Important Key Terms To Know:

- **Blob -** Azure Blob storage is a service for storing large amounts of unstructured object data, such as text or binary data. You can use Blob storage to expose data publicly to the world, or to store application data privately.

- **Azure storage** offers different **access tiers**, which allow you to store blob object data in the most cost-effective manner. The available access tiers include:

1. **Hot -** Optimized for storing data that is accessed frequently.
2. **Cool -** Optimized for storing data that is infrequently accessed and stored for at least 30 days.
3. **Archive -** Optimized for storing data that is rarely accessed and stored for at least 180 days with flexible latency requirements (on the order of hours).

- **Azure Logic Apps** is a cloud service that helps you schedule, automate, and orchestrate tasks, business processes, and workflows when you need to integrate apps, data, systems, and services across enterprises or organizations. **For Example** - Move uploaded files from an SFTP or FTP server to Azure Storage.

- **API Management (APIM)** is a way to create consistent and modern API gateways for existing back-end services.

- **Azure Functions** allows you to run small pieces of code (called "functions") without worrying about application infrastructure. With Azure Functions, the cloud infrastructure provides all the up-to-date

servers you need to keep your application running at scale**.**

- **Microsoft Azure Service Bus** is a fully managed enterprise integration message broker. Service Bus can decouple applications and services. Service Bus offers a reliable and secure platform for asynchronous transfer of data and state.

- **Azure Data Factory** is Azure's cloud ETL service for scale-out serverless data integration and data transformation. It offers a code-free UI for intuitive authoring and single-pane-of-glass monitoring and management.

- **Azure Reservations** help you save money by committing to one-year or three-years plans for multiple products. Committing allows you to get a discount on the resources you use. Reservations can significantly reduce your resource costs up to 72% on pay-as-you-go prices.

- **Azure Policy** is a service in Azure that you use to create, assign, and manage policies. These policies enforce different rules and effects over your resources, so those resources stay compliant with your corporate standards and service level agreements.

- **Role-based access control (RBAC)** helps you manage who has access to Azure resources, what they can do with those resources, and what areas they have access to.

- **Resource -** A manageable item that is available through Azure. Virtual machines, storage accounts, web apps, databases, and virtual networks are examples of resources.

- **Resource group** - A container that holds related resources for an Azure solution. The resource group includes those resources that you want to manage as a group. You decide which resources belong in a resource group based on what makes the most sense for your organization.

- **Microsoft Trust Center** as an unified trust-related resource across their enterprise cloud services which includes Azure, Dynamics 365, Office 365, Power BI, Visual Studio Team Services, and Windows Server 2016.

- **Azure Advisor** is a personalized cloud consultant that helps you follow best practices to optimize your Azure deployments. It analyzes your resource configuration and usage telemetry and then recommends solutions that can help you improve the cost effectiveness, performance, high availability, and security of your Azure resources.

- **Azure Resource Manager** is the deployment and management service for Azure. It provides a management layer that enables you to create, update, and delete resources in your Azure subscription. You use management features, like access control, locks, and tags, to secure and organize your resources after deployment.

- **Azure Blueprints** enables cloud architects and central information technology groups to define a repeatable set of Azure resources that implements and adheres to an organization's standards, patterns, and requirements. With Azure Blueprints, the relationship between the blueprint definition (what should be deployed) and the blueprint assignment (what was deployed) is preserved. There's no need to choose between a Resource Manager template and a blueprint. Each blueprint can consist of zero or more Resource Manager template artifacts. This support means that previous efforts to develop and maintain a library of Resource Manager templates are reusable in Azure Blueprints.

- **Azure DevTest Labs** enables developers on teams to efficiently self-manage virtual machines (VMs) and PaaS resources without waiting for approvals. DevTest Labs creates labs consisting of pre-configured bases or Azure Resource Manager templates. These have all the necessary tools and software that you can use to create environments. You can create environments in a few minutes, as opposed to hours or days.

- **Azure Bot Service** and Bot Framework provide tools to build, test, deploy, and manage intelligent bots, all in one place. Through the use of modular and extensible framework provided by the SDK, tools, templates, and AI services developers can create bots that use speech, understand natural language, handle questions and answers, and more.

