**Chapter 1 Virtual Networks**

<https://www.youtube.com/watch?v=uyRtYUg6bnw>

<https://www.youtube.com/watch?v=7rzawA--r20>

Virtual Networks

Virtual Networks Pricing & Limits

*Azure Virtual Network is free of charge. Every subscription is allowed to create up to 50 virtual networks across all regions.*

Public IP Addresses in Azure

Private IP Addresses

Public IP Addresses Pricing and Limits

Network Security Groups

<https://www.kainos.com/azure-network-security-groups-10-suggestions-for-best-practice>

NSG Limits

Azure DNS

Azure DNS for private domains

Azure DNS Pricing

Virtual Networks Peering

Virtual Network Peering Pricing

Gateway Transit and Remote Gateways

Routing within VNET using System Route

Routing within VNET using User Defined Route (UDR)

Next Hop Options when adding Route in Route Table

VNET Service Endpoints

**Chapter 2 Virtual Network Hybrid Connectivity over Internet**

Virtual Network Hybrid Connectivity using Virtual Network Gateway

VNET Hybrid Connectivity over Internet

VPN Type

VPN Gateway Editions

VPN Gateway SKUs Use cases

Site to Site VPN (S2S)

Point to Site VPN (P2S)

VPN Gateway Redundancy

Border Gateway Protocol (BGP) with Azure VPN Gateways

Forced Tunnelling

**Chapter 3 Virtual Network Hybrid Connectivity over ExpressRoute**

Virtual Network Hybrid Connectivity using Virtual Network Gateway

VNET Hybrid Connectivity over ExpressRoute connection

Connecting Azure Virtual Network to On-Premises

ExpressRoute Routing Domains

ExpressRoute Connectivity Options (3 Options)

ExpressRoute Connection Tiers

ExpressRoute Gateway SKU

ExpressRoute Bandwidth options

ExpressRoute Health

Comparing ExpressRoute and VPN

Connecting Virtual Networks (VNET) to ExpressRoute circuit

ExpressRoute Gateway Pricing

ExpressRoute Connection Pricing

ExpressRoute Direct

**Chapter 4 Azure Compute**

Azure Virtual Machine

Virtual Machines Series

Low Priority VMs

Azure Virtual Machine Storage

Comparing Virtual Machine Disks

Backup for Managed Disk

DR for Managed Disk

Virtual Machine Disk Storage Design Parameters

Azure Virtual Machine Networking

Virtual Machine Accelerated Networking (AN)

Virtual Machine Security using Network Security Group (NSG)

VM High Availability Options

VM High Availability using Availability Set (AS)

VM High Availability using Availability Zones

Virtual Machine Snapshot

Linux VM in Azure

Customizing Linux VM with Cloud init

Images

Azure Virtual Machine Agent

Virtual Machine Extensions

Custom Script Extension

Manage VM Sizes

VM Auto-Shutdown

Reset Password

Redeploy VM

VM Backup & Restore

Moving Virtual Machines

VM Alerts, Metrics & Diagnostic Settings

VM Update, Inventory, Change & Configuration Management

PowerShell DSC Extension

ARM Template

Virtual Machine Limits

Virtual Machine Compute Pricing

General Purpose Dv3 and DSv3 Series Pricing (PAYG)

Dv3Pricing (PAYG, Reserved Instance & Reserved Instance+ Hybrid )

How to Save on Virtual Machine Compute Pricing

Virtual Machine Disk Pricing

**Chapter 5 Azure Load Balancer**

Load Balancers in Azure

Comparing Different Types of Azure Load Balancers

Azure Load Balancer

Internet or Public Facing Load Balancer

Internal load Balancer

Azure Load Balancer Types

Additional Features in Standard Load Balancer

Traffic Distribution Mode for Azure Load Balancer

Load Balancer Health Probes

Idle timeout settings for Azure Basic Load Balancer

Outbound connections of Load Balanced VMs

Port Forwarding in Azure Load Balancer

Azure Basic Load Balancer Pricing

Azure Standard Load Balancer Pricing

**Chapter 6 Azure Application Gateway & Traffic Manager**

Application Gateway

Application Gateway Configuration Options

Application Gateway Use cases

Application Gateway Editions

Application Gateway Features

Web Application Firewall (WAF)

Application Layer Persistence using Cookie-based session affinity

Endpoint health monitoring with Probes

SSL Termination

End to End SSL with Application Gateway

Listeners

URL-based content routing

Multiple site hosting

Application Gateway Design Nuggets

Application Gateway Pricing

Traffic Manager

Traffic Manager Routing Methods

Traffic Manager Pricing

**Chapter 7 Virtual Machines Scale Sets (VMSS)**

Virtual Machine Scale Set (VMSS)

Virtual Machine Scale Set (VMSS) Architecture

Autoscaling with VMSS

Virtual Machine Scale Set (VMSS) Maximums

Design Nuggets

**Chapter 8 Storage Accounts**

Storage Accounts

Storage Account Types

Azure Storage Account Replication

Storage Account endpoints

Object Endpoints

Network Access to Storage Account using VNET Service Endpoints

Azure Storage Explorer

Options to Connect to Azure Storage using Storage Explorer

Download Storage Explorer

Accessing Azure Storage Accounts using Azure Account Credentials

Accessing Azure Storage Account using Storage Account Access Keys

Accessing Storage Account using Shared Access Signature

Accessing Storage Account using Azure Active Directory (Preview)

**Chapter 9 Azure Storage**

Azure Storage Introduction

Blob Storage

Data Compliance in Azure Cloud with Immutable Blob Storage

Blob Storage Pricing using GPv2 Storage Account (4 Components)

Premium Blob Storage Pricing using GPv2 Storage Account

Azure File Storage

File Storage Pricing using General Purpose v2 Account

Azure File Sync

Azure Import/Export service

Export from Azure

Import to Azure

Azure Import/Export Pricing

Azure Data Box

StorSimple

Content Delivery Networks (CDN)

Azure CDN Pricing

**Chapter 10 Azure Backup**

Azure Backup

Recovery services Vault

Backup scenarios with Azure Backup

Architecture of Azure Backup using Azure Backup Agent

Architecture of Azure Backup using System Center Data Protection Manager

Architecture of Azure Backup using Azure Backup Server

Azure IaaS VM Level Backup

Azure IaaS VM File & Folder level Backup

Backup Reports

Azure Backup Pricing

**Chapter 11 Azure Site Recovery**

Azure Site Recovery

Replication scenarios with Azure Site Recovery

Disaster Recovery Site option with Azure Site Recovery

Architecture for Disaster Recovery to Azure

Architecture for Disaster Recovery to Secondary Data Center

RPO & RTO

Replication Architecture of Azure VMs in Azure Cloud to Azure Cloud

Replication Architecture of VMware VMs or Physical Servers to Azure

Replication Architecture of Hyper-V VMs Managed by VMM to Azure

Replication Architecture of Hyper-V VMs to Azure

Replication Architecture of Hyper-V VMs Managed by VMM to Secondary DC Azure Site Recovery Pricing

**Chapter 12 Azure AD**

Azure AD Introduction

Default Azure AD Domain

Azure AD Basic & Premium License upgrade options

Azure AD Users

Azure AD Groups

Custom Domains

Self Service Password Reset (SSPR)

Device Management in Azure AD

Azure AD Join

Enterprise State Roaming

Managing Multiple Azure AD Directory Tenant

**Chapter 13 Azure AD Hybrid Identities**

Azure AD Hybrid Identity options with AD Connect

Components of AD Connect

Requirements for deploying AD Connect Server

Seamless Single Sign-on

Password Writeback

AD Connect with Federation with ADFS option

IDFIX Tool

**Chapter 14 Azure Multi Factor Authentication**

Azure Multi Factor Authentication

Versions of Azure Multi-Factor Authentication

Comparison between versions of Azure Multi-Factor Authentication

Azure Multi-Factor Authentication license options

Enabling Azure MFA options

MFA Service Settings

MFA Verification Options

App Passwords

Trusted IPs

Remember Multi-Factor Authentication

Fraud Alert

Block/Unblock Users

Account Lockout

One-time Bypass option

**Chapter 15 Azure AD Premium Features**

Conditional Access in Azure AD

Azure Active Directory Identity Protection

Azure AD Access Reviews

Azure AD Privileged Identity Management

What you can do with Privileged Identity Management

Just in time administrator access with Eligible Admin

Roles managed in PIM

Requirements to Enable Privileged Identity Management

Azure AD Application Proxy

**Chapter 16 Azure Active Directory B2C and B2B**

Azure Active Directory B2C

Azure Active Directory B2C Pricing

Azure Active Directory B2B

Azure Active Directory B2B License Pricing

Comparing B2C and B2B

**Chapter 17 Directory Role and RBAC**

Assign Azure AD Directory Role to Users

Assigning Administrative Permissions using Role Based Access Control

**Chapter 18 Azure Subscription Management 706**

Azure Subscription

Subscription Usage & Quota

Cost Management

Cost Analysis

Monitor Azure Spend and Create Billing Alarms using Budgets

Identify unused or underutilized Resources and Optimize Azure Cost

Implementing IT Governance using Azure Policy

**Chapter 19 Azure Resource Groups, Tags and Locks**

Resource Groups (RG)

IT Governance at Resource Group Level using Azure Policy

Moving Virtual Machines

Tags

Locks

**Chapter 20 Azure Global Infrastructure**

Regions

Geography

Paired Regions

**Chapter 21 Installing Azure PowerShell Module & Azure CLI**

Azure PowerShell Module

Azure CLI

**Chapter 22 Implementing Virtual Networks with CLI & PS**

**Chapter 23 Deploy Virtual Machines with CLI and PS**

**Chapter 24 Storage Accounts with CLI and PS**

**Chapter 25 Implement Storage with CLI and PowerShell**

**Lab Exercises**

**Chapter 1 Virtual Networks**

Create Resource Group RGCloud

Create Resource Group RGOnPrem

Create Virtual Network VNETCloud

Create additional Subnet (DB-Subnet 10.1.2.0/24)

Create additional Subnet (DMZ-Subnet 10.1.3.0/24)

Create Virtual Network representing On-Prem Network

Create Virtual Network VNETCloud2

Create Virtual Network VNETCloud3

<https://www.youtube.com/watch?v=uOYTzdYX4eY&list=PLJ9-xHCIEm7OAuAYNIVunBZNb7AuZTiwv>

Create Dynamic Public IP

<https://www.youtube.com/watch?v=ZlBxnK217NU>

Change Dynamic Public IP to Static IP

Create NSG and add inbound http, RDP and SSH allow rule

Associate Network Security Group (NSG) with Subnet

<https://www.youtube.com/watch?v=Lxy3ZxFMUlM>

<https://www.youtube.com/watch?v=Lxy3ZxFMUlM&list=PLJ9-xHCIEm7OAuAYNIVunBZNb7AuZTiwv&index=2>

Exploring IP Address Option in Network Security Group

Exploring Tag Option in Network Security Group

<https://www.youtube.com/watch?v=7walMNeNTX0>

DNS Zone, DNS Records and Delegation to Azure DNS

Peering between VNETs - VNETCloud & VNETCloud2

Peering between VNETs - VNETCloud & VNETCloud3

<https://www.youtube.com/watch?v=X8d6e2eIM_o&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=61>

<https://www.youtube.com/watch?v=-NnG95u68GE&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=60>

Routing Traffic between 2 Subnets to pass through another Subnet using UDR

<https://www.youtube.com/watch?v=tXLScLO-DRI>

Setting up Virtual Network (VNET) Service Endpoints and Service Endpoint Policy

<https://www.youtube.com/watch?v=gxsitRRgylI>

<https://www.youtube.com/watch?v=MuV9Zlz3hzo&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=3>

<https://www.youtube.com/watch?v=7walMNeNTX0&list=PLJ9-xHCIEm7OAuAYNIVunBZNb7AuZTiwv&index=3>

