

# 1. Objective:

- ✓ Explore Azure Global Infrastructure such as Geographies, Azure Regions, Availability Zones, Data centers.

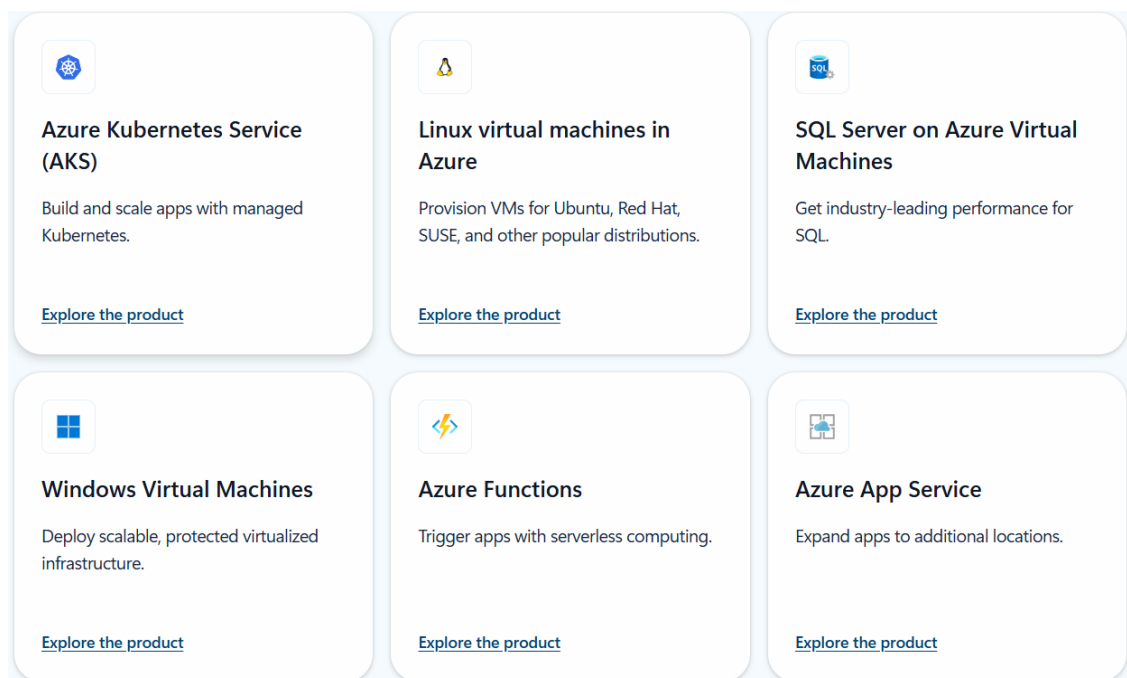
## 2. Introduction

**Microsoft Azure**, or just **Azure** is the cloud computing platform developed by Microsoft.


It has management, access and development of applications and services to individuals, companies, and governments through its global infrastructure. It also provides capabilities that are usually not included within other cloud platforms, including Software as a Service (SaaS), Platform as a Service (PaaS), and infrastructure as a Service (IaaS).

## 3. Services of Azure

- ✓ Compute Services




## ✓ Containers



### Azure Kubernetes Service (AKS)

Build and scale apps with managed Kubernetes.


[Explore the product](#)



### Azure App Service

Quickly create powerful cloud apps for web and mobile.


[Explore the product](#)



### Azure Functions

Trigger apps with serverless computing.


[Explore the product](#)



### Azure Kubernetes Fleet Manager

Seamlessly manage Kubernetes clusters at scale.


[Explore the product](#)



### Azure Container Instances

Run containers without managing servers.


[Explore the product](#)



### Azure Red Hat OpenShift

Build, deploy, and scale apps on fully managed OpenShift clusters.

[Explore the product](#)



### Azure Spring Apps

Build or migrate Spring applications with a fully managed service.

