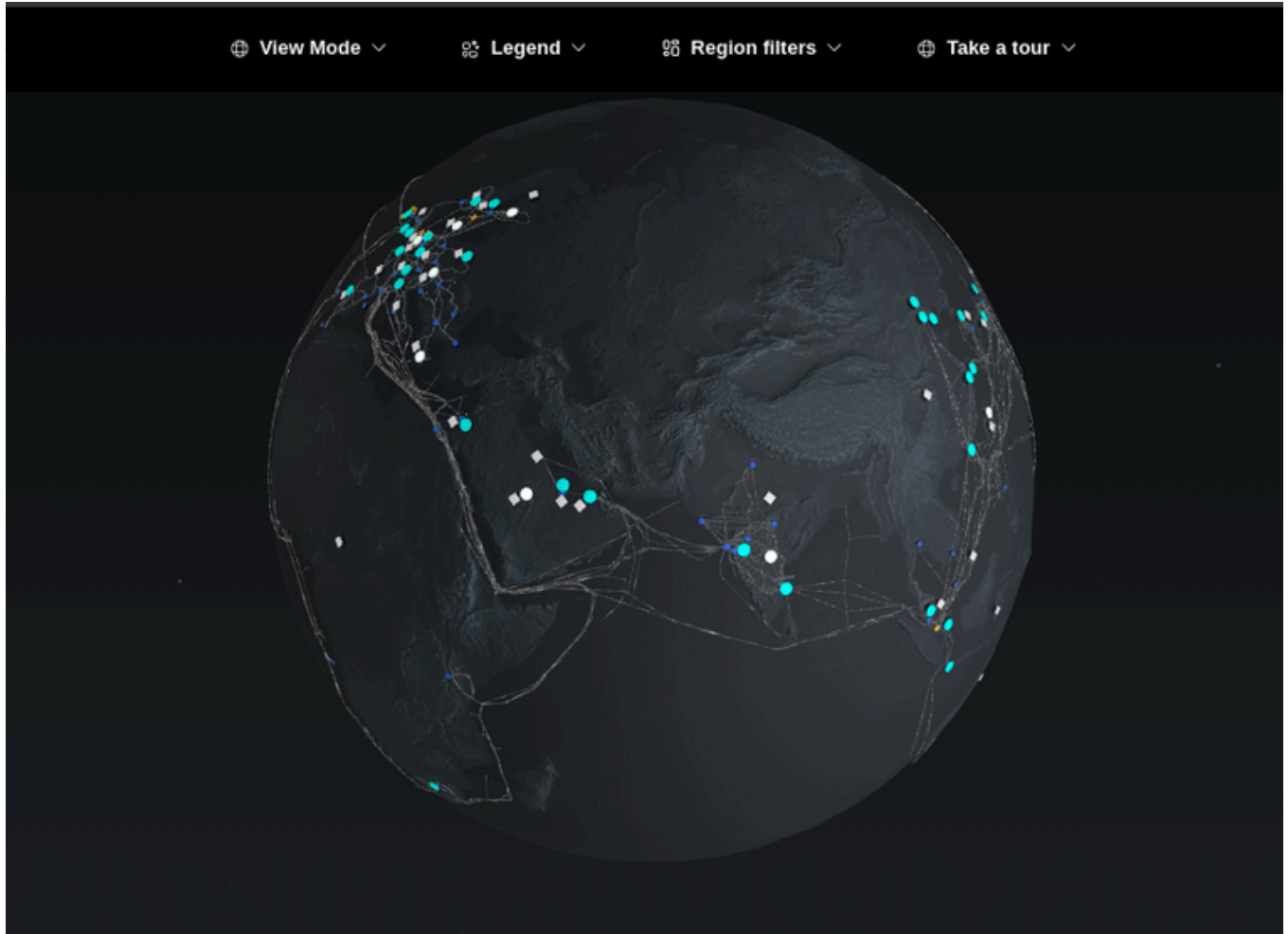


AZURE GLOBAL INFRASTRUCTURE

Introduction :

Azure Global Infrastructure refers to the massive, worldwide network of data centers, fiber optic cables, and interconnected components that Microsoft uses to deliver its Azure cloud services. It's designed for global scale, high availability, disaster recovery, and compliance with various data residency requirements. It also includes:

1. Geographies
2. Azure Regions
3. Availability Zones
4. Data Centers



GLOBE VIEW OF AZURE GLOBAL INFRASTRUCTURE

1. AZURE GEOGRAPHIES:

An Azure geography is a discrete market or area of the world that typically contains one or more Azure regions. Think of it as a large, defined boundary, often aligned with geopolitical or country borders.