**Chapter 2 Virtual Network Hybrid Connectivity over Internet**

Connecting Virtual Networks using S2S VPN

Connecting Virtual Network to On-Premises VPN Device using S2S VPN

**Chapter 3 Virtual Network Hybrid Connectivity over ExpressRoute**

Create Virtual Network Gateway of Type ExpressRoute

Create ExpressRoute Circuit and Connect to VNETCloud

**Chapter 4 Azure Compute**

Create Availability Set (AS) using Azure Portal

Create Windows Virtual Machine VMFE1

Log on to Windows VM with RDP

Install IIS

Access Default IIS website on VM VMFE1

Add Data Disk

Initialize the Data Disk

Create Snapshot of VM VMFE1 OS Hard Disk

Create and Add Network Interface to VM VMFE1

Create Windows Virtual Machine VMFE2

Log on to Windows VM with RDP

Install IIS

Access Default IIS website on VM VMFE2

Create Custom Website on VM VMFE2

Access Custom IIS website on VM VMFE2

Create Windows VM representing On-Premises AD DS

Enable AD DS Role in Virtual Machine VMAD

Create Linux VM

Connecting to Linux VM

Update Linux VM & Install NGINX Web Server

Create Custom Image of Azure VM

Deploy VM from Custom image

Demonstrating various VM Extensions available

Demonstrating Custom Script Extension using Azure Portal

Resizing VM

Virtual Machine Auto-Shutdown

Reset Password

Redeploy VM

**Chapter 5 Azure Load Balancer**

Create Internet facing Azure Load Balancer

Create Backend Address Pool and Add Endpoints (VMs)

Create Health Probe

Create Load Balancer Rule

Access the Websites on Load Balanced VMs

**Chapter 6 Azure Application Gateway & Traffic Manager**

Create Dedicated Subnet for Application Gateway

Create Application Gateway

Explore Dashboard of Application Gateway

ADD VMs VMFE1 and VMFE2 to Default Backend pool

Test the Load Balancing

Enabling HTTPS

Listeners

Create & Implement Traffic Manager in 2 Steps

**Chapter 7 Virtual Machines Scale Sets (VMSS)**

Deploying VMSS

<https://www.youtube.com/watch?v=XW_eqv8wdcg&t=1211s>

Connecting to Instances in VMSS

Register Resource Provider Microsoft.Insight

Enabling Autoscaling

**Chapter 8 Storage Accounts**

Create GPv2 Standard Storage Account

Create GPv2 Premium Storage Account

Demonstrating Storage Account sastdcloud functionalities

Demonstrating Storage Account Security

Connect to Azure Storage using Azure Account Credentials

Get Storage Account sastdcloud Access Keys

Connect to Storage Account sastdcloud using Access key

Generate Shared Access Signature of Storage Account

Connect to Storage Account using Shared Access Signature

**Chapter 9 Azure Storage**

Create Blob Storage Container and upload a File

Blob Storage Tiering

Create Blob Storage Container using Storage Explorer

Applying Time Bases Retention Policy

Creating and Mount File Share

Deploying Azure File Sync in 4 Steps

Demonstrating Export Job Creation

Demonstrating Data Box Order through Azure Portal

Implementing Azure CDN using Azure Portal

Enabling or Disabling Compression

Changing Optimization type

Changing Caching Rules

Allow or Block CDN in Specific Countries

**Chapter 10 Azure Backup**

<https://www.youtube.com/watch?v=zFs-m4cQ3UE&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=50>

Create Recovery Services Vault

Azure VM-level backup

<https://www.youtube.com/watch?v=bDTq_NyOPO4&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=112>

Restoring Azure VM-level backup

<https://www.youtube.com/watch?v=-YXg7HCHwDM&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=111>

<https://www.youtube.com/watch?v=M2le_6bub-Q>

Create Custom Backup Policy

<https://www.youtube.com/watch?v=N1wc1uzaemg&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=55>

Associating Custom Policy with VM VMFE1 Backup Job

Backup Files & Folder using Azure Backup Agent

<https://www.youtube.com/watch?v=nlBAzcWgJrA>

**Chapter 11 Azure Site Recovery**

Enabling Disaster Recovery for Azure VM using Azure Site Recovery

Demonstration of Failover of VM VMAD

<https://www.youtube.com/watch?v=jo4q-tp9NwM>

<https://www.youtube.com/watch?v=RZmD9Sy01VA&t=659s>

<https://www.youtube.com/watch?v=tbpjECyGZc0&t=3s>

<https://www.youtube.com/watch?v=mpwp7ZuN0ys>

**Chapter 12 Azure AD**

Exploring Dashboard of Default Azure AD

Activating Premium P2 Free Trial Licenses

Create User (User1 with Global Administrator Role)

Create User (User2 with Limited Administrator Role)

Create User (User3 with Directory Role User)

Exploring Dashboard of User

Checking User3 Access level

Create Group and add users manually

Assigning Azure AD Premium P2 License to Users

Add Custom Domain

Create TXT record in Domain Name Registrar

Verify the Custom Domain in Azure AD

Change Azure AD Login names to custom domain for User2

Enabling SSPR for Cloud Users

Setup SSPR Authentications for User3

Test SSPR for User3

Checking Device Settings for Azure AD Users

Joining Windows 10 PC to Azure AD using Azure AD Join

Log on to Windows 10 PC with User2

Enabling Enterprise State Roaming for Users

Creating New Azure AD Tenant

Associating Azure AD Tenant with the Subscription

**Chapter 13 Azure AD Hybrid Identities**

Install AD Connect with Password Hash Synchronisation

Check Users Test1 & Test2 synchronization to Azure AD

Check AD Connect options

AD Connect Health

**Chapter 14 Azure Multi Factor Authentication**

Enabling MFA for User1

Test MFA for User1

Accessing MFA Service Settings

Enable and disable verification methods

Allow users to create app passwords

Enabling Trusted IPs

Enabling Remember Multi-Factor

Enabling Fraud Alert

Enabling Block/Unblock

Enabling Account Lockout

Demonstrating One-time Bypass

**Chapter 15 Azure AD Premium Features**

Create Conditional Access Policy

Testing CA Policy from Location outside India

Testing the CA Policy from Location in India

Testing the Conditional Access Policy using What If option

Simulate suspicious locations using TOR Browser

Enabling Azure Active Directory Identity Protection

Accessing Azure AD Identity Protection Dashboard

Demonstrating Resetting Compromised User Password

Investigating Risk Events

Investigating Vulnerabilities

Implementing Sign-in Risk Conditional Access Policy

Create Access Review for Azure AD Group

**Chapter 16 Azure Active Directory B2C and B2B**

Create Azure AD B2C Tenant and Link it to Azure Subscription

Adding support for Social Account in your App (Facebook)

Admin Adding B2B Users

**Chapter 17 Directory Role and RBAC**

<https://www.youtube.com/watch?v=SIs26O1XICo>

<https://www.youtube.com/watch?v=WBj_zjVHMDw>

<https://www.youtube.com/watch?v=D3zS9rFMEOo>

Assign User3 Directory role of Limited Administrator

Check User3 Access by creating a User

Checking User3 Access level

Assigning User3 Role of Reader in Resource Group

Check User3 Access level in Azure Portal

Adding Co-Administrator to the subscription

Check User3 Access level in Azure Portal

**Chapter 18 Azure Subscription & Cost Management**

Exploring Subscription Dashboard

Checking Subscription Usage & Quota

Accessing Cost Management Dashboard

Cost Analysis Dashboard

Create Budgets with Billing Notification alarms

Advisor Recommendations

Applying Azure Policy at Subscription Level

<https://www.youtube.com/watch?v=WzWciF1Af64&list=PLlQ09DQt_50YqRAov9nnHjf9NYox5sQwe&index=46>

<https://www.youtube.com/watch?v=h5K3WU3TrXs>

Test the Allowed Virtual Machine SKU Policy

**Chapter 19 Azure Resource Groups, Tags and Locks**

Create Resource Group HKTest

Applying Azure Policy at Resource Group Level

Test the Allowed storage accounts SKU Policy

Move resources to new resource group

Create Tag with name Mktg for VM wvmportal

Create Tag with name Mktg for VM wvmportal OS Disk

Find Cost of Resources Associated with Mktg

Create CanNotDelete Lock on VM VMFE1

Test the Lock

**Chapter 21 Installing Azure PowerShell Module & Azure CLI**

Install latest Version of PowerShellGet

Install & Import Azure PowerShell Module

Connecting to Azure using Azure PowerShell Module

Install Azure CLI on Windows Machine

Login to Azure with CLI

**Chapter 22 Implementing Virtual Networks with CLI & PS**

Create Resource Group HKCLI using Azure CLI

Create Resource Group HKPS using Azure PowerShell

Create Virtual Network VNETCLI using Azure CLI

Create Virtual Network VNETPS using Azure PowerShell

**Chapter 23 Deploy Virtual Machines with CLI and PS**

Create Windows Server 2016 VM using Azure CLI

Create Windows Server 2016 VM using Azure PowerShell

**Chapter 24 Storage Accounts with CLI and PS**

Create Storage Account Using CLI

Create Storage Account Using PowerShell

**Chapter 25 Implement Storage with CLI and PowerShell**

Create Blob Storage Container using Azure CLI

Create Blob Storage Container using PowerShell

**Case Studies**

Design Virtual Network and Network Security Groups

Workload Isolation with Hub and Spoke VNETs using VNET Peering

Controlling Access to Database VM using NSG

Access to Database VM using UDR

Access to Azure SQL Database

Designing Disk Solution

Designing Disk and VM Soultion

Design for IOPS and Throughtput for your Application using Different I/O Sizes

Choosing VM size and Designing IOPs

Placement of Virtual Machines in Availability Set

Load Balancing e-commerce server

Highly Available Multisite Website

Design Compute Solution for Image Processing Application

Backup of Azure VM with Managed Disk

Backup of Azure VM with Managed Disk

Backup of Folder in Azure VM

DR for Azure VM

Secure Remote Access to on-premises Application

Identity Management

Licensing Case Study 1

Licensing Case Study 2

Design Role Based Access Control (RBAC)

**Chapter 1 Azure App Services or Web Apps**

Azure App Services or Web Apps

Comparing Windows VM and Web Apps

Web App Features

App Service Plan

Deployment Slot

Application Platform

Continuous Integration and Deployment (CI/CD)

Custom Domain Name

App Service Certificate

Assign SSL certificate to Web App

Website Authentication with identity providers

Web App Scale Up

Web App Scale out (Manual or AutoScaling)

Website Performance Test

Diagnostics logging for Apps in Azure App Service

Application Insights

Web App Backup

WebJobs

MySQL in Web App

Web App Networking Options

Web App VNET Integration

Web App Hybrid Connection

Azure CDN with Web Apps

Web App Access Restriction

App Service Environment (ASE)

Web App Extensions

Web App SCM Site

Web App for Containers

App Services Pricing

**Chapter 2 Containers**

Containers

Virtual Machines V/S Containers 7

What is required to run Containers

Benefits of Container Technology

Drawbacks of Container Technology

Container Deployment Options in Azure

Common Docker commands for running containers

Dockerfile

Container Registry

Azure Container Registry (ACR)

Architecture of Azure Container Registry

Azure Container Registry Tiers

Access to Azure Container Registry

Content formats supported in Azure Container Registry

Azure Container Registry Geo Replication

Content trust in Azure Container Registry

Azure Container Instances (ACI)

Container Groups in ACI

Azure Container Instance use case scenarios

Azure Web App for Containers

Web App for Containers Pricing Tier (Premium Container Plan)

Image Sources in Web App for Containers

Azure Kubernetes Service (AKS)

Azure Kubernetes Service (AKS) Architecture

Kubernetes Cluster Architecture

AKS Networking Options

HTTP Application Routing

Container Monitoring

Authenticate to Azure Container Registry from AKS

**Chapter 3 Azure SQL Database**

Azure SQL Database

Azure SQL Database v/s SQL Server

Comparing Azure SQL Database (PaaS) to SQL Server running on Azure VM (IaaS)

Azure SQL Database Deployment Options

Azure SQL Database - Single Database Model

Azure SQL Database – Elastic Pool Model

Azure SQL Database – Managed Instance

Azure SQL Database service tiers (DTU Model)

Azure SQL Database service tiers (vCore Model)

vCore Model – Hyperscale Service Tier

Azure Hybrid Benefits in vCore Model

Choosing between vCore and DTU Purchasing Model

Data Migration Assistant (DMA)

Business continuity options with Azure SQL Database

Azure SQL Database Backup and Restore

Azure SQL Database High Availability Using Active Geo-Replication

High availability using Active Geo-Replication and Failover groups

Long Term Backup Retention

Scaling up or scaling down a single database

In-Memory technologies in SQL Database

Azure SQL Database Access Control

Protecting SQL Data

Transparent Data Encryption (For Data at Rest)

Always Encrypted (For Data in Use)

Advanced Data Security

Azure SQL Database Auditing

Azure SQL Database Threat Detection & Auditing

SQL Database Dynamic Data Masking

SQL Server Stretch Database

Azure SQL Pricing DTU Model (Standard Tier)

SQL Pricing vCore (General Purpose) – Single Database/Elastic Pool

**Chapter 4 Implement Authentication**

Windows Integrated Authentication

Form based Authentication

Implement authentication using Certificates

Certificate-based authentication in Azure Active Directory

Oauth2 Authentication

Managed Service Identity (MSI)

