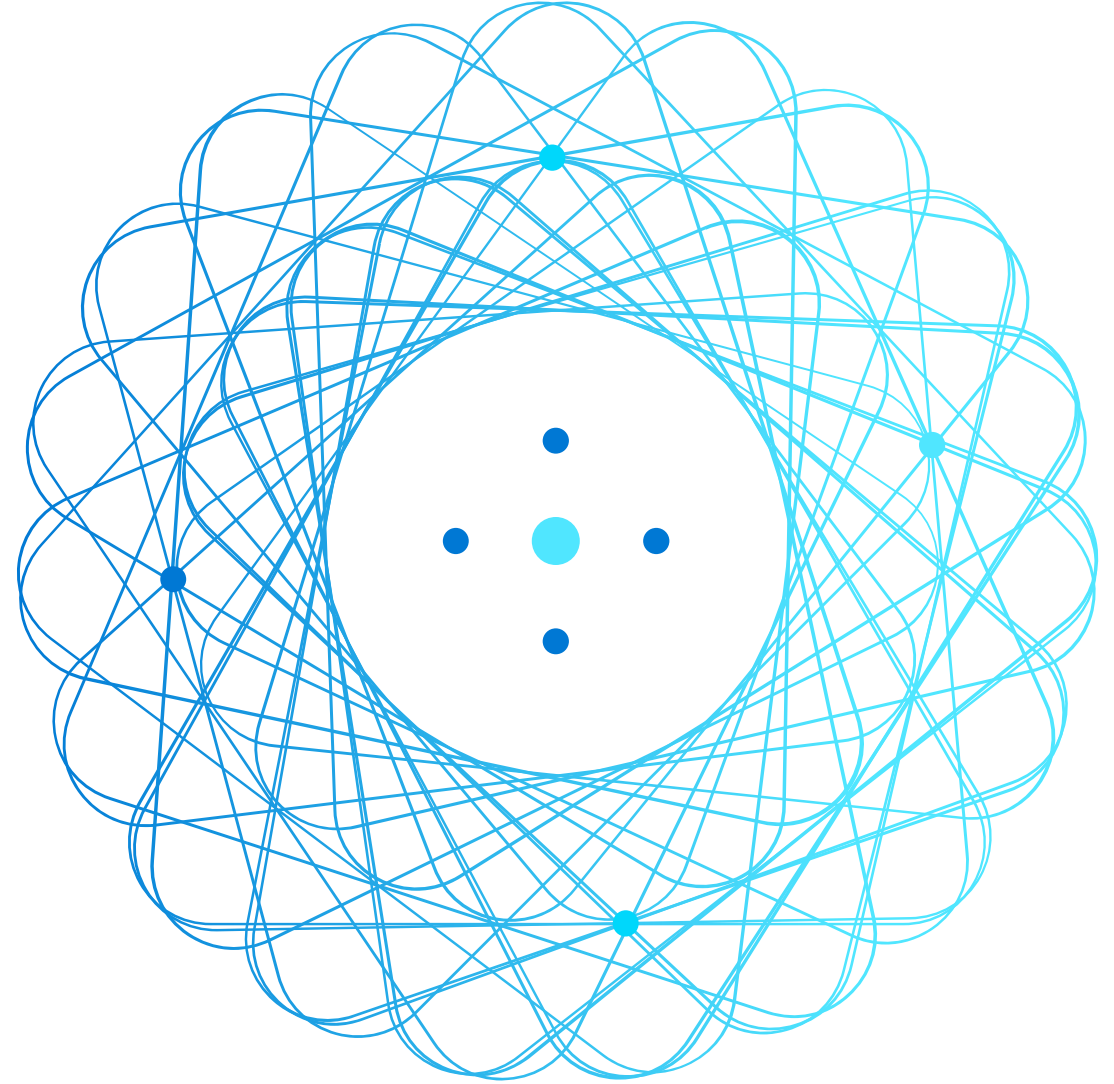


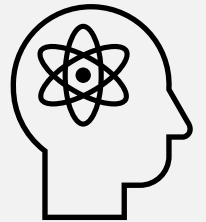
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Module 02:

Core Azure Services



Module Outline



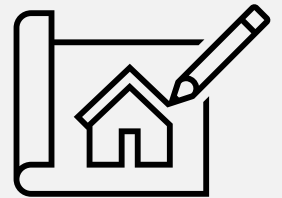
Module 02 – Outline

You will learn the following concepts:

- **Azure Architectural Components**
 - Regions and Availability Zones
 - Subscriptions and Resource Groups
- **Core Azure Resources**
 - Compute
 - Networking
 - Storage
 - Databases



