

# AZ-900T0

## Module 02:

### Core Azure services



# Lesson 01: Learning objectives



# Module 2 – Learning objectives

- Understand and describe core Azure architectural components.
- Understand and describe core Azure services and products.
- Understand and describe Azure solutions.
- Understand and describe Azure management tools.

# Lesson 02: Core Azure architectural components



# Regions

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



Worldwide there are 54 regions representing 140 countries

# Region Pairs

- 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).
- Paired regions are members of the same geography – except Brazil.

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

# Geographies

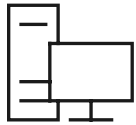
- Discrete markets that preserve data residency and compliance boundaries.
- Typically contain two or more regions.
- Allow customers with specific data-residency and compliance needs to keep their data and applications in close proximity.
- Categorized as Americas, Europe, Asia Pacific, Middle East, and Africa.



# Availability Options

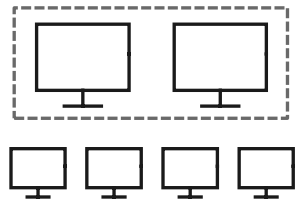
## VM SLA

99.9% with Premium Storage



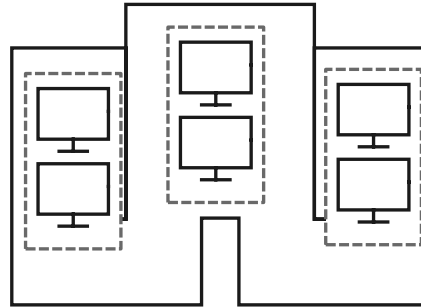
## VM SLA

99.95%

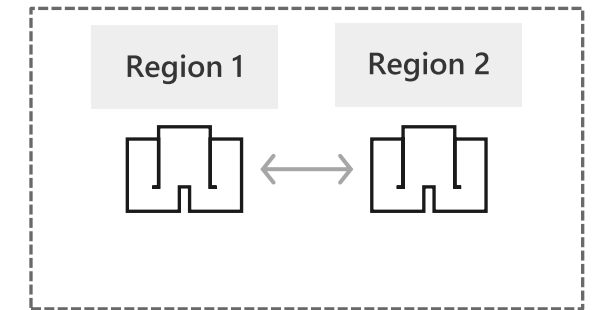


## VM SLA

99.99%



## MULTI-REGION DISASTER RECOVERY



## SINGLE VM

Easier lift and shift

## AVAILABILITY SETS

Protecting against failures within datacenters

## AVAILABILITY ZONES

Protection from entire datacenter failures

## REGION PAIRS

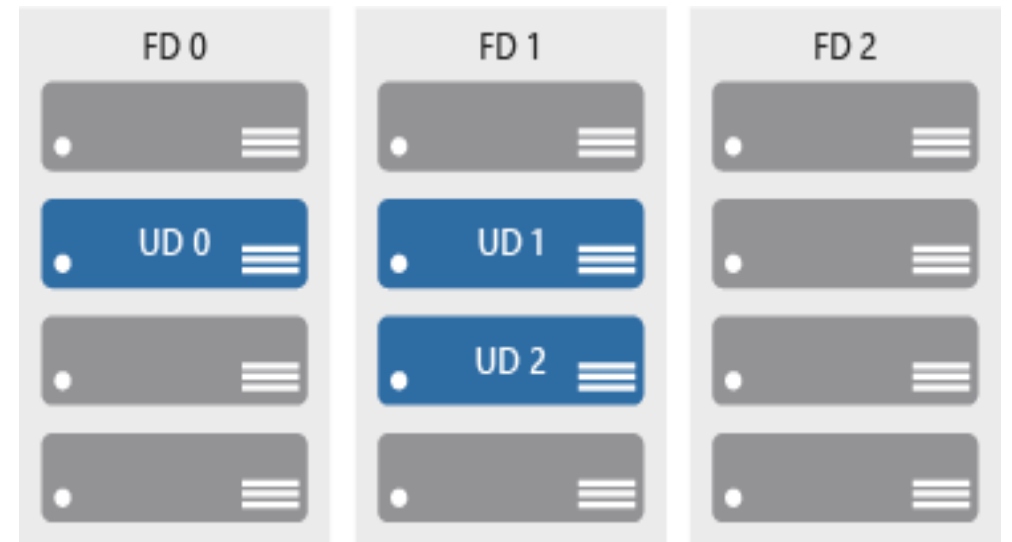
Regional protection within Data Residency Boundaries