An Azure Geography is like a major zone or country (like India) where Microsoft places its cloud "cities" (regions). Its main purpose is to:

- Keep your data within specific borders (like India) for legal and privacy reasons.
- Provide multiple "cities" within that zone so your applications can survive big problems in one "city" and keep running from another in the same zone.
- Ensure fast and secure connections between these "cities" within the same zone.

The importance of Azure Geographies is about:

- Staying Legal: Meeting country-specific data laws.
- Staying Online: Ensuring your services are resilient to major failures.
- Staying Fast: Providing the best possible performance for your users.

(US) West US 3

(Asia Pacific) Australia East

(Europe) North Europe

(Europe) UK South

(Europe) West Europe

(Africa) South Africa North

(Europe) North Europe

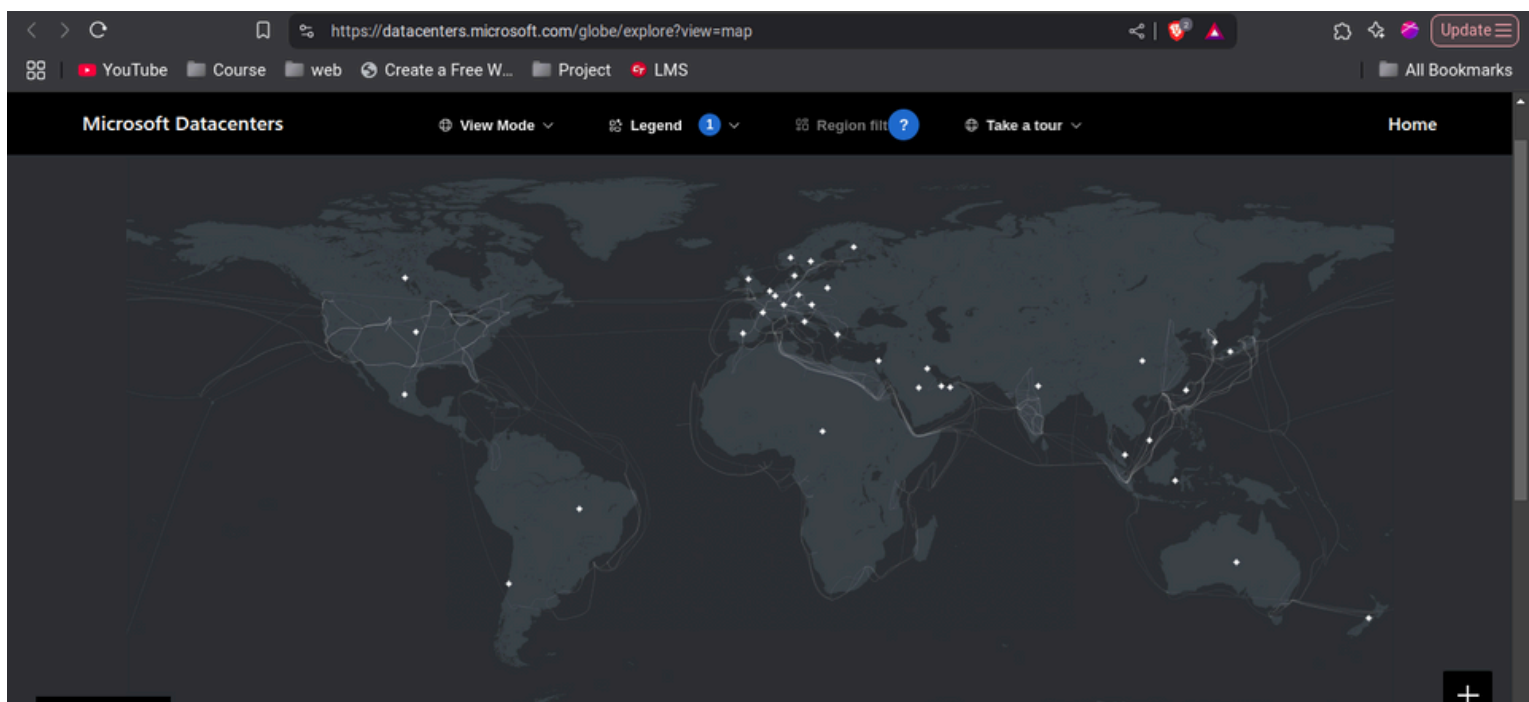
(Europe) UK South

(Europe) West Europe

(Africa) South Africa North

(Asia Pacific) Central India

(Asia Pacific) East Asia



MAP VIEW OF AZURE GEOGRAPHIES

2. AZURE REGIONS:

An Azure Region can be best understood as a dedicated, high-capacity operational center that Microsoft establishes in specific locations around the world. When you decide to use Azure for your online services or data, you're essentially choosing one of these established hubs as your primary base of operations. These help in :

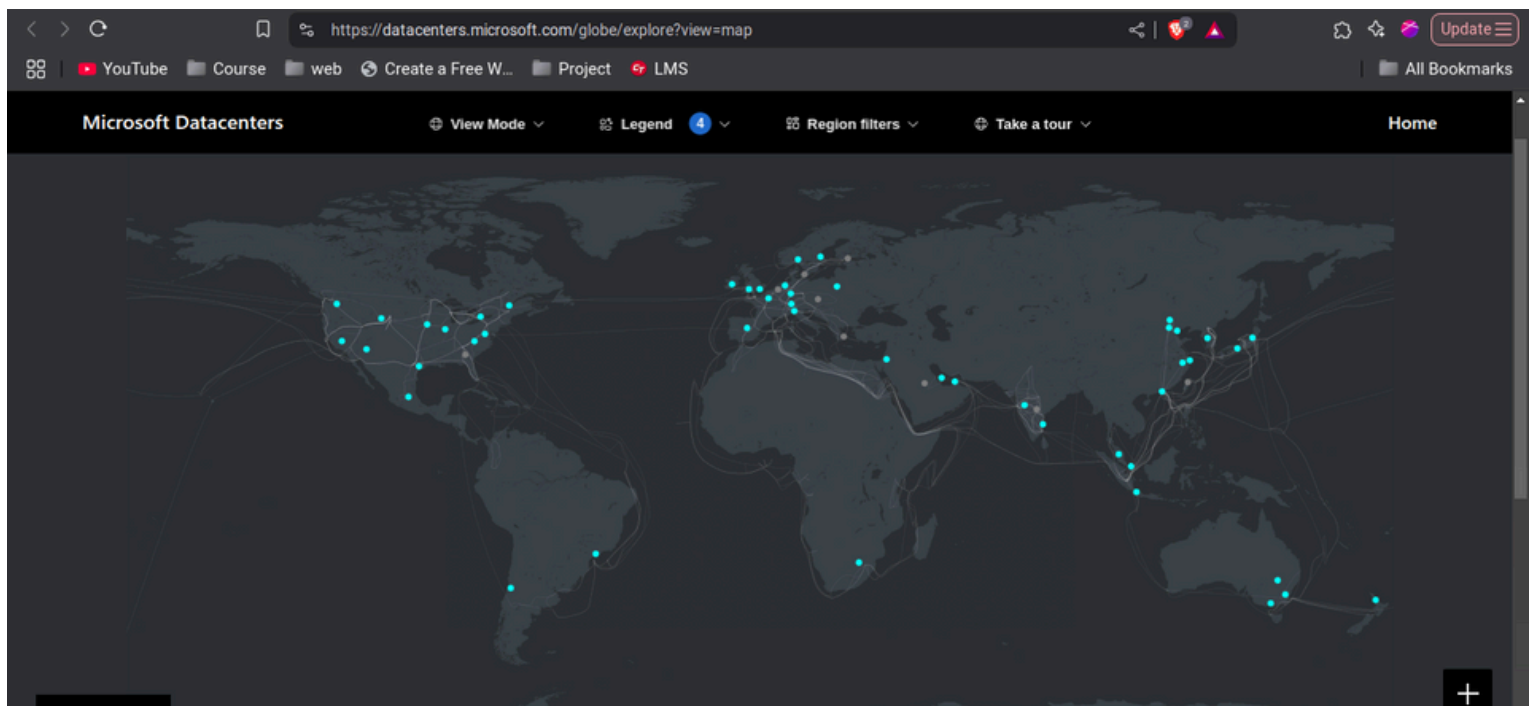
- Bringing Cloud Services Closer
- Reliability
- Meeting Local Requirements

