What is Azure?

Azure is Microsoft's cloud platform, just like Google has its Google Cloud and Amazon has its Amazon Web Service or AWS.000. Generally, it is a platform through which we can use Microsoft's resources. For example, to set up a huge server, we will require huge investment, effort, physical space, and so on. In such situations, Microsoft Azure comes to our rescue. It will provide us with virtual machines, fast processing of data, analytical and monitoring tools, and so on to make our work simpler. The pricing of Azure is also simpler and more cost-effective. Popularly termed as *"Pay As You Go"*, which means how much you use, pay only for that.

How does Microsoft Azure Work?

It is a private and public cloud platform that helps developers and IT professionals build deploy and manage applications. It uses the technology known as virtualization. Virtualization separates the tight coupling between the hardware and the operating system using an abstraction layer called a hypervisor. Hypervisor emulates all the functions of a computer in a virtual machine, it can run multiple virtual machines at the same time and each virtual machine can run any operating system, such as Windows or Linux.

Azure takes this virtualization technique and repeats it on a massive scale in the data center owned by Microsoft. Each data center has many racks filled with servers and each server includes a hypervisor to run multiple virtual machines. The network switch provides connectivity to all those servers.

Types of Azure Services

Microsoft Azure is a cloud computing platform which offers the following types of services:

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)

Infrastructure as a service (IaaS)

Virtual machines, storage, and networking will come under the category of infrastructure as a service but the users have to do manually the build and deploy of the applications. Azure will support a wide range of operating systems because of its Hyper-hypervisor.

Platform as a service (PaaS)

Azure app service, Azure functions, and logic apps are some services that are offered by Azure under the platform as a service. This service will provide autoscaling and load balancing and also there will be a pre-configured environment for the application.

Software as a service (SaaS)

Office 365, Dynamics 365, and Azure Active Directory are some of the services provided by Microsoft Azure under Software as a Service (SaaS) the complete application will be managed by the Microsoft azure including deploying, scaling and load balancing.

What is Microsoft Azure Used For?

Following are the some the use cases that Microsoft Azure Used.

- **Deployment Of applications:** You can develop and deploy the application in the azure cloud by using the service called Azure App Service and Azure Functions after deploying the applications end users can access it.

- **Identity and Access Management:** The application and data which is deployed and stored in the Microsoft Azure can be secured with the help of Identity and Access Management. It's commonly used for single sign-on, multi-factor authentication, and identity governance.
- **Data Storage and Databases:** You can store the data in Microsoft azure in service like blob storage for unstructured data, table storage for NoSQL data, file storage, and Azure SQL Database for relational databases. The service can be scaled depending on the amount of data we are getting.
- **DevOps and Continuous Integration/Continuous Deployment (CI/CD):** Azure DevOps will provide some tools like including version control, build automation, release management, and application monitoring.
- **Azure Site Recovery:** Your on-premises virtual machines (VMs) can be replicated to Azure more easily with the help of this solution. You may easily failover your virtual machines (VMs) to Azure in the event of a disaster and keep your business running. Azure VM replication to an alternative Azure region is also supported by Azure Site Recovery.
- **Azure Backup:** If you want to protect the data which is present in the cloud then you need to use the Azure Backup service. It offers a single area to monitor backup jobs, manage backup policies, and recover data. Azure pricing and costs.

What are the various Azure Services and How does Azure Work?

Following are some of the services Microsoft Azure offers:

- **Compute:** Includes Virtual Machines, Virtual Machine Scale Sets, Functions for serverless computing, Batch for containerized batch workloads, Service Fabric for microservices and container orchestration, and Cloud Services for building cloud-based apps and APIs.
- **Networking:** With Azure, you can use a variety of networking tools, like the Virtual Network, which can connect to on-premise data centers; Load Balancer; Application Gateway; VPN Gateway; Azure DNS for domain hosting, Content Delivery Network, Traffic Manager, ExpressRoute dedicated private network fiber connections; and Network Watcher monitoring and diagnostics
- **Storage:** Includes Blob, Queue, File, and Disk Storage, as well as a Data Lake Store, Backup, and Site Recovery, among others.
- **Web + Mobile:** Creating Web + Mobile applications is very easy as it includes several services for building and deploying applications.
- **Containers:** Azure has a property that includes Container Service, which supports Kubernetes, DC/OS or Docker Swarm, and Container Registry, as well as tools for microservices.
- **Databases:** Azure also included several SQL-based databases and related tools.
- **Data + Analytics:** Azure has some big data tools like HDInsight for Hadoop Spark, R Server, HBase, and Storm clusters
- **AI + Cognitive Services:** With Azure developing applications with artificial intelligence capabilities, like the Computer Vision API, Face API, Bing Web Search, Video Indexer, and Language Understanding Intelligent.
- **Internet of Things:** Includes IoT Hub and IoT Edge services that can be combined with a variety of machine learning, analytics, and communications services.

- **Security + Identity:** Includes Security Center, Azure Active Directory, Key Vault, and Multi-Factor Authentication Services.
- **Developer Tools:** Includes cloud development services like Visual Studio Team Services, Azure DevTest Labs, HockeyApp mobile app deployment and monitoring, Xamarin cross-platform mobile development, and more.

Features of Azure

Azure offers a comprehensive array of features designed to enhance data protection and application management:

- **Data Protection:** Azure ensures the security of your data through various methods, including replication, snapshots, and encryption. These options allow for data protection across multiple regions globally, providing an added layer of security against natural disasters, cyberattacks, or hardware failures. By storing data in various data centers worldwide, Azure guarantees that your information remains safe, even if one location experiences an incident.
- **Azure Site Recovery:** This feature gives you full control over data replication processes, allowing you to define the level of detail and metrics to monitor. You can customize the replication schedule based on your business requirements, ensuring your data remains secure and accessible.
- **Development Flexibility:** Azure supports a wide range of capabilities for building, deploying, and managing applications that can run on any device at any time. Users can choose their preferred programming languages and frameworks, enabling horizontal scaling by adding servers or distributing the load across multiple servers.
- **Open-Source Tools:** Azure provides numerous tools and services rooted in open-source technology, facilitating monitoring, logging, and troubleshooting. These resources enable you to keep track of your application's health and address any issues that may arise.
- **App Services and Mobile Management:** Azure offers hosting through App Services, allowing you to quickly deploy updates and new features to your applications without downtime. It also supports mobile device management (MDM) for apps tailored to mobile users.
- **Active Directory Integration:** Azure Active Directory (AAD) enhances security by connecting user profiles with applications, enabling seamless sign-in experiences. Through Active Directory synchronization, user accounts, groups, and permissions are automatically managed between on-premises Active Directory and Azure Active Directory, streamlining user management and policy enforcement within your organization.