Microsoft Azure Fundamentals FAQ's

Lesson 01 : Cloud Computing

Q. 1	**What is cloud computing?**
Ans :	Cloud computing is a virtualized computing platform that provides infinite resources for running our applications. It leverages economies of scale to save our money by only requiring us to pay for what we use.
Q. 2	**What is cloud provider?**
Ans :	A cloud provider is a company that offers some component of cloud computing services like servers, storage, databases, networking analytics and more over the internet. Cloud providers are sometimes referred to as cloud service providers or CSPs.
Q. 3	**Which company first moved to cloud platforms?**
Ans :	Amazon
Q. 4	**Explain cloud computing categories**
Ans :	• Cloud Applications : Running applications in data centers owned by third parties and accessed via the internet • Cloud Platforms : Computing resources at data centers across the internet • Private Clouds : Cloud platforms used by a single organization inside their own on-premise data center
Q. 5	**Explain Benefits of cloud computing**
Ans :	• Cost : Hugely reduced capital cost of buying hardware and software's • Speed : Computing resources can be provisioned in minutes typically with in few minutes • Scalability : Computing resources can be scaled up and down quickly according to the business requirements • Productivity : Cloud Computing takes out hardware setup, patching etc. so that IT team can focus on achieving business goals • Reliability : Cloud computing makes data backup, data recovery and business continuity less expensive and faster recovery
Q. 6	**Explain type of cloud services**
Ans :	• Infrastructure as a Service (IaaS) Rent IT infrastructure servers and virtual machines (VMs), storage, networks, operating systems from a cloud provider on a pay-as-you-go basis • Platform as a Service (PaaS) Cloud computing services that supply an on-demand environment for developing, testing, delivering and managing software applications

	• Software as a Service (SaaS) Delivering software applications over the Internet, on demand and typically on a subscription basis.
Q. 7	**Explain SaaS with example**
Ans :	Running applications on the public cloud is commonly referred as Software as a Service(SaaS) Cloud applications is nothing but an application which offers CRM(Customer Relationship Management), Email, ERP, collaboration, productivity etc. Microsoft, Google, Salesforce, SAP, IBM, Oracle, NetSuite & Zoho were some of the important service providers to offer cloud applications. • Microsoft : Office 365 Microsoft offers Dynamics CRM Online (CRM), Exchange Online(Email), SharePoint online(Collaboration), Office Web Apps(Productivity) • Google : Google Apps Gmail(Email), Google Sites(Collaboration), Google Docs(Productivity) • SAP: Business By Design(ERP) • IBM: Lotus Live(Collaboration) • Oracle: Fusion CRM (CRM) • NetSuite: CRM+ (CRM) • Zoho: CRM, Mail(Email), Docs(Collaboration), Writer(Productivity) • Salesforce: CRM (Salesforce was first vendor to experience real success with SaaS)
Q. 8	**What is single-tenant application?**
Ans :	Multiple users or Multiple customer organizations, are assigned with their own copy of the application. It requires one instance for each customer, there's no cost advantage
Q. 9	**What is multi-tenant application?**
Ans :	Multiple users or Multiple customer organizations, shares a single copy of the application with their data. It is easy to update, to maintain, to work with, and thus provides cost saving to customers
Q. 10	**Explain SaaS benefits**
Ans :	Faster deployment because no local installation required Usage based pricing i.e. letting us to pay only for what we use Less financial risk by lowering up-front cost, in-fact we have free trail option so that we can try it before we buy Easier upgrade, no need to worry about updates application will be up to date
Q. 11	**Explain SaaS limitations**
Ans :	Requires trusted SaaS Provider for availability and data security

	Legal / regulatory concerns can arise due to the data getting stored outside the customer premises. App Customization is limited when using a multi-tenant application. Harder to integrate with on-premises applications Lower performance can arise if customer has low band internet connectivity
Q. 12	**Explain cloud platform**
Ans :	Cloud platform provides an environment with that developers can build applications on that and users can then use it Cloud platform is a platform not an application. It allows developers to create application, run applications, store data and more Cloud platform provides self service access to resources such as a virtual machine , storage , service through a browser interface Cloud platform allows us charging only for the resources an application uses. i.e. we can use a VM for an hour or Giga bytes of storage for a day
Q. 13	**Explain difference between IaaS and PaaS**
Ans :	**IaaS** / **PaaS** Higher degree of control / Lower degree of control Higher support for legacy apps / Lower support for legacy apps Lower ease of management / Higher ease of management Lower agility / Higher agility
Q. 14	**Explain IaaS benefits**
Ans :	Customers have full control over their VM and everything inside it; customers can choose to automate the provisioning or build their own VM Customers can run anything they want inside their VM also get full control of processing inside VM Customers can pay what they actually utilize, they can shut down the resources, if it is not in use and save money. Customers can run and control their own virtual infrastructure without the overheads of cost and maintenance from running their own hardware.
Q. 15	**Explain IaaS limitation**
Ans :	Most expensive, since the customer is now leasing the resource, provider can charge for every Cycle, bit of RAM or disk space used. Customer is responsible for backups and patch updates. The performance of the network depends on the speed of the internet connectivity
Q. 16	**Explain PaaS benefits**
Ans :	Faster deployment because no local installation required Cost effective in comparison to IaaS, because we are essentially leasing the software platform not a resource.

	Developers need to do less work so than applications can be created quickly No need to administer the application, organizations can spend less on supporting their applications
Q. 17	**Explain PaaS limitations**
Ans :	PaaS is less familiar to developers, they need to learn the PaaS platform PaaS gives developers less control, they must work with the constraints of PaaS technology. PaaS platforms can be quite different from one another and from the on-premises world, so that there is a chance of locking with vendor.
Q. 18	**What is Private cloud?**
Ans :	Private cloud infrastructure is a dedicated infrastructure provided to a single organization or client Deployed inside firewalls and offer robust IT security for the organization Companies also pay third-party service providers to host their private cloud Using Private clouds VM admin in an organization can create a predefined services with predefined users, access rights, and quotas so that it will be immediately available to IT user as soon as they make the request
Q. 19	**Explain benefits of private cloud**
Ans :	Better controls for data, users and information assets. The cloud belongs to a single client. Hence, the infrastructure and systems can be configured to provide high levels of security. The hardware and other resources can be customized easily by the company. Compliance is achieved easily in private clouds.
Q. 20	**Explain Cloud Deployment Models**
Ans :	• Public cloud Public clouds are owned and operated by a third-party cloud service provider, which delivers computing resources such as servers and storage over the Internet. • Private cloud A private cloud refers to cloud computing resources used exclusively by a single business or organization. A private cloud can be physically located on the company's on-site datacenter. Some companies also pay third-party service providers to host their private cloud • Hybrid cloud Hybrid clouds combine public and private clouds, bound together by technology that allows data and applications to be shared between them.