The importance of Azure Regions is about:

- Ensuring Smooth Performance for Users:
- Staying Online
- Meeting Legal and Data Rules

The regions can be viewed in azure by:

- Opening the command prompt, PowerShell, or Azure Cloud Shell.
- Running the command: `az account list-locations --output table`



MAP VIEW OF AZURE REGIONS

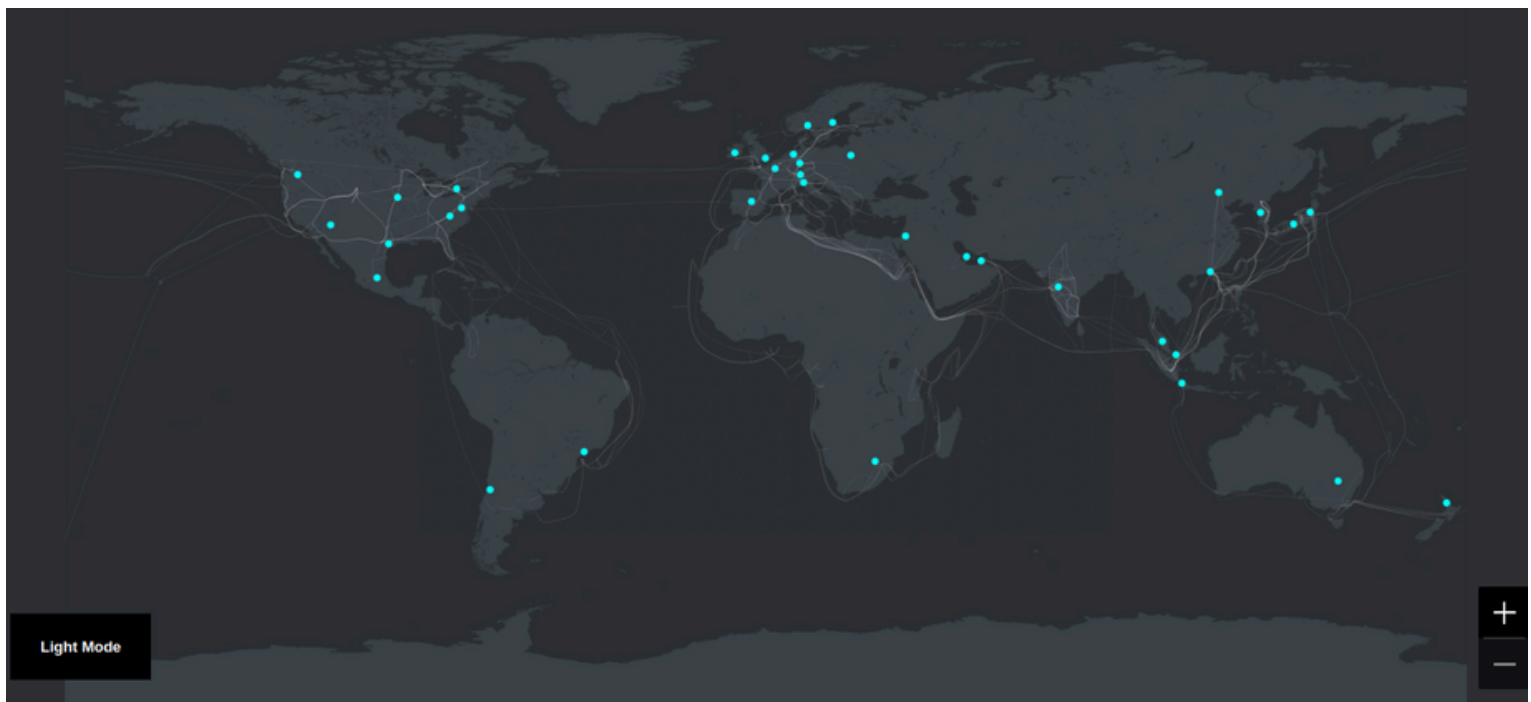
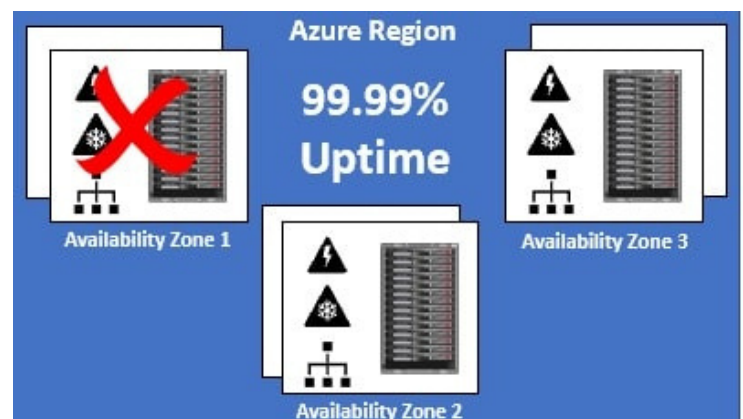
3. AZURE AVAILABILITY ZONES:

An Azure Availability Zone is a unique physical location within an Azure region. Each Availability Zone is made up of one or more datacenters with independent power, cooling, and networking. Not all Regions have Availability Zones. Regions that support Availability Zones have a minimum of three separate zones to ensure resiliency.

If one of the Availability Zones has gone down for some reason, we still have our applications and data available from the rest of the two Availability Zones. There is a physical separation between each Availability Zone and it is this separation that protects our applications and data from Datacenter failures. With Availability Zones, Azure offers industry best 99.99% VM uptime SLA.

Each of these Availability Zones is built to be independent, meaning they have their own dedicated:

- Power sources
- Cooling systems
- Networking



MAP VIEW OF AZURE REGIONS WITH AVAILABILITY ZONES

4. AZURE DATA CENTERS:

Azure Data Centers are the highly secure, interconnected physical buildings that house the immense computing and storage power of the Microsoft Azure cloud. They are the essential, unseen engines that allow cloud services to operate globally, reliably, and securely.

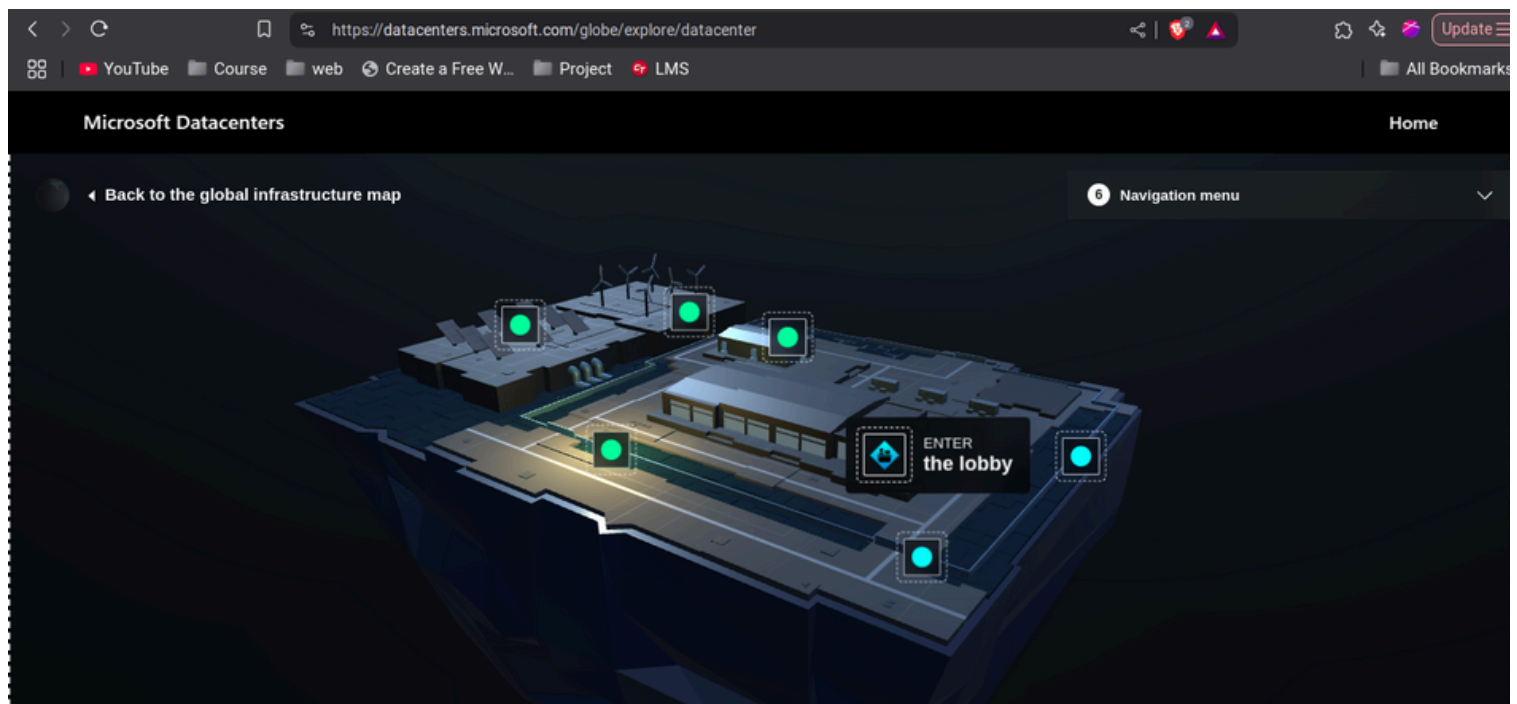
Why Azure Data Centers Are Essential ?

- The True Home for Your Digital Assets
- Ensuring Speed and Smooth Experience
- Keeping Everything Running
- Protecting Your Valuable Information
- Enabling Global Reach and Local Trust