Service Principal

Managed Service Identity or Service Principal

**Chapter 5 Implement Secure Data Solutions**

Encryption at Rest

Encryption at rest options for Azure Storage

Encryption at rest options for Azure SQL Database

Data Encryption Models in Azure

Client side Encryption Model

Server-side encryption model

Azure Storage Service encryption (Server-side encryption)

Azure Disk Encryption (Data at Rest)

Difference between Storage Service Encryption and Disk encryption

Encryption in transit for Azure Storage

TLS/SSL Communication

Azure confidential Computing

Azure Key Vault

Software-Protected and HSM-Protected Keys

Using Keys with Key Vault

Using Secrets with Key Vault

Using Certificates with Key Vault

Using Key Vault Secret with ARM Templates

Securing Azure Key Vault Management and Data Plane

Key Vault Advance Access Policies

Key Rotation

Soft Delete

Key Logging

Azure Key Vault Tiers

Azure Key Vault Pricing

**Chapter 6 Azure Serverless Computing**

Azure Functions

Common scenarios for Azure Functions

Triggers and Bindings

Azure Functions pricing

Azure Functions scale and hosting

Azure Logic Apps

Connectors

Types of Triggers

Examples of Logic Apps workflow Automation

Logic Apps pricing

**Chapter 7 Azure Messaging Solutions**

Azure Service Bus

Azure Service Bus Queues

Azure Service Bus Topics

Service Bus Architecture (Queues and Topics)

Service Bus Tiers

Azure Relay

Comparing Queues, Topics and Relays

Azure Notification Hubs

Azure Notification Hubs Tiers & Pricing

Azure Event Grid

Event Grid Working

Event Grid use cases

Event Grid Pricing

Azure Event Hub

Event Hub Use Cases

Event Hub Anti Use Cases

Event Hub Architecture

Azure IoT Hub and Azure Event Hubs Comparison

Azure Event Hub Tiers & Pricing

Event Hub Capture

SendGrid Email Service

**Chapter 8 Azure Cosmos DB**

NoSQL Databases

Cosmos DB Database

Cosmos DB Core SQL (Document) Database

Cosmos DB Table API (key-value pair) Database

Cosmos DB Gremlin (Graph) Database

Cosmos DB for MongoDB API (Document) Database

Cosmos DB Cassandra (Wide-Column) Database

Cosmos DB Firewall & Virtual Network Feature

Cosmos DB Replication Feature

Add Azure Function

Consistency levels in Azure Cosmos DB

Azure Cosmos DB Provisoned Throughput

Azure Cosmos DB Consumed Storage

Partitioning

Cosmos DB Pricing

Saving Cost with Reserved Instances

**Chapter 9 Analyzing & Monitoring Azure Resources**

Azure Monitoring Solutions

Application Insights

Azure Monitor

Metrics & Logs

Activity Log

Diagnostic Logs (Non-Compute Resources)

Diagnostic Logs (Compute Resource)

Metrics

Action Group

Alerts

Log Analytics

Management Solutions

Advisor

Azure Service Health

**Chapter 10 Monitor Virtual Networking**

Network Watcher

Network Performance Monitor

Requirements and Steps for Enabling Network Performance Monitor

**Chapter 11 Azure Automation**

Azure Automation

Process Automation Working and Architecture

Automate configuration management using Desired State Configuration

Update Management

Inventory Management

Change Tracking

**Chapter 12 Azure Resource Manager (ARM) Template**

**Azure Resource Manager (ARM) Template**

Why we need ARM Template

Advantages of ARM Template

Disadvantage of ARM Template

Creating ARM template options

ARM Template Deployment Options

Viewing ARM Template

**Chapter 13 Azure Redis Cache**

Azure Redis Cache

Redis Cache Use Cases

Azure Redis Cache Features and tiers

**Chapter 14 Hybrid Applications**

On-premises Data Gateway

Data Management Gateway for Data Factory

Identify Options to Join VM to domains

Azure Relay Service

Web App Hybrid and VPN Connection

**Chapter 15 High Performance Computing (HPC)**

High Performance Computing

High Performance Computing with Azure Batch

Azure Batch Use cases (Intrinsically Parallel Workloads)

Azure Batch Use cases (Tightly coupled Workloads)

Azure Batch Architecture & Working

Azure Batch Pricing

Low-priority VMs in Batch

**Chapter 16 Azure Service Fabric**

Azure Service Fabric

Service Fabric Deployment Options

What Are Microservices

Microservices Types

High level view of Service Fabric Cluster

Service Fabric Architecture

Azure Service Fabric Cluster Architecture

Service Fabric Management Components (System Services)

Service Fabric programming model overview

Application Deployment in Service Fabric Cluster

Service Fabric Application Scalability and Availability

**Chapter 17 API Management**

API Management (APIM)

How API Management is implemented

Why do we need API Management (APIM)

Common scenarios of API Management

API Management Components

API Management Tiers

Caching

Virtual Network Support

Scaling API Management

API Management Pricing

**Chapter 18 Azure Data Factory**

Azure Data Factory

Examples of Data Factory

Data Factory Working

Data Factory Components

Activity Types

Data Flow

**Chapter 19 Azure SQL Data Warehouse**

Data Warehouse Introduction

Azure SQL Data Warehouse

Azure SQL Data Warehouse Architecture

Azure SQL Data Warehouse performance tiers

Concurrency slots

Azure SQL Data Warehouse Working

Loading Data into Azure SQL Data Warehouse

**Chapter 20 Azure Data lake Store**

Azure Data lake Store

What can be done with Azure Data lake Store

Features of Data Lake Store

Comparing Data lake Store and Azure Blob Storage

Step by Step Using Azure Data Lake Store for big data processing

Integrating Data Lake Store with other Azure Services

Azure Data lake Pricing

**Chapter 21 Big Data with Azure Data Lake Analytics**

Azure Data lake Analytics

Features of Azure Data Lake Analytics

Azure Data lake Analytics Architecture

What can you do with Data lake Analytics

Azure Data Lake Analytics Pricing

**Chapter 22 Azure Migrate**

Azure Migrate

Features & Benefits of Azure Migrate Service

Azure Migrate Discovery & Assessment for VMware VMs

Azure Migrate Step by Step working for VMware VMs

Information Discovered by Collector VM

Azure Migrate Assessment calculations

Dependency Mapping by Azure Migrate

**Lab Exercises**

**Chapter 1 Azure App Services or Web Apps**

Create Empty App Service Plan (Standard S1 Plan)

Create Web App

Add FTP Credentials

Create Custom Website Code

Upload index.html to Web App HKWA1 using FileZilla

Create Deployment Slot

Swap the Production Web App with Deployment Slot

Swap Back the HKWA1 and delete the deployment Slot HKWA2

Exploring CI/CD options

Adding Custom Domain Name

Purchase and Configure App Service Certificate

Upload & Bind SSL Certificate

Enabling Authentication/Authorization

Web App Scale Up

Web App Manual scale out

Web App Autoscaling

Configuring Performance Test

Enabling and downloading Web App Diagnostic Logs

Exploring Application Insight dashboard

Manual Backup

Restoring Backup

Configuring Hybrid Connection

Adding CDN to Web App HKWA1

Web App Access Restrictions

Adding Extensions

Accessing & Exploring Kudu Dashboard

**Chapter 2 Containers**

Create Azure Ubuntu VM

Connect to Ubuntu VM and update the VM

Install Docker Engine and Deploy Container on Ubuntu VM

Deploy NGINX Container on Azure Ubuntu Linux VM

Browse Public Container Registry Docker Hub

Create Azure Container Registry (ACR)

Install Azure CLI on Ubuntu VM vmlinux

Login to ACR and push image hello-world to ACR

Run hello-world:v1 image from Registry ACRCloud

Login to Azure Container Registry using Docker Login Command

Exploring Replication feature

Exploring Content Trust feature

Deploy Azure Container Instance (ACI) using Public Image

Deploy Web App for Containers

Create AKS Cluster with Basic Networking

Install Kubectl

Connect to AKS Cluster using kubectl

Access Kubernetes Web UI Dashboard

Deploy NGINX Container to AKS Cluster

Edit the NGINX Application

Deploy Second NGINX Container to AKS Cluster

**Chapter 3 Azure SQL Database**

Create and Connect to Azure SQL Single Database (DTU Model)

Enabling Azure AD Authentication for User1

Create Azure SQL Single Database (vCore Model)

Point in Time Restore

Active Geo-Replication. Creating Replica of Primary Database

Configuring Long Term Backup Retention

Transparent Data Encryption at database level

Transparent Data Encryption at Server level

Enabling Advanced Data Security

Enabling Database Auditing at Server Level

Adding Dynamic Data Masking Rule

**Chapter 4 Implement Authentication**

Implementing Point to Site (P2S) VPN using Certificates

Enabling MSI on Azure VMs

Generating Service Principal Values

**Chapter 5 Implement Secure Data Solutions**

Checking Storage Service Encryption (MS Managed Keys)

Checking Status of Secure Transfer Required

Azure Storage Service Encryption (customer-managed keys)

Protecting Database Connection Identifier with Key Vault Secret

Generating Self-Signed Certificate

Enabling Key Vault Advanced Accees Policies

Key Rotation

**Chapter 6 Azure Serverless Computing**

**Publishing Hello World using http triggered Functions**

Check Trigger Option Templates to create a Function

Use Blob Storage Trigger Template to create a Function

Exploring Function App HWCloud Settings, Config & Platform Features

Exploring Function (MyBlob) Settings

Delete Function MyBlob

Create Logic App workflow (Check RSS Feed)

**Chapter 7 Azure Messaging Solutions**

Implementing Service Bus Name Space

Create Service Bus Queues

Implementing Topics & Subscriptions

Implementing Relay Namespace & Connections

Create Storage Account and Add a Blob Container

Routing Blob Storage Events toWeb Endpoint (Azure Web App)

Create Event Hub Namespace

Create Event Hub

Configure Event Producers to Send Events to Event Hub

Send Output of Event Hub to Stream Analytics

**Chapter 8 Azure Cosmos DB**

Cosmos DB Core SQL (Document) Database

Cosmos DB Table (Key-Value) Database

Cosmos DB Gremlin (Graph) Database

Cosmos DB for MongoDB API (Document) Database

Exploring Firewall and Virtual Network Feature

Adding Read Regions

Add Azure Function

**Chapter 9 Analyzing & Monitoring Azure Resources**

<https://www.youtube.com/watch?v=A0jAeGf2zUQ&t=1511s>

<https://www.youtube.com/watch?v=xuq3hCodYI4>

Create Application Insight Service in Azure

Accessing & Exploring Monitor Dashboard

Accessing Activity Log from a Monitor Dashboard

Accessing Activity Log from a Resource Dashboard

Accessing Diagnostic Log from the Monitor Dashboard

Enabling Diagnostic Logs for Recovery Services Vault

Enabling Diagnostic Logs for Network Security Group

Enabling Guest OS Diagnostic Logs in VM VMFE1

Virtual Machine Percentage CPU Metrics

Storage Account Used Capacity Metrics

Create Action Group

Create an alert on Metric (Percentage CPU) for VM

Accessing Alert from Resource (VM) Dashboard

Monitoring IIS Web Server with Log Analytics

Installing Management Solution (NSG Analytics)

Installing Microsoft Monitoring Agent in On-Premises VM

Checking Advisor Recommendations

Checking Service Health Events

Configuring Alerts for Service Health Events

**Chapter 10 Monitor Virtual Networking**

Enabling Network Watcher

Network Watcher Capabilities

Adding NPM in Log Analytics Workspace

**Chapter 11 Azure Automation**

Create Automation Account

Desired State Configuration (DSC) using Azure Automation

PowerShell DSC Extension

Enabling Update Management and Add Azure VM

Scheduling Update Deployment

Enabling Inventory Management and Add VM VMFE2

Checking Change Tracking for VM VMFE2

**Chapter 12 Azure Resource Manager (ARM) Template**

View ARM Template of an Existing Resource

Save a Template in library

Deploy or Edit Template

**Chapter 13 Azure Redis Cache**

Create and use Azure Redis Cache

**Chapter 15 High Performance Computing (HPC)**

Azure Batch Computing

**Chapter 16 Azure Service Fabric**

Service Fabric Cluster Deployment

**Chapter 17 API Gateway**

Step by Step Implementing API Management

**Chapter 18 Azure Data Factory**

Create Storage Account and upload a txt File

Create Azure Data Factory

Data Flow

**Chapter 19 Azure SQL Data Warehouse**

Create, Connect and Query SQL DW using Sample Database

**Chapter 20 Azure Data lake Store**

Create Data Lake Store and upload Data

**Chapter 21 Big Data with Azure Data Lake Analytics**

Create Data Lake Analytics Account with associated Data lake Store

Perform Analytics on Data stored in Data Lake Store using U-SQL Script

**Chapter 22 Azure Migrate**

Create Azure Migrate Project

**Case Studies**

• Azure Web App High Availability

• Design a Business Continuity Solution for Web/App tier and Database Tier

• Choosing a Database tier

• Oauth2 Authentication

• Integrating Structured and Unstructured Data into Azure SQL DW using Azure Data Factory