		Hybrid cloud gives businesses greater flexibility and more deployment options. Microsoft is the leading cloud platform companies which has the strongest focus on hybrid cloud

Lesson 02 : Azure Fundamentals

Q. 1	**Explain Microsoft Azure in detail.**
Ans :	Microsoft Azure is a comprehensive cloud platform that enables solutions based on individual challenges and needs - with the benefits of a public cloud service. Azure can be described as a growing collection of integrated cloud services that developers and IT professionals can use to build, deploy, and manage applications through a global network of datacenters. It is introduced as Windows Azure and renamed as Microsoft Azure in 2014. With Azure, you get the freedom to build and deploy wherever you want, using the tools, applications, and frameworks of your choice. You can store data using relational SQL databases, NoSQL table stores, and unstructured blob storages, and optionally use Hadoop and business intelligence services to data-mine it. You can take advantage of Microsoft Azure's robust capabilities to enable scalable distributed applications, as well as deliver hybrid solutions that run across a cloud and on-premise enterprise environment. Microsoft Azure can provide a bridge from your data center to the cloud.
Q. 2	**What is region?**
Ans :	A region is a set of datacenters deployed within a latency-defined perimeter and connected through a dedicated regional low-latency network. With more global regions than any other cloud provider, Azure gives customers the flexibility to deploy applications where they need to.
Q. 3	**What is geographies?**
Ans :	A geography is a discrete market, typically containing two or more regions, that preserves data residency and compliance boundaries. Geographies allow customers with specific data-residency and compliance needs to keep their data and applications close. Geographies are fault-tolerant to withstand complete region failure through their connection to our dedicated high-capacity networking infrastructure.
Q. 4	**What is availability zone?**
Ans :	Availability Zones are physically separate locations within an Azure region. Each Availability Zone is made up of one or more datacenters equipped with independent power, cooling, and networking. Availability Zones allow customers to run mission-critical applications with high availability and low-latency replication.
Q. 5	**Explain benefits of Microsoft Azure**
Ans :	Reliable and secure Quick and easy deployment Pay only for what you use Flexible and scalable

	Worldwide data centers Unlimited storage and capacity
Q. 6	**Explain Azure Storage Services**
Ans :	• Blob Storage : Rest-based object storage for unstructured data • Table Storage : NoSQL key-value store using semi-structured datasets • Queue Storage : Used to create queue in the cloud and post and read messages from it • File Storage : File shares that use the standard SMB 3.0 protocol. SMB Stands for "Server Message Block". SMB is a network protocol used by Windows-based computers that allows systems within the same network to share files. • Backup Storage : Used to take backup either on-premise VM or Azure VM with cloud-based backup as a service • Site Recovery Storage : Used to replicate the work loads to disaster recovery data center or Azure storage
Q. 7	**Explain Azure Network Services**
Ans :	• Virtual Network : Provision private networks, optionally connect to on-premises datacenters • Load Balancer : Deliver high availability and network performance to your applications • Application Gateway : Build secure, scalable, and highly available web front ends in Azure • Traffic Manager : Route incoming traffic for high performance and availability • Express Route : Used to connect private data centers to cloud in a private connection mode • VPN : It delivers the same functionality like Express Route but over the internet • DNS : Host your DNS domain in Azure
Q. 8	**Explain Azure Compute Services**
Ans :	• Virtual Machine : Is a IaaS offering from Azure with that we can create servers using in-built or own images • Cloud Service : Classical way of deploying application along with the infrastructure • Service Fabric : Develop microservices and orchestrate containers on Windows or Linux • Container Instances : Easily runs container in a single command • Functions : Process events with serverless code
Q. 9	**Explain Azure Databases**
Ans :	• SQL DB : Managed relational SQL Database as a service • SQL Data Warehouse : Elastic data warehouse as a service with enterprise-class features. It is a cloud-based Enterprise Data

	Warehouse (EDW) that leverages Massively Parallel Processing (MPP) to quickly run complex queries across petabytes of data. • SQL Stretch DB : Dynamically stretch on-premises SQL Server databases to Azure • Consmos DB : Globally distributed, multi-model database for any scale • Azure Redis Cache : Power applications with high-throughput, low-latency data access. It is based on the popular open-source Redis cache. It is typically used as a cache to improve the performance and scalability of systems that rely heavily on backend data-stores. Performance is improved by temporarily copying frequently accessed data to fast storage located close to the application. With Redis cache, this fast storage is located in-memory with Redis Cache instead of being loaded from disk by a database. • Azure Data Factory : Orchestrate and manage data transformation and movement.It is a fully managed service for composing data storage, processing, and movement services into streamlined, scalable, and reliable data production pipelines. Developers can use Data Factory to transform semi-structured, unstructured and structured data from on-premises and cloud sources into trusted information
Q. 10	**Explain Azure App Services**
Ans :	• Web Apps : Quickly create and deploy mission critical Web apps at scale • Mobile Apps : Build and host the backend for any mobile app • Logic Apps : Automate the access and use of data across clouds without writing code • API Apps : Easily build and consume Cloud APIs • Content Delivery Network : Ensure secure, reliable content delivery with broad global reach
Q. 11	**Explain Azure Security Services**
Ans :	• Azure AD : Synchronize on-premises directories and enable single sign-on • Azure Key Vault : Safeguard and maintain control of keys and other secrets • Azure Security Center : Unify security management and enable advanced threat protection across hybrid cloud workloads • Azure B2C : Consumer identity and access management in the cloud • Azure Multi-Factor Authentication : Add security for your data and apps without adding hassles for users
Q. 12	**Explain Azure Monitoring Services**
Ans :	• Application Insights : Detect, triage, and diagnose issues in your web apps and services

	• Azure Service Health : Get personalized guidance and support for when issues in Azure services affect you • Automation : Simplify cloud management with process automation • Azure Monitor : Highly granular and real-time monitoring data for any Azure resource • Azure Log Analytics : Collect, search, and visualize machine data from on-premises and cloud • Azure Advisor : Your personalized Azure best practices recommendation engine
Q. 13	**What is Microsoft Azure Portal**
Ans :	Azure portal helps us to view and manage all of your applications in one unified hub Link is : portal.azure.com
Q. 14	**Explain different Azure Development Tools.**
Ans :	Microsoft offers a comprehensive set of development tools for any developer using any platform or language to deliver cloud applications.

Tool	Description
Visual Studio	Get all the power and capabilities you need to easily develop, debug, deploy, manage and diagnose cloud-scale applications on Azure, using a full-featured IDE
Visual Studio Code	Edit and debug code quickly with a lightweight code editor that runs on macOS, Linux and Window streamlined for building and deploying Node.js and JAVA apps to the cloud using serverless computing, containers or managed Web Apps
SDKs	Download and install language-specific SDKs and tools for your platform of choice, including .NET, JAVA, Node.js, Python and Go
CLIs	Use a Azure CLI/PowerShell command-line interface to create and manage services and automate everyday tasks in Azure
REST APIs	REST APIs allow us to interact with nearly every type of resource in Azure programatically

Lesson 03 : Azure Compute

Q. 1	**What is Azure Computing?**
Ans :	Computing resources like CPU, Memory, Disk space etc. are needed to run or deploy the application / logic Microsoft Azure lays the foundation for lot of such resources and services. Azure provides computing resources through IaaS, PaaS & LaaS as options for running our applications **IaaS** Full Control for us but we need to own complete responsibility Vendor agnostic(No ties to specific vendor) **PaaS** Azure Manages the app We need to manage the scaling and configuration **LaaS** Azure Manages the app including scaling We need to manage just the configuration
Q. 2	**What is Azure Resource Manager?**
Ans :	Azure Resource Manager (ARM) is the service used to provision resources in your Azure subscription It helps to deploy, manage, and monitor resources and 3rd party services as a group in Azure Resource: A manageable item that is available through Azure. Some common resources are a virtual machine, storage account, web app, database, and virtual network Resource group: A container that holds related resources for an Azure solution
Q. 3	**Explain benefits of Azure Resource Manager**
Ans :	You can deploy, manage, and monitor all the resources for your solution as a group, rather than handling these resources individually. You can repeatedly deploy your solution throughout the development lifecycle and be confident that your resources are deployed in a consistent state. You can manage your infrastructure through declarative templates rather than scripts. You can define the dependencies between resources so they are deployed in the correct order. You can apply access control to all services in your resource group because Role-Based Access Control (RBAC) is natively integrated into the management platform. You can apply tags to resources to logically organize all the resources in your subscription. You can clarify your organization's billing by viewing costs for a group of resources sharing the same tag.