Azure Data Centers as Pioneers in Sustainable and Intelligent Infrastructure:

Unlike traditional data infrastructure, Azure's approach involves:

- Aggressive Carbon Neutrality Goals
- AI-Driven Optimization
- Circular Economy Principles



AZURE DATA CENTERS

CONCLUSION

The Microsoft Azure cloud is built upon a vast and sophisticated global infrastructure, a network of physical assets and logical groupings designed to deliver computing services with unparalleled reach, reliability, and security.

- **Azure Geographies:** Large, distinct areas (often countries like India) that contain one or more regions, primarily ensuring data stays within specified borders for compliance.
- **Azure Regions:** Specific, physically distinct locations within a geography, housing data centers where your cloud resources are deployed to ensure proximity to users and local control.
- **Azure Availability Zones:** Isolated sets of data centers within a region, each with independent power, cooling, and networking, designed to protect applications from localized failures.
- **Azure Data Centers:** The fundamental, highly secure physical buildings packed with servers and networking equipment, which are the true home for your cloud data and services.

Submitted by:

Sambit Kumar Panda

References:

<https://www.pragimtech.com/blog/azure/azure-geographies/>
<https://datacenters.microsoft.com/globe/explore/?view=map>
<https://datacenters.microsoft.com/globe/explore/datacenter>
<https://www.microsoft.com/en-in/sustainability/>