Core Azure architectural components



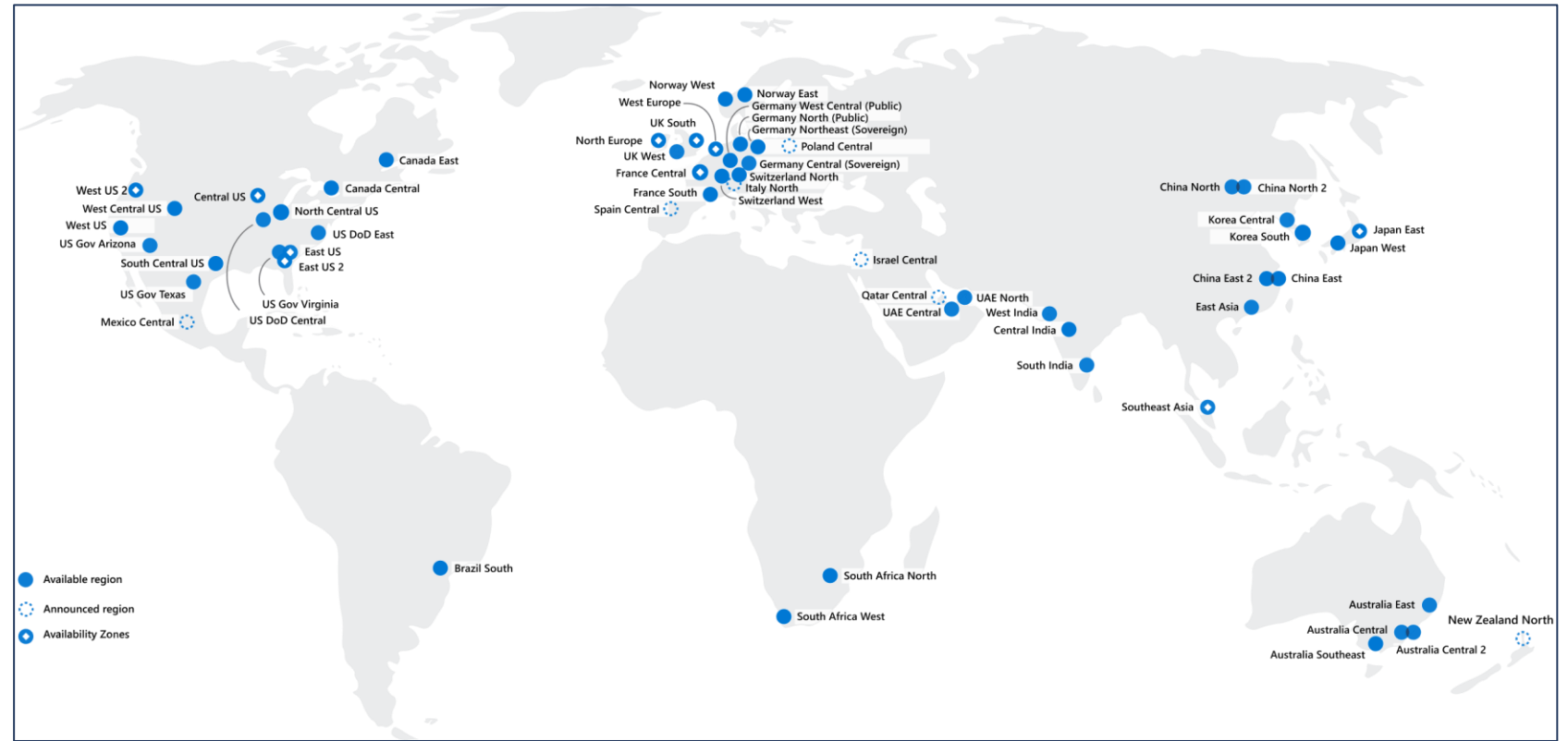
Core Azure architectural components – Objective Domain

Describe the benefits and usage of:

- Regions and Region Pairs
- Availability Zones
- Azure Resources
- Resource Groups
- Azure Resource Manager
- Subscriptions
- Azure Management Groups

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.

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.

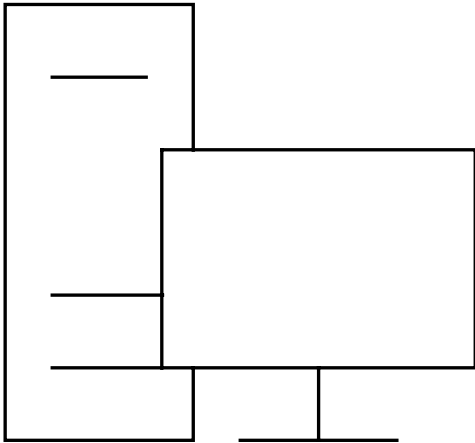
Web Link: <https://aka.ms/PairedRegions>

