sequence and then deploy a Server App-V virtualized application.

Module 5: Creating the Private Cloud Building Blocks

In this module you will learn about the profile configurations that you can use as a foundation for virtual machine deployment templates and service templates. You will also learn how to configure user self-service in Microsoft System Center 2012 R2 Virtual Machine Manager (VMM), which allows you to delegate virtual machine management tasks.

Lessons

1. Configuring Templates and Profiles
2. Configuring Networks and Sites
3. Configuring Service Provider Foundation
4. Configuring User Roles

Lab: Creating the Private Cloud building blocks

1. Configuring Virtual Machine Profiles
2. Configuring Virtual Machine Templates
3. Installing and Configuring the Service Provider Foundation
4. Configuring User Roles

After completing this module, students will be able to:

1. Configure Templates & Profiles.
2. Configure Networks and Sites.
3. Configure the Service Provider Foundation.
4. Configure User Roles.

Module 6: Deploying and Configuring Access to a Private Cloud

A private cloud is one of the main concepts in Microsoft System Center 2012 R2 - Virtual Machine Manager (VMM). By defining a private cloud, you define a set of resources and technologies that are available to users. To create and manage private clouds, you need to understand the private cloud concept, in addition to its properties and components. You also need a clear understanding of how private cloud services and technologies in VMM provide end users with private cloud accessibility. In this module, you will learn about private clouds, Microsoft System Center 2012 R2 - App Controller, and private cloud services.

Lessons

1. Understanding Private Cloud Resources
2. Installing and Configuring App Controller
3. Creating and Managing Service Templates

Lab: Deploying and configuring access to a Hybrid Cloud

1. Creating and configuring a Private Cloud
2. Configuring App Controller
3. Creating, deploying and managing Services

After completing this module, students will be able to:

1. Configure Cloud resources in VMM.
2. Install and configure App Controller.
3. Create and manage services and service templates.

Module 7: Monitoring a Cloud infrastructure

You can use Microsoft System Center 2012 R2 Operations Manager to monitor your cloud infrastructure. By using Operations Manager, you can gather performance

information and receive notifications when problems occur. This module explains how you can provide end-to-end monitoring and visibility of your hybrid cloud environment.

Lessons

1. Operations Manager Architecture and Security
2. Operations Manager Installation Considerations
3. Configuring Roles and Notifications
4. Configuring Management Packs
5. Configuring Integration with System Center 2012 R2

Lab: Monitoring the Cloud infrastructure

1. Deploying Agents
2. Deploying and configuring Management Packs
3. Configuring Roles and Notifications
4. Configuring VMM integration
5. Configuring DPM integration

After completing this module, students will be able to:

1. Describe Operations Manager architecture and security considerations.
2. Operations Manager Installation Considerations.
3. Describe the user roles notification options that are available in Operations Manager.
4. Install, configure, and upgrade management packs.
5. Configure Operations Manager integration with System Center 2012 R2 for a Cloud.

Module 8: Extending and Customizing Monitoring of the Cloud Infrastructure

The standard management packs for platforms, such as Microsoft System Center 2012 R2 Virtual Machine Manager and Windows Azure, allow you to monitor the individual components of your hybrid cloud. However, your monitoring needs are likely to extend beyond the base set of monitoring that comes with standard management packs. If you want to monitor applications for which there is no specific management pack, such as an in house written application, then you need to create your own management pack. To simplify monitoring of custom applications, Operations Manager includes templates for monitoring various application components or functions. This module explains how you can extend and customize the monitoring of the cloud infrastructure with Operations Manager.

Lessons

1. Configuring System Center Advisor
2. Configuring the SharePoint Server Portal
3. Monitoring Templates
4. Distributed Application Monitoring

Lab: Extending and Customizing Monitoring

1. Configuring custom monitoring
2. Configuring a Distributed Application Diagram
3. Configuring Service Level Management
4. Creating views for Cloud infrastructure
5. Configuring SharePoint integration

After completing this module, students will be able to:

1. Configure System Center Advisor.
2. Integrate Operations Manager data with Microsoft SharePoint Server 2010.
3. Use monitoring templates in Operations Manager.
4. Implement distributed application monitoring.

