

# Course AZ-300T01-A: Deploying and Configuring Infrastructure

## About this course

This course teaches IT Professionals how to manage their Azure resources, including deployment and configuration of virtual machines, virtual networks, storage accounts, and Azure AD that includes implementing and managing hybrid identities. You will also learn how cloud resources are managed in Azure through user and group accounts, and how to grant access to Azure AD users, groups, and services using Role-based access control (RBAC).

You will learn about the different storage accounts and services as well as basic data replication concepts and available replication schemes. Students are also introduced to Storage Explorer as a convenient way to work with Azure storage data. Students also learn the types of storage and how to work with managed and custom disks.

Azure blob storage is how Azure stores unstructured data in the cloud, and you will work with blobs and blob containers. In addition to blob storage, the course covers Table and Queue storage as storage options for structured data.

You will learn how to create and deploy virtual machines in Azure, using the Azure portal, PowerShell, and ARM templates. The course includes instruction on deploying custom images and Linux virtual machines. You will see how to configure the networking and storage components of virtual machines. Deploying highly available virtual machines is critical for planned and unplanned events, and you will learn how to use availability sets to ensure that virtual machine resources are available during downtime.

You will learn the monitoring tools and capabilities provided by Azure, including Azure Alerts and Activity Log. In addition to alerts and logs, you will be introduced to Log Analytics as an effective data analytics solution for understanding your system status and health. And perhaps the most exciting thing you will learn is how to use the Azure Resource Manager deployment model to work with resources, resource groups, and ARM templates.

Because this course is the first course in the series for the Azure Solutions Architect exams, there is a sizeable amount of introductory content presented to prepare students for the remaining courses in the curriculum. Students are provided with a lesson that covers tips and tricks for working in the Azure portal, as well as an introduction to key tools used in the Azure environment, such as the Cloud Shell and Resource Explorer. Emphasis is focused on PowerShell and the command line interface (CLI) as important skills to acquire not only in preparation for the exam but for the job role itself.

## Course Outline

### Module 1: Managing Azure Subscriptions and Resources

In this module you will explore Azure monitoring capabilities using Azure alerts, Azure activity logs, and Log Analytics. You will learn to query, analyze, and interpret the data viewed in Log Analytics.

After completing this module, students will be able to:

- Managing Azure Subscriptions and Resources

### Module 2: Implementing and Managing Storage

In this module you will learn about Azure storage accounts, data replication, how to use Azure Storage Explorer, and monitor storage.

After completing this module, students will be able to:

- Implementing and Managing Storage

### Module 3: Deploying and Managing Virtual Machines (VMs)

In this module you will learn how to do the following: • Create Virtual Machines (VM)s within the Azure Portal • Create Virtual Machines (VM)s using Azure PowerShell • Create Virtual Machines (VM)s using ARM templates • Deploy Linux Virtual Machines (VM)s • Monitor Virtual Machines (VM)s Additionally, you will learn how to protect data using backups at regular intervals, whether by snapshot, Azure Backup, or Azure Site Recovery.



After completing this module, students will be able to:

- Deploying and Managing VMs

#### **Module 4: Configuring and Managing Virtual Networks**

In this module you will create and implement virtual networks using the Azure Portal as well as Azure PowerShell and CLI. You will receive an overview on how to assign IP addresses to Azure resources to communicate with other Azure resources, your on-premises network, and the Internet.

##### **Lessons**

- Network routing using routing tables and algorithms
- Inter-site connectivity using VNet-to-VNet connections and VPNs
- Virtual network peering for regional and global considerations
- Gateway transit

After completing this module, students will be able to:

- Configuring and Managing Virtual Networks

#### **Module 5: Managing Identities**

This module covers Azure Active Directory (Azure AD) for IT Admins and Developers with a focus on the Azure AD multi-tenant cloud-based directory and identity management service.

##### **Lessons**

- Role-Based Access Control (RBAC)
- built-in roles
- Self-Service Password Reset (SSPR)
- authentication methods for password reset

After completing this module, students will be able to:

- Managing Identities using Azure Active Directory

## **Course AZ-300T02-A: Implementing Workloads and Security**

### **About this course**

This course teaches IT professionals how to discover, assess, plan and implement a migration of on-premises resources and infrastructure to Azure. Students will learn how to use Azure Migrate to perform the discovery and assessment phase that is critical to a successful migration. Students will also learn how to use Azure Site Recovery for performing the actual migration of workloads to Azure. The course focuses primarily on using ASR on a Hyper-V infrastructure to prepare and complete the migration process.

Also, you will learn how to deploy serverless computing features like Azure Functions, Event Grid, and Service Bus. You will learn how Azure Multi-Factor Authentication helps safeguard access to data and applications, helping to meet customer demand for a simple sign-in process. Also, how to use Azure Active Directory Privileged Identity Management to manage, control, and monitor access to Azure resources within your organization.

See how to manage and maintain the infrastructure for the core web apps and services that developers build and deploy. Students will learn how Azure App Service is used as a Platform as a Service (PaaS) offering for deploying cloud apps for web and mobile environments.