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

Availability Options

VM SLA

99.9% with Premium Storage

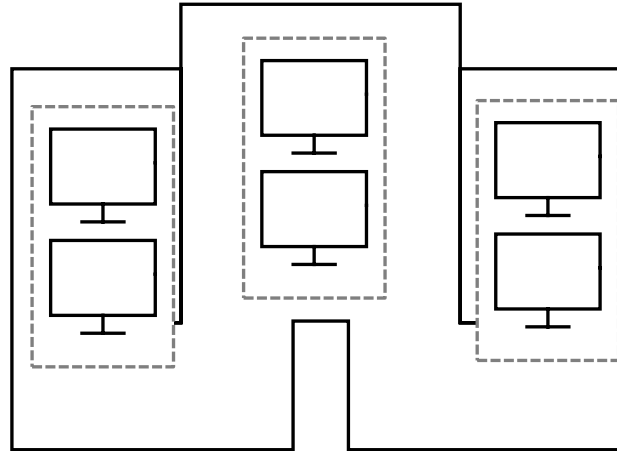


SINGLE VM

Easier lift and shift

VM SLA

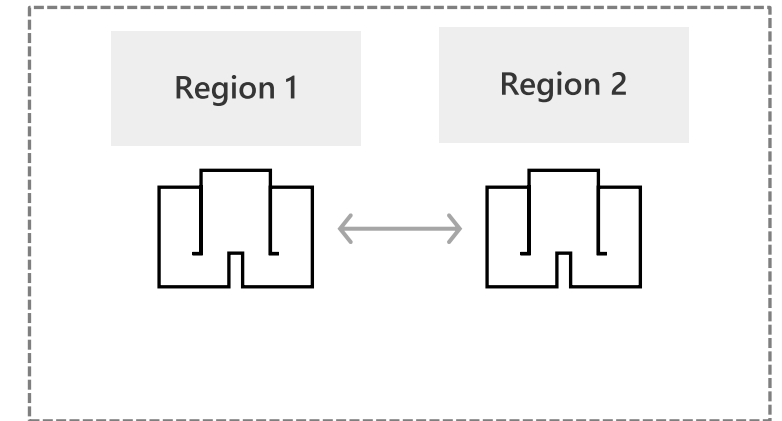
99.99%



AVAILABILITY ZONES

Protection from entire datacenter failures

MULTI-REGION DISASTER RECOVERY

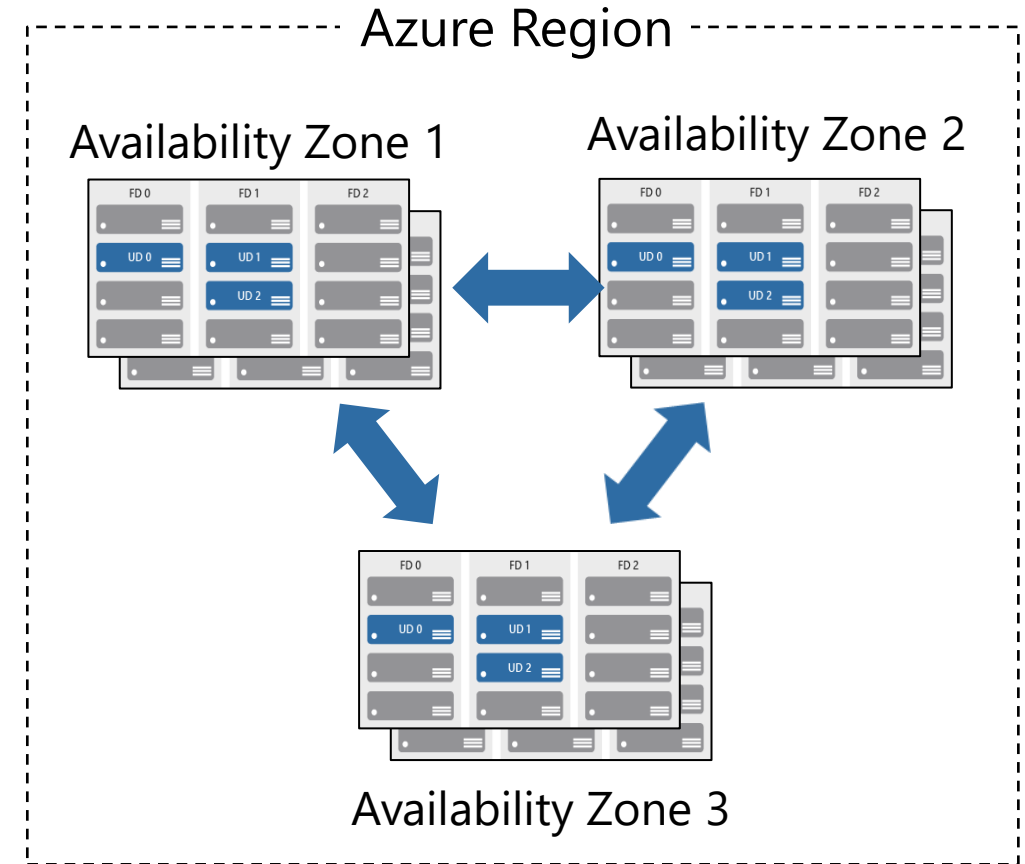


REGION PAIRS

Regional protection within Data Residency Boundaries

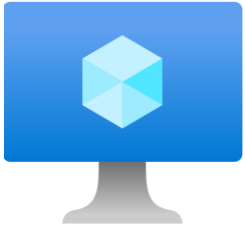
Availability zones

- 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.