Q. 4 **Explain Azure Virtual Machine in detail**

Ans :

This is a managed virtual machine service in the cloud where we can run our applications in to it
It starts and stops in minutes
Azure Marketplace has many images, Windows, Linux etc. and also we can create a VM with our own image
We have many options to choose the size of our VM in terms of CPU memory and disk type which fits best with our workload
VM's can be managed easily with configuration options like auto shutdown, adding disks and to virtual networks
Virtual Machine is a fully functioning virtual computer which imitates dedicated hardware
Azure Virtual Machines gives you the flexibility of virtualization for a wide range of computing solutions with support for Linux, Windows Server, SQL Server, Oracle, IBM, SAP and more.
Azure virtual machines can be used in various ways. Some examples are:

- **Development and test**
  Azure VMs offer a quick and easy way to create a computer with specific configurations required to code and test an application.
- **Applications in the cloud**
  Because demand for your application can fluctuate, it might make economic sense to run it on a VM in Azure. You pay for extra VMs when you need them and shut them down when you don't.
- **Extended datacenter**
  Virtual machines in an Azure virtual network can easily be connected to your organization's network.

Q. 5 **What virtual machine size determines? Explain the type of virtual machines.**

Ans :

A virtual machine size determines the amount of compute resources such as CPU, GPU, and memory that are made available to the virtual machine. Virtual machines need to be created with a size appropriate for the expect workload. If workload increases, an existing virtual machine can be resized.
You can capture and upload your own custom VM images as well

Type	Common Sizes	Description
General Purpose	Dsv3, Dv3, DSv2, Dv2, DS, D, Av2, A0-7	Balanced CPU-to-memory. Ideal for dev / test and small to medium applications and data solutions
Compute Optimized	Fs, F	High CPU-to-memory. Good for medium traffic applications, network appliances and batch processes

	Memory Optimized	Esv3, Ev3, M, GS, G, DSv2, DS, Dv2, D	High memory-to-core. Great for relational databased, medium to large caches and in-memory analytics
	Storage Optimized	Ls	High disk throughput and IO. Ideal for Big Data, SQL and NoSQL database
	GPU	NV, NC	Specialized VMs targeted for heavy graphic rendering and video editing
	High Performance	H, A8-11	Our most powerful CPU VMs with optional high-throughput network interfaces (RDMA)

Q. 6 **Explain VM Power States**

Ans :

An Azure VM can have one of many power states. This state represents the current state of the VM from the standpoint of the hypervisor.
Connecting Virtual Machines
Windows VMs can be connected using Remote Desktop Protocol or RDP most of the time. By default this service listens TCP 3389, but for security reasons it can be changed within the virtual machine, and also need to updated in Network Security Group
PowerShell remoting depends on HTTP at port 5985 or HTTPS at 5986
Linux VMs can be connected using Secure Shell(SSH), Authentication using password or keys and via RDP

Power State	Description
Starting	Indicates the virtual machine is being started
Running	Indicates that the virtual machine is running
Stopping	Indicates that the virtual machine is being stopped
Stopped	Indicates that the virtual machine is stopped. Virtual machines in the stopped state still incur compute charges
Deallocating	Indicates that the virtual machine is being deallocated
Deallocated	Indicates that the virtual machine is completely removed from the hypervisor but still available in the control plane. Virtual machines in the Deallocated state do not incur compute charges
-	Indicates that the power state of the virtual machine is unknown

Q. 7 **Explain keypoints regarding Azure VMs**

Ans :

Unless the VM is deallocated, it still incurs charge
Related assets are charged separately

	You can't connect to VMs in other virtual networks Deleting the VM doesn't delete the VHD You can't connect without an NSG rule DNS names require creativity and should be standardized
Q. 8	**Explain the important aspects for creating VM**
Ans :	• **Naming** The name of a VM can be up to 15 characters. • **Locations** Usually, the region is called location when you create a VM. For a VM, the location specifies where the virtual hard disks are stored. • **VM size** The size of the VM that you use is determined by the workload that you want to run. The size that you choose then determines factors such as processing power, memory, and storage capacity. • **VM Limits** Your subscription has default quota limits in place that could impact the deployment of many VMs for your project. The current limit on a per subscription basis is 20 VMs per region • **Operating system** Azure provides many marketplace images to use with various versions and types of operating system. Only 64-bit operating systems are supported. • **Related resources** Resource Group, Storage Account, Virtual Network, Public Ip Address, Network Interface and Data disks are the related resources used by the VM and need to exist or be created when the VM is created.
Q. 9	**What is VM Extensions?**
Ans :	Azure virtual machine (VM) extensions are small applications that provide post-deployment configuration and automation tasks on Azure VMs Can be added, updated, disabled or removed any time Managed via portal, Powershell and Management APIs For example, If a virtual machine requires software installation, anti-virus protection, or to run a script inside of it, a VM extension can be used.
Q. 10	**Explain Azure Container Instance**
Ans :	Azure Container Instances Service is meant for running single containers at a time, which also start and stop in seconds. There is no need to have a container orchestrator to run containers in Azure Container Instances Both Linux and Windows-based containers can be run in Azure Container Instances Images from Docker Hub or the Azure Container Registry can be used.