[Explore the product](#)

## ✓ Databases

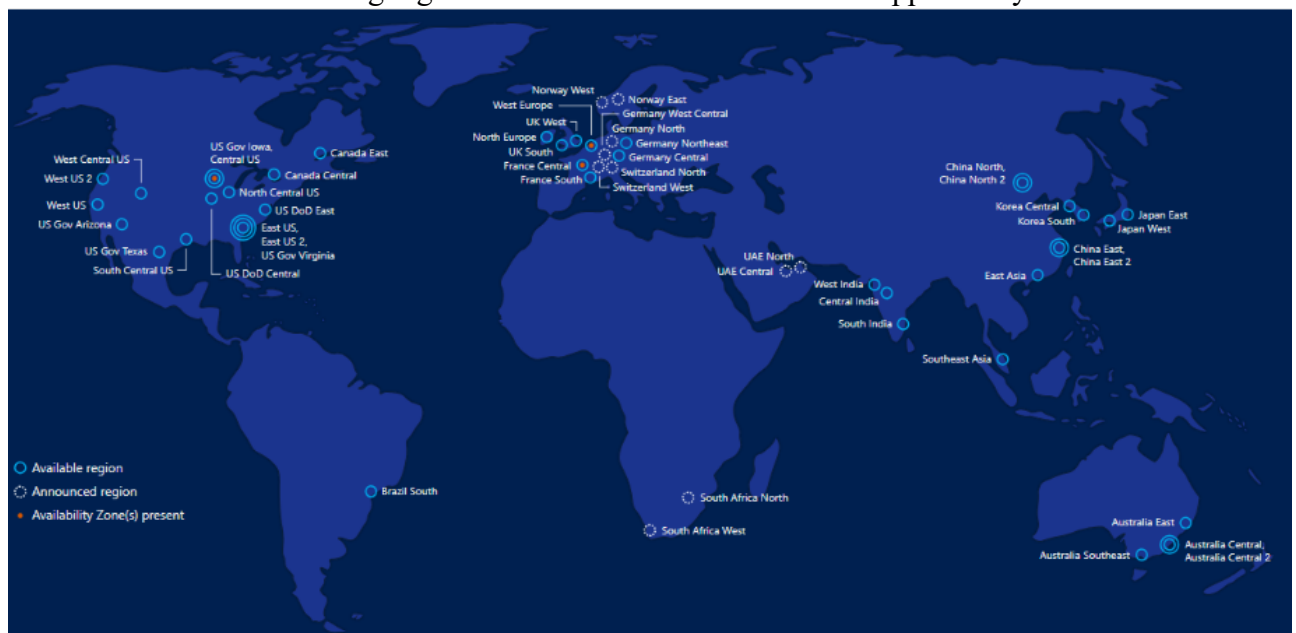
<a href="#">Azure Cosmos DB</a>	<b>Fast, distributed NoSQL and relational database at any scale</b> Develop high-performance applications of any size or scale with a fully managed and serverless distributed database supporting open-source PostgreSQL, MongoDB, and Apache Cassandra as well as Java, NodeJS, Python, and .NET.	<b>Best for</b> <ul style="list-style-type: none"><li>• Delivering real-time personalization</li><li>• High-quality, global app experiences at scale</li><li>• Handling peak sales periods with ease</li><li>• Leveraging real-time, IoT telemetry streaming data</li></ul>
<a href="#">Azure SQL Database</a>	<b>Flexible, fast, and elastic SQL database for your new apps</b> Build apps that scale with a fully managed and intelligent SQL database built for the cloud. Grow your applications with near-limitless storage capacity and responsive serverless compute, backed by AI-based advanced security.	<b>Best for</b> <ul style="list-style-type: none"><li>• High-performance transactional applications</li><li>• Finance, sales order management, systems of record</li><li>• Processing streaming data to uncover app insights</li><li>• Simplifying complex data landscapes</li></ul>
<a href="#">Azure Database for PostgreSQL</a>	<b>Fully managed, intelligent, and scalable PostgreSQL database</b> Innovate faster with a fully managed PostgreSQL database service for open-source developers building scalable and secure enterprise-ready apps.	<b>Best for</b> <ul style="list-style-type: none"><li>• Open-source, enterprise app development</li><li>• Rich and personalized digital marketing experiences</li><li>• Secure and scalable e-commerce solutions</li><li>• Finance management apps</li><li>• Scalable web and mobile apps</li></ul>
<a href="#">Azure Database for MySQL</a>	<b>Scalable, open-source MySQL database</b> Develop apps with a fully managed community MySQL database service delivering high availability, mission-critical performance, and elastic scaling for open-source developers building mobile and web apps.	<b>Best for</b> <ul style="list-style-type: none"><li>• Secure and scalable e-commerce solutions</li><li>• Scalable web and mobile apps</li><li>• Rich and personalized digital customer experiences</li><li>• High-performance and secure finance management apps</li><li>• Low-latency gaming experiences</li></ul>

