Course 10971A:

Storage and High Availability with Windows Server

Course Details

Course Outline

Module 1: Disks and Volumes with Windows Server

This module introduces you to different storage technologies. It discusses how to implement the storage solutions in Windows Server 2012, and how to use EFS (Encrypting File System) and BitLocker Drive Encryption, which enable you to secure data at rest.

Lessons

- Managing Disks in Windows Server

- Managing Volumes in Windows Server

- Securing Volumes and Drives

Lab : Managing Disks and Volumes in Windows Server 2012

- Creating and Managing Virtual Hard Disks by Using Windows PowerShell

- Converting Virtual Hard Disks from the .vhd Format to the .vhdx Format

- Resizing a Volume

- Enabling BitLocker Drive Encryption to Secure a Drive

After completing this module, students will be able to:
- Describe various storage options, including partition table formats, basic and dynamic disks, file systems, virtual hard disks, and drive hardware.

- Explain how to manage disks and volumes.

- Explain how to implement data security by using EFS, a trusted platform module (TPM), and BitLocker.

Module 2: Fundamental Storage Technologies and Components

This module introduces you to different storage hardware and communications technologies. It discusses enterprise storage hardware such as storage area network (SAN) and network-attached storage (NAS) solutions, direct-attached storage (DAS), bus technologies, storage controllers, and

communications protocols.

Lessons

- Server Storage Topology

- Bus Technologies and Protocols

- Configuring Sharing in Windows Server

Lab : Planning and Configuring Storage Technologies and Components

- Planning Storage Requirements

- Configuring iSCSI Storage

- Configuring and Managing Share Infrastructure

After completing this module, students will be able to:

- Understand the advantages and disadvantages of using DAS, NAS, and SAN topologies.

- Understand and configure bus technologies and protocols.

- Describe Server Message Block (SMB) and network file system (NFS) storage protocols.

- Configure SMB and NFS shares.

Module 3: Implementing Storage Spaces and Data Deduplication

This module discusses how to manage, maintain, and recover Storage Spaces, how to configure storage pools and virtual hard disks, and how to implement Data Deduplication.

Lessons

- Implementing Storage Spaces

- Maintaining Storage Spaces

- Implementing Data Deduplication

Lab : Implementing Storage Spaces

- Creating a Storage Space

- Enabling and Configuring Storage Tiering

Lab : Implementing Data Deduplication

- Installing Data Deduplication

- Configuring Data Deduplication

After completing this module, students will be able to:

- Describe and implement Storage Spaces in the context of enterprise storage needs.

- Maintain storage spaces.

- Describe and implement Data Deduplication.

Module 4: High Availability in Windows Server

This module covers how to achieve high availability on several levels of Information Technology (IT) infrastructure. Students will learn how to implement high availability and disaster recovery solutions with Hyper-V in Windows Server 2012 virtual machines with technologies such as live migration, storage migration, and Hyper-V Replica. Also covered is implementing high availability in virtual environments by using failover clustering technology.

Lessons

- Defining Levels of Availability

- High Availability and Disaster Recovery Solutions with Hyper-V Virtual Machines

- High Availability with Failover Clustering in Windows Server 2012

Lab : Planning and Configuring High Availability and Disaster Recovery Solutions

- Determining an Appropriate High Availability and Disaster Recovery Solution

- Implementing Storage Migration

- Implementing Hyper-V Replica

After completing this module, students will be able to:
- Describe levels of availability.

- Describe high availability and disaster recovery solutions with Hyper-V in Windows Server 2012 virtual machines with technologies such as live migration, storage migration, and Hyper-V Replica, a feature of Windows Server 2012 Hyper-V.

- Describe high availability as provided by failover clustering in the Windows Server 2012 operating system and the Windows Server 2012 R2 operating system.

Module 5: Implementing Failover Clustering

In this module, students will learn how to plan Failover Clustering implementation and how to create and configure new failover clusters.

Lessons

- Planning a Failover Cluster

- Creating a New Failover Cluster

Lab : Creating and Administering a Cluster

- Validating and Configuring Servers for Failover Clustering

- Creating a Cluster and Configuring a Highly Available Application

- Verifying Quorum Settings and Managing Nodes in the Cluster

- Configuring a Quorum from a Disk Witness to a File Share Witness and Defining Node Voting

After completing this module, students will be able to:
- Plan a failover cluster.

- Create, configure, and manage a failover cluster.

Module 6: Managing Server Roles and Clustering Resources

This module describes how to configure roles and services for high availability on a failover cluster. Students will learn about configuring, managing, maintaining, and troubleshooting failover clusters, in addition to implementing site high availability with multisite failover clustering.

