🚀R&D DOCUMENT ON AZURE GLOBAL INFRASTRUCTURE

TITLE :

In-depth study and analysis of Azure's Global Infrastructure, such as Geographies, Azure Regions, Availability Zones and Data Centres.

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PURPOSE :

To explore the design, scope, and global distribution of Microsoft Azure's cloud infrastructure, including its Geographies, Regions, Availability Zones, and Data centres.

🌐AZURE GLOBAL INFRASTRUCTURE

Azure's global infrastructure is designed to provide the following through a geographically distributed cloud platform:

- High availability
- Resiliency
- Scalability
- Data sovereignty

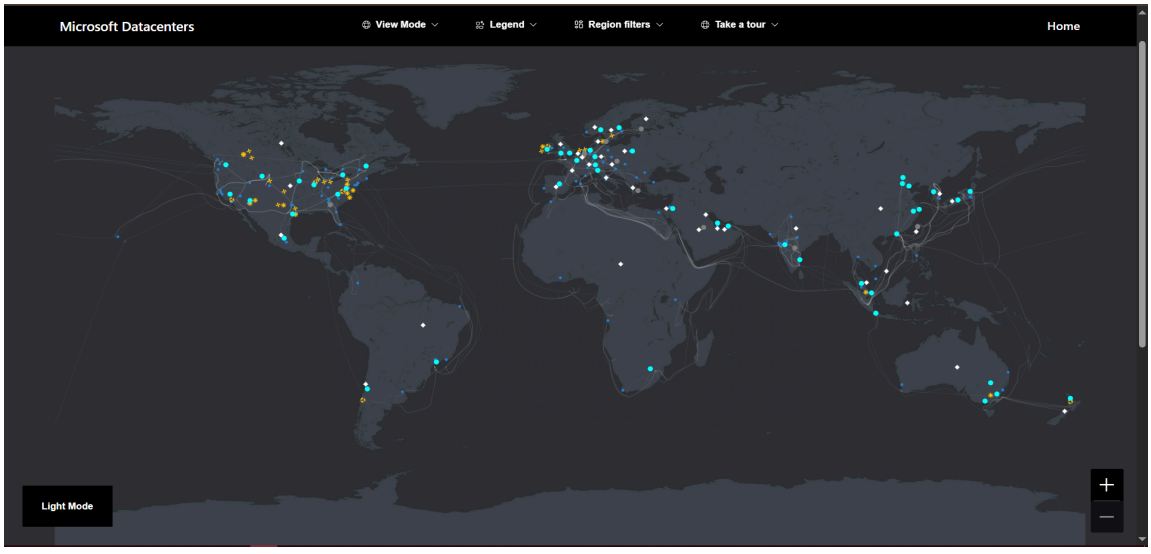
📈 KEY BENEFITS

- Scalability: Supports global scalability and performance.
- Data Sovereignty: Ensures data residency and sovereignty compliance.
- Reliability: Built-in fault tolerance and redundancy.
- Security: End-to-end security at the physical and network level.
- Global Reach: Enables global business operations with local data presence.