And many more services...

## 4. Azure Global Infrastructure

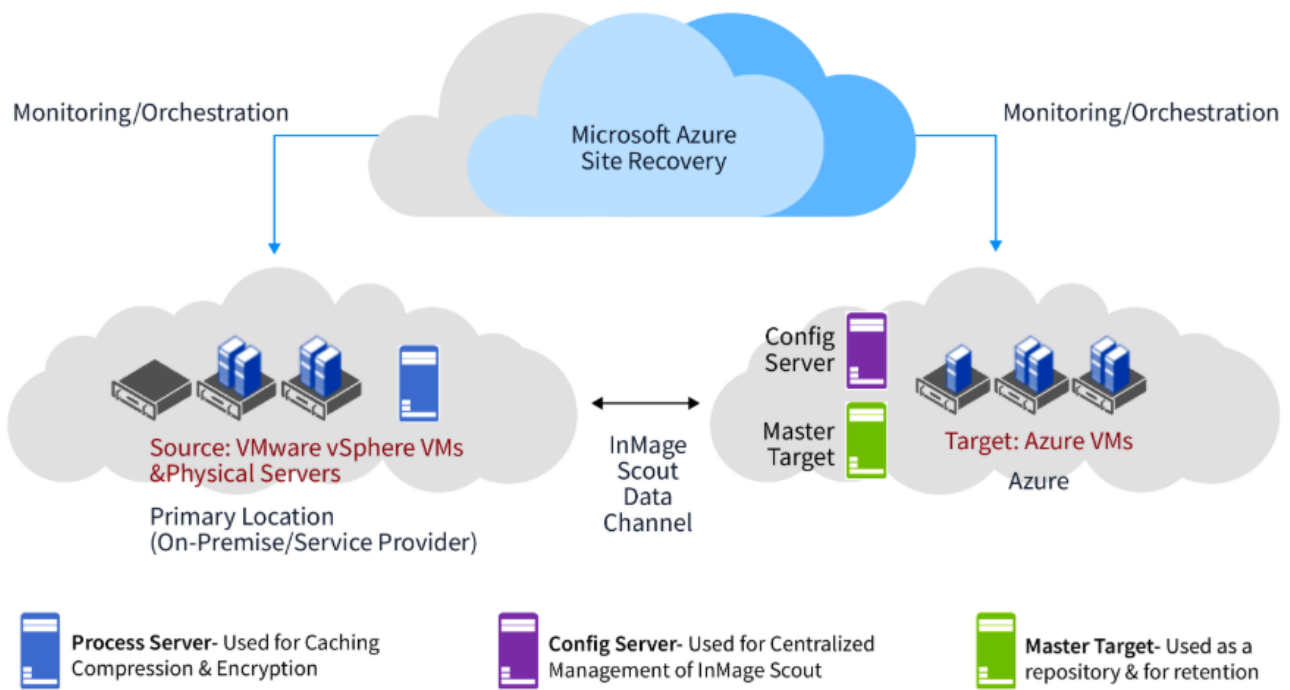
1. Region : physical datacentre placed inside a low-latency perimeter and connected through a dedicated high-bandwidth network connection.
2. Data centre: On-premise traditional data warehouses where servers, etc are maintained
3. Availability Zones: Availability Zones is made up of one or more datacentre.
4. Geography: A geography is a separate market, typically comprise two or more regions.
5. Azure site recovery: formidable safeguard within the cloud computing domain. Azure is capable of effectively shielding your organization from unforeseen disasters. It seamlessly integrates into Azure's expansive global infrastructure, ensuring the steadfast resilience and constant availability of your critical data.