• Integrating & Processing Non- Structured Data with Azure Data lake Analytics

**AZ-300 Skills Measured:**

* **Deploy and configure infrastructure (25-30%)**
  + Analyze resource utilization and consumption
  + configure diagnostic settings on resources
  + create baseline for resources
  + create and rest 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
  + Create and configure storage accounts
  + configure network access to the storage account
  + create and configure storage account
  + generate shared access signature
  + install and use Azure Storage Explorer
  + manage access keys
  + monitor activity log by using Azure Monitor logs
  + implement Azure storage replication
  + Create and configure a Virtual Machine (VM) for Windows and Linux
  + configure high availability
  + configure monitoring, networking, storage, and virtual machine size
  + deploy and configure scale sets
  + Automate deployment of Virtual Machines (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
  + Implement solutions that use virtual machines (VM)
  + provision VMs
  + create Azure Resource Manager templates
  + configure Azure Disk Encryption for VMs
  + Create connectivity between virtual networks
  + create and configure VNET peering
  + create and configure VNET to VNET
  + verify virtual network connectivity
  + create virtual network gateway
  + Implement and manage virtual networking
  + configure private and public IP addresses, network routes, network interface, subnets, and virtual network
  + Manage Azure Active Directory (AD)
  + add custom domains
  + configure Azure AD Identity Protection, Azure AD Join, and Enterprise State Roaming
  + 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 and single sign-on
  + manage Azure AD Connect
  + manage password sync and writeback

**Implement workloads and security (20-25%)**

Migrate servers to Azure

* + migrate by using Azure Site Recovery
  + migrate using P2V
  + configure storage
  + create a backup vault
  + prepare source and target environments
  + backup and restore data
  + deploy Azure Site Recovery agent
  + prepare virtual network

Configure serverless computing

* + manage a Logic App resource
  + manage Azure Function app settings
  + manage Event Grid
  + manage Service Bus

Implement application load balancing

* + configure application gateway and load balancing rules
  + implement front end IP configurations
  + manage application load balancing

Integrate on-premises network with Azure virtual network

* + create and configure Azure VPN Gateway
  + create and configure site to site VPN
  + configure Express Route
  + verify on-premises connectivity
  + manage on-premises connectivity with Azure

Manage role-based access control (RBAC)

* + create a custom role
  + configure access to Azure resources by assigning roles
  + configure management access to Azure
  + troubleshoot RBAC
  + implement RBAC policies
  + assign RBAC roles

Implement Multi-Factor Authentication (MFA)

* + enable MFA for an Azure tenant
  + configure user accounts for MFA
  + configure fraud alerts
  + configure bypass options
  + configure trusted IPs
  + configure verification methods
  + manage role-based access control (RBAC)
  + implement RBAC policies
  + assign RBAC Roles
  + create a custom role
  + configure access to Azure resources by assigning roles
  + configure management access to Azure

**Create and deploy apps (5-10%)**

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

Design and develop apps that run in containers

* + configure diagnostic settings on resources
  + create a container image by using a Docker file
  + create an Azure Kubernetes Service
  + publish an image to the Azure Container Registry
  + implement an application that runs on an Azure Container Instance
  + manage container settings by using code

**Implement authentication and secure data (5-10%)**

Implement authentication

* + implement authentication by using certificates, forms-based authentication, tokens, or Windows-integrated authentication
  + implement multi-factor authentication by using Azure AD
  + implement OAuth2 authentication
  + implement Managed identities for Azure resources Service Principal authentication

Implement secure data solutions

* + encrypt and decrypt data at rest and in transit
  + encrypt data with Always Encrypted
  + implement Azure Confidential Compute and SSL/TLS communications
  + create, read, update, and delete keys, secrets, and certificates by using the KeyVault API

**Develop for the cloud and for Azure storage (20-25%)**

Develop solutions that use Cosmos DB storage

* + create, read, update, and delete data by using appropriate APIs
  + implement partitioning schemes
  + set the appropriate consistency level for operations

Develop solutions that use a relational database

* + provision and configure relational databases
  + configure elastic pools for Azure SQL Database
  + create, read, update, and delete data tables by using code

Configure a message-based integration architecture

* + configure an app or service to send emails, Event Grid, and the Azure Relay Service
  + create and configure Notification Hub, Event Hub, and Service Bus rules and patterns (schedule, operational/system metrics, code that addresses singleton application instances)
  + implement code that addresses transient state

**AZ-301 Skills Measured:**

**Determine workload requirements (10-15%)**

Gather Information and Requirements

* + identify compliance requirements, identity and access management infrastructure, and service-oriented architectures (e.g., integration patterns, service design, service discoverability)
  + identify accessibility (e.g. Web Content Accessibility Guidelines), availability (e.g. Service Level Agreement), capacity planning and scalability, deploy-ability (e.g., repositories, failback, slot-based deployment), configurability, governance, maintainability (e.g. logging, debugging, troubleshooting, recovery, training), security (e.g. authentication, authorization, attacks), and sizing (e.g. support costs, optimization) requirements
  + recommend changes during project execution (ongoing)
  + evaluate products and services to align with solution
  + create testing scenarios

Optimize Consumption Strategy

* + optimize app service, compute, identity, network, and storage costs

Design an Auditing and Monitoring Strategy

* + define logical groupings (tags) for resources to be monitored
  + determine levels and storage locations for logs
  + plan for integration with monitoring tools
  + recommend appropriate monitoring tool(s) for a solution
  + specify mechanism for event routing and escalation
  + design auditing for compliance requirements
  + design auditing policies and traceability requirements

**Design for identity and security (20-25%)**

Design Identity Management

* + choose an identity management approach
  + design an identity delegation strategy, identity repository (including directory, application, systems, etc.)
  + design self-service identity management and user and persona provisioning
  + define personas and roles
  + recommend appropriate access control strategy (e.g., attribute-based, discretionary access, history-based, identity-based, mandatory, organization-based, role-based, rule-based, responsibility-based)

Design Authentication

* + choose an authentication approach
  + design a single-sign on approach
  + design for IPSec, logon, multi-factor, network access, and remote authentication

Design Authorization

* + choose an authorization approach
  + define access permissions and privileges
  + design secure delegated access (e.g., oAuth, OpenID, etc.)
  + recommend when and how to use API Keys

Design for Risk Prevention for Identity

* + design a risk assessment strategy (e.g., access reviews, RBAC policies, physical access)
  + evaluate agreements involving services or products from vendors and contractors
  + update solution design to address and mitigate changes to existing security policies, standards, guidelines and procedures

Design a Monitoring Strategy for Identity and Security

* + design for alert notifications
  + design an alert and metrics strategy
  + recommend authentication monitors

**Design a data platform solution (15-20%)**

Design a Data Management Strategy

* + choose between managed and unmanaged data store
  + choose between relational and non-relational databases
  + design data auditing and caching strategies
  + identify data attributes (e.g., relevancy, structure, frequency, size, durability, etc.)
  + recommend Database Transaction Unit (DTU) sizing
  + design a data retention policy
  + design for data availability, consistency, and durability
  + design a data warehouse strategy

Design a Data Protection Strategy

* + recommend geographic data storage
  + design an encryption strategy for data at rest, for data in transmission, and for data in use
  + design a scalability strategy for data
  + design secure access to data
  + design a data loss prevention (DLP) policy

Design and Document Data Flows

* + identify data flow requirements
  + create a data flow diagram
  + design a data flow to meet business requirements
  + design a data import and export strategy

Design a Monitoring Strategy for the Data Platform

* + design for alert notifications
  + design an alert and metrics strategy

**Design a business continuity strategy (15-20%)**

Design a Site Recovery Strategy

* + design a recovery solution
  + design a site recovery replication policy
  + design for site recovery capacity and for storage replication
  + design site failover and failback (planned/unplanned)
  + design the site recovery network
  + recommend recovery objectives (e.g., Azure, on-prem, hybrid, Recovery Time Objective (RTO), Recovery Level Objective (RLO), Recovery Point Objective (RPO))
  + identify resources that require site recovery
  + identify supported and unsupported workloads
  + recommend a geographical distribution strategy

Design for High Availability

* + design for application redundancy, autoscaling, data center and fault domain redundancy, and network redundancy
  + identify resources that require high availability
  + identify storage types for high availability

Design a Data Archiving Strategy

* + recommend storage types and methodology for data archiving
  + identify requirements for data archiving and business compliance requirements for data archiving
  + identify SLA(s) for data archiving

**Design for deployment, migration, and integration (10-15%)**

Design Deployments

* + design a compute, container, data platform, messaging solution, storage, and web app and service deployment strategy

Design Migrations

* + recommend a migration strategy
  + design data import/export strategies during migration
  + determine the appropriate application migration, data transfer, and network connectivity method
  + determine migration scope, including redundant, related, trivial, and outdated data
  + determine application and data compatibility

Design an API Integration Strategy

* + design an API gateway strategy
  + determine policies for internal and external consumption of APIs
  + recommend a hosting structure for API management

**Design an infrastructure strategy (15-20%)**

Design a Storage Strategy

* + design a storage provisioning strategy
  + design storage access strategy
  + identify storage requirements
  + recommend a storage solution and storage management tools

Design a Compute Strategy

* + design compute provisioning and secure compute strategies
  + determine appropriate compute technologies (e.g., virtual machines, functions, service fabric, container instances, etc.)
  + design an Azure HPC environment
  + identify compute requirements
  + recommend management tools for compute

Design a Networking Strategy

* + design network provisioning and network security strategies
  + determine appropriate network connectivity technologies
  + identify networking requirements
  + recommend network management tools

Design a Monitoring Strategy for Infrastructure

* + design for alert notifications
  + design an alert and metrics strategy

# Microsoft Azure Architect Technologies

The study guide to Exams AZ-300: Microsoft Azure Architect Technologies. Below is a Table of Contents that has links to all different parts of this Exam. Everything on the [official site for the AZ-300 exam](https://www.microsoft.com/en-us/learning/exam-AZ-300.aspx) is found here verbatim. The detailed breakdown of the individual components are presented in an outline style with links to documentation on each Azure resource in the exams. Enjoy!