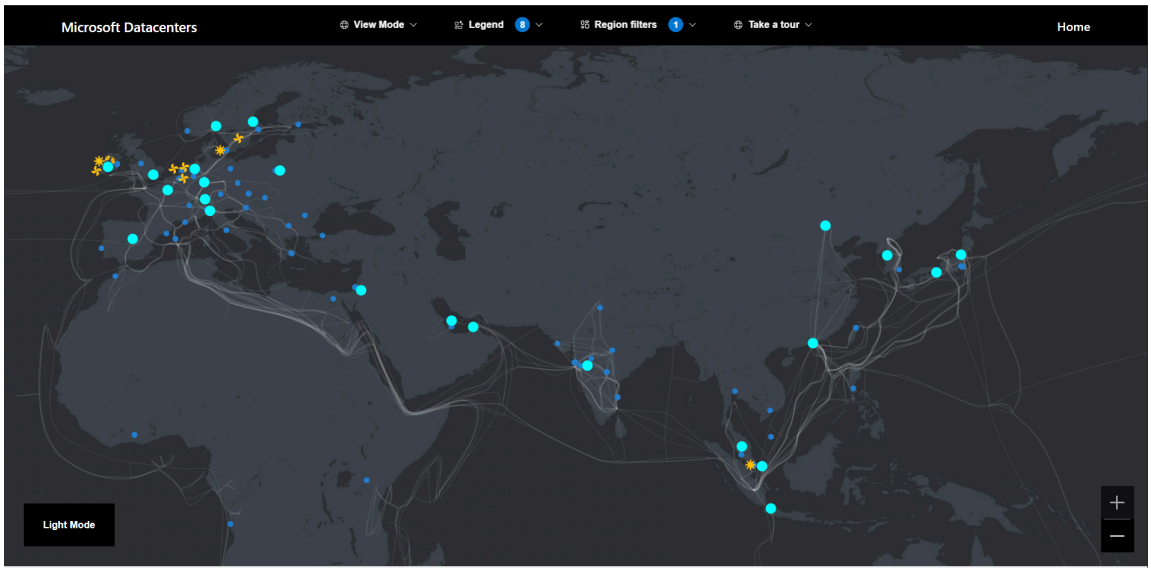
🌍AZURE GEOGRAPHIES

- A Geography is a discrete market that typically contains two or more regions and preserves data residency and compliance boundaries.
- Its purpose is to meet specific data governance, residency, and compliance requirements.
- Examples:
    - United States
    - Europe
    - Asia
    - India
- Azure has more than 60 geographies, more than any other cloud provider.

  Following is an image depicting all of Microsoft's data centres across the world:



  An overview of all available data centres across India and other neighbouring countries and continents:



🔵 represents a network PoP.

🟢 represents the available regions.

🌆 AZURE REGIONS

- A Region is a set of data centres deployed within a specific geographic area, connected through a low-latency network.
- It serves the following purpose:
    - To deliver high availability and redundancy.
    - Allow customers to deploy apps and services close to users.
- Number of regions: Over 60+ Azure regions worldwide (as of 2025).
- Each region is made up of at least one data centre, with availability zones in many cases.

✅ Key Features:

- Customers select regions to meet their performance, availability, and regulatory requirements.

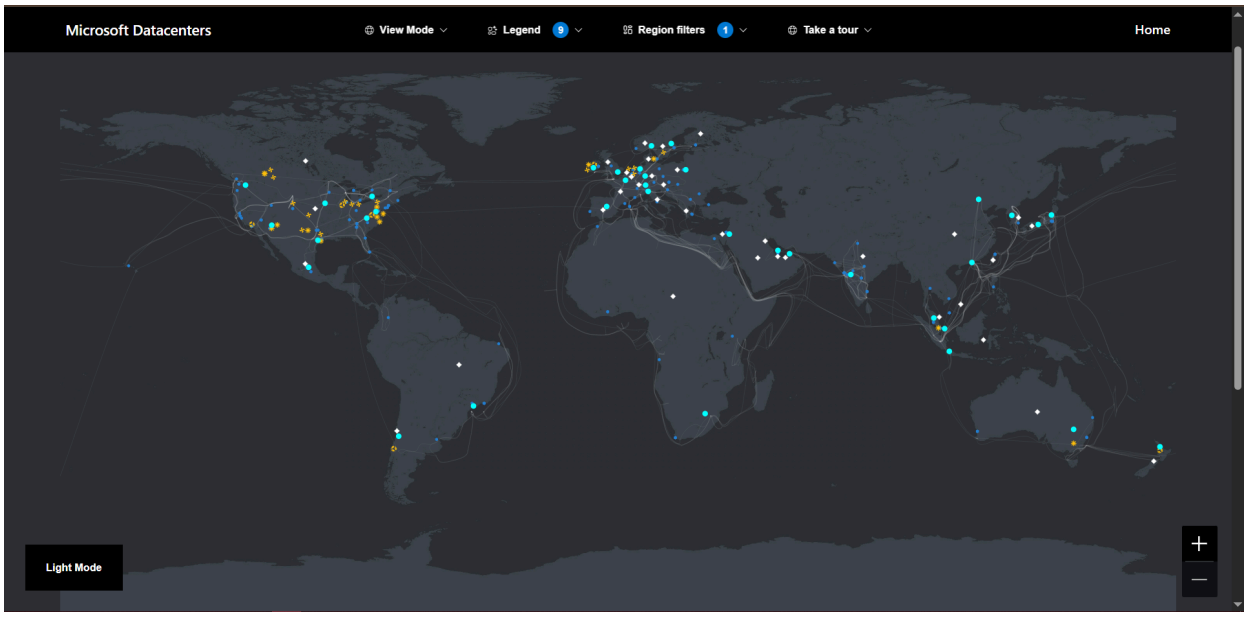
- Examples:
    - East US
    - West Europe
    - Southeast Asia
    - Central India