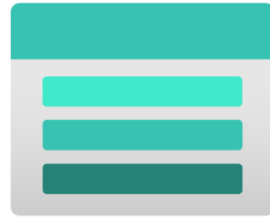


Azure Resources

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

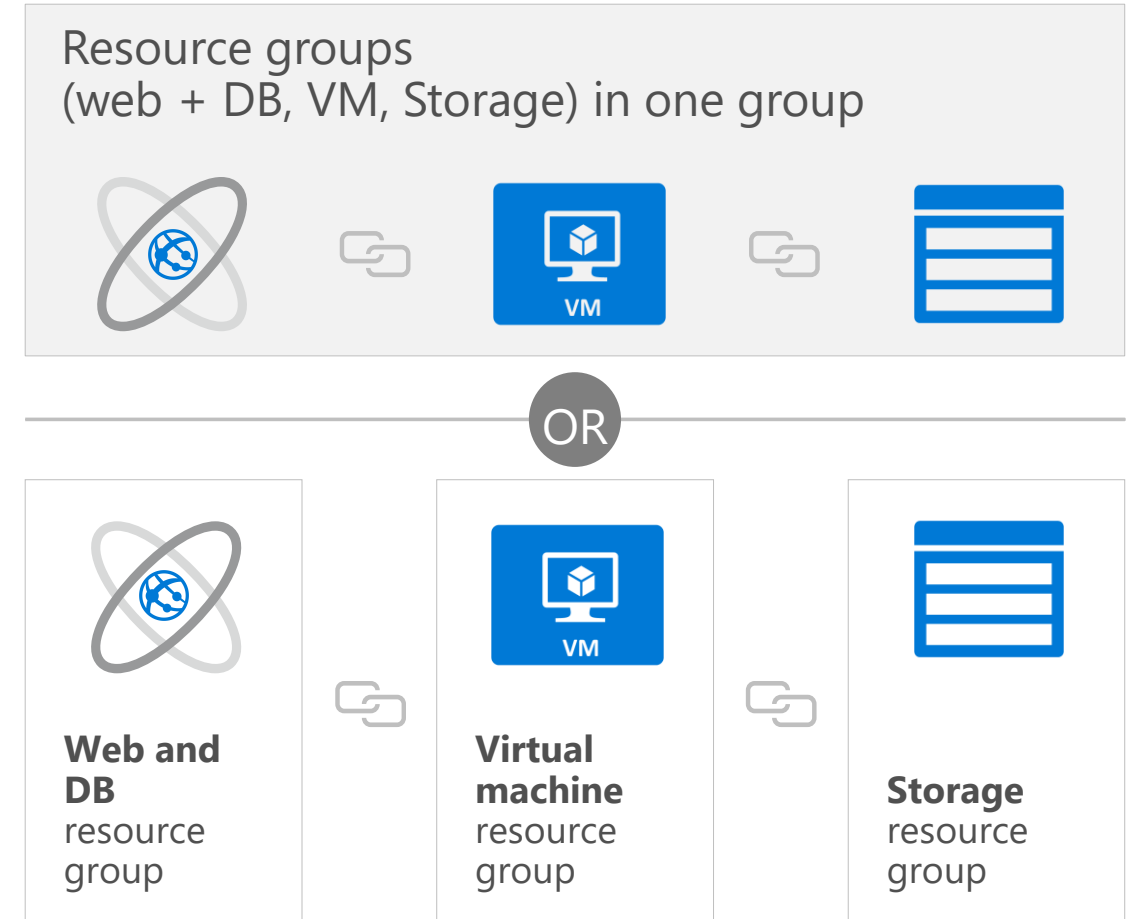