**TABLE OF CONTENTS**

* [Deploy and Configure Infrastructure](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#deploy-and-configure-infrastructure)
  + [Analyze resource utilization and consumption](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#analyze-resource-utilization-and-consumption)
  + [Create and configure storage accounts](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#create-and-configure-storage-accounts)
  + [Create and configure a Virtual Machine (VM) for Windows and Linux](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#create-and-configure-vm-windows-and-linux)
  + [Automate deployment of Virtual Machines (VMs)](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#automate-deployment-of-virtual-machines)
  + [Create connectivity between virtual networks](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#create-connectivity-between-virtual-networks)
  + [Implement and manage virtual networking](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-and-manage-virtual-networking)
  + [Manage Azure Active Directory (AD)](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#manage-azure-active-directory)
  + [Implement and manage hybrid identities](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-and-manage-hybrid-identities)
* [Implement Workloads and Security](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-workloads-and-security)
  + [Migrate servers to Azure](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#migrate-servers-to-azure)
  + [Configure serverless computing](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#configure-serverless-computing)
  + [Implement application load balancing](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-application-load-balancing)
  + [Integrate on-premises network with Azure virtual network](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#integrate-on-premises-network-with-azure-virtual-network)
  + [Manage role-based access control (RBAC)](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#manage-role-based-access-control-rbac)
  + [Implement Multi-Factor Authentication (MFA)](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-multi-factor-authentication)
* [Architect Cloud Technology Solutions](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#architect-cloud-technology-solutions)
  + [Select an appropriate compute solution](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#select-an-appropriate-compute-solution)
  + [Select an appropriate integration solution](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#select-an-appropriate-integration-solution)
  + [Select an appropriate storage solution](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#select-an-appropriate-storage-solution)
* [Create and Deploy Apps](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#create-and-deploy-apps)
  + [Create web applications by using PaaS](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#create-web-applications-by-using-paas)
  + [Create app or service that runs on Service Fabric](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#create-app-or-service-that-runs-on-service-fabric)
  + [Design and develop applications that run in containers](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-and-develop-applications-that-run-in-containers)
* [Implement Authentication and Secure Data](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-authentication-and-secure-data)
  + [Implement authentication](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-authentication)
  + [Implement secure data solutions](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-secure-data-solutions)
* [Develop for the Cloud](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#develop-for-the-cloud)
  + [Develop long-running tasks](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#develop-long-running-tasks)
  + [Configure a message-based integration architecture](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#configure-a-message-based-integration-architecture)
  + [Develop for asynchronous processing](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#develop-for-asynchronous-processing)
  + [Develop for autoscaling](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#develop-for-autoscaling)
  + [Implement distributed transactions](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#implement-distributed-transactions)
  + [Develop advanced cloud workloads](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#develop-advanced-cloud-workloads)
* [Determine Workload Requirements](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#determine-workload-requirements)
  + [Gather Information and Requirements](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#gather-information-and-requirements)
  + [Optimize Consumption Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#optimize-consumption-strategy)
  + [Design an Auditing and Monitoring Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-an-auditing-and-monitoring-strategy)
* [Design for Identity and Security](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-for-identity-and-security)
  + [Design Identity Management](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-identity-management)
  + [Design Authentication](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-authentication)
  + [Design Authroization](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-authorization)
  + [Design for Risk Prevention for Identity](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-for-risk-prevention-for-identity)
  + [Design a Monitoring Strategy for Identity and Security](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-monitoring-strategy-for-identity-and-security)
* [Design a Data Platform Solution](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-data-platform-solution)
  + [Design a Data Management Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-data-management-strategy)
  + [Design a Data Protection Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-data-protection-strategy)
  + [Design and Document Data Flows](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-and-document-data-flows)
  + [Design a Monitoring Strategy for the Data Platform](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-monitoring-strategy-for-the-data-platform)
* [Design a Business Continuity Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-business-continuity-strategy)
  + [Design a Site Recovery Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-site-recovery-strategy)
  + [Design for High Availability](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-for-high-availability)
  + [Design a disaster recovery strategy for individual workloads](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-disaster-recovery-strategy-for-individual-workloads)
  + [Design a Data Archiving Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-data-archiving-strategy)
* [Design for Deployment, Migration, and Integration](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-for-deployment-migration-and-integration)
  + [Design Deployments](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-deployments)
  + [Design Migrations](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-migrations)
  + [Design an API Integration Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-an-api-integration-strategy)
* [Design an Infrastructure Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-an-infrastructure-strategy)
  + [Design a Storage Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-an-storage-strategy)
  + [Design a Compute Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-compute-Strategy)
  + [Design a Networking Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-networking-strategy)
  + [Design a Monitoring Strategy for Infrastructure](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam#design-a-monitoring-strategy-for-infrastructure)

[**Deploy and Configure Infrastructure**](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/blob/master/AZ-300/README.md#deploy-and-configure-infrastructure-25-30)

**Analyze resource utilization and consumption**

* configure diagnostic settings on resources
* create baseline for resources
* create and rest 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 Log Analytics

**Create and configure storage accounts**

* configure network access to the storage account
* create and configure storage account
* generate shared access signature
* install and use Azure Storage Explorer
* manage access keys
* monitor activity log by using Log Analytics
* implement Azure storage replication

**Create and configure a Virtual Machine (VM) for Windows and Linux**

* configure high availability
* configure monitoring, networking, storage, and virtual machine size
* deploy and configure scale sets

**Automate deployment of Virtual Machines (VMs)**

* modify Azure Resource Manager (ARM) template
* configure location of new VMs
* configure VHD template
* deploy from template
* save a deployment as an ARM template
* deploy Windows and Linux VMs

**Create connectivity between virtual networks**

* create and configure VNET peering
* create and configure VNET to VNET
* verify virtual network connectivity
* create virtual network gateway

**Implement and manage virtual networking**

* configure private and public IP addresses, network routes, network interface, subnets, and virtual network

**Manage Azure Active Directory (AD)**

* add custom domains
* configure Azure AD Identity Protection, Azure AD Join, and Enterprise State Roaming
* 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 and single sign-on
* manage Azure AD Connect
* manage password sync and writeback

[**Implement Workloads and Security**](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/blob/master/AZ-300/README.md#implement-workloads-and-security-20-25)

**Migrate servers to Azure**

* migrate by using Azure Site Recovery (ASR)
* migrate using P2V
* configure storage
* create a backup vault
* prepare source and target environments
* backup and restore data
* deploy Azure Site Recovery (ASR) agent
* prepare virtual network

**Configure serverless computing**

* create and manage objects
* manage a Logic App resource
* manage Azure Function app settings
* manage Event Grid
* manage Service Bus

**Implement application load balancing**

* configure application gateway and load balancing rules
* implement front end IP configurations
* manage application load balancing

**Integrate on-premises network with Azure virtual network**

* create and configure Azure VPN Gateway
* create and configure site to site VPN
* configure Express Route
* verify on-premises connectivity
* manage on-premises connectivity with Azure

**Manage role-based access control (RBAC)**

* create a custom role
* configure access to Azure resources by assigning roles
* configure management access to Azure
* troubleshoot RBAC
* implement RBAC policies
* assign RBAC roles

**Implement Multi-Factor Authentication (MFA)**

* enable MFA for an Azure tenant
* configure user accounts for MFA
* configure fraud alerts
* configure bypass options
* configure trusted IPs
* configure verification methods
* manage role-based access control (RBAC)
* implement RBAC policies
* assign RBAC Roles
* create a custom role
* configure access to Azure resources by assigning roles
* configure management access to Azure

[**Architect Cloud Technology Solutions**](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/blob/master/AZ-300/README.md#architect-cloud-technology-solutions-5-10)

**Select an appropriate compute solution**

* leverage appropriate design patterns
* select appropriate network connectivity options
* design for hybrid topologies

**Select an appropriate integration solution**

* address computational bottlenecks, state management, and OS requirements
* provide for web hosting if applicable
* evaluate minimum number of nodes

**Select an appropriate storage solution**

* validate data storage technology capacity limitations
* address durability of data
* provide for appropriate throughput of data access
* evaluate structure of data storage
* provide for data archiving, retention, and compliance

[**Create and Deploy Apps**](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/blob/master/AZ-300/README.md#create-and-deploy-apps-5-10)

**Create web applications by using PaaS**

* create an Azure app service web app by using Azure CLI, PowerShell, and other tools
* create documentation for the API by using open source and other tools
* create an App Service Web App for containers
* create an App Service background task by using WebJobs

**Create app or service that runs on Service Fabric**

* develop a stateful Reliable Service and a stateless Reliable Service
* develop an actor-based Reliable Service
* write code to consume Reliable Collections in your service

**Design and develop applications that run in containers**

* configure diagnostic settings on resources
* create a container image by using a Docker file
* create an Azure Container Service (ACS/AKS) cluster by using the Azure CLI and Azure Portal
* publish an image to the Azure Container Registry
* implement an application that runs on an Azure Container Instance
* implement container instances by using Azure Container Service (ACS/AKS), Azure Service Fabric, and other tools
* manage container settings by using code

[**Implement Authentication and Secure Data**](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/blob/master/AZ-300/README.md#implement-authentication-and-secure-data-5-10)

**Implement authentication**

* implement authentication by using certificates, forms-based authentication, tokens, Windows-integrated authentication
* implement multi-factor authentication by using Azure AD options

**Implement secure data solutions**

* encrypt and decrypt data at rest
* encrypt data with Always Encrypted
* implement Azure Confidential Compute and SSL/TLS communications
* manage cryptographic keys in the Azure Key Vault

[**Develop for the Cloud**](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/blob/master/AZ-300/README.md#develop-for-the-cloud-20-25)

**Develop long-running tasks**

* implement large-scale, parallel, and high-performance apps by using batches
* implement resilient apps by using queues
* implement code to address application events by using web hooks
* address continuous processing tasks by using web jobs

**Configure a message-based integration architecture**

* configure an app or service to send emails, Event Grid, and the Azure Relay Service
* create and configure a Notification Hub, an Event Hub, and a Service Bus
* configure queries across multiple products
* configure an app or service with Microsoft Graph

**Develop for asynchronous processing**

* implement parallelism, multithreading, processing, durable functions, Azure logic apps, interfaces with storage, interfaces to data access, and appropriate asynchronous compute models

**Develop for autoscaling**

* implement autoscaling rules and patterns (schedule, operational/system metrics, code that addresses singleton application instances, and code that addresses transient state

**Implement distributed transactions**

* identify tools to implement distributed transactions (e.g., ADO.NET, elastic transactions, multi-database transactions)
* manage transaction scope
* manage transactions across multiple databases and servers

**Develop advanced cloud workloads**

* develop solutions by using intelligent algorithms that identify items from images and videos
* develop solutions by using intelligent algorithms related to speech, natural language processing, Bing Search, and recommendations and decision making
* create and integrate bots
* integrate machine learning solutions in an app
* create and implement IoT solutions

**Determine Workload Requirements**

**Gather Information and Requirements**

* identify compliance requirements, identity and access management infrastructure, and service-oriented architectures (e.g., integration patterns, service design, service discoverability)
* identify accessibility (e.g. Web Content Accessibility Guidelines), availability (e.g. Service Level Agreement), capacity planning and scalability, deploy-ability (e.g., repositories, failback, slot-based deployment), configurability, governance, maintainability (e.g. logging, debugging, troubleshooting, recovery, training), security (e.g. authentication, authorization, attacks), and sizing (e.g. support costs, optimization) requirements
* recommend changes during project execution (ongoing)
* evaluate products and services to align with solution
* create testing scenarios

**Optimize Consumption Strategy**

* optimize app service, compute, identity, network, and storage costs

**Design an Auditing and Monitoring Strategy**

* define logical groupings (tags) for resources to be monitored
* determine levels and storage locations for logs
* plan for integration with monitoring tools
* recommend appropriate monitoring tool(s) for a solution
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* design auditing policies and traceability requirements

**Design for Identity and Security**

**Design Identity Management**

* choose an identity management approach
* design an identity delegation strategy, identity repository (including directory, application, systems, etc.)
* design self-service identity management and user and persona provisioning
* define personas and roles
* recommend appropriate access control strategy (e.g., attribute-based, discretionary access, history-based, identity-based, mandatory, organization-based, role-based, rule-based, responsibility-based)

**Design Authentication**

* choose an authentication approach
* design a single-sign on approach
* design for IPSec, logon, multi-factor, network access, and remote authentication

**Design Authorization**

* choose an authorization approach
* define access permissions and privileges
* design secure delegated access (e.g., oAuth, OpenID, etc.)
* recommend when and how to use API Keys

**Design for Risk Prevention for Identity**

* design a risk assessment strategy (e.g., access reviews, RBAC policies, physical access)
* evaluate agreements involving services or products from vendors and contractors
* update solution design to address and mitigate changes to existing security policies, standards, guidelines and procedures

**Design a Monitoring Strategy for Identity and Security**

* design for alert notifications
* design an alert and metrics strategy
* recommend authentication monitors

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* choose between managed and unmanaged data store
* choose between relational and non-relational databases
* design data auditing and caching strategies
* identify data attributes (e.g., relevancy, structure, frequency, size, durability, etc.)
* recommend Database Transaction Unit (DTU) sizing
* design a data retention policy
* design for data availability, consistency, and durability
* design a data warehouse strategy

**Design a Data Protection Strategy**

* recommend geographic data storage
* design an encryption strategy for data at rest, for data in transmission, and for data in use
* design a scalability strategy for data
* design secure access to data
* design a data loss prevention (DLP) policy

**Design and Document Data Flows**

* identify data flow requirements
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* design a recovery solution
* design a site recovery replication policy
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* recommend recovery objectives (e.g., Azure, on-prem, hybrid, Recovery Time Objective (RTO), Recovery Level Objective (RLO), Recovery Point Objective (RPO))
* identify resources that require site recovery
* identify supported and unsupported workloads
* recommend a geographical distribution strategy

**Design for High Availability**

* design for application redundancy, autoscaling, data center and fault domain redundancy, and network redundancy
* identify resources that require high availability
* identify storage types for high availability

**Design a disaster recovery strategy for individual workloads**

* design failover/failback scenarios
* document recovery requirements
* identify resources that require backup
* recommend a geographic availability strategy

**Design a Data Archiving Strategy**

* recommend storage types and methodology for data archiving
* identify requirements for data archiving and business compliance requirements for data archiving
* identify SLA(s) for data archiving

**Design for Deployment, Migration, and Integration**

**Design Deployments**

* design a compute, container, data platform, messaging solution, storage, and web app and service deployment strategy

**Design Migrations**

* recommend a migration strategy
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* design a storage provisioning strategy
* design storage access strategy
* identify storage requirements
* recommend a storage solution and storage management tools

**Design a Compute Strategy**

* design compute provisioning and secure compute strategies
* determine appropriate compute technologies (e.g., virtual machines, functions, service fabric, container instances, etc.)
* design an Azure HPC environment
* identify compute requirements
* recommend management tools for compute

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* design network provisioning and network security strategies
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* identify networking requirements
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* design for alert notifications
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# Microsoft Azure Architect Design

The study guide to Exams AZ-301: Microsoft Azure Architect Design. Below is a Table of Contents that has links to all different parts of this Exam. Everything on the [official site for the AZ-301 exam](https://www.microsoft.com/en-us/learning/exam-AZ-301.aspx) is found here verbatim. The detailed breakdown of the individual components are presented in an outline style with links to documentation on each Azure resource in the exams. Enjoy!