Lastly, you will get a glimpse of how to implement advanced networking features like Application Gateway and how to configure load balancing. Learn to integrate on-premises networks with Azure virtual networks and to use Network Watcher to monitor and troubleshoot issues.

### **Course Outline**

#### **Module 1: Evaluating and Performing Server Migration to Azure**

This module covers migrating workloads to a new environment, whether it be another datacenter, or to a public cloud, and setting clear goals for the migration. Goals include both technology-focused and business-focused goals for migrations, and the benefits to an organization's business. Activities include components of the Azure migration process: creating a project, creating a collector, assessing readiness, and estimating costs. Additionally, you will receive an overview of Azure Site Recovery (ASR) that includes end-to-end scenarios.

After completing this module, students will be able to:

- Evaluating and Performing Server Migration to Azure

## **Module 2: Implementing and Managing Application Services**

This module includes the following topics: • Deploying Web Apps • Managing Web Apps • App Service Security • Serverless Computing Concepts • Managing Event Grid • Managing Service Bus • Managing Logic App

After completing this module, students will be able to:

- Implementing and Managing Application Services

## **Module 3: Implementing Advanced Virtual Networking**

This module includes the following topics: • Azure Load Balancer • Azure Application Gateway • Site-to-Site VPN Connections As well as an overview of ExpressRoute which allows companies to extend on-premises networks into the Microsoft cloud over a dedicated private connection facilitated by a connectivity provider.

After completing this module, students will be able to:

- Implementing Advanced Virtual Networking.

## **Module 4: Securing Identities**

This module includes the following topics with an emphasis on identity and roles: • Azure AD Identity Protection • Azure Domains and Tenants • Azure Users and Groups • Azure Roles As well as an overview of Azure AD integration options that focuses on Azure AD Connect to integrate on-premises directories with Azure Active Directory.

After completing this module, students will be able to:

- Securing Identities using Azure AD.

# **Course AZ-300T03-A: Understanding Cloud Architect Technology Solutions**

## **About this course**

This course teaches IT professionals how operations are done in parallel and asynchronously. And, how your whole enterprise system must be resilient when failures occur, and just as importantly, how deployments can be automated and predictable. By using the Azure Application Architecture Guide and Azure reference architectures as a basis, you will understand how monitoring and telemetry are critical for gaining insight into the system.

You will dive into the cloud design patterns that are important, such as partitioning workloads where a modular application is divided into functional units that can be integrated into a larger application. In such cases, each module handles a portion of the application's overall functionality and represents a set of related concerns.

Also, load balancing where the application traffic, or load, is distributed among various endpoints by using algorithms. Load balancers allow multiple instances of your website to be created so they can behave in a predictable manner. In Azure, it is possible to use virtual load balancers, which are hosted in virtual machines, if a company requires a very specific load balancer configuration.

Also, transient fault handling which helps define the primary differences between developing applications on-premises and in the to handle transient errors. Transient errors are errors that occur due to temporary interruptions in the service or to excess latency.

Lastly, a discussion of hybrid networking that provides an overview of site-to-site connectivity, point-to-site connectivity, and the combination of the two.

## **Course Outline**

### **Module 1: Selecting Compute and Storage Solutions**

This module includes the following topics: • Azure Architecture Center • Cloud design patterns • Competing consumers pattern • Cache-aside pattern As well as sharding patterns to divide a data store into horizontal partitions, or shards. Each shard has the same schema but holds its own distinct subset of the data.

After completing this module, students will be able to:

- Design and Connectivity Patterns

### **Module 2: Hybrid Networking**

This module includes the following topics: • Site-to-site connectivity • Point-to-site connectivity • Combining site-to-site and point-to-site connectivity • Virtual network-to-virtual network connectivity As well as connecting across cloud providers for failover, backup, or even migration between providers such as AWS.

After completing this module, students will be able to:

- Hybrid Networking

### **Module 3: Measuring Throughput and Structure of Data Access**

This module includes the following topics: • DTUs – Azure SQL Database • RUs – Azure Cosmos DB • Structured and unstructured data • Using structured data stores

After completing this module, students will be able to:

- Address Durability of Data and Caching
- Measure Throughput and Structure of Data Access

## **Course AZ-300T04-A: Creating and Deploying Apps**

### **About this course**

This course teaches IT Professionals how to build Logic App solutions that integrate apps, data, systems, and services across enterprises or organizations by automating tasks and business processes as workflows. Logic Apps is cloud service in Azure that simplifies how you design and create scalable solutions for app integration, data integration, system integration, enterprise application integration (EAI), and business-to-business (B2B) communication, whether in the cloud, on premises, or both.

You will also see how Azure Service Fabric is a distributed systems platform that makes it easy to package, deploy, and manage scalable and reliable microservices and containers. Service Fabric also addresses the significant challenges in developing and managing cloud native applications. Developers and administrators can avoid complex infrastructure problems and focus on implementing mission-critical, demanding workloads that are scalable, reliable, and manageable. Service Fabric represents the next-generation platform for building and managing these enterprise-class, tier-1, cloud-scale applications running in containers.