🌐AVAILABILITY ZONES

- An Availability Zone (AZ) is a physically separate location within an Azure region, comprising one or more data centres equipped with independent power, cooling, and networking.
- **Purpose**:
    - To protect applications and data from data centre failures.
    - Enable high availability architecture.
- At least 3 Availability Zones are available in most supported regions.
- Each zone is an isolated failure domain.
- **Use Cases:**

  ⏩Deploy redundant virtual machines (VMs) across zones for enhanced resilience.
  ⏩Leverage zonal services like Zone-redundant storage(ZRS) or Zone-redundant SQL Databases.

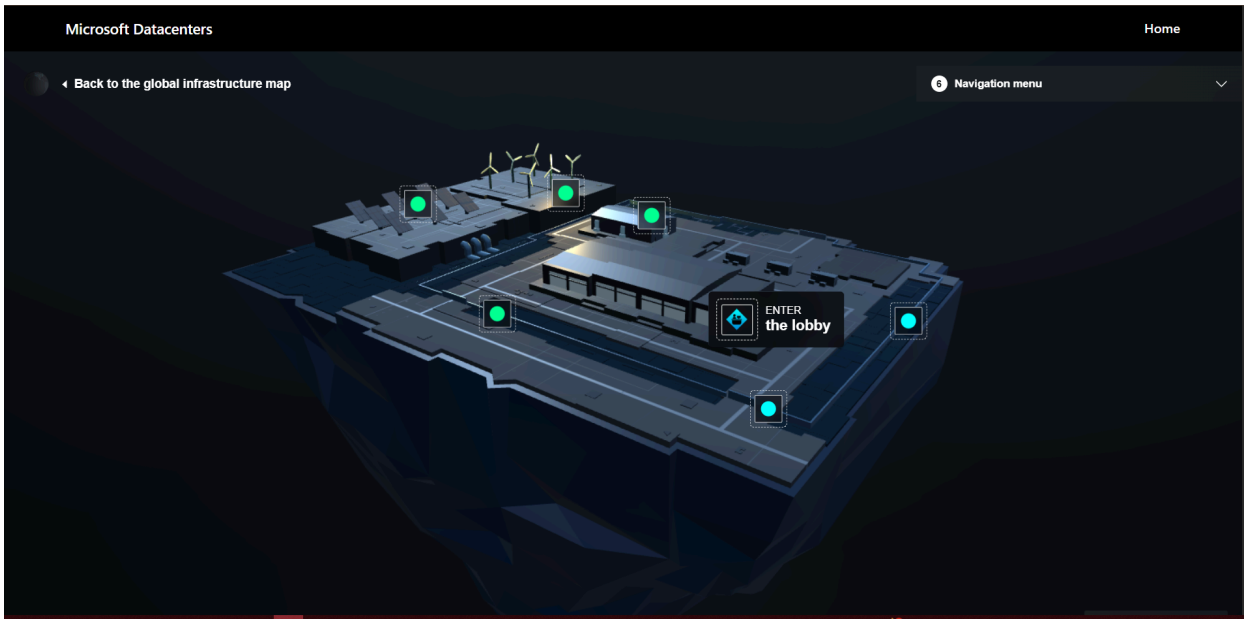
A glimpse of all the available regions of Microsoft Datacentres across the world:



🏙️ DATA CENTER

- A data centre is the physical facility that houses Azure's servers, storage systems, networking hardware, and infrastructure.
- Security & Compliance:
    - It is equipped with 24/7 physical security, redundant power, and environmental controls.
    - It adheres to global compliance standards (e.g., ISO 27001, SOC, GDPR).
- Environmental Initiatives:
    - Microsoft commits to being carbon-negative by 2030.
    - Uses renewable energy sources for data centres.

A look into the virtual data centre tour of Microsoft :



👌 CONCLUSION

Microsoft Azure's global infrastructure is purposefully built to deliver resilient, secure, and high-performance cloud services to users across the world. In conclusion, Azure's infrastructure offers a robust foundation for organisations seeking to build, scale, and maintain their applications.
