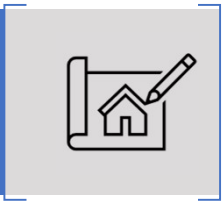
2. Azure architectural components



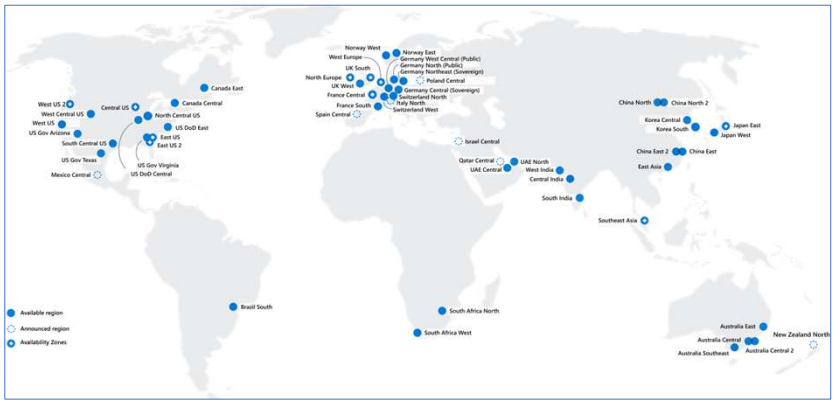
Core Azure architectural components – Objective Domain

- Describe Azure regions, region pairs, and sovereign regions.
- Describe Availability Zones.
- Describe Azure datacenters.
- Describe Azure resources and Resource Groups.
- Describe subscriptions.
- Describe management groups.
- Describe the hierarchy of resource groups, subscriptions, and management groups.

https://docs.microsoft.com/learn/modules/describe-core-architectural-components-of-azure/1-introduction

Regions

Azure offers more global regions than any other cloud provider with 60+ regions representing over 140 countries



- Regions are made up of one or more datacenters in close proximity.
- Provide flexibility and scale to reduce customer latency.
- Preserve data residency with a comprehensive compliance offering.

https://docs.microsoft.com/en-us/learn/modules/describe-core-architectural-components-of-azure/5-describe-azure-physical-infrastructure

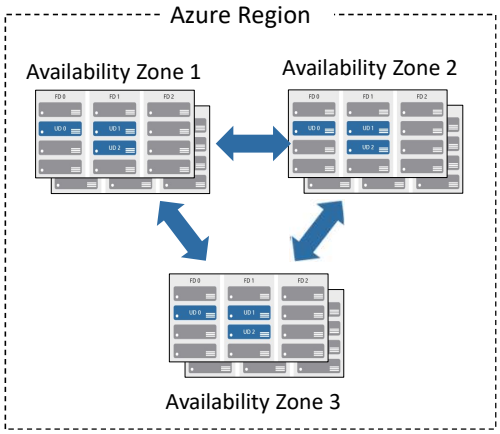
- A region represents a collection of datacentres.
- Provide flexibility and scale.
- Preserve data residency.
- Select regions close to your users.
- Be aware of region deployment availability.
- There are global services that are region independent.

A list of regions and their locations is available at https://azure.microsoft.com/en-us/global-infrastructure/locations/

https://docs.microsoft.com/en-us/learn/modules/azure-architecture-fundamentals/regions-availability-zones

Availability zones

- Provide protection against downtime due to datacenter failure.
- Physically separate datacenters within the same region.
- Each datacenter is equipped with independent power, cooling, and networking.
- Connected through private fiber-optic networks.



https://docs.microsoft.com/learn/modules/describe-core-architectural-components-of-azure/5-describe-azure-physical-infrastructure

- Physically separate locations within an Azure region.
- Takes availability sets to the next level
- Includes one or more datacenters, equipped with independent power, cooling, and networking.
- Acts as an isolation boundary.
- If one availability zone goes down, the other continues working.

More details about Availability Zones in Azure are available at https://docs.microsoft.com/en-us/azure/availability-zones/az-overview

Region Pairs

- At least 300 miles of separation between region pairs.
- Automatic replication for some services.
- Prioritized region recovery in the event of outage.
- Updates are rollout sequentially to minimize downtime.