Q. 11	**What is Azure Container Service?**
Ans :	This service is used to run and orchestrate multiple containers that makes up the application. This is similar to hosting applications in a virtual machine. But the main difference between containers and VMs is that containers start and stop in seconds where VMs start and stop in minutes. Containers are much more lightweight than virtual machines as your container service comes with a container orchestrator it is required when we have multiple containers. Container orchestrator takes care of provisioning and deprovisioning containers scaling them up and down and monitoring them.
Q. 12	**Explain Azure Service Fabric in detail**
Ans :	Azure Service Fabric is another way to run the applications. Service Fabric is an orchestrator that replicates your applications over multiple notes to keep it available and performant and to upgrade them seamlessly Any type of application can be run in Azure Service Fabric. Service fabric can be run in Azure, on-premises, on local machine or in another cloud. **Azure Service Fabric** is the technology that Microsoft uses itself to run many of their own Azure services like Azure SQL Databases. Any type of application in Azure Service Fabric. • Can run any stand-alone executable. • Can run reliable services which is a concept within service fabric that allows you to have services that can be stateful. • Can run actor-based applications that can share state • Can even run application in containers within Azure Service Fabric To make sure that services are reliable and available, we need to run service fabric on a minimum of five VMs in a production scenario.
Q. 13	**Explain Azure Cloud Services in detail**
Ans :	Cloud services run the applications in VMs and manages that in the form of web or worker roles It abstracts the VM, so that we don't have to deal with it It also provides the ability to scale the amount of roles and sizes of underlying VMs. Application can be deployed by packaging it, which can be done using Visual Studio template We can remote desktop into the VM and even we can create tasks to install things on the VMs even though cloud services takes care of the VM and operating system. Cloud service was one of the first platform as a services offerings from Azure and takes care of the management of the VMs on behalf of us. You don't have to worry about the operating system or the network, cloud services does that for you. It also provides the ability to scale the amount of roles and sizes of underlying VMs.

	You can deploy web applications or APIs to it to run in web roles that are HTTP-based or you can run background jobs in worker roles or both.
Q. 14	**Explain Azure Web App in detail**
Ans :	The web app is a web server as a service which means that runs the app in an abstraction of a web server like IIS or Tomcat. All sorts of applications in the web app like .NET, Java, PHP, Node.js, Python can be run. The app services platform is special because it provides lots of capabilities like Continuous Deployment, Custom Domains, Deployment Slots, Scaling, Authentication / Authorization, Web Jobs and Hybrid Connection to on-premises resources. The app services platform is special because it provides lots of capabilities out of the box like • Ability to easily continuously deploy from source code. • Use custom domains and deployment slots that let you test your new app before you deploy it into production and lets you deploy to production with almost no downtime. • Automatic and manual scaling and easy authentication and authorization WebJobs and hybrid connections that let you connect to resources on-premises like a database in your own data center. WebJobs are a feature of Azure Apps Services Web Apps, mobile apps and function apps. They allow you to run background tasks. They run as part of your app service, so they take up some of the resources like CPU and memory. Because they are a part of the app service they are dependent on them. If you use a WebJob as a part of a web app, the WebJob will be stopped when the Web app is stopped. WebJobs can run continuously or on a timer like every 10 minutes, or it can be triggered by outside events like when a new message is put on a queue. The WebJobs SDK enables these triggers and makes it easy to consume data from triggers like queues without you needing to write the plumbing to connect to the queue App services web apps are available for 99.95% of the time by default even if you run just one instance of them.
Q. 15	**Explain Azure Mobile App in detail**
Ans :	Azure Mobile App are meant for running a backend for mobile applications We can create backend for Azure Mobile Apps in .NET or Node.js. Mobile applications can easily connect to backends using the Azure App Services Mobile App SDK which is available for almost every mobile platform Mobile apps offer some unique features like offline sync and push notifications that web apps don't have. Offline sync enables the application to lose connection to the backend and continue working and sync its data back whenever it reconnects Push notifications enables to send notifications to mobile devices

	Since mobile apps is part of Azure App Services it also has all of the other features of Azure App Services like deployment slots, scaling, and so on.
Q. 16	**Explain Azure Function App in detail**
Ans :	Azure Function App executes small pieces of code in a faster manner Azure Function App runs one or more Azure Functions continuously or on a scheduled interval, or can be triggered by outside resources like new messages on a queue. Function apps binding makes it easy to get input for the function and outputs it to resource like azure block storage without writing any code. Function Apps are use these to run small pieces of code that execute something small and fast like resizing an image and putting it somewhere every time an image is uploaded to storage. As function apps are part of Azure Apps Services they also share the app services features like deployment slots, continuous deployment, and so on. Function apps can run like web apps where you run them continuously and pay for them the whole month, or you can run them in a consumption mode which is sometimes called serverless. In this mode you only pay for when the function is invoked and functions scale automatically. This works well for functions that run a short time as in consumption mode. They are cut off after five minutes.
Q. 17	**Explain Azure Logic App**
Ans :	Azure Logic apps are used to design and execute a pipeline of tasks in a process It replaces Azure BizTalk Services A logic app can be triggered on a schedule or by outside resources just like function apps and WebJobs. Logic app can be started by calling its endpoint when it is exposed as a WebHook or trigger it by a new message on a queue, or with many other trigger possibilities. After being triggered, the logic app goes on to execute a process by calling connectors, which basically are APIs Logic Apps are used to create business process and workflows visually. It automates EAI, B2B/EDI and business process There are many connectors available out of the box like connectors to Office 365, Twitter, SendGrid, and many more. You can also expose your own APIs or Azure Functions as connectors for the logic app. Just like Azure Function Apps, logic apps can run in consumption mode. Actually, it can only run in consumption mode so you don't have to worry about scaling. Logic apps does that for you.

Lesson 04 : Azure Data Storage

Q. 1	**Explain Azure Data Storage**
Ans :	Database as a Service is a public cloud offering defined by 3 fundamental characteristics. The service provider owns and manages the database software, common administration tasks like backups and high availability, the operating system, hypervisors, and bare metal hardware The service users pay according to their usage of the service. There is no upfront expense or contract lock-in unless the user wants it. Users can scale up or down on demand and also create and destroy environments on demand with no provider intervention.
Q. 2	**Explain Azure Relational Data**
Ans :	• Azure SQL Database : Azure SQL Database is a relational database-as-a service using the Microsoft SQL Server Engine. SQL Database is a high-performance, reliable, and secure database. Data-driven applications and websites can be built in the programming language of choice, without needing to manage infrastructure • Azure Databases for mySQL : Azure Database for MySQL is a relational database service based on the open source MySQL Server engine. It is a fully managed database as a service offering capable of handing mission-critical workload with predictable performance and dynamic scalability. • Azure Databases for PostgreSQL : Azure Database for PostgreSQL is a relational database service based on the open source Postgres database engine. It is a fully managed database as a service offering capable of handling mission-critical workloads with predictable performance, security, high availability, and dynamic scalability
Q. 3	**Explain Azure SQL Database**
Ans :	Azure SQL Database is a relational database service in the cloud based on the market leading Microsoft SQL Server engine, with mission critical capabilities. SQL database delivers predictable performance, scalability with no down time, business continuity and data protection. **Billing model** The service is paid by the hour. The hourly rate is based on the highest service tier selected during that hour. The service tier determines the size, performance, features and recovery characteristics of the database **Database Transaction Unit** A DTU is a unit of measure of the resources that are guaranteed to be available to an Azure SQL database at a specific performance level.

