Microsoft Azure

Azure Cloud Computing Overview

Learning Objective

- **Understanding Cloud Computing and Azure**

Topics Covered

- ❑ What is Cloud Computing
- ❑ Service Model of Cloud
- ❑ Types of Cloud
- ❑ Azure Fundamentals
- ❑ Azure Certifications
- ❑ Azure Regions and Services
- ❑ Azure Domain and Services
- ❑ Azure Subscriptions

Azure Virtual Machine in Compute Domain

Learning Objective

- **Design a compute strategy**
  - **Design a compute provisioning strategy**
  - **Design a secure compute strategy**
  - **Determine appropriate compute technologies**
  - **Design an Azure HPC environment**
  - **Identify compute requirements**

- **Recommend management tools for compute**

- **Create and configure a VM for Windows and Linux**
  - **Configure high availability**
  - **Configure monitoring**
  - **Configure networking**
  - **Configure storage**
  - **Configure virtual machine size**
  - **Implement dedicated hosts**
  - **Deploy and configure scale sets**
- **Implement solutions that use virtual machines (VM)**
  - **Provision VMs**
  - **Create Azure Resource Manager templates**
  - **Configure Azure Disk Encryption for VMs**
  - **Implement Azure Backup for VMs**
- **Automate deployment of VMs**
  - **Modify Azure Resource Manager template**
  - **Configure location of new VMs**
  - **Configure VHD template**
  - **Deploy from template**
  - **Save a deployment as an Azure Resource Manager template**
  - **Deploy Windows and Linux VMs**

Topics Covered:

- Launching VM Instance and Connect
  - Windows Instance
  - Linux Instance
- VM Types
  - General Purpose
  - Compute Optimise
  - Memory Optimise
  - Storage Optimise
  - GPU Optimise
- VM Instance Pricing Options
  - On-Demand
  - Spot
  - Reserved
- Types of Images to Launch Virtual Machine Instance

- ❏ Azure Published
- ❏ Azure Marketplace
- ❏ Creating from existing Instance
- ❏ Azure Shared Image Gallery

❏ Azure Service Limits and Support Plans

❏ Summary of Virtual Machine Services

❏ Exam Essentials

Hand-on Lab:

❏ Launch Virtual Machine Instance (Windows) with Standard SSD Storage, Connect to Windows Instance with Remote Desktop Protocol, and make Web Server.

❏ Launch Virtual Machine Instance (Linux) with Standard SSD Storage, Connect to Linux instance with Secure Shell via Putty software and make Web Server.

❏ Create Custom Image using existing Windows Instance to Launch a new Pre-configured Windows Web Server.

❏ Create Custom Image using existing Linux Instance to Launch a new Pre-configured Linux Web Server.

Azure Storage Service

Learning Objective

- **Design a storage strategy**
  - **Design a storage provisioning strategy**
  - **Design storage access strategy**
  - **Identify storage requirements**
  - **Recommend a storage solution**
  - **Recommend storage management tools**
- **Create and configure storage accounts**
  - **Configure network access to the storage account**
  - **Create and configure storage account**
  - **Generate shared access signature**
  - **Implement Azure AD authentication for storage**

- **Install and use Azure Storage Explorer**
- **Manage access keys**
- **Monitor activity log by using Azure Monitor logs**
- **Implement Azure storage replication**
- **Implement Azure storage account failover**

Topics Covered

- ❑ Understanding Cloud Storage
- ❑ Advantages of Cloud Storage
- ❑ Understanding Terminologies of Cloud Storage
    - ❑ Physica Hard Disk
    - ❑ Virtual Hard Disk
    - ❑ Virtual Hard Disk
    - ❑ HDD/SSD
    - ❑ IOPS
    - ❑ Disk I/O
    - ❑ Storage Memory in GiB, MiB, KiB
- ❑ Azure Storage Accounts
    - ❑ Managed Disks
    - ❑ Unmanaged Disks
- ❑ Hard Disk Snapshots
- ❑ Azure Storage Services
    - ❑ Block Blob
    - ❑ Blob
    - ❑ File
    - ❑ Table
    - ❑ Queue
- ❑ Azure Storage Types
    - ❑ Standard
    - ❑ Premium
- ❑ Azure Storage Redundancy
    - ❑ Local Redundant
    - ❑ Zone Redundant
    - ❑ Geo-Redundant
    - ❑ Read-Access Geo-Redundant
- ❑ Summary of Cloud Storage
- ❑ Exam Essentials