### TABLE OF CONTENTS

* [Determine Workload Requirements (10-15%)](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/tree/master/AZ-301#determine-workload-requirements-10-15)
  + [Gather Information and Requirements](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/tree/master/AZ-301#gather-information-and-requirements)
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  + [Design an Auditing and Monitoring Strategy](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/tree/master/AZ-301#design-an-auditing-and-monitoring-strategy)
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  + [Design Deployments](https://github.com/shrasool/Azure-Solutions-Architect-Expert-Exam/tree/master/AZ-301#design-deployments)
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## AZ-300 Resources:

### ****AZ-300 Video Content Options****

|  |  |
| --- | --- |
| Pluralsight (Free trial) | [**Microsoft Azure Architect Technologies (AZ-300)**](https://pluralsight.pxf.io/aZX5Q) |
| LinkedIn Learning (Free trial) | [**Exam Tips: Azure Architect Technologies (AZ-300)**](https://linkedin-learning.pxf.io/b94Ok) |
| Udemy | [**AZ-300: Microsoft Azure Architect Technologies**](https://www.udemy.com/course/70534-azure/learn/lecture/17313412) |
| SkylinesAcademy | [**https://courses.skylinesacademy.com/p/microsoft-az-300-certification-azure-architect-technologies**](https://courses.skylinesacademy.com/p/microsoft-az-300-certification-azure-architect-technologies) |

### ****AZ-300 Practice Tests & Labs****

|  |  |
| --- | --- |
| Whizlabs Practice Tests | [**5 Practice Tests for AZ-300 (a total of 275 questions)**](https://www.whizlabs.com/microsoft-azure-certification-az-300/) |
| Udemy Practice Tests | [**AZ-300 (Lab Scenarios + Practice Tests)**](https://ravikirans.com/udemy/az-300Practice) |

### ****AZ-300 Exam Reference Books (PDF)****

|  |  |
| --- | --- |
| Amazon India | [**Exam Ref AZ-300 Azure Architect Technologies**](https://amzn.to/339huPM) |
| Amazon (Other Countries) | [**Exam Ref AZ-300 Azure Architect Technologies**](https://amzn.to/2lnaQEX) |
| Packt.com | [**https://www.packtpub.com/cloud-networking/microsoft-azure-architect-technologies-exam-guide-az-300**](https://www.packtpub.com/cloud-networking/microsoft-azure-architect-technologies-exam-guide-az-300) |
| Exam Ref AZ-400 | [**https://kingsumo.com/g/eolt6d/win-a-copy-of-exam-ref-az-300-microsoft-azure-architect-technologies**](https://kingsumo.com/g/eolt6d/win-a-copy-of-exam-ref-az-300-microsoft-azure-architect-technologies) |

Exam content is as followers,

### ****Deploy and Configure Infrastructure (40-45%)****

#### **Analyze Resource Utilization and Consumption**

REPORT THIS AD

**Configure diagnostic settings on resources**

[**Linkedin Learning: Configure Diagnostic Setting (check with a free trial)**](https://linkedin-learning.pxf.io/diagnostic)

**Create a baseline for resources**

[**LinkedIn Learning: Creating a Baseline for Resources (check with a free trial)**](https://linkedin-learning.pxf.io/baseLine)

**Create and test alerts**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/alerts-metric**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/alerts-metric)

**Analyze alerts across subscription**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/alerts-managing-alert-instances**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/alerts-managing-alert-instances)

**Analyze metrics across subscription**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/metrics-charts**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/metrics-charts)

**Create action groups**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/action-groups**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/action-groups)

**Monitor for unused resources**

[**https://docs.bmc.com/docs/reclaiming-the-unused-and-overallocated-azure-virtual-machines-785283461.html**](https://docs.bmc.com/docs/reclaiming-the-unused-and-overallocated-azure-virtual-machines-785283461.html)

**Monitor Cost**

[**https://docs.microsoft.com/en-us/azure/billing/billing-getting-started**](https://docs.microsoft.com/en-us/azure/billing/billing-getting-started)

**Report on Cost**

[**https://docs.microsoft.com/en-us/azure/billing/billing-download-azure-invoice-daily-usage-date**](https://docs.microsoft.com/en-us/azure/billing/billing-download-azure-invoice-daily-usage-date)

**Utilize Log Search query functions**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/log-query/search-queries**](https://docs.microsoft.com/en-us/azure/azure-monitor/log-query/search-queries)

**View alerts in Azure Monitor logs**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/alerts-activity-log**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/alerts-activity-log)

**Visualize diagnostics data using Azure Monitor Workbooks**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/app/usage-workbooks**](https://docs.microsoft.com/en-us/azure/azure-monitor/app/usage-workbooks)

[**https://github.com/microsoft/Application-Insights-Workbooks/blob/Visualizations.md**](https://github.com/microsoft/Application-Insights-Workbooks/blob/Visualizations.md)

**Create and Configure Storage Accounts**

**Configure network access to the storage account**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-network-security**](https://docs.microsoft.com/en-us/azure/storage/common/storage-network-security)

**Create and configure storage account**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-quickstart-create-account?tabs=azure-portal**](https://docs.microsoft.com/en-us/azure/storage/common/storage-quickstart-create-account?tabs=azure-portal)

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-account-manage**](https://docs.microsoft.com/en-us/azure/storage/common/storage-account-manage)

**Generate shared access signature**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-dotnet-shared-access-signature-part-1**](https://docs.microsoft.com/en-us/azure/storage/common/storage-dotnet-shared-access-signature-part-1)

**Implement Azure AD authentication for storage**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-auth-aad-app**](https://docs.microsoft.com/en-us/azure/storage/common/storage-auth-aad-app)

**Install and use Azure Storage Explorer**

[**https://docs.microsoft.com/en-us/azure/vs-azure-tools-storage-manage-with-storage-explorer**](https://docs.microsoft.com/en-us/azure/vs-azure-tools-storage-manage-with-storage-explorer)

**Manage access keys**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-account-manage**](https://docs.microsoft.com/en-us/azure/storage/common/storage-account-manage)

**Monitor activity log by using Azure Monitor logs**

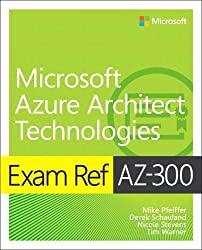
[**https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-audit**](https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-audit)

**Implement Azure storage replication**

[**MSDN Blog: Azure Storage Replication Implementation**](https://blogs.msdn.microsoft.com/windowsazurestorage/2013/12/11/windows-azure-storage-redundancy-options-and-read-access-geo-redundant-storage/)

**Implement Azure storage account failover**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-initiate-account-failover?tabs=azure-portal**](https://docs.microsoft.com/en-us/azure/storage/common/storage-initiate-account-failover?tabs=azure-portal)

**[](https://www.amazon.com/gp/product/0135802547/ref=as_li_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=0135802547&linkCode=as2&tag=ravikirans-20&linkId=85bc51f5e60272d1f20084ee0c74be93)**

#### **Create and Configure a VM for Windows and Linux**

REPORT THIS AD

**Configure high availability**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-availability-sets**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-availability-sets)

**Configure monitoring**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-monitoring**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-monitoring)

**Configure networking**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-virtual-network**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-virtual-network)

**Configure storage**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/managed-disks-overview**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/managed-disks-overview)

**Configure Virtual Machine Size**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/sizes**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/sizes)

**Implement dedicated hosts**

**Deploy and configure scale sets**

[**https://docs.microsoft.com/en-us/azure/virtual-machine-scale-sets/quick-create-portal**](https://docs.microsoft.com/en-us/azure/virtual-machine-scale-sets/quick-create-portal)

#### **Automate Deployment of VMs**

**Modify Azure Resource Manager template**

[**https://docs.microsoft.com/en-us/azure/architecture/building-blocks/extending-templates/update-resource**](https://docs.microsoft.com/en-us/azure/architecture/building-blocks/extending-templates/update-resource)

**Configure the location of new VMs**

REPORT THIS AD

[**https://docs.microsoft.com/en-us/azure/site-recovery/azure-to-azure-tutorial-migrate**](https://docs.microsoft.com/en-us/azure/site-recovery/azure-to-azure-tutorial-migrate)

**Configure VHD template**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/create-vm-specialized**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/create-vm-specialized)

**Deploy from template**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/ps-template**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/ps-template)

**Save a deployment as an Azure Resource Manager template**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/download-template**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/download-template)

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/ps-template**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/ps-template)

**Deploy Windows and Linux VMs**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/linux/create-ssh-secured-vm-from-template**](https://docs.microsoft.com/en-us/azure/virtual-machines/linux/create-ssh-secured-vm-from-template)

#### **Create Connectivity Between Virtual Networks**

**Create and configure Vnet peering**

[**https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-connect-virtual-networks-portal**](https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-connect-virtual-networks-portal)

**Create and configure Vnet to Vnet connections**

[**https://docs.microsoft.com/en-us/azure/vpn-gateway/create-routebased-vpn-gateway-portal**](https://docs.microsoft.com/en-us/azure/vpn-gateway/create-routebased-vpn-gateway-portal)

[**https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-vnet-vnet-rm-ps**](https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-vnet-vnet-rm-ps)

**Implement and Manage Virtual Networking**

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**Configure private IP addressing**

[**https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-static-private-ip-arm-pportal**](https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-static-private-ip-arm-pportal)

**Configure public IP addresses**

[**https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-public-ip-address**](https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-public-ip-address)

**Create and configure network routes**

[**https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-create-route-table-portal**](https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-create-route-table-portal)

**Create and configure network interface**

[**https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-network-interface**](https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-network-interface)

**Create and configure subnets**

[**https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-manage-subnet**](https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-manage-subnet)

**Create and configure virtual network**

[**https://docs.microsoft.com/en-us/azure/virtual-network/manage-virtual-network**](https://docs.microsoft.com/en-us/azure/virtual-network/manage-virtual-network)

**Create and configure Network Security Groups and Application Security Groups**

[**https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-filter-network-traffic#create-a-network-security-group**](https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-filter-network-traffic#create-a-network-security-group)

[**https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-filter-network-traffic#create-application-security-groups**](https://docs.microsoft.com/en-us/azure/virtual-network/tutorial-filter-network-traffic#create-application-security-groups)

**Manage Azure Active Directory**

**Add custom domains**

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[**https://docs.microsoft.com/en-us/azure/active-directory/fundamentals/add-custom-domain**](https://docs.microsoft.com/en-us/azure/active-directory/fundamentals/add-custom-domain)

**Configure Azure AD Identity Protection**

[**https://docs.microsoft.com/en-us/azure/active-directory/identity-protection/enable**](https://docs.microsoft.com/en-us/azure/active-directory/identity-protection/enable)

**Configure Azure AD Join**

[**https://docs.microsoft.com/en-us/azure/active-directory/devices/hybrid-azuread-join-managed-domains**](https://docs.microsoft.com/en-us/azure/active-directory/devices/hybrid-azuread-join-managed-domains)

**Configure self-service password reset**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/quickstart-sspr**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/quickstart-sspr)

**Implement conditional access policies**

[**https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/app-based-mfa**](https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/app-based-mfa)

[**https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/require-tou**](https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/require-tou)

[**https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/app-sign-in-risk**](https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/app-sign-in-risk)

**Manage multiple directories**

[**https://docs.microsoft.com/en-us/azure/active-directory/users-groups-roles/licensing-directory-independence**](https://docs.microsoft.com/en-us/azure/active-directory/users-groups-roles/licensing-directory-independence)

**Perform an access review**

[**https://docs.microsoft.com/en-us/azure/active-directory/governance/access-reviews-overview**](https://docs.microsoft.com/en-us/azure/active-directory/governance/access-reviews-overview)