Q. 4 **Explain difference between Azure SQL Database and SQL Server on Azure VMs**

Ans :

Azure SQL Database	SQL Server on Azure VMs
It is optimized for Software as a Service (SaaS) app development	It is optimized for migrating existing SQL Server application
SQL license included in pay as you go price	Either use pay as you go for a SQL Server license or use existing license
No management for underlying operating system and configuration settings	Customized environment with full administrative rights
Near to zero administrative effort	Administration effort will be needed
Total Cost of Application = Highly minimized administration costs + Software Development Costs + SQL Database service cost	Total Cost of Application = Highly minimized software development cost + administration costs + SQL Server and Windows Server licensing costs + Azure Storage costs

Q. 5 **What is Database Transaction Unit (DTU)?**

Ans :

A DTU is a unit of measure of the resources that are guaranteed to be available to an Azure SQL database at a specific performance level.
For a single database, use service tiers to increase or decrease the performance.
Basic: Good for small database that doesn't have multiple concurrent requests. Performance predictability is at hour by hour.
Standard: Ideal for databases that have multiple concurrent requests like web applications. Performance predictability is at minute by minute.
Premium: The Premium service tier provides predictable performance, second over
second, for each Premium database.
Billing model: The service is billed by the hour, based on the service tier of the database.

Q. 6 **Explain Azure SQL Purchasing Model**

Ans :

Azure SQL Database delivers dynamically scalable performance within two different purchasing models

- DTU-based purchasing model
  Basic, Standard and Premium Tiers
- vCore-based purchasing model (preview).
  General Purpose and Business Critical

We can move from a lower tier to a higher one and vice versa at any point in time.
Performance is measured in Database Transaction Units (DTUs).

Q. 7	**Explain Elastic Database Pool**
Ans :	Pools are well suited for a large number of databases with a pattern of low average utilization with relatively infrequent utilization spikes. The more databases you can add to a pool the greater your savings become. Elastic pools are pools of databases where you can allocate performance at pool level and pay for the collective performance rather the individual database. In SQL database, the relative measure of database's ability to handle resource demands is expressed in Database Transaction Units (DTUs) for single databases and elastic DTUs for elastic databases in an elastic pool. A pool is given a set number of eDTUs, for a set price. Within the pool, individual databases are given the flexibility to auto-scale within set parameters. Additional eDTUs can be added to an existing pool without any database downtime. Databases can be added & removed from the pool. Within the pool, management tasks are simplified by running scripts in elastic jobs. An elastic job allows you to execute T-SQL scripts that span multiple databases.
Q. 8	**Explain Azure SQL Database Security**
Ans :	• Connection Security : Firewall rules can be used by both server and database to reject connection attempts from IP addresses that have not been explicitly whitelisted. Also, all connections to Azure SQL Database requires encryption at all times while data is in transit to and from database • Authentication : Supports two types of authentication. SQL authentication, which uses a username and password. Azure Active Directory Authentication which uses identities managed by Azure Active Directory • Authorization : Authorization can be achieved by using Database roles, granular permission, row level security, data masking etc. • Encryption : Data can be protected at rest using Transparent Data Encryption. Even a cell-level encryption can be applied • Auditing : SQL Database Auditing allows you to record events in your database to an audit log in your Azure Storage Account • Firewall Settings : o Pools are well suited for a large number of databases with a pattern of low average utilization with relatively infrequent utilization spikes. o The more databases you can add to a pool the greater your savings become.
Q. 9	**Explain Azure Database advanced security features**

Ans :	Dynamic Data Masking • Can limit access to sensitive data by controlling how data appears • Masking rules can be defined on particular columns Row-level Security • Restrict row-level access based on a user's identity • Access restriction logic is located in database tier Always Encrypted • Encrypt data inside client applications and not reveal encryption keys to Database Engine • Ensure sensitive data never appears as plaintext inside the system • Only systems that have access to keys can access plaintext data • Encryption keys are stored in Azure Key Vault Transparent Data Encryption • Real-time encryption and decryption of database, backups, and transaction log files at rest • Encrypts storage using a symmetric key • Azure SQL Database does not support Azure Key Vault integration with TDE
Q. 10	**Explain Azure Database Scalability**
Ans :	Azure SQL Database is a flexible Platform as a service database that can be easily scaled to fit your needs. Azure SQL Database supports two types of scaling: • Vertical scaling: where you can scale up or down the database by adding more compute power. • Horizontal scaling: where you can add more databases and to shard your data into multiple database nodes.
Q. 11	**What is sharding?**
Ans :	You can add more compute or storage to satisfy your performance requirements without waiting for new hardware or migrating data to more powerful machines. Azure enables you to change performance characteristics of your database on the fly and assign more resources when needed or release the resources when they are not needed in order to decrease the cost. Sharding is technique to distribute large amounts of identically structured data across a number of independent databases. This type of technique is popular with cloud developers creating Software as a Service (SSAS) offerings for end customers or business. • Single tenant sharding pattern For each tenant, a separate database will becreated. Each database will be associated with a specific tenant ID value and it is application responsibility • Multi-tenant sharding pattern In this pattern, rows in the database table are all designed to carry a key identifying the tenant ID or sharding key.

Q. 12	**Explain Geo Replication**
Ans :	Geo-replication is a type of data storage replication in which the same data is stored on servers in multiple distant physical locations Geo-replication typically works in this fashion: data is created or updated in a primary location and then asynchronously replicated to a secondary location so that the same data exists (and is backed up) in both locations. Ideally, these locations remain completely independent of each other, with no need to communicate with one another beyond data transfer. Available in Basic, Standard, and Premium tiers Provides a readable replica database (secondary) in a different region Can replicate to any size within performance tier Estimated Recovery Time (ERT) < 30s with a Recovery Point Objective (RPO) < 1h
Q. 13	**Explain Backups and Recovery in Azure SQL Database**
Ans :	Azure SQL Database offers service managed backups and restores. • Backups happen automatically as part of the service. • Backups are Geo-Replicated • Backup retention depends on service tier. Restores can be done to the logical server hosting the database or to another region. • **Database backups** SQL Database automatically performs a combination of full database backups weekly, differential database backups hourly, and transaction log backups every five minutes to protect your business from data loss. These backups are stored in locally redundant storage for 35 days for databases in the Standard and Premium service tiers and seven days for databases in the Basic service tier. In most cases recovery time of less than 12 hours. • **Active Geo-Replication** This is to configure the database to have up to four readable secondary databases in the regions of your choice. These databases are kept synchronized with the primary database using an asynchronous replication mechanism. You can quickly promote one of these secondary databases into primary in the event of unexpected failure. • **Restore the database** Use the automated backups to recover a copy of data. Once a copy is recovered, either replace the original database with the restored database or copy the needed data from restored data into the original database. If database uses active geo-replication, later is recommended.
Q. 14	**Explain Azure SQL Database features**