Azure has in total 42 existing regions and 12 more are scheduled to appear very soon.



Some of the Regions and Availability zones in Azure

Regions	Availability Zones
(US) East US	3
(US) West Central US	0
(Europe) West Europe	3
(Asia Pacific) Southeast Asia	3



- Azure services that support Availability Zones fall into two categories:
  - **Zonal services** – a resource is pinned to a specific zone
  - **Zone-redundant services** – replicates automatically across zones

## 5. Architecture



## 6. Deployment and configuration

- Criteria in choosing a Region:
  - **Location** – a region closest to your users minimizes the latency
  - **Features** – some features are not available in all regions
  - **Price** – the price of services vary from region to region
- Regions that are unique when it comes to compliance:
  - **Azure Government Cloud** – only US federal, state, local, and tribal governments and their partners have access to this dedicated instance
  - **China Region** – data center is physically located within China and has no connection outside of China, including other Azure regions

## 7. Difference between Region and availability zones

Azure's Regions	Amazon Availability Zones
Azure regions are data centers within the geographic location.	Amazon Availability Zones are the data centers within the Amazon regions.
Azure Region consists of one or more zones under it.	There will be minimal one or more availability zones under single regions.
You can select the required services depending on the requirement of your application.	You can deploy your application in different availability zones to avoid data loss.

## 8. Tour of Azure Global infrastructure:

<https://datacenters.microsoft.com/globe/explore>

## 9. Troubleshooting

Issue	Possible Cause	Fix
Can't deploy in a specific region	Region not available in your subscription or quota limit exceeded	Check subscription limits and Azure status page
Zone deployment failed	The selected VM size may not be available in the zone	Choose a different zone or VM size
Latency issues	Resources deployed far from users	Use Azure Traffic Manager or Front Door for geo-routing
Data compliance alerts	Wrong region used	Re-deploy in the correct geography with compliance policies

## 10. References

- <https://www.geeksforgeeks.org/microsoft-azure-what-are-regions-and-availability-zones/>
- <https://www.scaler.com/topics/azure/azure-global-infrastructure/>
- <https://www.scaler.com/topics/azure/azure-global-infrastructure/>
- <https://azurecharts.com/overview>
- <https://www.scholarhat.com/tutorial/azure/microsoft-azure-global-infrastructure>
- [https://azure.microsoft.com/en-in/?ef\\_id=k\\_Cj0KCQjwxo\\_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBlaApLREALw\\_wcB\\_k\\_&OCID=AI\\_Dcmmf1elj9v5\\_SEM\\_k\\_Cj0KCQjwxo\\_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBlaApLREALw\\_wcB\\_k\\_&gad\\_source=1&gad\\_campaignid=1635074322&gbraid=0AAAAADcJh\\_v\\_rl0Oj7R4RJA1P3ji7dNmE&gclid=Cj0KCQjwxo\\_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBlaApLREALw\\_wcB#pill-bar-products\\_tab3](https://azure.microsoft.com/en-in/?ef_id=k_Cj0KCQjwxo_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBlaApLREALw_wcB_k_&OCID=AI_Dcmmf1elj9v5_SEM_k_Cj0KCQjwxo_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBlaApLREALw_wcB_k_&gad_source=1&gad_campaignid=1635074322&gbraid=0AAAAADcJh_v_rl0Oj7R4RJA1P3ji7dNmE&gclid=Cj0KCQjwxo_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBlaApLREALw_wcB#pill-bar-products_tab3)