Functions

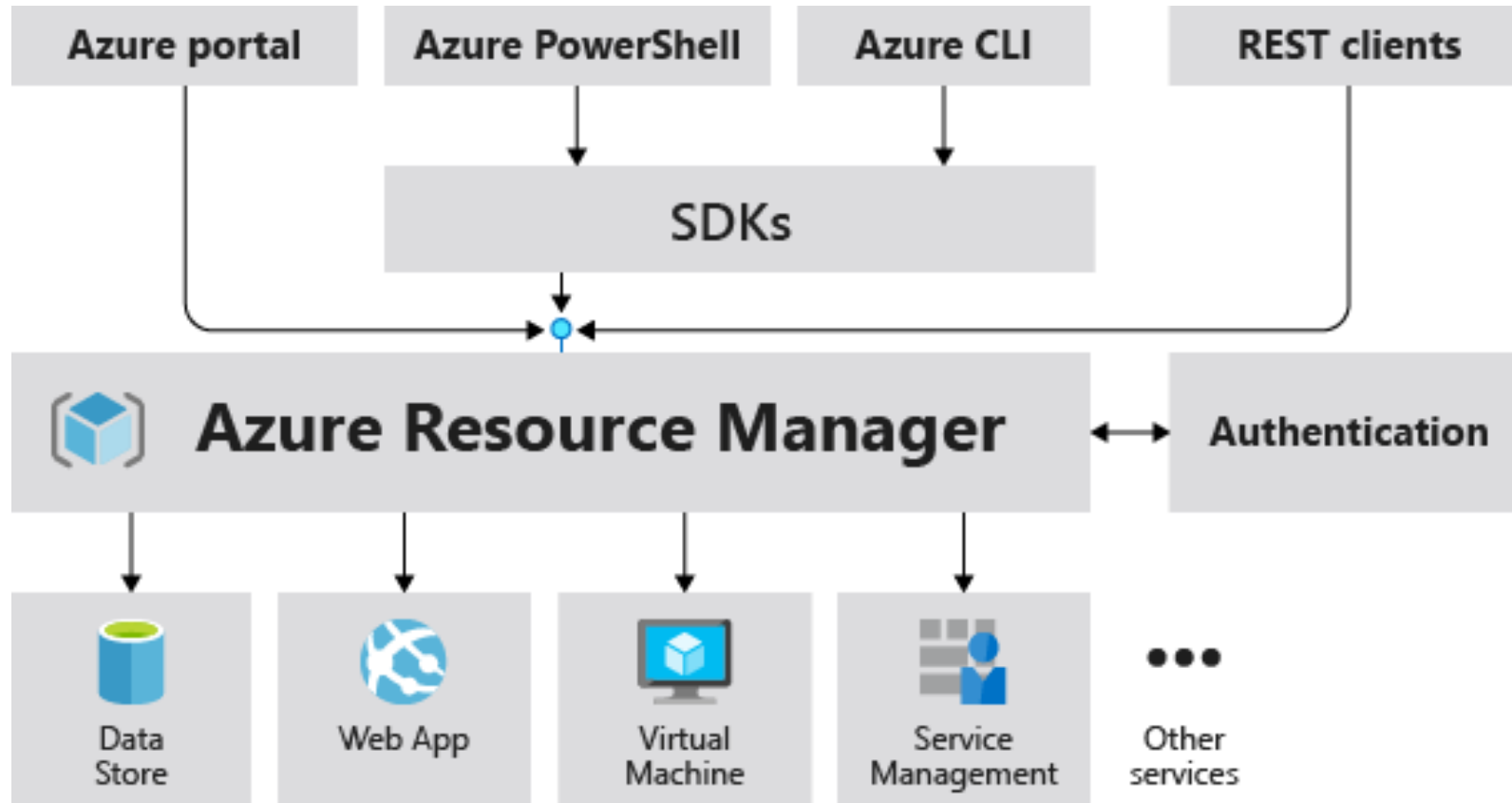
Resource groups

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.