- **Azure Machine Learning** gives you a cloud-based environment for preparing data, train the data, testing, deploying and managing machine learning models.

- **Machine Learning Studio** is a drag-and-drop visual workspace which you can use to build, test and deploy machine learning solutions without the need of writing any sort of code.

- **Azure Cognitive Services** are APIs, SDKs, and services available to help developers build intelligent applications without having direct AI or data science skills or knowledge. The goal of Azure Cognitive Services is to help developers create applications that can see, hear, speak, understand, and even begin to reason. The catalog of services within Azure Cognitive Services can be categorized into five main pillars – Vision (Images),Face API, Speech, Language, Web Search, and Decision.

- **Azure Monitor** maximizes the availability and performance of your applications and services by delivering a comprehensive solution for collecting, analyzing, and acting on telemetry from your cloud and on-premises environments. It helps you understand how your applications are performing and proactively identifies issues affecting them and the resources they depend on.

- **Application Insights** is a feature of Azure Monitor, is an extensible Application Performance Management (APM) service for developers and DevOps professionals. Use it to monitor your live applications. It will automatically detect performance

anomalies, and includes powerful analytics tools to help you diagnose issues and to understand what users actually do with your app. It's designed to help you continuously improve performance and usability.

- **Azure DevOps** is a complete set of tools that can be used to help teams to plan work, collaborate on code development and build and deploy applications.

  Azure DevOps services:

  1. **Azure Repos** –host Git repositories or use Team Foundation Version Control.
  2. **Azure Pipelines** –build and release services for continuous integration and release.
  3. **Azure Boards** - plan and track work items.
  4. **Azure Test Plans** provides tools for testing of applications.
  5. **Azure Artifacts** allows teams to share Maven, npm and NuGet packages manager from public and private sources.

- **Azure Traffic Manager** is a DNS-based traffic load balancer that enables you to distribute traffic optimally to services across global Azure regions, while providing high availability and responsiveness.

- **Network security group (NSG)** contains a list of security rules that allow or deny network traffic to resources connected to Azure Virtual Networks (VNet). NSGs can be associated to subnets, individual VMs (classic), or individual network interfaces (NIC) attached to VMs (Resource Manager).

- **Application Security Groups** helps to manage the security of Virtual Machines by grouping them according the applications that runs on them. It is a feature that allows the application-centric use of Network Security Groups.

- **Basic Support plan** – no SLA in place.

- **Professional Direct Support plan** - has an SLA of 1 hour for Critical business impact cases.

- **Premier support plan** does provide an initial SLA of 15 minutes for business critical cases.

- **Azure Synapse/ SQL data-warehouse** is a limitless analytics service that brings together enterprise data warehousing and Big Data analytics.

- **CosmosDB** is a NoSQL database that is offered by Azure. It is a globally distributed, multi-model database service.

- **Azure HDInsight** is a cloud distribution of Hadoop components. Azure HDInsight makes it easy, fast, and cost-effective to process massive amounts of data.

- **High Availability** — The major cloud providers (Azure, AWS, GCP) have multiple data centers spread

around throughout the world. Data and code stored in the cloud are copied to more than one data center. If anything happens to one data center, the data can be recovered from another data center.

- **Fault Tolerance** — In case there is any fault in the application or infrastructure, the service can continue to work by moving the work to other healthy servers.
- **Disaster Discover** — The data in the cloud can also get copied to other regions e.g. copy data from West US to East US. If there is natural disaster happened in West US and every data center goes down, the data center in East US will still have the copy of data.
- **Scalability** — The application running in the cloud can expand its size when there are more users in the system.
- **Elasticity** — The application running in the cloud can shrink its size when there are fewer users in the system. The users can also set automatic shutdown during the non-business hours to save money.
- **Agility** — Cloud allows the business to deliver IT system to customers faster. The machines in the cloud are ready for cloud users to spin up when they need and shut down when they are not required.
- **Economies of scale** — Cloud is a shared pool of machines and services. As the number of customer grows, the cloud providers can lower the cost or increase quality of the services.
- **Azure virtual machine scale sets** let you create and manage a group of identical, load balanced VMs. The number of VM instances can automatically increase or decrease in response to demand or a defined schedule. Scale sets provide high availability to your applications,

and allow you to centrally manage, configure, and update a large number of VMs. With virtual machine scale sets, you can build large-scale services for areas such as compute, big data, and container workloads.

