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PARULINSTITUTEOF ENGINEERING &TECHNOLOGY
FACULTY OF ENGINEERING & TECHNOLOGY
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Subject: Azure Fundamentals

Unit 2 : Familiarity with the various Azure services

Computer Science & Engineering

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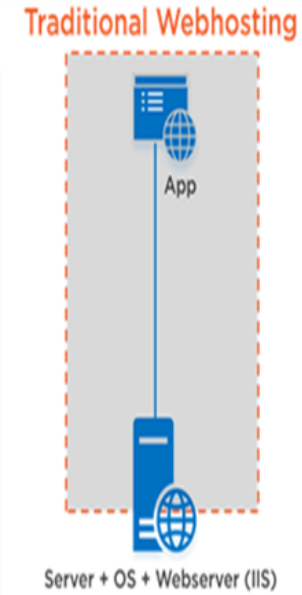
Outline

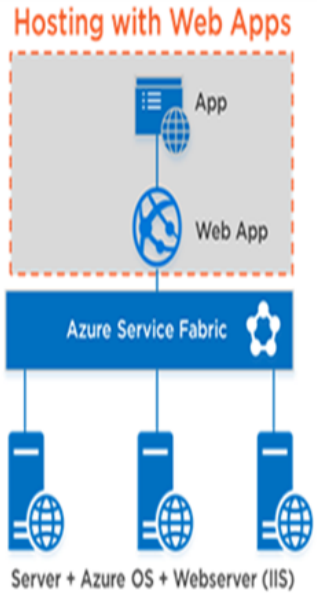
- **Familiarity with the various Azure services and their common use cases**
- **Azure Virtual Machines**
- **Azure App Services**
- **Azure Storage**
- **Azure Functions**
- **Azure SQL Database**

Azure App Services

Azure App Service

- Azure App Service is an HTTP-based service for hosting web applications, REST APIs, and mobile back ends. It supports multiple languages, including .NET, .NET Core, Java, Ruby, Node.js, PHP, or Python
- It offers automatic scaling and high availability. App Service supports Windows and Linux. It enables automated deployments from GitHub, Azure DevOps, or any Git repo to support a continuous deployment model.
- The App Service is deployed on to an App Service Plan which would define the compute and Storage Capacity needed for the App Service





Azure App Services

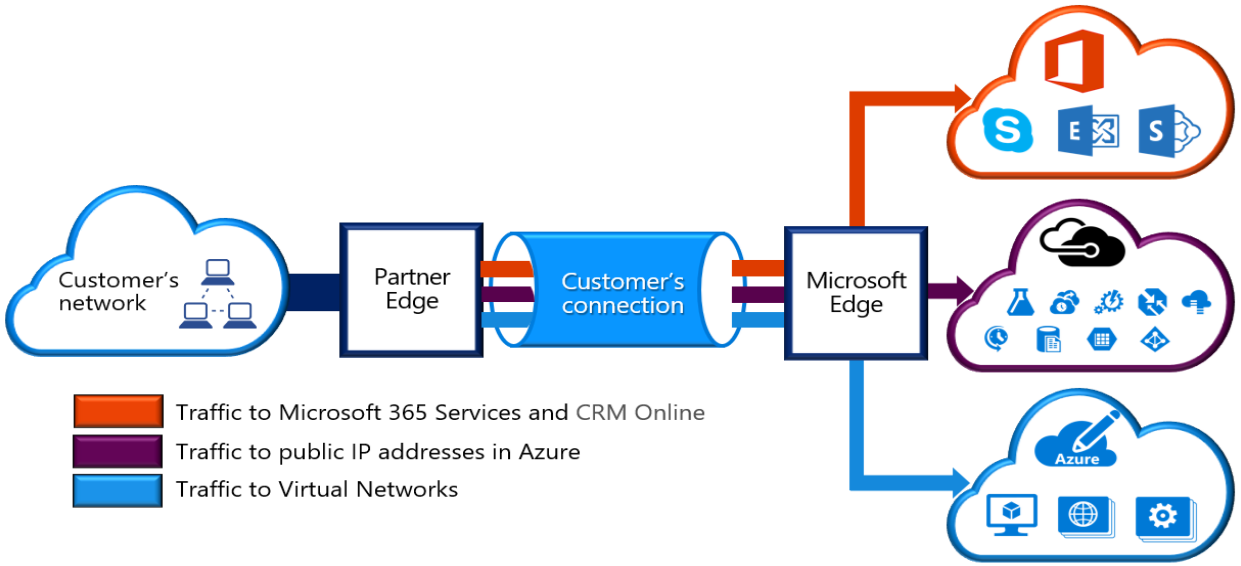
Azure Virtual Networking (VNET)

- Azure Virtual Network is the fundamental building block for your private network in Azure. A virtual network enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks
- When you set up a virtual network, you define a private IP address space by using either public or private IP address ranges. The IP range only exists within the virtual network and isn't internet routable. You can divide that IP address space into subnets and allocate part of the defined address space to each named subnet
- You can inter-connect multiple VNETs by using VNET peering or VNET to VNET connection using virtual network gateway device
- You can connect to your on-premises networks privately using VPN Tunnels(site to site or point to site) or ExpressRoute
- To control traffic flow, you may deploy Firewalls or use Network Security Groups

Azure App Services

Azure Express Route

extends on-premises networks into Azure over a private connection that is facilitated by a connectivity provider.



