

Microsoft Azure Tutorial



**Microsoft
Azure**

Microsoft Azure is a cloud computing platform that provides a wide variety of services that we can use without purchasing and arranging our hardware. It enables the fast development of solutions and provides the resources to complete tasks that may not be achievable in an on-premises environment. Azure Services like compute, storage, network, and application services allow us to put our effort into building great solutions without worrying about the assembly of physical infrastructure.

What is Azure

Microsoft Azure is a growing set of cloud computing services created by Microsoft that hosts your existing applications, streamline the development of a new application, and also enhances our on-premises applications. It helps the organizations in building, testing, deploying, and managing applications and services through Microsoft-managed data centers.

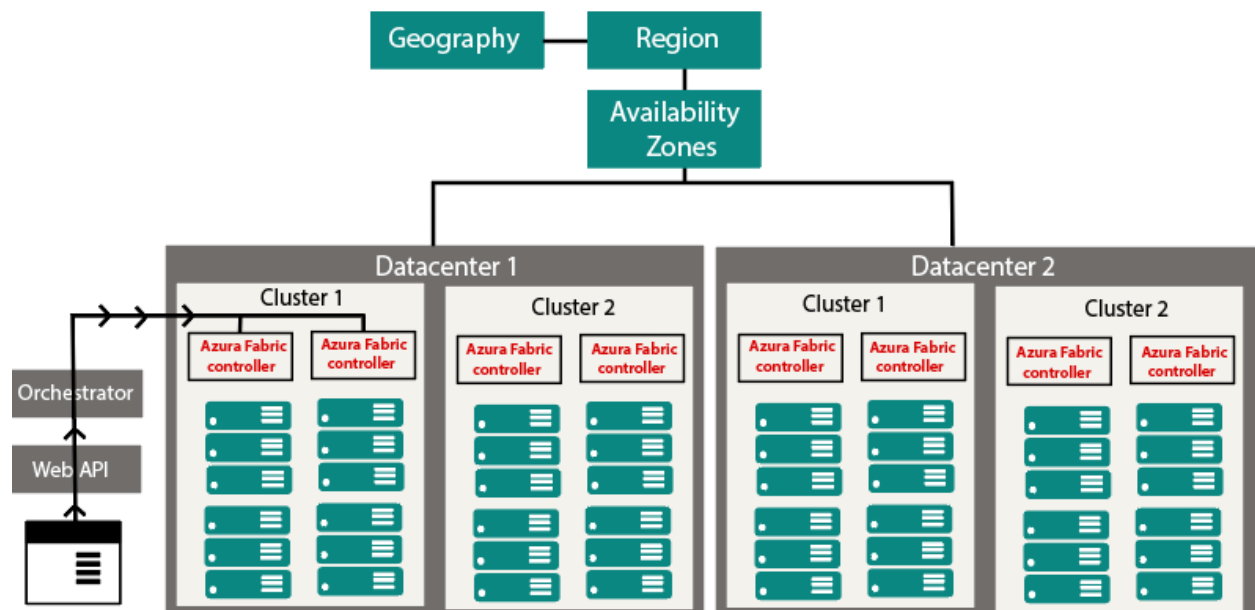
Azure Services

- **Compute services:** It includes the Microsoft Azure Cloud Services, Azure Virtual Machines, Azure Website, and Azure Mobile Services, which processes the data on the cloud with the help of powerful processors.
- **Data services:** This service is used to store data over the cloud that can be scaled according to the requirements. It includes Microsoft Azure Storage (Blob, Queue Table, and Azure File services), Azure SQL Database, and the Redis Cache.

- **Application services:** It includes services, which help us to build and operate our application, like the Azure Active Directory, Service Bus for connecting distributed systems, HDInsight for processing big data, the Azure Scheduler, and the Azure Media Services.
- **Network services:** It helps you to connect with the cloud and on-premises infrastructure, which includes Virtual Networks, Azure Content Delivery Network, and the Azure Traffic Manager.

How Azure works

It is essential to understand the internal workings of Azure so that we can design our applications on Azure effectively with high availability, data residency, resilience, etc.



Microsoft Azure is completely based on the concept of virtualization. So, similar to other virtualized data center, it also contains *racks*. Each rack has a separate power unit and network switch, and also each rack is integrated with a software called *Fabric-Controller*. This *Fabric-controller* is a distributed application, which is responsible for managing and monitoring servers within the rack. In case of any server failure, the Fabric-controller recognizes it and recovers it. And Each of these Fabric-Controller is, in turn, connected to a piece of software called *Orchestrator*. This *Orchestrator* includes web-services, Rest API to create, update, and delete resources.

When a request is made by the user either using PowerShell or Azure portal. First, it will go to the Orchestrator, where it will fundamentally do three things:

1. Authenticate the User
2. It will Authorize the user, i.e., it will check whether the user is allowed to do the requested task.
3. It will look into the database for the availability of space based on the resources and pass the request to an appropriate Azure Fabric controller to execute the request.

Combinations of racks form a cluster. We have multiple clusters within a data center, and we can have multiple Data Centers within an Availability zone, multiple Availability zones within a Region, and multiple Regions within a Geography.

- **Geographies:** It is a discrete market, typically contains two or more regions, that preserves data residency and compliance boundaries.
- **Azure regions:** A region is a collection of data centers deployed within a defined perimeter and interconnected through a dedicated regional low-latency network.

Azure covers more global regions than any other cloud provider, which offers the scalability needed to bring applications and users closer around the world. It is globally available in 50 regions around the world. Due to its availability over many regions, it helps in preserving data residency and offers comprehensive compliance and flexible options to the customers.



- **Availability Zones:** These are the physically separated location within an Azure region. Each one of them is made up of one or more data centers, independent configuration.

Azure Pricing

It is one of the main reasons to learn Microsoft Azure. Because Microsoft is providing free Credits in the Azure account to access Azure services for free for a short duration. This credit is sufficient for people who are new at Microsoft Azure and want to use the services.

Microsoft offers the **pay-as-you-go** approach that helps organizations to serve their needs. Typically the cloud services will be charged based on the usage. The flexible pricing option helps in up-scaling and down-scaling the architecture as per our requirements.