- **Capital Expenditure (CapEx) vs Operational Expenditure (OpEx)** — Building a data center requires large capital investment for hardware as well as the facility. A data center will also require ongoing electricity and staffs cost for operation. By using cloud, the capital expenditure for building a data center is not required.
- **Consumption-based model (pay-as-you-go)** — The cloud users only pay for what they need, by the duration they need.
- **IaaS (Infrastructure as a Service)** — In this offering, the cloud providers offer barebone hardware in managed data center such as virtual machine or file storage. The cloud providers will take care of the physical infrastructure e.g. data center security or hardware repair, while the cloud users need to take care of server maintenance. For example, Azure VM allows the users to spin up new virtual machines in any size.
- **PaaS (Platform as a Service)** — The cloud providers will take care of the servers. The cloud users only need to bring in application code or data. For example, Azure SQL Database is fully managed service by Azure that the users do not need to / cannot access anything beyond their data.
- **SaaS (Software as a Service)** — The cloud providers will take care of both servers and code. The cloud users only need to configure the software to suit their needs. For example, Office 365 allows the users to use Microsoft Office software suite.

- **Public Cloud** — When the companies decided to use all their servers from the cloud providers' data center.

  - **Advantages of public clouds:**

  1. Lower costs—no need to purchase hardware or software and you pay only for the service you use.

  2. No maintenance—your service provider provides the maintenance.

  3. Near-unlimited scalability—on-demand resources are available to meet your business needs.;

  4. High reliability—a vast network of servers ensures against failure.

- **Private Cloud** — When the companies decided to use all their servers on their own data center to replicate the cloud services e.g. offering self-service components.
- **Hybrid Cloud** — When the companies decided to use some of the servers in their own data center, and some of the servers in public cloud.
- **Availability Zones** is a high availability offering that protects your applications and data from datacenter failures. Availability Zones are unique physical locations within an Azure region. Each zone is made up of one or more datacenters equipped with independent power, cooling, and networking. To ensure resiliency, there's a minimum of three separate zones in all enabled regions.

- **Azure Content Delivery Network (CDN)** offers developers a global solution for rapidly delivering high-bandwidth content to users by caching their content at strategically placed physical nodes across the world. Azure CDN can also accelerate dynamic content, which cannot be cached, by leveraging various network optimizations using CDN POPs. For example, route optimization to bypass Border Gateway Protocol (BGP).

  The benefits of using Azure CDN to deliver web site assets include:

  1. Better performance and improved user experience for end users, especially when using applications in which multiple round-trips are required to load content.
  2. Large scaling to better handle instantaneous high loads, such as the start of a product launch event.
  3. Distribution of user requests and serving of content directly from edge servers so that less traffic is sent to the origin server.

- **Azure Key Vault** is a tool for securely storing and accessing secrets. A secret is anything that you want to tightly control access to, such as API keys, passwords, or certificates. A vault is a logical group of secrets.

- **Azure Security Center** is a unified infrastructure security management system that strengthens the security posture of your data centers and provides advanced threat protection across your hybrid workloads in the cloud - whether they're in Azure or not - as well as on premises.

- **Azure AD Identity Protection** is a service that can help detect suspicious actions related to user identities.

- **Azure AD Privileged Identity Management** is a service that can help manage, control and monitor access to important resources in your organization.