Ans :	Predictable performance and pricing Elastic pool for unpredictable workloads 99.99% availability in built-in Geo-replication and restore services Supports existing SQL Server tools, libraries and APIs Scalability with no downtime Secure and compliant for your sensitive data
Q. 15	**Explain SQL Datawarehouse in detail**
Ans :	Azure SQL Data Warehouse is a massively parallel processing (MPP) cloud-based, scale-out, relational database capable of processing massive volumes of data Azure SQL Database is optimized for doing CRUD operations where as Azure SQL Data Warehouse is optimized for performing data analytics tasks. SQL DW has 12 different pricing tiers and uses Data Warehouse Units (DWU) to specify the performance level Massively parallel processing architecture – In this architecture, requests are received by the control node, optimized and passed on to the compute nodes to do work in parallel. SQL data warehouse stores the data in Premium locally redundant storage, and linked to compute nodes for query extraction. Azure SQL Database is optimized for doing CRUD operations (Create, Read, Update and Delete) that you typically perform from an application. This is also called OLTP (Online Transaction Processing). This is reflected by the functionality that it offers, which is typically used when you are building applications. Azure SQL Database also scales for OLTP, as different pricing tiers typically scale to give you more query throughput and not so much data (the current maximum is 1TB, and in some regions 4TB). Azure SQL Data Warehouse is optimized for performing data analytics tasks, and working with large amounts of data. This is also called OLAP (Online Analytical Processing). Data Warehouse is optimized for OLAP because it is built on top of the MPP (Massive Parallel Processing) architecture, and because it can hold massive amounts of data (currently the maximum is around 1PB) – much more than Azure SQL Database can store in one instance.
Q. 16	**How SQL Server Stretch Database works?**
Ans :	Stretch Database migrates your cold data transparently and securely to the Microsoft Azure Cloud. Enable Stretch Database for a SQL server instance at a database or table level. Once enabled, Stretch database will start migrating the cold data into the cloud • If you store cold data into a separate table then you can migrate entire table • If your table contains both hot and cold data, you can specify a filter function to select rows to migrate.

	Existing queries will not be impacted because SQL server provides seamless access to both onsite and cloud data. If query includes cold data, you might experience latency because of remote data retrieval. You can pause data migration at any point of time to troubleshoot problems. Stretch Database are best suited for transaction databases with large amounts of cold data typically stored in small tables
Q. 17	**Explain features of Azure Database for MySQL**
Ans :	MySQL in the Cloud Relational Database Managed and Scalable Highly available (99.99%) and redundant Works well with LAMP Stack • Linux, Apache, MySQL and PHP Use it with tools for MySQL • MySQL Workbench and SQLyog
Q. 18	**Explain features of Azure Database for PostgreSQL**
Ans :	PostgreSQL in the Cloud Relational Database Managed and Scalable Highly available (99.99%) and redundant Write functions in several languages • Use PostgreSQL extensions Use it with tools for PostgreSQL
Q. 19	**What is NoSQL? Explain features of NoSQL.**
Ans :	Modern application produces huge volumes of data which is un-structured, semi-structured and un-predictable RDBMS is designed to maintain structured data up to certain limit NoSQL is a Non-relational database management system. NoSQL stands for Not Only SQL Features of NoSQL • Stores large volumes of structured-semi-structured and unstructured data • High performance, high scalability and high availability • Quick iteration • Object-oriented programming approach that is easy to use and flexible • Dynamic schemas • Replication and auto sharding **Distributed** Replicas ensure high throughput/availability, and low latency **Scale-out** Horizontal partitioning enables virtually limitless storage and throughput

	Schema-free Supports Document, table, graph, and columnar data models
Q. 20	**Name different NoSQL Databases**
Ans :	• Key-Value Stores : Redis, Dynamo, Riak • Column-Oriented : BigTable, Cassandra, SimpleDB, HBase • Graph : OrientDB, Neo4j, Titan • Document-Oriented : MongoDB, CouchDB, CosmosDB
Q. 21	**Explain Cosmos DB**
Ans :	• Evolution of DocumentDB Scalable NoSQL document database Low latency (single-digit millisecond) • Multi-model / Multi-API No longer exclusively a document database Also supports tables, graph, and columnar • Virtually unlimited scale Scale storage with server-side partitioning Scale throughput with variable request units • Turnkey global distribution Point-and-click control over where your data gets geo-replicated
Q. 22	**Explain Cosmos DB Emulator**
Ans :	Emulate Cosmos DB in a local development environment • Supports identical functionality as Azure Cosmos DB in the cloud No need for: • Azure subscription • Cosmos DB account • Internet connection Develop and test locally • Incur no costs • Deploy to the cloud when ready
Q. 23	**Explain Azure Storage**
Ans :	A basic building block in any application is data storage. Azure Storage provides multiple options for storing data, like files or rows of data. Azure Storage provides storage for data objects that is highly available, secure, durable, massively scalable, and redundant. All access to data objects in Azure Storage happens through a storage account.

Q. 24	**Explain Azure Storage Account**
Ans :	An Azure Storage account provides a unique namespace in the cloud to store and access your data objects in Azure Storage A storage account contains any blobs, files, queues, tables, and disks that you create under that account, which can be accessed through the endpoint created for the storage account. Configurations like geographic regions, data encryption and authentication can be carried out here. Storage Account name should be unique across all existing storage account names in azure Replication Options • Locally Redundant Storage (LRS) : 3 copies within single data center for Premium Storage • Zone Redundant Storage (ZRS) : 3 copies across 2-3 data centers. Block blobs only; available only during SA creation • Geo Redundant Storage (GRS) : 3 copies in primary region and 3 copies in secondary region • Read-Access Geo- Redundant Storage (RAGRS) : RO access to secondary region data
Q. 25	**Explain Azure Storage Benefits**
Ans :	• Scalable We can store and process huge amount of data which supports Bigdata scenarios • Elastic It supports applications which targets large audience and scale those applications as needed • Accessible It is accessible anywhere in the world and also for any type of application like web, desktop, mobile devices which run in the Cloud / On-Premises • Supports Multiple clients It supports different OS and Programming languages. • Premium Storage Delivers high performance, low latency disk support for I/O intensive workload • Auto partitioning System Automatically load balance the data based on traffic, it will automatically allocates the resource to meet the demand of requests
Q. 26	**Explain Azure Storage Account**
Ans :	• General Purpose Storage Account : Gives the access to Azure Storage services such as Tables, Queues, Files, Blobs and Azure virtual machine disks under a single account.

	• Blob Storage Accounts: It is a specialized storage account for storing unstructured data as blobs (objects) in Azure Storage. For applications requiring only block or append blob storage, Microsoft recommend using Blob storage accounts • Standard Tier: A standard storage performance tier which allows you to store Tables, Queues, Files, Blobs and Azure virtual machine disks. • Premium Tier: A premium storage performance tier which currently only supports Azure virtual machine disks. • Locally-redundant: Data replicated 3 times within the storage unit which is hosted in a data center where the account is located. • Geo-Redundant: Data gets replicates into secondary region and updates in both primary and secondary region and reads from secondary region if failover happens. • Read-access geo-redundant: Same as Geo-Redundant but provides read only access to the data in secondary location
Q. 27	**Explain Azure Storage Types**
Ans :	Every object that you store in Azure Storage has a unique URL address. The storage account name forms the subdomain of that address. The combination of subdomain and domain name, which is specific to each service, forms an endpoint for your storage account. For example, if your storage account is named mystorageaccount, then the default endpoints for your storage account are: • Blob service: http://mystorageaccount.blob.core.windows.net • Table service: http://mystorageaccount.table.core.windows.net • Queue service: http://mystorageaccount.queue.core.windows.net • File service: http://mystorageaccount.file.core.windows.net Note : A Blob storage account only exposes the Blob service endpoint and it can map custom domain to the service endpoints
Q. 28	**Explain Azure Blob Storage**
Ans :	Azure Blob(Binary Large Objects) storage can be used for storing large amounts of unstructured data such as documents, images, videos etc. Every blob is placed in a container Security policies can be assigned to containers which will be cascaded to all objects under that container Storage account can contain unlimited number of containers and each container can contain unlimited number of blobs up to the storage account size limit of 500 TB
Q. 29	**Explain naming conventions for container**
Ans :	A container name must be a valid DNS name, conforming to the following naming rules:

	• Container names must start with a letter or number, and can contain only letters, numbers, and the dash (-) character. • Every dash (-) character must be immediately preceded and followed by a letter or number; consecutive dashes are not permitted in container names. • All letters in a container name must be lowercase. • Container names must be from 3 through 63 characters long.
Q. 30	**Explain Blob naming conventions**
Ans :	A blob name must conforming to the following naming rules: • A blob name can contain any combination of characters. • A blob name must be at least one character long and cannot be more than 1,024 characters long. • Blob names are case-sensitive. • Reserved URL characters must be properly escaped. • The number of path segments comprising the blob name cannot exceed 254. A path segment is the string between consecutive delimiter characters (e.g., the forward slash '/') that corresponds to the name of a virtual directory.
Q. 31	**Explain Azure Blob Types in detail**
Ans :	Blob storage offers three types of blobs • Block blobs : o Documents, media files and back up can be stored. Optimized for streaming and storing o Block Blobs are comprised of a series of blocks o Blocks can be uploaded in parallel sets to speed up the ingress of a large file. o MD5 hash can be used to verify that each block is uploaded successfully and retry failed blocks. o Progress of block upload can be tracked. o While uploading, the blob is considered uncommitted. o Block Blobs can be no larger than 200 GB. o Note: Choice of blob type will affect the performance and scalability of your solution • Append blobs : Similar to block blobs but optimized for append operations. For instance storing logs • Page blobs : o Optimized for representing IaaS disks and supports random writes o Page Blobs are a collection of 512-byte pages o Optimized for Random Access and Frequent Updates o Used as persistent disks for VMs in Azure. o Highly performant, durable and reliable o Can grow and shrink in size by adding or removing pages o Modifications of a page blob can overwrite one or more pages. o Changes are in-place and immediately committed.

	○ A page blob can be no larger than 1 TB. ○ A Virtual Machine network attached IaaS disk is a VHD(Virtual Hard Disk) stored as a page blob Blob storage account supports only block and append blobs.
Q. 32	**Explain Blob Storage – Access Tiers**
Ans :	Blob storage accounts expose the Access Tier attribute which can be specified during account creation and modified later as needed. • Hot access tier which indicates that the objects in the storage account will be more frequently accessed. This allows you to store data at a lower access cost. • Cool access tier which indicates that the objects in the storage account will be less frequently accessed. This allows you to store data at a lower data storage cost. If there is a change in the usage pattern of your data, you can also switch between these access tiers at any time. Changing the access tier may result in additional charges.
Q. 33	**Explain Azure File Storage**
Ans :	Azure File Storage provides fully managed file shares in the cloud using SMB(Server Message Block) 3.0 protocol in a secured and reliable manner Applications running in Azure VMs or cloud services can mount a file storage share to access file data File share data can be accessed via Azure Portal, File Explorer, CLI and REST APIs Helps legacy applications that rely on file share can be migrated on Azure with no code changes. A file storage share is SMB file share in Azure. All directories and files must be created in parent share. 5TB upper limit on file share URL Format : https://<storageaccount>.file.core.windows.net/<share>/<directory>/<file>
Q. 34	**Explain Azure Table Storage**
Ans :	Table storage is a service that stores structures NoSQL data in the cloud. It is a key/attribute store with schema less design. It is much faster & cheaper compared to traditional SQL Databases Table storage is best suited to store flexible datasets such as user data, address data, device information etc. Table is a collection of entities. Table don't enforce a schema on entities which means a single table can contain entities with different properties Entity is a set of properties similar to database row. It can be up to 1 MB of size.

	Properties is a name-value pair. Each entity can be up to 252 properties URL Format : http://<storageaccount>.table.core.windows.net/<table>
Q. 35	**Explain Azure Table Properties**
Ans :	• Partiotion Key Unique identifier for the partition with a given table Forms the first part of an entity's primary key Must be included in every insert, update and delete operation • RowKey Unique identifier for an entity within a given partition Must be included in every insert, update and delete operation • Timestamp DateTime value maintained on the server side, to record the time an entity last modified
Q. 36	**Explain Azure Queue**
Ans :	Azure Queue storage is a service for storing large number of messages in the cloud that can be accessed from anywhere in the world using HTTP and HTTPS. A queue contains set of messages. Queue name must be in lowercase A single queue message can be up to 64KB in size. A message can remain in the queue for maximum time of 7 days. URL Format : http://<storageaccount>.queue.core.windows.net/<queue> Note When message retrieved from the queue, it stays invisible for 30 seconds. Message need to deleted explicitly from the queue to avoid getting picked up by another application
Q. 37	**Explain Azure Redis Cache in detail**
Ans :	Azure Redis Cache is a distributed, managed cache that helps you build highly scalable and responsive applications by providing super-fast access to your data. Azure Redis Cache gives access to secure, dedicated Redis cache, managed by Microsoft. A cache created using Azure Redis Cache is accessible from any application within Microsoft Azure Microsoft Azure Redis Cache is available in the following tiers: Basic : Single node. Multiple sizes up to 53 GB. Standard: Two-node Primary/Replica. Multiple sizes up to 53 GB. 99.9% SLA. Premium: Two-node Primary/Replica with up to 10 shards. Multiple sizes from 6 GB to 530 GB A cache end point will look like this <cachename>.redis.cache.windows.net

Q. 38	**Explain Azure Data Factory**
Ans :	Data factory is a cloud based data integration service that orchestrates and automates the movement and transformation of date. This service can ingest data from various data stores, transform/process the data, and publish the result data to data stores. Using Azure Data factory, we can • Ingest the data from different data sources • Prepare the data • Transform & Analyze • Publish the data for consumption

Lesson 05 : Azure Networking

Q. 1	**Explain Azure Virtual Network**
Ans :	Azure Virtual Network(VNet) is a private network in the cloud. Azure 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. It is a logical isolation of Azure cloud dedicated for your subscription.
Q. 2	**What are the capabilities of Azure Virtual Network?**
Ans :	Internet connectivity Connect Azure resources Connect virtual networks Network isolation and segmentation Connect on-premise network Filter and route network traffic
Q. 3	**What is subnet?**
Ans :	A subnet (short for "subnetwork") is an identifiably separate part of an organization's network. It is a range of IP Addresses in the VNet. VNet can be divided into multiple subnets Resources & services deployed to the subnets (same or different) in the same Vnet can communicate with each other without any extra configuration A subnetwork or subnet is a logical subdivision of an IP network. The practice of dividing a network into two or more networks is called subnetting. For example, 255.255.255.0 is the subnet mask for the 192.168.1.0/24 prefix.
Q. 4	**What is Network Security Groups (NSG)?**
Ans :	A 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) When an NSG is associated to a subnet, the rules apply to all resources connected to the subnet
Q. 5	**Explain NSG Rules.**
Ans :	Inbound rule protects the network against incoming traffic from the internet or other network segments Outbound rule protects against outgoing traffic originating inside the network
Q. 6	**Explain IP Address Types**
Ans :	• Public IP Address