Lastly, you'll see how Azure Kubernetes Service (AKS) makes it simple to deploy a managed Kubernetes cluster in Azure. AKS reduces the complexity and operational overhead of managing Kubernetes by offloading much of that responsibility to Azure. As a hosted Kubernetes service, Azure handles critical tasks like health monitoring and maintenance for you.

### **Audience profile**

Successful Cloud Solutions Architects begin this role with practical experience with operating systems, virtualization, cloud infrastructure, storage structures, billing, and networking.

### **Course Outline**

#### **Module 1: Creating Web Applications using PaaS**

This module provides an overview of Azure App Service Web Apps for hosting web applications, REST APIs, and a mobile back end. Topics include the following: • Using shell commands to create an App Service Web App • Creating Background Tasks • Using Swagger to document an API As well as an explanation of how Logic Apps help to build solutions that integrate apps, data, systems, and services across enterprises or organizations by automating tasks and business processes as workflows.

After completing this module, students will be able to:

- Use shell commands to create an App Service Web App
- Create Background Tasks
- Use Swagger to document an API

#### **Module 2: Creating Apps and Services Running on Service Fabric**

This module provides an overview of Azure Service Fabric as a distributed systems platform that makes it easy to package, deploy, and manage scalable and reliable microservices and containers. This module also addresses the challenges in developing and managing cloud native applications. Additional topics include: • Creating a reliable service • Creating a Reliable Actors app • Working with Reliable collections

After completing this module, students will be able to:

- Create a reliable service
- Create a Reliable Actors app
- Hands-on with Reliable collections

### **Module 3: Using Azure Kubernetes Service This module focuses on the Azure**

Kubernetes Service (AKS) for deploying and managing a Kubernetes cluster in Azure. Topics include how to reduce operational overhead of managing Kubernetes by offloading much of that responsibility to Azure, such as health monitoring and maintenance. Additional topics include:

- Azure Container Registry
- Azure Container Instances

After completing this module, students will be able to:

- Understand the Azure Container Registry
- Use Azure Container instances

## **Course AZ-300T05-A: Implementing Authentication and Secure Data**

### **About this course**

Learn how to Implement authentication in applications (certificates, Azure AD, Azure AD Connect, token-based), implement secure data (SSL and TLS), and manage cryptographic keys in Azure Key Vault.

### **Course Outline**

#### **Module 1: Implementing Authentication Topics for this module include**

##### **Lessons**

- Implementing authentication in applications (certificates, Azure AD, Azure AD Connect, token-based)
- Implementing multi-factor authentication
- Claims-based authorization
- Role-based access control (RBAC) authorization

After completing this module, students will be able to:

- Understand how to Implement authentication using certificates, Azure AD, Azure AD Connect, and tokens
- Implement Role-Based Access Control (RBAC) authorization

#### **Module 2: Implementing Secure Data**

##### **Lessons**

- End-to-end encryption
- Implementing Azure confidential computing
- Implementing SSL and TLS communications
- Managing cryptographic keys in Azure Key Vault

After completing this module, students will be able to:

- Implement secure data for end-to-end encryption
- Implement secure data for implementing SSL and TLS communications.
- Use Azure Key Vault to manage cryptographic keys

## **Course AZ-300T06-A: Developing for the Cloud**

### **About this course**

Learn how to configure a message-based integration architecture, develop for asynchronous processing, create apps for autoscaling, and better understand Azure Cognitive Services solutions.

### **Course Outline**

#### **Module 1: Developing Long-Running Tasks and Distributed Transactions**

Topics for this module include:

- Implementing large-scale, parallel, and high-performance apps using batches
- HPC using Microsoft Azure Virtual Machines
- Implementing resilient apps by using queues As well as, implementing code to address application events by using webhooks. Implementing a webhook gives an external resource a URL for an application. The external resource then issues an HTTP request to that URL whenever a change is made that requires the application to take an action.

#### **Module 2: Configuring a Message-Based Integration Architecture**

**Lessons**

- Configure an app or service to send emails
- Configure an event publish and subscribe model
- Configure the Azure Relay service
- Configure apps and services with Microsoft Graph

After completing this module, students will be able to:

- How to configure a message-based integration architecture

**Module 3: Developing for Asynchronous Processing****Lessons**

- Implement parallelism, multithreading, and processing
- Implement Azure Functions and Azure Logic Apps
- Implement interfaces for storage or data access
- Implement appropriate asynchronous computing models
- Implement autoscaling rules and patterns

After completing this module, students will be able to:

- Understand how to Develop for Asynchronous Processing

**Module 4: Developing for Autoscaling****Lessons**

- Implementing autoscaling rules and patterns
- Implementing code that addresses singleton application instances
- Implementing code that addresses a transient state

After completing this module, students will be able to:

- Begin creating apps for Autoscaling

**Module 5: Developing Azure Cognitive Services Solutions****Lessons**

- Developing Solutions using Computer Vision
- Developing solutions using Bing Web Search
- Developing solutions using Custom Speech Service
- Developing solutions using QnA Maker

After completing this module, students will be able to:

- Understand Azure Cognitive Services Solutions