- **Azure Information Protection** is a solution that can help an organization classify and protect its documents and email by applying labels.
- **Azure Advanced Threat Protection** is a cloud-based security tool that can be used to identify, detect and investigate advanced threats, compromised identities. can be used to protect identities and credentials stored in Active Directory.
- **Virtual Network** is used to define an isolated network in Azure. The virtual network can then be used to host your resources such as Azure virtual machines.
- **A VPN gateway /virtual network gateway** is used to send encrypted traffic between an Azure virtual network and an on-premises location over the public Internet.
- **Virtual Network Peering** is used to connect two Azure virtual networks together via the backbone network.
- **Azure Firewall** is a managed, cloud-based network security service that can be used to protect your network resources.
- **A Point-to-Site VPN** connection is used to establish a secure connection between multiple client machines an an Azure virtual network via the Internet.
- **A Site-to-Site VPN connection** is used to establish a secure connection between an on-premise network and an Azure network via the Internet.
- **Availability Sets** allows workloads to be spread over multiple hosts, racks but **still remain at the same data center** you only achieve an SLA of 99.95%.
- **Availability Zones** allows workloads to be spread over multiple locations, so you automatically don't care

on which host the workload will run. you can achieve an SLA of 99.99%.

- **Pricing calculator** can give you indicative pricing for hosting resources on the Azure platform.
- **Azure Cost Management** is used to monitor Azure resource cost usage once they are already running on Azure.
- **TCO Calculator** is used to get an estimate of cost savings when you want to migrate your workloads to the cloud.
- **Azure Storage Accounts:**
  1. **BlobStorage -** legacy storage
  2. **FileStorage** -file-only storage
  3. **BlockBlobStorage -** storing block or append blobs
  4. **General-purpose v1 -** blob, file , queue and table service, but is the older version
  5. **General-purpose v2 –** new version
- **Services:**
- **File service -** store files that need to be accessed by machines using the SMB
- **Table service** - store NoSQL data or table like data
- **Queue service** - exchange messages between components of your application
- **Blob service -** store massive amounts of unstructured data like images, documents, video and audio files.
  1. **Block blobs -** storing text and binary data.
  2. **Append blobs-** logging data.
  3. **Page blobs -** store virtual hard disk files.

- **Locally-redundant storage (LRS)** data is replicated synchronously three times within a physical location in the primary region.

- **Zone-redundant storage (ZRS)** data is replicated synchronously across three Azure availability zones in the primary region.

- ***Geo-redundant storage (GRS)*** data is replicated synchronously three times in the primary region, then replicated asynchronously to the secondary region

- ***Read access Geo-redundant storage (RA-GRS)*** *same as GRS in addition,* in the secondary region is also available for read-only purposes

- **Azure virtual machine scale sets** allow you create and manage a group of identical, load balanced virtual machines. The number of VM instances can automatically increase or decrease in response to demand or a defined schedule

- **Azure Kubernetes Service (AKS)** is a fully managed Kubernetes service makes deploying and managing containerized applications easy. It offers serverless Kubernetes, an integrated continuous integration and continuous delivery (CI/CD) experience, and enterprise-grade security and governance. Unite your development and operations teams on a single platform to rapidly build, deliver, and scale applications with confidence.

- **IoT Hub** is a managed service, hosted in the cloud, that acts as a central message hub for bi-directional communication between your IoT application and the devices it manages. You can use Azure IoT Hub to build IoT solutions with reliable and secure communications between millions of IoT devices and a cloud-hosted solution backend. You can connect virtually any device to IoT Hub.

- **Azure IoT Edge** moves cloud analytics and custom business logic to devices so that your organization can focus on business insights instead of data management. Scale out your IoT solution by packaging your business logic into standard containers, then you can deploy those containers to any of your devices and monitor it all from the cloud.

- **IoT Central** is a fully SaaS and IoT application platform that reduces the burden and cost of developing, managing, and maintaining enterprise-grade IoT solutions. Choosing to build with IoT Central gives you the opportunity to focus time, money, and energy on transforming your business with IoT data, rather than just maintaining and updating a complex and continually evolving IoT infrastructure.

- **Azure Time Series Insights** is built to store, visualize, and query large amounts of time series data, such as that generated by IoT devices. If you want to store, manage, query, or visualize time series data in the cloud, Time Series Insights is likely right for you. It joins metadata with telemetry and indexes your data in a columnar store.