**Implement and Manage Hybrid Identities**

**Install and configure Azure AD Connect**

REPORT THIS AD

[**https://docs.microsoft.com/en-us/azure/active-directory/hybrid/how-to-connect-install-express**](https://docs.microsoft.com/en-us/azure/active-directory/hybrid/how-to-connect-install-express)

**Configure federation and single sign-on**

[**https://docs.microsoft.com/en-us/azure/active-directory/hybrid/how-to-connect-fed-single-adfs-multitenant-federation**](https://docs.microsoft.com/en-us/azure/active-directory/hybrid/how-to-connect-fed-single-adfs-multitenant-federation)

**Configure single sign-on**

[**https://docs.microsoft.com/en-us/azure/active-directory/manage-apps/configure-single-sign-on-portal**](https://docs.microsoft.com/en-us/azure/active-directory/manage-apps/configure-single-sign-on-portal)

**Manage and troubleshoot Azure AD Connect**

[**https://docs.microsoft.com/en-us/azure/active-directory/hybrid/how-to-connect-post-installation**](https://docs.microsoft.com/en-us/azure/active-directory/hybrid/how-to-connect-post-installation)

[**https://docs.microsoft.com/en-us/azure/active-directory/hybrid/tshoot-connect-connectivity**](https://docs.microsoft.com/en-us/azure/active-directory/hybrid/tshoot-connect-connectivity)

**Troubleshoot password sync and writeback**

[**https://docs.microsoft.com/en-us/azure/active-directory/hybrid/tshoot-connect-password-hash-synchronization**](https://docs.microsoft.com/en-us/azure/active-directory/hybrid/tshoot-connect-password-hash-synchronization)

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/active-directory-passwords-troubleshoot#troubleshoot-password-writeback**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/active-directory-passwords-troubleshoot#troubleshoot-password-writeback)

**Implement solutions that use virtual machines (VM)**

**Provision VMs**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/quick-create-portal**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/quick-create-portal)

**Create Azure Resource Manager templates**

[**https://docs.microsoft.com/en-us/azure/azure-resource-manager/template-tutorial-create-first-template?tabs=azure-powershell**](https://docs.microsoft.com/en-us/azure/azure-resource-manager/template-tutorial-create-first-template?tabs=azure-powershell)

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/ps-template**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/ps-template)

**Configure Azure Disk Encryption for VMs**

[**https://docs.microsoft.com/en-us/azure/virtual-machines/windows/disk-encryption-portal-quickstart**](https://docs.microsoft.com/en-us/azure/virtual-machines/windows/disk-encryption-portal-quickstart)

**Implement Azure Backup for VMs**

[**https://docs.microsoft.com/en-us/azure/backup/backup-azure-vms-first-look-arm**](https://docs.microsoft.com/en-us/azure/backup/backup-azure-vms-first-look-arm)

**Implement Workloads and Security (20-25%)**

**Migrate Servers to Azure**

**Migrate servers using Azure Migrate**

[**https://docs.microsoft.com/en-in/azure/migrate/tutorial-migrate-hyper-v**](https://docs.microsoft.com/en-in/azure/migrate/tutorial-migrate-hyper-v)

**Backup and restore data**

[**https://docs.microsoft.com/en-us/azure/backup/quick-backup-vm-portal**](https://docs.microsoft.com/en-us/azure/backup/quick-backup-vm-portal)

[**https://docs.microsoft.com/en-us/azure/backup/tutorial-restore-disk**](https://docs.microsoft.com/en-us/azure/backup/tutorial-restore-disk)

**Configure Serverless Computing**

**Create and manage objects**

[**https://docs.microsoft.com/en-us/azure/azure-functions/functions-create-your-first-function-visual-studio**](https://docs.microsoft.com/en-us/azure/azure-functions/functions-create-your-first-function-visual-studio)

**Manage a Logic App resource**

REPORT THIS AD

[**https://docs.microsoft.com/en-us/azure/logic-apps/logic-apps-overview**](https://docs.microsoft.com/en-us/azure/logic-apps/logic-apps-overview)

**Manage Azure Function app settings**

[**https://docs.microsoft.com/en-us/azure/azure-functions/functions-how-to-use-azure-function-app-settings**](https://docs.microsoft.com/en-us/azure/azure-functions/functions-how-to-use-azure-function-app-settings)

**Manage Event Grid**

[**https://docs.microsoft.com/en-us/azure/event-grid/overview**](https://docs.microsoft.com/en-us/azure/event-grid/overview)

**Manage Service Bus**

[**https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-messaging-overview**](https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-messaging-overview)

**Implement Application Load Balancing**

**Configure application gateway**

[**https://docs.microsoft.com/en-us/azure/application-gateway/quick-create-powershell**](https://docs.microsoft.com/en-us/azure/application-gateway/quick-create-powershell)

**Configure Azure Front Door service**

[**https://docs.microsoft.com/en-us/azure/frontdoor/quickstart-create-front-door**](https://docs.microsoft.com/en-us/azure/frontdoor/quickstart-create-front-door)

**Configure Azure Traffic Manager**

[**https://docs.microsoft.com/en-us/azure/traffic-manager/quickstart-create-traffic-manager-profile**](https://docs.microsoft.com/en-us/azure/traffic-manager/quickstart-create-traffic-manager-profile)

**Integrate On premises Network with Azure Virtual Network**

**Create and configure Azure VPN Gateway**

[**https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-tutorial-create-gateway-powershell**](https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-tutorial-create-gateway-powershell)

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**Create and configure site to site VPN**

[**https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-howto-site-to-site-resource-manager-portal**](https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-howto-site-to-site-resource-manager-portal)

**Configure Express-Route**

[**https://docs.microsoft.com/en-us/azure/expressroute/expressroute-howto-circuit-portal-resource-manager**](https://docs.microsoft.com/en-us/azure/expressroute/expressroute-howto-circuit-portal-resource-manager)

**Configure Virtual WAN**

[**https://docs.microsoft.com/en-us/azure/virtual-wan/connect-virtual-network-gateway-vwan**](https://docs.microsoft.com/en-us/azure/virtual-wan/connect-virtual-network-gateway-vwan)

**Verify on premises connectivity**

[**https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-verify-connection-resource-manager**](https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-verify-connection-resource-manager)

**Troubleshoot on premises connectivity with Azure**

[**https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-troubleshoot-site-to-site-cannot-connect**](https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-troubleshoot-site-to-site-cannot-connect)

**Implement Multi factor Authentication (MFA)**

**Configure user accounts for MFA**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-userstates/enable-azure-mfa-by-changing-user-state**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-userstates/enable-azure-mfa-by-changing-user-state)

**Configure fraud alerts**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/fraud-alert**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/fraud-alert)

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**Configure bypass options**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/one-time-bypass**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/one-time-bypass)

**Configure trusted IPs**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/trusted-ips**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/trusted-ips)

**Configure verification methods**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/verification-methods**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-mfasettings/verification-methods)

**Manage Role based Access Control (RBAC)**

**Create a custom role**

[**https://docs.microsoft.com/en-us/azure/role-based-access-control/tutorial-custom-role-powershell**](https://docs.microsoft.com/en-us/azure/role-based-access-control/tutorial-custom-role-powershell)

**Configure access to Azure resources by assigning roles**

[**https://docs.microsoft.com/en-us/azure/role-based-access-control/role-assignments-portal**](https://docs.microsoft.com/en-us/azure/role-based-access-control/role-assignments-portal)

**Configure management access to Azure**

[**https://docs.microsoft.com/en-us/azure/role-based-access-control/role-assignments-portal**](https://docs.microsoft.com/en-us/azure/role-based-access-control/role-assignments-portal)

**Troubleshoot RBAC**

[**https://docs.microsoft.com/en-us/azure/role-based-access-control/troubleshooting**](https://docs.microsoft.com/en-us/azure/role-based-access-control/troubleshooting)

**Implement Azure policies**

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[**https://docs.microsoft.com/en-us/azure/governance/policy/tutorials/create-and-manage**](https://docs.microsoft.com/en-us/azure/governance/policy/tutorials/create-and-manage)

**Assign RBAC roles**

[**https://docs.microsoft.com/en-us/azure/role-based-access-control/quickstart-assign-role-user-portal**](https://docs.microsoft.com/en-us/azure/role-based-access-control/quickstart-assign-role-user-portal)

**Create and Deploy Apps (5-10%)**

**Create Web Apps by Using PaaS**

**Create an Azure App Service Web App**

[**https://docs.microsoft.com/en-us/azure/app-service/app-service-web-get-started-dotnet**](https://docs.microsoft.com/en-us/azure/app-service/app-service-web-get-started-dotnet)

**Create documentation for the API**

[**https://www.c-sharpcorner.com/article/azure-app-service-api-configure-swashbuckle/**](https://www.c-sharpcorner.com/article/azure-app-service-api-configure-swashbuckle/)

**Create an App Service Web App for containers**

[**https://docs.microsoft.com/en-us/azure/app-service/app-service-web-get-started-windows-container**](https://docs.microsoft.com/en-us/azure/app-service/app-service-web-get-started-windows-container)

**Create an App Service background task by using WebJobs**

[**https://docs.microsoft.com/en-us/azure/app-service/webjobs-create**](https://docs.microsoft.com/en-us/azure/app-service/webjobs-create)

**Enable diagnostics logging**

[**https://docs.microsoft.com/en-us/azure/app-service/troubleshoot-diagnostic-logs**](https://docs.microsoft.com/en-us/azure/app-service/troubleshoot-diagnostic-logs)

**Design and Develop Apps That Run in Containers**

**Configure diagnostic settings on resources**

[**https://docs.microsoft.com/en-us/azure/container-instances/container-instances-get-logs**](https://docs.microsoft.com/en-us/azure/container-instances/container-instances-get-logs)

**Create a container image by using a Docker file**

[**https://docs.microsoft.com/en-us/azure/container-registry/container-registry-quickstart-task-cli**](https://docs.microsoft.com/en-us/azure/container-registry/container-registry-quickstart-task-cli)

**Create an Azure Kubernetes Service**

[**https://docs.microsoft.com/en-us/azure/aks/kubernetes-walkthrough-portal**](https://docs.microsoft.com/en-us/azure/aks/kubernetes-walkthrough-portal)

**Publish an image to the Azure Container Registry**

[**https://docs.microsoft.com/en-us/azure/container-registry/container-registry-get-started-docker-cli**](https://docs.microsoft.com/en-us/azure/container-registry/container-registry-get-started-docker-cli)

**Implement an application that runs on an Azure Container Instance**

[**https://docs.microsoft.com/en-us/azure/container-instances/container-instances-quickstart-portal**](https://docs.microsoft.com/en-us/azure/container-instances/container-instances-quickstart-portal)

**Manage container settings by using code**

[**https://azure.microsoft.com/en-gb/resources/samples/container-service-python-manage/**](https://azure.microsoft.com/en-gb/resources/samples/container-service-python-manage/)

## ****Implement Authentication and Secure Data (5-10%)****

**Implement Authentication**

**Implement authentication by using certificates, forms-based authentication, tokens, or Windows-integrated authentication**

[**https://github.com/Azure-Samples/active-directory-dotnetcore-daemon-v2**](https://github.com/Azure-Samples/active-directory-dotnetcore-daemon-v2)

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[**https://docs.microsoft.com/en-us/aspnet/web-api/overview/security/forms-authentication**](https://docs.microsoft.com/en-us/aspnet/web-api/overview/security/forms-authentication)

[**https://docs.microsoft.com/en-us/azure/app-service/overview-authentication-authorization**](https://docs.microsoft.com/en-us/azure/app-service/overview-authentication-authorization)

[**https://docs.microsoft.com/en-us/aspnet/web-api/overview/security/integrated-windows-authentication**](https://docs.microsoft.com/en-us/aspnet/web-api/overview/security/integrated-windows-authentication)

**Implement multi-factor authentication by using Azure AD**

[**https://docs.microsoft.com/en-us/azure/active-directory/authentication/tutorial-mfa-applications**](https://docs.microsoft.com/en-us/azure/active-directory/authentication/tutorial-mfa-applications)

**Implement OAuth2 authentication**

[**https://docs.microsoft.com/en-us/azure/active-directory/develop/tutorial-v2-asp-webapp**](https://docs.microsoft.com/en-us/azure/active-directory/develop/tutorial-v2-asp-webapp)

**Implement Managed identities for Azure resources Service Principal authentication**

[**https://docs.microsoft.com/en-us/azure/active-directory/managed-identities-azure-resources/tutorial-windows-vm-access-arm**](https://docs.microsoft.com/en-us/azure/active-directory/managed-identities-azure-resources/tutorial-windows-vm-access-arm)