Hands-On

- ❏ Launch Windows Virtual Machine Instance with Unmanaged Virtual Hard Disk (Default Size).
- ❏ Create a Virtual Hard Disk in Local Computer and upload the VHD to Storage Account
- ❏ Implement RAID Configuration in Windows for Data and Application Backup using Disk Management.
- ❏ Create a File Share in Azure Files and Mount the File Share in Azure VMs.

Azure Virtual Network and Security

Learning Objective

- **Design a networking strategy**
  - **Design a network provisioning strategy**
  - **Design a network security strategy**
  - **Determine appropriate network connectivity technologies**
  - **Identify networking requirements**
  - **Recommend network management tools**
  - **Recommend network security solutions**
- **Implement and manage virtual networking**
  - **Configure private IP addressing**
  - **Configure public IP addresses**
  - **Create and configure network routes**
  - **Create and configure network interface**
  - **Create and configure subnets**
  - **Create and configure virtual network**
  - **Create and configure Network Security Groups and Application Security Groups**
- **Create connectivity between virtual networks**
  - **Create and configure Vnet peering**
  - **Create and configure Vnet to Vnet connections**
  - **Verify virtual network connectivity**
  - **Create virtual network gateway**
- **Implement application load balancing**
  - **Configure Application Gateway**

- **Configure Azure Front Door service**
- **Configure Azure Traffic Manager**

- **Integrate on premises network with Azure virtual network**
  - **Create and configure Azure VPN Gateway**
  - **Create and configure site to site VPN**
  - **Configure ExpressRoute**
  - **Configure Virtual WAN verify on premises connectivity**
  - **Troubleshoot on premises connectivity with Azure**

Topics Covered

- ❑ Basics of Networking
- ❑ Virtual Networks
- ❑ Subnets
- ❑ Route Tables
- ❑ Network Security Groups
- ❑ Public IP and NICs
- ❑ Virtual Private Gateway,
- ❑ Local Network Gateway
- ❑ V-Net Peering
- ❑ Azure Direct Connect
- ❑ Summary
- ❑ Exam Essentials

Hands-On

- ❑ Create Virtual Network, Public Subnets and Route Table and Launch Virtual Machine Instance.
- ❑ Create Virtual Network Public and Private Subnets, Route table and Launch Virtual Machine instance Windows in Public and Linux in Private.
- ❑ Create Nat Gateway and allow internet access to Private Subnet.
- ❑ Create two different Virtual Networks in different regions and use Virtual Network Peering Connection to Connect.
- ❑ Build Network and Instance Security Between Instances using Security Group and Network ACL
- ❑ Create Customer and VPN Gateway to describe VPN Connection.

Azure CDN Profiles

Learning Objective

- **Understanding Content Delivery Network for Videos and media files.**

Topics Covered

- ❏ Content Delivery Network
- ❏ Azure Edge Locations
- ❏ Distributions
- ❏ CDN Profiles
- ❏ Summary
- ❏ Exam Essentials

Hands-On

- ❏ Create Blob Storage, and Container. Upload videos to distribute to all edge locations
- ❏ Create distribution in CDN Profile to distribute videos to all edge locations.