Azure Resource Manager

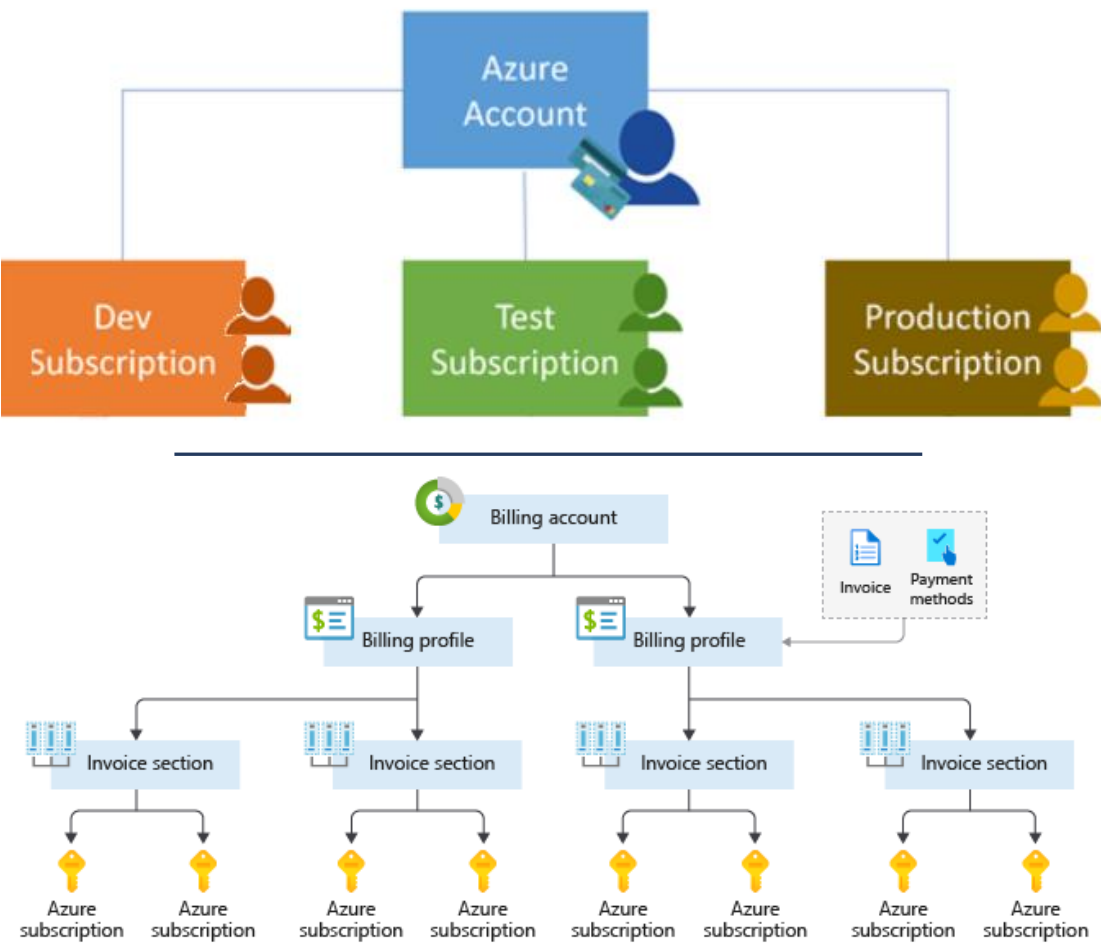


The **Azure Resource Manager (ARM)** provides a management layer that enables you to create, update, and delete resources in your Azure subscription.

Azure Subscriptions

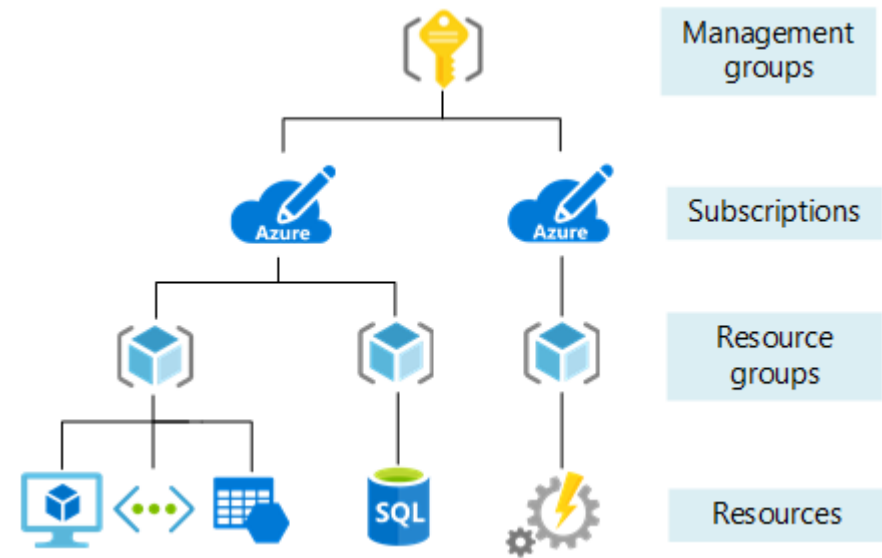
An Azure subscription provides you with authenticated and authorized access to Azure accounts.

- **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.

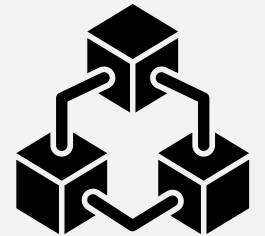


Management Groups

- 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.



Core Azure workload products



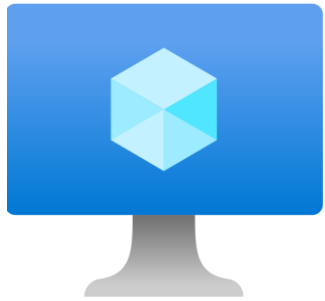
Core Azure Workloads - Objective Domain

Describe the benefits and usage of:

- Virtual Machines, Azure App Services, Azure Container Instances (ACI), Azure Kubernetes Service (AKS), and Windows Virtual Desktop
- Virtual Networks, VPN Gateway, Virtual Network peering, and ExpressRoute
- Container (Blob) Storage, Disk Storage, File Storage, and storage tiers
- Cosmos DB, Azure SQL Database, Azure Database for MySQL, Azure Database for PostgreSQL, and SQL Managed Instance
- Azure Marketplace

Azure compute services

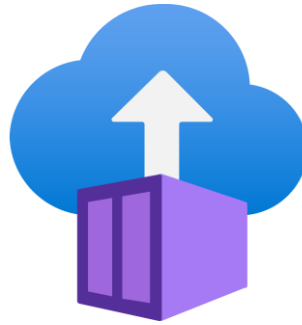
Azure **compute** is an on-demand computing service that provides computing resources such as disks, processors, memory, networking, and operating systems.



