Azure Course Content

Development of a .NET Web Application with Azure Platform as a Service components.

Microsoft Azure **PaaS** (Platform as a Service) provides a great platform and many services that enable you to build highly-available performant and secure applications.

In this course, we are going to build a globally-distributed application that is resilient, performant, and secure.

Some of the major topics that we will cover include the following

- **Azure Basics**

    - Introduction to Cloud Computing
    - IaaS Vs PaaS vs SaaS and Serverless
    - Understand Azure Management Portal
    - Understand various Components of Azure (Subscription, Resource Groups etc.)

- **Azure App Service**

    - Introduction to various web apps supported in Azure App Services.
        - App Service – Web Apps
        - App Service – API Apps
        - App Service – Mobile Apps

    - Creating & Publish the Asp.NET web application using Visual Studio
    - Understand various Deployment Options available with Azure App Services
    - Understand how App Settings & Connection Strings work in Azure App Service
    - Learn how to secure the Secrets and Keys using Key Vault and learn how to access them in App Service – Web app.
    - Debugging Azure App Service – Web App from a local Visual Studio.
    - Zero downtime deployment and rollback using App Service Deployment Slots
    - Restriction of access to only whitelisted IP Addresses
    - Understand various troubleshooting options of App Services.
        - Web Server and Application Logs
        - KUDU
        - Diagnose and Solve Errors
        - App Service Diagnost
        - Troubleshooting with Visual Studio

- Configure real-time diagnostics logs using Log Stream.
- Host a RESTful API with CORS in Azure App Service.

- **Web Jobs (Background jobs)**

    - Create a background scheduler and deploy the same to Azure
    - Understand the different type of Web Jobs.
    - Understand the limitations of Web Jobs

- **Application Insights - Monitoring and Troubleshooting**

    - Overview of App Insights
    - Configure Application Insights with the App Service from Visual Studio
    - Create & Configure Availability Tests to monitor the availability of Web Apps from various locations across the globe.
    - Application Insights - Write queries to understand how to filter data of Application analytics.

- **Creating a Logical SQL Server along with a SQL Database**

    - Create Logical SQL Server and Sql Database
    - Understand how to scale-up and scale-down the capacity of SQL Database
    - Understand how to configure Alerts on db load
    - Configure Web App code to access SQL Database
    - Hardening the Database connection for secured access using Managed Identity.
    - Configure Geo-Replication for disaster recovery.

- **Cosmos DB**

    - Cosmos DB – architecture
    - Understand the RUs and Throughput
    - Understand Partitions and the advantages

- **CDN**

    - Add the CDN to a Web App
    - Set Caching Rules

- **Redis Cache**

    - Create Redis Cache
    - Azure Redis Cache Configure Data Persistence
    - Azure Redis Cache – Improve performance using Clustering
    - Azure Redis Cache Enhanced security and network isolation

- Leverage Redis Cache to manage Application Sessions in a Load Balancing environment

- **Azure Storage for storing Images & documents**

    - Understand different Storage Services
    - Learn how to work with Blob Storage to save files and folders on the cloud
    - Understand how to use Queues and implement Queue-Centric Patterns
    - Copy files from on-premises to Azure Storage using AzCopy
    - Understand how to configure SMB protocol with Azure File Share

- **App Service scaling and Load Balancing**

    - Overview of various App Service Plan tiers, it's features and limits
    - Understanding Vertical Scaling Vs Horizontal Scaling
    - Simulate Load on App Services using PowerShell
    - Manual Scale-out of App Service instances after simulating the load
    - Auto Scale-out of the App Service instances based on CPU Utilization
    - Configure Alerts when new instances gets provisioned and de-provisioned
    - Understand the Auto-scale Core concepts and best practices that needs to be followed in real-world applications

- **Azure Functions - a Serverless Technology**

    - Understand the evolution of various Cloud services (IaaS, PaaS & Serverless)
    - Understand how scaling works in IaaS, PaaS & Serverless.
    - Overview of Azure Functions - Core Concepts
        - Triggers
        - Bindings (Input & Output)
    - Develop Azure Functions using Portal
    - Integrate Azure Functions with other Azure Services.
        - Storage
        - Cosmos DB
    - Understand how to configure background services and schedule them

- **Security**

    - Configure security to Storage account using
        - Access keys
        - Shared Access Signature
    - Configure Firewall to whitelist the required IP Address for secure access at both Server level and Database Level
    - Implement RBAC (Role-Based Access Control) authorization to Azure Services
    - Create and Configure Key-Vaults to secure secrets

- **Orchestrating the on-boarding process with Azure Logic apps.**

- Getting Started with Logic Apps and it's architecture
- Understand the building blocks of Logic Apps
- Understand the use cases of Logic Apps with a real-time examples
- Integrate Logic Apps with Azure Functions

- **Build Intelligence using Cognitive Services**

  - Create Computer Vision API Cognitive Services for building intelligence
    - Understand how to analyze an image
    - Crop the image smartly without losing aspect ratio
  - Understand various categories of Cognitive Services
  - Understand how to monitor & analyze metrics and alerts

- **API Management for securing the APIs**

  - Create and Configure API Management to secure your APIs
  - Configure Throttling and Rate limit to limit the number of requests
  - Understand how to secure and customize the API using APIM Policies

- **Azure Service Bus**

  - Overview of Service Bus
  - Understand various components like queues, Topics

- **Azure search**

  - Overview of Azure Search
  - Understand the use-case of Azure Search
  - Understand how to utilize and integrate Azure Search service to your application to implement Search.
  - Import Data from Azure SQL Database
  - Create Indexes and schedule the data-sync
  - Understand how to search the index data

- **Azure DevOps (VSTS)**

  - Create an Organization
  - Create Project & Configure Git / TFVC
  - Understand the different types of users (Basic & Stakeholder)
  - Understand Build & Release Agents
  - Create & Manage repositories
  - Create & Manage Branches
  - Sync Branches using Visual Studio
  - Implement Continuous integration
    - Understand Build Tasks
    - Understand Build Templates

- Create Build Definitions for .NET Application
- Integrate Sonarqube for Static Code Analysis of .NET Application
- Run Build Definition
- Understand the pre-defined Build variables
- Configure Build Automation to automatically trigger the build
- Understand and review Build Artifacts

- Implement Continuous Deployment

  - Create Release pipeline
  - Configure Azure Subscriptions & Azure Resource Groups to the pipeline
  - Link Build artifacts with release pipeline
  - Create Release stages (Environments)
  - Create Environment Specific variables

- **ARM Templates**

  - Overview of ARM Templates
  - Benefits of ARM Templates
  - Understand the Structure of ARM Templates
  - Provision Azure Resources using ARM Templates
  - Plug-in ARM Templates to Release pipeline to automate the process of provisioning the Resources

- **Azure Data Factory**

  - Overview
  - Understand ADF Core Concepts
  - Move Data from SQL Database to Data Warehouse using pipelines and activities
  - Learn how to integrate Azure Functions with ADF pipelines.
  - Understand scheduling and Monitoring the ADF Pipelines

By the end of this course, you'll know how to design and build a global application using the power of Microsoft Azure Platform as a Service offering.