Web Link: https://aka.ms/PairedRegions

Region	Region
North Central US	South Central US
East US	West US
West US 2	West Central US
US East 2	Central US
Canada Central	Canada East
North Europe	West Europe
UK West	UK South
Germany Central	Germany Northeast
South East Asia	East Asia
East China	North China
Japan East	Japan West
Australia Southeast	Australia East
India South	India Central
Brazil South (Primary)	South Central US

https://docs.microsoft.com/learn/modules/describe-core-architectural-components-of-azure/5-describe-azure-physical-infrastructure

- Each Azure region is paired with another region.
- Azure prefers at least 300 miles of separation between datacenters in a regional pair.
- Some services provide automatic replication to the paired region.
- In an outage, recovery of one region is prioritized out of every pair.
- Azure system updates are rolled out to paired regions sequentially (not at the same time).

List of geographies, regions, region-pairs, and other details -https://azure.microsoft.com/en-us/global-infrastructure/geographies/

Azure Resources

- Azure **resources** are components like storage, virtual machines, and networks that are available to build cloud solutions.


Virtual Machines


Storage Accounts


Virtual Networks


App Services

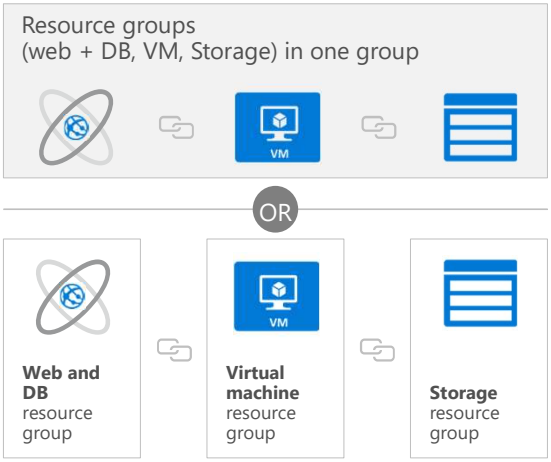
SQL Databases


Functions

https://docs.microsoft.com/learn/modules/describe-core-architectural-components-of-azure/6-describe-azure-management-infrastructure

Resource groups

- A **resource group** is a container to manage and aggregate resources in a single unit.
- Resources can exist in only one resource group.
- Resources can exist in different regions.
- Resources can be moved to different resource groups.
- Applications can utilize multiple resource groups.

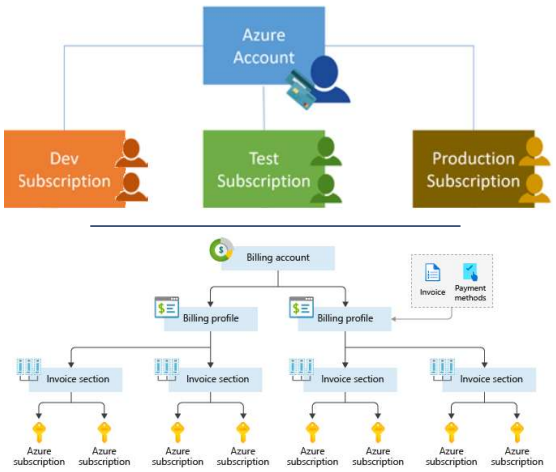


https://docs.microsoft.com/learn/modules/describe-core-architectural-components-of-azure/6-describe-azure-management-infrastructure

- Containers for multiple resources that share the same life cycle.
- Aggregates resources into a single manageable unit.
- Every Azure resource must exist in one (and only one) resource group.
- Secure at the resource group (or resource) level - using role-based access control (RBAC).

Azure Subscriptions

- An Azure subscription provides you with authenticated and authorized access to Azure accounts.
- Billing boundary: generate separate billing reports and invoices for each subscription.
- Access control boundary: manage and control access to the resources that users can provision with specific subscriptions.



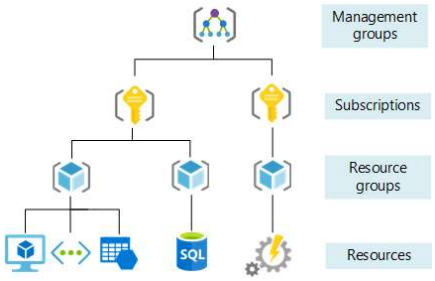
https://docs.microsoft.com/learn/modules/describe-core-architectural-components-of-azure/6-describe-azure-management-infrastructure

An account can have one subscription or multiple subscriptions.

Azure subscription offers - https://azure.microsoft.com/en-us/support/legal/offer-details/

Management Groups

- Management groups can include multiple Azure subscriptions.
- Subscriptions inherit conditions applied to the management group.
- 10,000 management groups can be supported in a single directory.
- A management group tree can support up to six levels of depth.



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Management groups - https://docs.microsoft.com/en-us/azure/governance/management-groups/