Azure Management Tools

Learning Objective

- **Analyze resource utilization and consumption**
  - **Configure diagnostic settings on resources**
  - **Create baseline for resources**
  - **Create and test alerts**
  - **Analyze alerts across subscription**
  - **Analyze metrics across subscription**
  - **Create action groups**
  - **Monitor for unused resources**
  - **Monitor spend**
  - **Report on spend**
  - **Utilize Log Search query functions**
  - **View alerts in Azure Monitor logs**
  - **Visualize diagnostics data using Azure Monitor Workbooks**

Topics Covered

- ❑ Azure Monitor
- ❑ Azure alerts
- ❑ Cost Management
- ❑ Event Managements
- ❑ Azure VM Extensions
- ❑ VM Boot Diagnostics
- ❑ PowerShell and Powershell Scripts
- ❑ Summary
- ❑ Exam Essentials

Hands-on

- ❑ Monitor Virtual Machine instance with Detailed Monitoring
- ❑ Monitor Virtual Network
- ❑ Audit event using Event Management
- ❑ Create Azure Alert Subscribe Email to get Notifications
- ❑ Run Powershell Script to Build Azure Resource.

Load Balancing and Auto Scaling of Virtual Machines

Learning Objective

- **Use load balancing in the creation of highly available systems.**
- **Learn scaling Applications/Systems with AutoScaling and its use in Building Fault Tolerant Networks.**
- **Create web apps by using PaaS**
  - **Create an Azure app service Web App**
  - **Create documentation for the API**
  - **Create an App Service Web App for Containers**
  - **Create an App Service background task by using WebJobs**
  - **Enable diagnostics logging**

Topics Covered

- ❏ Fault Domain
- ❏ Update Domain
- ❏ Availability Sets
- ❏ Load Balancers Types
    - ❏ Application
    - ❏ Network
- ❏ Load Balancer Configuration
    - ❏ Service Health Check
    - ❏ Launch Configurations
- ❏ Scaling Groups
    - ❏ Scaling Policies
- ❏ VMScale Sets
- ❏ Building Fault Tolerant and Highly Available Applications
- ❏ Summary of Auto Scaling and Load Balancers
- ❏ Exam Essentials

Hands-On

- ❏ Create Availability Sets to build High Availability
- ❏ Attach a load balancer to Virtual Network and Launching VMs
- ❏ Create VMScalesets to build AutoScaling.

Azure Identity and Access Management

Learning Objective

- **Understanding IAM in Azure**
- **Manage Azure Active Directory**
    - **Add custom domains**
    - **Configure Azure AD Identity Protection**
    - **Configure Azure AD Join**
    - **Configure self-service password reset**
    - **Implement conditional access policies manage multiple directories**
    - **Perform an access review**
- **Implement and manage hybrid identities**
    - **Install and configure Azure AD Connect**

- Configure federation
- Configure single sign-on
- Manage and troubleshoot Azure AD Connect
- Troubleshoot password sync and writeback

- **Implement multi factor authentication**
  - Configure user accounts for MFA
  - Configure fraud alerts
  - Configure bypass options
  - Configure trusted IPs
  - Configure verification methods
- **Manage role-based access control**
  - Create a custom role
  - Configure access to Azure resources by assigning roles
  - Configure management access to Azure
  - Troubleshoot RBAC
  - Implement Azure Policies
  - Assign RBAC Roles

Topics Covered

- ❑ IAM Principles
- ❑ Understanding Azure Active Directory
- ❑ Creating Users
- ❑ Creating Groups
- ❑ Create RBAC to Set Permissions to Users
- ❑ Summary
- ❑ Exam Essentials

Hands-On

- ❑ Create Users in Azure Active Directory
- ❑ Assign RBAC access to a Specific Resource Group.

Database Services, Backup and Migration

Learning Objective

- **Understanding Azure Database services and their use case.**
- **Develop solutions that use a relational database**

- **Provision and configure relational databases**
- **Configure elastic pools for Azure SQL Database**
- **Implement Azure SQL Database managed instances**
- **Create, read, update, and delete data tables by using code**

- **Understanding Site Recovery Services Vault**
- **Optimize consumption strategy**
  - **Optimize App service costs**
  - **Optimize Compute costs**
  - **Optimize Identity costs**
  - **Optimize Network costs**
  - **Optimize Storage costs**

Topics Covered

- ❏ Azure Databases
- ❏ Create and Manage MS SQL Databases
- ❏ Site Recovery Services Vault

Hands-On

- ❏ Create MySql Database.
- ❏ Taking Backup of VM
- ❏ Migrating Hyper-V Virtual Machines from On-Premises to Azure.