	Used for communication with internet, which includes Azure public-facing services In Azure resource manager, a public IP address is a resource that has its own properties. Public IP Address can be associated with Virtual Machines, Internet-facing Load balancers, VPN Gateways and Application Gateways There are two methods in which an IP address is allocated to a *public* IP resource • **Dynamic***:* It is the default allocation in which IP address will be allocated when the associated virtual machine is started. IP Address will get changed when VM is stopped and restarted • **Static** : To ensure the IP address for the associated resource remains the same, the allocation method need to be explicitly set to *static* • Private IP Address Used for communication within Azure VNet and on-premises network when VPN gateway or Express route circuit to extend network to Azure Private IP addresses allows Azure resources to communicate with other resources in a virtual network or an on-premises network through a VPN gateway or ExpressRoute circuit, without using an Internet-reachable IP address Private IP Address can be associated with Virtual Machines, Internal Load balancers and Application Gateways
Q. 7	**Explain host name resolution**
Ans :	• DNS hostname resolution DNS domain name label can be specified for a public IP resource, which creates a mapping for domainnamelabel.location.cloudapp.azure.com to the public IP address in the Azure-managed DNS servers • Internal DNS hostname resolution (for VMs) All azure VMs are configured with Azure-managed DNS servers by default, unless it is explicitly configured with custom DNS servers. These DNS servers provide internal name resolution for VMs that reside within the same VNet
Q. 8	**Explain Load Balancer**
Ans :	Load Balancer is used to distribute the traffic evenly among the resources. There are 2 types of Load Balancers • External Load Balancers(Internet Load Balancers) It receives traffic from internet and sits outside the Virtual network • Internal Load Balancers It sits inside the virtual network and wont get the traffic from internet.

Q. 9	**Explain features of Load Balancer**
Ans :	Traffic distribution Port forwarding Automatic reconfiguration Service monitoring
Q. 10	**Explain Load Balancer Resource**
Ans :	• Front-end IP configuration A Load balancer can include one or more front end IP addresses, otherwise known as a virtual IPs (VIPs). These IP addresses serve as ingress for the traffic. • Back-end address pool These are IP addresses (DIPs) associated with the virtual machine Network Interface Card (NIC) to which load will be distributed. • Load balancing rules A rule property maps a given front end IP and port combination to a set of back end IP addresses and port combination. A single load balancer can have multiple load balancing rules. Each rule is a combination of a front-end IP and port and back-end IP and port associated with VMs. • Inbound NAT rules NAT rules defining the inbound traffic flowing through the front end IP and distributed to the back end IP. • Probes probes enable you to keep track of the health of VM instances. If a health probe fails, the VM instance will be taken out of rotation automatically.
Q. 11	**What is Load Balancer Probes?**
Ans :	Azure Load Balancer can probe the health of the various server instances. When a probe fails to respond, the load balancer stops sending new connections to the unhealthy instances. Load balancers supports three types of probes Guest Agent Probe, Http Custom Probe & TCP Custom Probe
Q. 12	**Explain Azure Available Sets**
Ans :	Azure Availability sets ensures that if a hardware or software failure within Azure happens, only a subset of your VMs are impacted and that your overall solution remains available and operational To provide redundancy to the application, it is recommended to add two or more similarly configured virtual machines in an availability set. This configuration will meet the SLA of 99.95% Azure SLA Combine the Azure load balancer with an availability set to get the most application resiliency Each virtual machine is assigned an update domain and a fault domain by Azure.

	• Update domains define the group of virtual machines that can be rebooted at the same time • Fault domain define the group of virtual machines that share a common power source and network switch. For example, when you add two virtual machines into a availability set, Azure automatically assigns different fault & update domain to each virtual machine.
Q. 13	**Explain Azure Application Gateway**
Ans :	Azure Application Gateway is a web traffic load balancer that enables us to manage traffic to web applications. Traditional load balancers operate at the transport layer and route traffic based on source IP address and port, to a destination IP address and port. But with the Application Gateway you can be even more specific. For example, you can route traffic based on the incoming URL This type of routing is known as application layer (OSI layer 7) load balancing If /images is in the incoming URL, we can route traffic to a specific set of servers (known as a pool) configured for images. If /video is in the URL, that traffic is routed to another pool optimized for videos.
Q. 14	**Explain Traffic Manager**
Ans :	Microsoft Azure Traffic Manager allows us to control the distribution of user traffic for service endpoints in different datacenters. Service endpoints supported by Traffic Manager include Azure VMs, Web Apps, and cloud services. Traffic Manager can be used with external, non-Azure endpoints also.
Q. 15	**Explain Traffic Manager Benefits**
Ans :	• Improve availability of critical applications : Traffic Manager delivers high availability for your applications by monitoring your endpoints and providing automatic failover when an endpoint goes down. • Improve responsiveness for high-performance applications : Azure allows you to run cloud services or websites in datacenters located around the world. Traffic Manager improves application responsiveness by directing traffic to the endpoint with the lowest network latency for the client. • Perform service maintenance without downtime : You can perform planned maintenance operations on your applications without downtime. Traffic Manager directs traffic to alternative endpoints while the maintenance is in progress. • Combine on-premises and Cloud-based applications : Traffic Manager supports external, non-Azure endpoints enabling it to be used with hybrid cloud and on-premises deployments, including the "burst-to-cloud," "migrate-to-cloud," and "failover-to-cloud" scenarios.

	• Distribute traffic for large, complex deployments : Using nested Traffic Manager profiles, traffic-routing methods can be combined to create sophisticated and flexible rules to support the needs of larger, more complex deployments.
Q. 16	**Explain Azure VPN Gateway**
Ans :	A VPN gateway is a specific type of virtual network gateway that is used to send encrypted traffic between an Azure virtual network and an on-premises location over the public Internet. Gateways can be of two types: • VPN: Network traffic is sent encrypted over internet • Express: Network traffic is sent on a dedicated private connection Express Route enables to connect Azure with on-premises network over a dedicated private connection facilitated by connectivity provider. They do not go over public internet. You can establish the same in three different ways. Co-located at a cloud exchange: If you are co-located in a facility with cloud exchange, you can order virtual cross-connections to the Microsoft cloud through the co-location provider's Ethernet exchange. It can offer layer 2 cross connections or managed layer 3 cross connections. Point to Point Ethernet connections: You can connect your on-premises datacenters/offices to the Microsoft cloud through point-to-point Ethernet links. It can offer layer 2 cross-connections or managed layer 3 cross connections. Any to any networks: You can integrate your WAN with the Microsoft cloud. WAN providers typically offer managed Layer 3 connectivity. Once connected to one region it will provide access to all regions within the geopolitical region. Use ExpressRoute premium add-on to extend the connectivity across geopolitical boundaries.

Lesson 06 : Azure Service Bus

Q. 1	**What is Service Bus?**
Ans :	Scalable Messaging Fabric that allows to create Namespace(URI) Azure Service Bus is a multi-tenant cloud messaging service used to send information between applications and services. The asynchronous operations gives flexible, brokered messaging, along with structured first-in, first-out (FIFO) messaging, and publish/subscribe capabilities.