Module 9: Implementing Service Management for the Cloud

To implement service management in a cloud environment and provide business process automation you should understand how to install and configure Service Manager. Service Manager provides an integrated platform for automating and adapting your organization's IT service management best practices, such as those found in Microsoft Operations Framework (MOF) and IT Infrastructure Library (ITIL). Service Manager provides built-in processes for incident and problem resolution, change control, and asset life cycle management. In this module, you will learn about the Service Manager architecture, upgrade options, work items, connectors, and notifications.

Lessons

1. Service Manager Architecture Overview
2. Upgrading to System Center 2012 R2 Service Manager
3. Understanding Service Manager Work Items
4. Configuring Service Manager Connectors
5. Configuring Service Manager Notifications

Lab: Implementing Service Management for a Cloud

1. Configuring Service Manager Basic settings
2. Configuring Service Manager Connectors
3. Configuring the Self-Service Portal
4. Configuring Notifications

After completing this module, students will be able to:

1. Describe the Service Manager architecture.
2. Upgrade to System Center 2012 R2 Service Manager.
3. Understand Service Manager Work items.
4. Configure Service Manager Connectors.
5. Configure Service Manager Notifications.

Module 10: Configuring High Availability, Disaster Recovery and Protection for a Cloud

It is recommended that your cloud infrastructure is designed to be highly available and resilient. Hyper-V replica provides the ability to replicate a virtual machine from one host to the other in real time. Microsoft Hyper-V Recovery Manager builds on Hyper-V Replica by providing orchestration in failover scenarios. Data Protection Manager provides protection and recovery for your cloud infrastructure and virtual machines running within it. This module explains how you can configure high-availability, disaster recovery and protection for a cloud.

Lessons

1. Planning for Hyper-V Recovery Manager
2. Planning DPM deployment
3. DPM Architecture and Components
4. Upgrading DPM
5. Configuring DPM for a Private Cloud
6. Configuring Application Protection for a Cloud
7. Restoring Applications to a Cloud

Lab: Protecting the Private Cloud infrastructure

1. **Configuring the Storage Pool**
2. **Deploying DPM Protection Agents**
3. **Creating and configuring Protection Groups**
4. **Configuring SQL Server Self-Service recovery**
5. **Restoring data from a SQL Server Protection Group**
6. **Performing Self-Service recovery to recovery SQL Server data**

After completing this module, students will be able to:

1. **Plan for Hyper-V Recovery Manager.**
2. **Plan DPM deployment.**
3. **Describe DPM architecture and components.**
4. **Upgrade DPM.**
5. **Configure DPM for the private cloud.**
6. **Configure application protection for the cloud.**
7. **Restore applications to the cloud.**

Module 11: Automating and Standardizing a Cloud

A cloud is more than just a virtualized platform; it must offer self-service administration and flexible deployment options. To facilitate this, you must use automation to streamline activities and provide additional control to the administrators. Automation can improve the speed and accuracy of administrative tasks while reducing the overall cost. This modules explains how to automate and standardize a cloud with System Center 2012 R2 Orchestrator.

Lessons

1. **Orchestrator Architecture and Components Overview**
2. **Deploying and Configuring Core Components**
3. **Managing Runbooks**
4. **Configuring Integration Packs**

Lab: Automating the a Private Cloud

1. **Deploying a Runbook Server and configuring Integration Packs**
2. **Configuring a template to deploy agents to a new Virtual Machine**
3. **Creating a Runbook to protect all resources on a Virtual Machine**

After completing this module, students will be able to:

1. **Describe Orchestrator architecture and components.**
2. **Deploy and configure Orchestrator components.**
3. **Create and execute run books.**
4. **Configure integration packs.**

Module 12: Configuring a Self-Service and Multi-tenant Private Cloud

Microsoft System Center 2012 R2 provides the infrastructure to create a private cloud. Once you have that infrastructure in place, you can enhance the user experience by automating the private cloud provisioning and management. This final module explains how you can configure a self-service and multi-tenant private cloud by using the Cloud Services Process Pack and Windows Azure Pack.

Lessons

1. **Implementing the Cloud Services Process Pack**
2. **Configuring the Windows Azure Pack**

Lab: Configuring the Cloud Services Process Pack

1. **Installing the Cloud Services Process Pack**
2. **Configuring User Roles and settings**
3. **Configuring Service Offerings**
4. **Creating an Incident Request**

After completing this module, students will be able to:

1. **Implement the Cloud Services Process Pack.**
2. **Configure the Windows Azure Pack.**