Lessons

- Configuring Highly Available Applications and Services on a Failover Cluster

- Managing and Maintaining a Failover Cluster

- Troubleshooting a Failover Cluster

- Implementing Site High Availability with Multisite Failover Clusters

Lab : Managing Server Roles and Clustering Resources

- Preparing for and Creating a Failover Cluster by Using Windows PowerShell

- Implementing Storage Spaces by using Failover Clustering

- Configuring the File Server Cluster and Creating Data

- Verifying the File Server Role High Availability

- Securing CSVs by Using BitLocker

- Configuring CAU on the Failover Cluster

After completing this module, students will be able to:
- Configure high availability applications and services on failover clusters.

- Manage and maintain failover clusters.

- Troubleshoot failover clusters.

- Implement multisite failover clusters.

Module 7: Implementing Failover Clustering with Hyper-V

In this module, students will learn how to implement failover clustering in a Hyper-V scenario to achieve high availability for a virtual environment. This includes an overview of Hyper-V and failover clustering integration, how to implement Hyper-V failover Clustering with Scale-Out File Server (SoFS), and how to manage and maintain Hyper-V virtual machines on failover clusters.

Lessons

- Overview of Integrating Hyper-V with Failover Clustering

- Implementing Hyper-V with Failover Clustering

- Managing and Maintaining Hyper-V Virtual Machines on Failover Clusters

Lab : Implementing Failover Clustering by Using Hyper-V

- Creating a Hyper-V Application Failover Cluster

- Creating a Scale-Out File Server Cluster

- Configuring Hyper-V to Use File Server and Then Verify Availability

- Configuring a Shared Virtual Hard Disk

After completing this module, students will be able to:

- Describe how Hyper-V integrates with failover clustering.

- Implement Hyper-V with failover clustering.

- Manage and maintain Hyper-V virtual machines on failover clusters.

Module 8: Storage Infrastructure Management with Virtual Machine Manager

This module provides an overview of Virtual Machine Manager, which is one of the Microsoft virtualization technologies, and explains how you can use it to manage both virtualization and traditional storage infrastructures.

Lessons

- Overview of Virtual Machine Manager

- Managing Storage Infrastructure with Virtual Machine Manager

- Provisioning Failover Clustering in Virtual Machine Manager

Lab : Managing Storage Infrastructure

- Configuring and Provisioning Storage Infrastructure Components

- Adding iSCSI Storage to VMM

- Creating a Scale-Out File Server Storage Cluster

After completing this module, students will be able to:
- Navigate within Microsoft System Center 2012 R2 Virtual Machine Manager (System Center 2012 R2 VMM).

- Manage storage infrastructure with System Center 2012 R2 Virtual Machine Manager.

- Provision a scale-out file server cluster by using System Center 2012 R2 VMM.

Module 9: Cloud-Based Storage and High Availability

This module discusses cloud-based storage and high availability solutions, including Azure, StorSimple, and disaster recovery with Azure Site Recovery.

Lessons

- Azure Storage Solutions and Infrastructure

- Cloud Integrated Storage with StorSimple

- Disaster Recovery with Azure Site Recovery

Lab : Managing Cloud-Based Storage and High Availability

- Assessing Options for A. Datum's Future Storage and Service Needs

- Configuring Azure Storage

- Configuring Azure Virtual Machines

- Managing Azure Storage and VMs by Using Windows PowerShell

After completing this module, students will be able to:
- Describe Microsoft Azure Storage solutions and infrastructure.

- Describe cloud-integrated storage (with Microsoft Azure StorSimple.

- Describe disaster recovery with Microsoft Azure Site Recovery.

Module 10: Implementing Network Load Balancing Clusters

This module introduces Network Load Balancing(NLB). It covers how this technology works, and the situations for which NLB is appropriate. Students will learn how to configure and manage NLB clusters, how to perform maintenance tasks on NLB clusters, and how load balancing works in

Microsoft System Center 2012 R2 - Virtual Machine Manager and Microsoft Azure.

Lessons
- Overview of NLB
- Configuring an NLB Cluster
- Planning an NLB Implementation

Lab : Implementing a Network Load Balancing Cluster
- Implementing an NLB Cluster
- Configuring and Managing the NLB Cluster
- Validating High Availability for the NLB Cluster

After completing this module, students will be able to:
- Describe NLB.
- Explain how to configure an NLB cluster.
- Explain how to plan an NLB implementation.