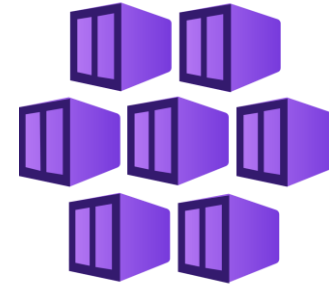
Virtual
Machines



App
Services



Container
Instances



Azure Kubernetes
Services (AKS)

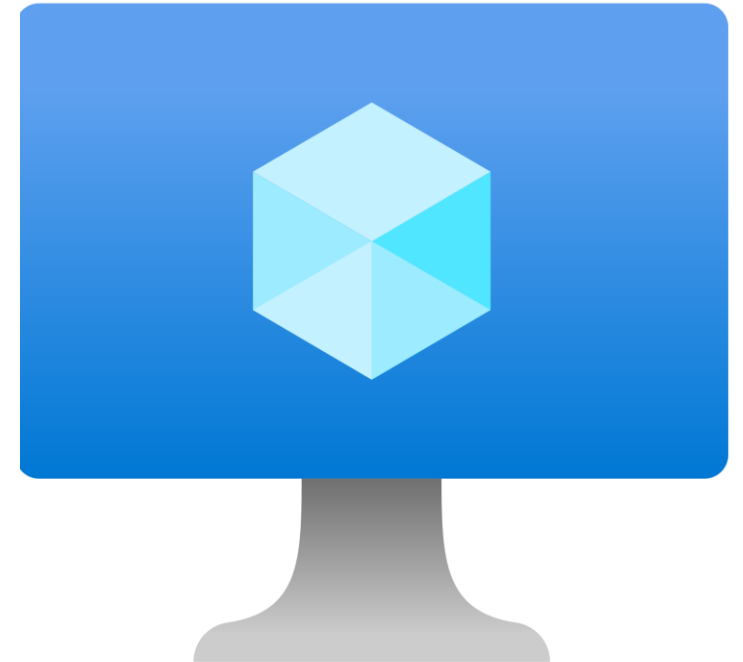


Windows Virtual
Desktop

Azure virtual machines

Azure **Virtual Machines (VM)** are software emulations of physical computers.

- Includes virtual processor, memory, storage, and networking.
- IaaS offering that provides total control and customization.



Azure App Services



Azure **App Services** is a fully managed platform to build, deploy, and scale web apps and APIs quickly.

- Works with .NET, .NET Core, Node.js, Java, Python, or php.
- PaaS offering with enterprise-grade performance, security, and compliance requirements.

Azure Container Services

Azure **Containers** are a light-weight, virtualized environment that does not require operating system management, and can respond to changes on demand.



Azure Container Instances: a PaaS offering that runs a container in Azure without the need to manage a virtual machine or additional services.



Azure Kubernetes Service: an orchestration service for containers with distributed architectures and large volumes of containers.

Windows Virtual Desktop

Windows Virtual Desktop is a desktop and app virtualization that runs in the cloud.

- Create a full desktop virtualization environment without having to run additional gateway servers.
- Publish unlimited host pools to accommodate diverse workloads.
- Reduce costs with pooled, multi-session resources.



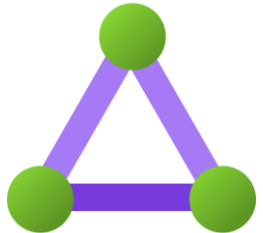
Azure networking services



Azure Virtual Network (VNet) enables Azure resources to communicate with each other, the internet, and on-premises networks.



Virtual Private Network Gateway (VPN) is used to send encrypted traffic between an Azure virtual network and an on-premises location over the public internet.

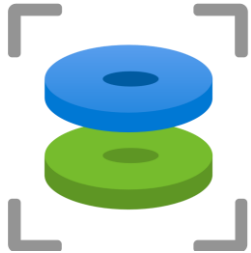


Azure Express Route extends on-premises networks into Azure over a private connection that is facilitated by a connectivity provider.

Azure storage services



Container storage (blob) is optimized for storing massive amounts of unstructured data, such as text or binary data.


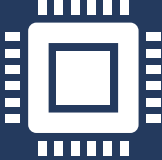



Disk storage provides disks for virtual machines, applications, and other services to access and use.