Azure App Services

Azure DNS

- Azure DNS is a hosting service for DNS domains that provides name resolution by using Microsoft Azure infrastructure.
- By hosting your domains in Azure, you can manage your DNS records using the same credentials, APIs, tools, and billing as your other Azure services.
- Azure DNS also supports private DNS domains. This feature allows you to use your own custom domain names in your private virtual networks, rather than being stuck with the Azure-provided names.

Azure App Services

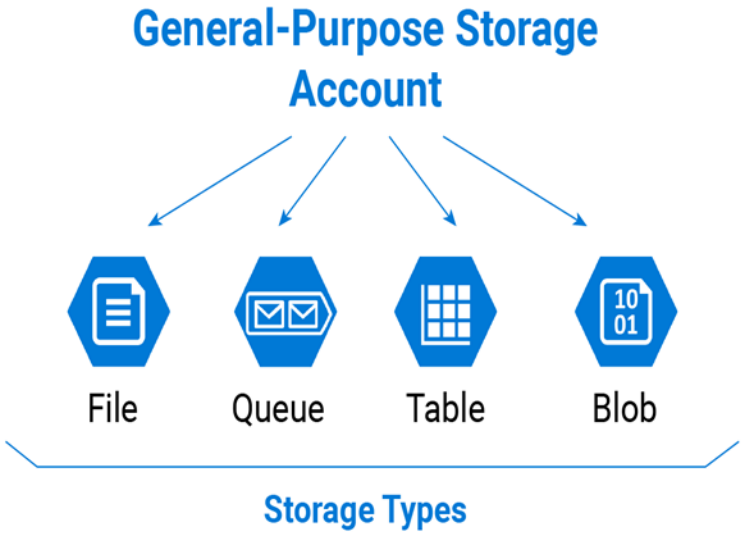
Demo: Create an App Service in Azure and host sample website

Step by step instructions:
https://www.youtube.com/watch?v=VLTNyM8DGds

Deploy an ASP.NET web app https://learn.microsoft.com/en-us/azure/app-service/quickstart-dotnetcore?tabs=net80&pivots=development-environment-cli
Deploy a PHP Web App: https://learn.microsoft.com/en-us/azure/app-service/quickstart-php?tabs=cli&pivots=platform-linux

Azure Storage

- **Azure storage account**
  - Azure Storage Account is a cloud based, web-based storage service which is secure, highly available, durable, and massively scalable and accessible over HTTP or HTTPS.
  - Storage Account must have a globally unique name
  - Azure Storage Account support four Azure data storage objects Blob, File, Table and Queue
  - Azure Storage Account supports six replication options, Namely, Locally redundant storage (LRS), Geo-redundant storage (GRS), Read-access geo-redundant storage (RA-GRS), Zone-redundant storage (ZRS), Geo-zone-redundant storage (GZRS), Read-access geo-zone-redundant storage (RA-GZRS)



Azure Storage

Azure Data Migration Options:

- Azure supports both real-time migration of infrastructure, applications, and data using Azure Migrate as well as asynchronous migration of data using Azure Data Box

Azure Data Box:

- Azure Data Box is a physical migration service that helps transfer large amounts of data in a quick, inexpensive, and reliable way.
- The secure data transfer is accelerated by shipping you a proprietary Data Box storage device that has a maximum usable storage capacity of 80 terabytes.
- The Data Box is transported to and from your datacenter via a regional carrier. A rugged case protects and secures the Data Box from damage during transit.

Azure Storage

Azure file movement options

- **AzCopy**

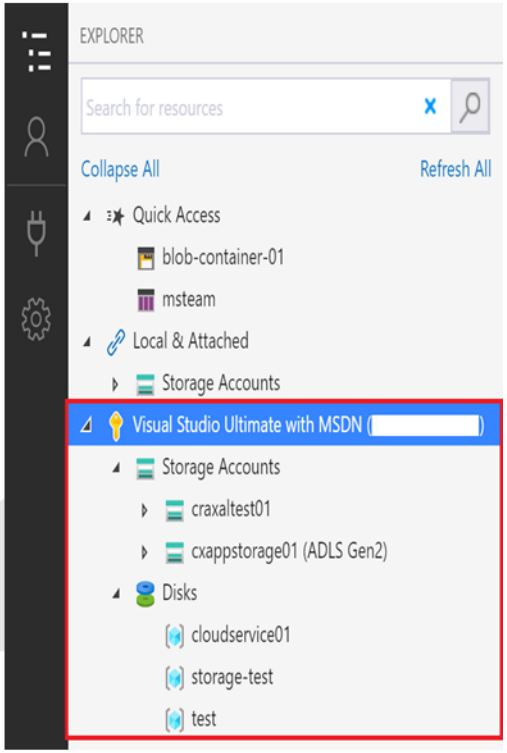
AzCopy is a command-line utility that you can use to copy blobs or files to or from your storage account. With AzCopy, you can upload files, download files, copy files between storage accounts

Azure Storage Explorer

Azure Storage Explorer is a standalone app that provides a graphical interface to manage files and blobs in your Azure Storage Account. It works on Windows, macOS, and Linux operating systems. With Storage Explorer, you can upload to Azure, download from Azure, or move between storage accounts.