**Implement Secure Data Solutions**

**Encrypt and decrypt data at rest and in transit**

**This block has encountered an error and cannot be previewed.**

**Encrypt data with Always Encrypted**

[**https://docs.microsoft.com/en-us/azure/sql-database/sql-database-always-encrypted-azure-key-vault**](https://docs.microsoft.com/en-us/azure/sql-database/sql-database-always-encrypted-azure-key-vault)

**Implement Azure Confidential Compute**

[**https://azure.microsoft.com/en-in/blog/azure-confidential-computing/**](https://azure.microsoft.com/en-in/blog/azure-confidential-computing/)

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**Implement SSL/TLS communications**

[**https://docs.microsoft.com/en-us/azure/storage/common/storage-security-tls**](https://docs.microsoft.com/en-us/azure/storage/common/storage-security-tls)

**Create, read, update, and delete keys, secrets and certificates by using the KeyVault API**

**Keys**

[**https://docs.microsoft.com/en-us/rest/api/keyvault/createkey/createkey**](https://docs.microsoft.com/en-us/rest/api/keyvault/createkey/createkey)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/getkey/getkey**](https://docs.microsoft.com/en-us/rest/api/keyvault/getkey/getkey)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/updatekey**](https://docs.microsoft.com/en-us/rest/api/keyvault/updatekey)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/deletekey**](https://docs.microsoft.com/en-us/rest/api/keyvault/deletekey)

**Secrets**

[**https://docs.microsoft.com/en-us/rest/api/keyvault/setsecret/setsecret**](https://docs.microsoft.com/en-us/rest/api/keyvault/setsecret/setsecret)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/getsecret/getsecret**](https://docs.microsoft.com/en-us/rest/api/keyvault/getsecret/getsecret)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/updatesecret**](https://docs.microsoft.com/en-us/rest/api/keyvault/updatesecret)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/deletesecret**](https://docs.microsoft.com/en-us/rest/api/keyvault/deletesecret)

**Certificates**

[**https://docs.microsoft.com/en-us/rest/api/keyvault/createcertificate/create**](https://docs.microsoft.com/en-us/rest/api/keyvault/createcertificate/create)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/getcertificate/get**](https://docs.microsoft.com/en-us/rest/api/keyvault/getcertificate/get)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/updatecertificate/update**](https://docs.microsoft.com/en-us/rest/api/keyvault/updatecertificate/update)

[**https://docs.microsoft.com/en-us/rest/api/keyvault/deletecertificate/delete**](https://docs.microsoft.com/en-us/rest/api/keyvault/deletecertificate/delete)

## ****Develop for the Cloud and for Azure Storage (15-20%)****

**Configure a Message-based Integration Architecture**

**Configure an app or service to send emails**

[**https://docs.microsoft.com/en-us/azure/sendgrid-dotnet-how-to-send-email**](https://docs.microsoft.com/en-us/azure/sendgrid-dotnet-how-to-send-email)

**Configure Event Grid**

[**https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-event-quickstart-powershell**](https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-event-quickstart-powershell)

**Configure Azure Relay Service**

[**https://docs.microsoft.com/en-us/azure/service-bus-relay/relay-hybrid-connections-dotnet-get-started**](https://docs.microsoft.com/en-us/azure/service-bus-relay/relay-hybrid-connections-dotnet-get-started)

**Create and configure a Notification Hub**

[**https://docs.microsoft.com/en-us/azure/notification-hubs/create-notification-hub-portal**](https://docs.microsoft.com/en-us/azure/notification-hubs/create-notification-hub-portal)

**Create and configure an Event Hub**

[**https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-create**](https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-create)

**Create and configure a Service Bus**

[**https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-quickstart-portal**](https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-quickstart-portal)

**Configure queries across multiple products**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/log-query/cross-workspace-query**](https://docs.microsoft.com/en-us/azure/azure-monitor/log-query/cross-workspace-query)

**Develop for Autoscaling**

**Implement autoscaling rules and patterns (schedule, operational/system metrics)**

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/autoscale-get-started**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/autoscale-get-started)

[**https://docs.microsoft.com/en-us/azure/azure-monitor/platform/autoscale-common-scale-patterns**](https://docs.microsoft.com/en-us/azure/azure-monitor/platform/autoscale-common-scale-patterns)

**Implement code that addresses singleton application instances**

[**Check the entire module (Writing Code to Handle Singleton Application Instances) with a free trial**](https://pluralsight.pxf.io/PqDz6)

**Implement code that addresses transient state**

[**https://docs.microsoft.com/en-us/azure/architecture/best-practices/retry-service-specific**](https://docs.microsoft.com/en-us/azure/architecture/best-practices/retry-service-specific)

**Develop Solutions That Use Cosmos DB Storage**

**Create, read, update, and delete data by using appropriate APIs**

[**https://docs.microsoft.com/en-us/rest/api/cosmos-db/documents**](https://docs.microsoft.com/en-us/rest/api/cosmos-db/documents)

**Implement partitioning schemes**

[**https://docs.microsoft.com/en-us/azure/cosmos-db/how-to-model-partition-example**](https://docs.microsoft.com/en-us/azure/cosmos-db/how-to-model-partition-example)

**Set the appropriate consistency level for operations**

[**https://docs.microsoft.com/en-us/azure/cosmos-db/consistency-levels-choosing**](https://docs.microsoft.com/en-us/azure/cosmos-db/consistency-levels-choosing)

**Develop Solutions That Use a Relational Database**

Provision and configure relational databases

[**https://docs.microsoft.com/en-us/azure/sql-database/sql-database-single-database-get-started**](https://docs.microsoft.com/en-us/azure/sql-database/sql-database-single-database-get-started)

[**https://docs.microsoft.com/en-us/azure/sql-database/sql-database-server-level-firewall-rule**](https://docs.microsoft.com/en-us/azure/sql-database/sql-database-server-level-firewall-rule)

**Configure elastic pools for Azure SQL Database**

[**https://docs.microsoft.com/en-us/azure/sql-database/sql-database-elastic-pool**](https://docs.microsoft.com/en-us/azure/sql-database/sql-database-elastic-pool)

**Implement Azure SQL Database managed instances**

[**https://docs.microsoft.com/en-us/azure/sql-database/sql-database-managed-instance-get-started**](https://docs.microsoft.com/en-us/azure/sql-database/sql-database-managed-instance-get-started)

**Create, read, update, and delete data tables by using code**

[**https://docs.microsoft.com/en-us/azure/sql-database/sql-database-connect-query-dotnet-core**](https://docs.microsoft.com/en-us/azure/sql-database/sql-database-connect-query-dotnet-core)

Hope the resources and the links helps you to get through the exams and make you Azure Solutions Architect. Good luck!

## AZ-301 Resources:

### ****AZ-301 Video Content Options:****

|  |  |
| --- | --- |
| Pluralsight (Free Trial) | [**Microsoft Azure Architect Design (AZ-301)**](https://pluralsight.pxf.io/BoGQy) |
| SkylinesAcademy | [**https://courses.skylinesacademy.com/p/az-301**](https://courses.skylinesacademy.com/p/az-301) |
| Udemy | [**AZ-301 Certif**](https://www.udemy.com/course/microsoft-az-301-certification-azure-architect-design/)[**ication: Azure Architect Design**](https://www.udemy.com/course/az301-azure/) |
| LinkedIn Learning (Free Trial) | [**Exam Tips: Azure Architect Design (AZ-301)**](http://linkedin-learning.pxf.io/vr4JO) |

### ****AZ-301 Practice Tests****

|  |  |
| --- | --- |
| Official Practice test | [**https://docs.microsoft.com/en-us/learn/certifications/exams/az-301**](https://docs.microsoft.com/en-us/learn/certifications/exams/az-301) |
| Whizlabs Practice Tests | [**5 Practice Tests for AZ-301**](https://www.whizlabs.com/microsoft-azure-certification-az-301/)[**(275 Questions)**](https://www.whizlabs.com/microsoft-azure-certification-az-301/practice-tests/) |
| Udemy Practice Tests | [**Microsoft AZ-301 Exam Preparation Practice tests**](https://www.udemy.com/course/az-301-microsoft-azure-architect-design-practice-tests-w) |

### ****AZ-301 E-book****

|  |  |
| --- | --- |
| Amazon India | [**AZ-301 Practice Tests**](https://amzn.to/2PY2Hne) |
| Amazon (Other countries) | [**Exam AZ-301 Lab Guide**](https://amzn.to/2Ikiqs7) |

### ****AZ-301 Learning Path (aka.ms/learn)****

|  |  |
| --- | --- |
| Microsoft Learn | [**https://docs.microsoft.com/en-us/learn/certifications/exams/az-301**](https://docs.microsoft.com/en-us/learn/certifications/exams/az-301) |

### ****1.Determine Workload Requirements (10-15%)****

#### **Gather Information and Requirements**

[**Gathering Information About Existing Enterprise Architecture in Microsoft Azure**](https://pluralsight.pxf.io/M3m0K)

#### **Optimize Consumption Strategy**

[**Optimizing Consumption Strategy in Microsoft Azure**](https://pluralsight.pxf.io/L3XzZ)

#### **Design an Auditing and Monitoring Strategy**

[**Design Auditing for Microsoft Azure**](https://pluralsight.pxf.io/xDk05)

[**Designing a Monitoring Strategy for a Solution in Microsoft Azure**](https://pluralsight.pxf.io/Q3yRA)

### ****2.Design for Identity and Security (20-25%)****

#### **Design Identity Management**

[**Design Identity Management in Microsoft Azure**](https://pluralsight.pxf.io/roQAR)

#### **Design Authentication**

[**Design Authentication for Microsoft Azure**](https://pluralsight.pxf.io/qX4eL)

#### **Design Authorization**

[**Design Authorization for Microsoft Azure**](https://pluralsight.pxf.io/DzKjd)

#### **Design for Risk Prevention for Identity**

[**Design for Risk Prevention in Microsoft Azure**](https://pluralsight.pxf.io/9agb3)

#### **Design a Monitoring Strategy for Identity and Security**

[**Design a Monitoring Strategy for Identity and Security in Microsoft Azure**](https://pluralsight.pxf.io/roQA3)

### ****3.Design a Data Platform Solution (15-20%)****

#### **Design a Data Management Strategy**

[**Design a Data Management Strategy for Microsoft Azure**](https://pluralsight.pxf.io/jArM0)

#### **Design a Data Protection Strategy**

[**Design a Data Protection Strategy with Microsoft Azure**](https://pluralsight.pxf.io/5PgXN)

#### **Design and Document Data Flows**

[**Design and Document Data Flows with Microsoft Azure**](https://pluralsight.pxf.io/ePKOz)

#### **Design a Monitoring Strategy for the Data Platform**

[**Designing a Monitoring Strategy for the Microsoft Azure Data Platform**](https://pluralsight.pxf.io/aQnBM)

### ****4.Design a Business Continuity Strategy (15-20%)****

#### **Design a Site Recovery Strategy**

[**Designing a Site Recovery Strategy on Microsoft Azure**](https://pluralsight.pxf.io/G3mAL)

#### **Design for High Availability**

[**Designing for High Availability on Microsoft Azure**](https://pluralsight.pxf.io/JyzgE)

#### **Design a Data Archiving Strategy**

[**Designing a Data Archiving Strategy on Microsoft Azure**](https://pluralsight.pxf.io/Z3QPk)

### ****5.Design for Deployment, Migration, and Integration (10-15%)****

#### **Design Deployments**

[**Designing Deployments in Microsoft Azure**](https://pluralsight.pxf.io/EvEbK)

#### **Design Migrations**

[**Designing Migrations for Microsoft Azure**](https://pluralsight.pxf.io/b9Obk)

#### **Design an API Integration Strategy**

[**Designing an API Management Strategy for Microsoft Azure**](https://pluralsight.pxf.io/65yWG)

### ****6.Design an Infrastructure Strategy (15-20%)****

#### **Design a Storage Strategy**

[**Design a Storage Strategy for Microsoft Azure**](https://pluralsight.pxf.io/3rJAd)

#### **Design a Compute Strategy**

[**Design a Compute Strategy for Microsoft Azure**](https://pluralsight.pxf.io/vqPzj)

#### **Design a Networking Strategy**

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[**Design a Networking Strategy for Microsoft Azure**](https://pluralsight.pxf.io/4jG5o)

#### **Design a Monitoring Strategy for Infrastructure**

[**Design a Monitoring Strategy for Infrastructure in Microsoft Azure**](https://pluralsight.pxf.io/djOKk)