Azure Files sets up a highly available network file shares that can be accessed by using the standard Server Message Block (SMB) protocol.

Azure storage access tiers

 Hot	 Cool	 Archive
<p>Optimized for storing data that is accessed frequently.</p>	<p>Optimized for storing data that is infrequently accessed and stored for at least 30 days.</p>	<p>Optimized for storing data that is rarely accessed and stored for at least 180 days with flexible latency requirements.</p>

You can switch between these access tiers at any time.

Azure database services



Azure Cosmos Database is a globally-distributed database service that elastically and independently scales throughput and storage.



Azure SQL Database is a relational database as a service (DaaS) based on the latest stable version of the Microsoft SQL Server database engine.



Azure Database for MySQL is a fully-managed MySQL database service for app developers.



Azure Database for PostgreSQL is a relational database service based on the open-source Postgres database engine.

Azure SQL Managed Instance

Azure SQL Managed Instance allows existing SQL Server customers to lift and shift their on-premises applications to the cloud with minimal application and database changes.

- Fully managed and evergreen platform as a service.
- Preserves all PaaS capabilities (automatic patching and version updates, automated backups, and high availability)
- Exchange existing licenses for discounted rates on SQL Managed Instance using the Azure Hybrid Benefit



Explore Azure Marketplace

Azure Marketplace allows customers to find, try, purchase, and provision applications and services from hundreds of leading service providers, which are all certified to run on Azure.

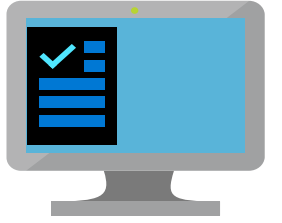
- Open source container platforms.
- Virtual machine and database images.
- Application build and deployment software.
- Developer tools.
- And much more, with 10,000+ listings!



Knowledge Checks (5 min)

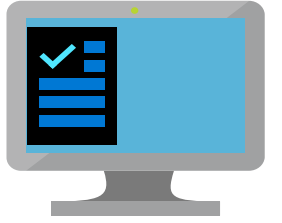


Knowledge Check



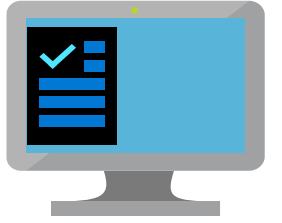
1. Which best describes region? (Choose 3 answers)
 - a) Regions are made up of one or more datacenters in close proximity.
 - b) Collective of datacenters in a single city, country.
 - c) Provide flexibility and scale to reduce customer latency.
 - d) A group of datacenters that belongs to a failure domain .
 - e) Preserve data residency with a comprehensive compliance offering.

Knowledge Check



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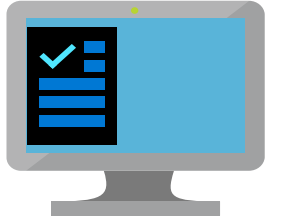
Knowledge Check



2. Which best describes Azure Resource Manager? (Choose 2)

- a) It provides a management layer
- b) It provides a monitoring layer to Azure resources
- c) It enables you to upload resources to extend Azure's functionality
- d) It enables you to create, update, and delete resources in your Azure subscription.

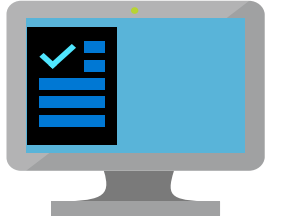
Knowledge Check



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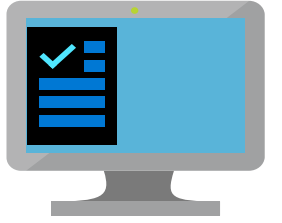
Knowledge Check



Q. Which type of scaling involves adding or removing resources (such as virtual machines or containers) to meet demand?

- a) Vertical scaling
- b) Horizontal scaling
- c) Direct scaling

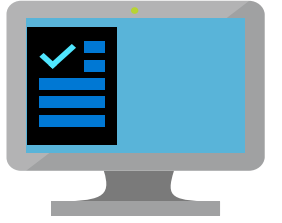
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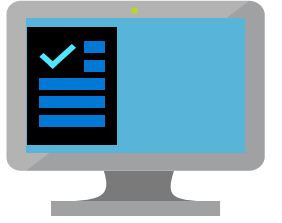
Knowledge Check



Q. What is characterized as the ability of a system to recover from failures and continue to function?

- a) Reliability
- b) Predictability
- c) Scalability

Knowledge Check



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Module 02 Review



Microsoft Learn Modules
(docs.microsoft.com/Learn)

- Microsoft provides more global presence than any other cloud provider with over 60 regions distributed worldwide
- Azure Management tools
- Azure's multiple services (compute, networking, storage, and databases)
- Azure Marketplace