Azure File Sync

Azure File Sync is a tool that lets you centralize your file shares in Azure Files and keep the flexibility, performance, and compatibility of a Windows file server. It's almost like turning your Windows file server into a miniature content delivery network. Once you install Azure File Sync on your local Windows server, it will automatically stay bi-directionally synced with your files in Azure.



Azure Storage

Demo: Create an Azure storage account and upload a BLOB, access the BLOB using endpoint

Step by step instructions:
https://www.youtube.com/watch?v=_NlNTiliTPs

Create a Storage Account: https://learn.microsoft.com/en-us/azure/storage/common/storage-account-create?tabs=azure-portal

Upload, download, and list blobs with the Azure portal:
https://learn.microsoft.com/en-us/azure/storage/blobs/storage-quickstart-blobs-portal

Azure Functions

- Azure Functions is an event-driven, serverless compute option that doesn't require maintaining virtual machines or containers.
- If you build an app using VMs or containers, those resources have to be "running" in order for your app to function. With Azure Functions, an event wakes the function, alleviating the need to keep resources provisioned when there are no events.
- Functions are commonly used when you need to perform work in response to an event (often via a REST request), timer, or message from another Azure service, and when that work can be completed quickly, within seconds or less.
- Functions scale automatically based on demand. Azure Functions runs your code when it's triggered and automatically deallocates resources when the function is finished. In this model, you're only charged for the CPU time used while your function runs.

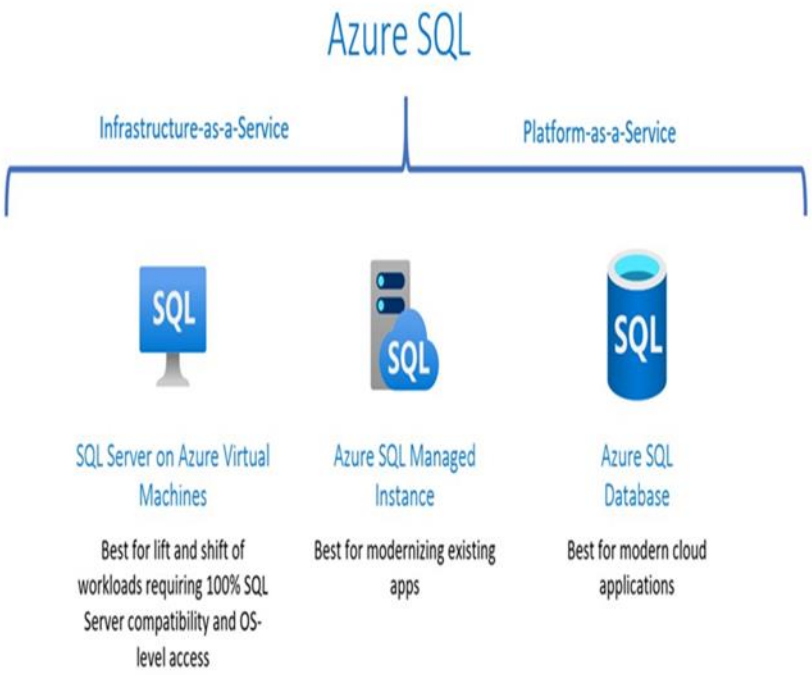
Azure Functions

Azure Containers

- A container is a unit of software that packages code and its dependencies, so the application runs quickly and reliably across computing environments
- Much like running multiple virtual machines on a single physical host, you can run multiple containers on a single physical or virtual host. Unlike virtual machines, you don't manage the operating system for a container
- Containers are lightweight and designed to be created, scaled out, and stopped dynamically.
- One of the most popular container engines is Docker, which is supported by Azure.
- Azure Container Instances offer the fastest and simplest way to run a container in Azure. Azure Container Instances are example of PaaS offering.

Azure SQL Database

- SQL Database is a PaaS deployment option of Azure SQL that abstracts both the OS and the SQL Server instance away from users.
- This deployment option allows you to just get a database and start developing applications. SQL Database supports scenarios that require unlimited database storage (hyperscale) and autoscaling fo unpredictable workloads (serverless).
- SQL Database has the industry's highest availability SLA. It provide other intelligent capabilities related to monitoring and performanc partly because Microsoft manages instances.
- Azure also has other SQL Deployment options like SQL in Azure VM and SQL Managed Instance
- Azure also supports Cosmos DB, MySQL and PostgreSQL



Azure SQL Database

Demo: Create Azure SQL Database instance

Step by step instructions:
https://www.youtube.com/watch?v=6joGkZMVX4o

Create a single database - Azure SQL Database:
https://learn.microsoft.com/en-us/azure/azure-sql/database/single-database-create-quickstart?view=azuresql-db&tabs=azure-portal

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