# Availability sets

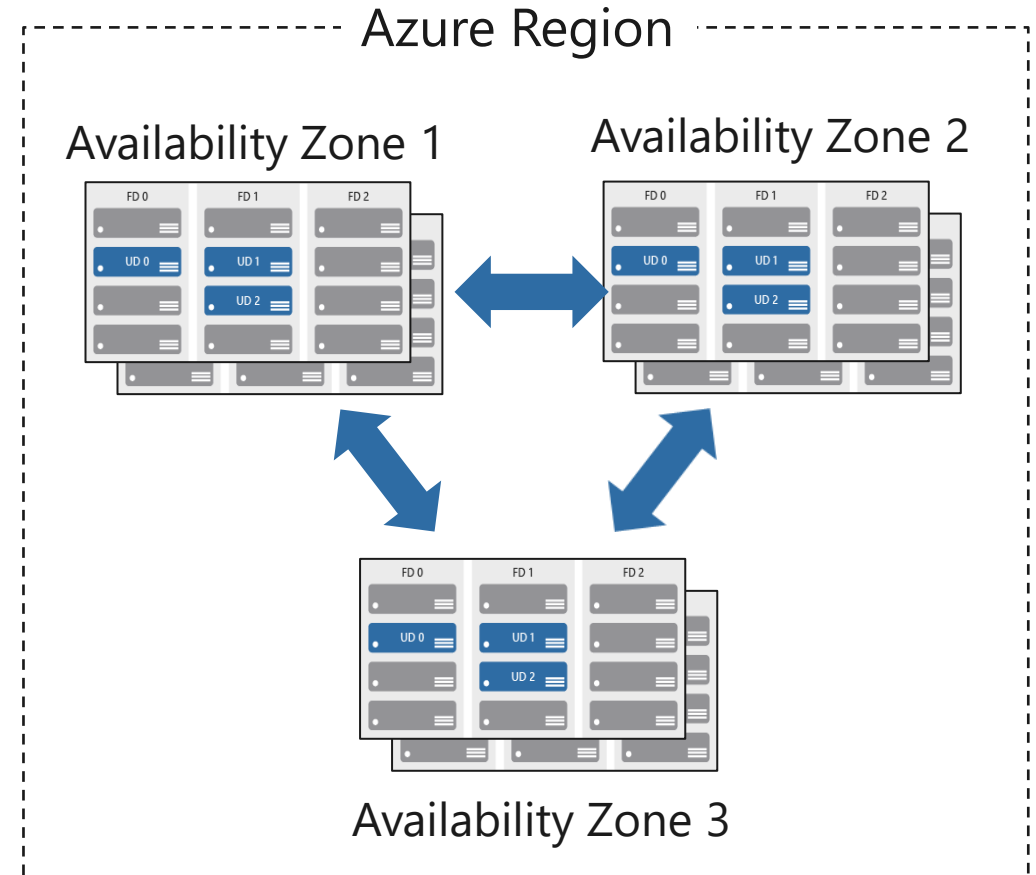
Keep applications online during maintenance or hardware failure.

- **Update domains (UD):** Scheduled maintenance, performance or security updates are sequenced through update domains.
- **Fault domains (FD):** Provide a physical separation of workloads across different hardware in a datacenter.



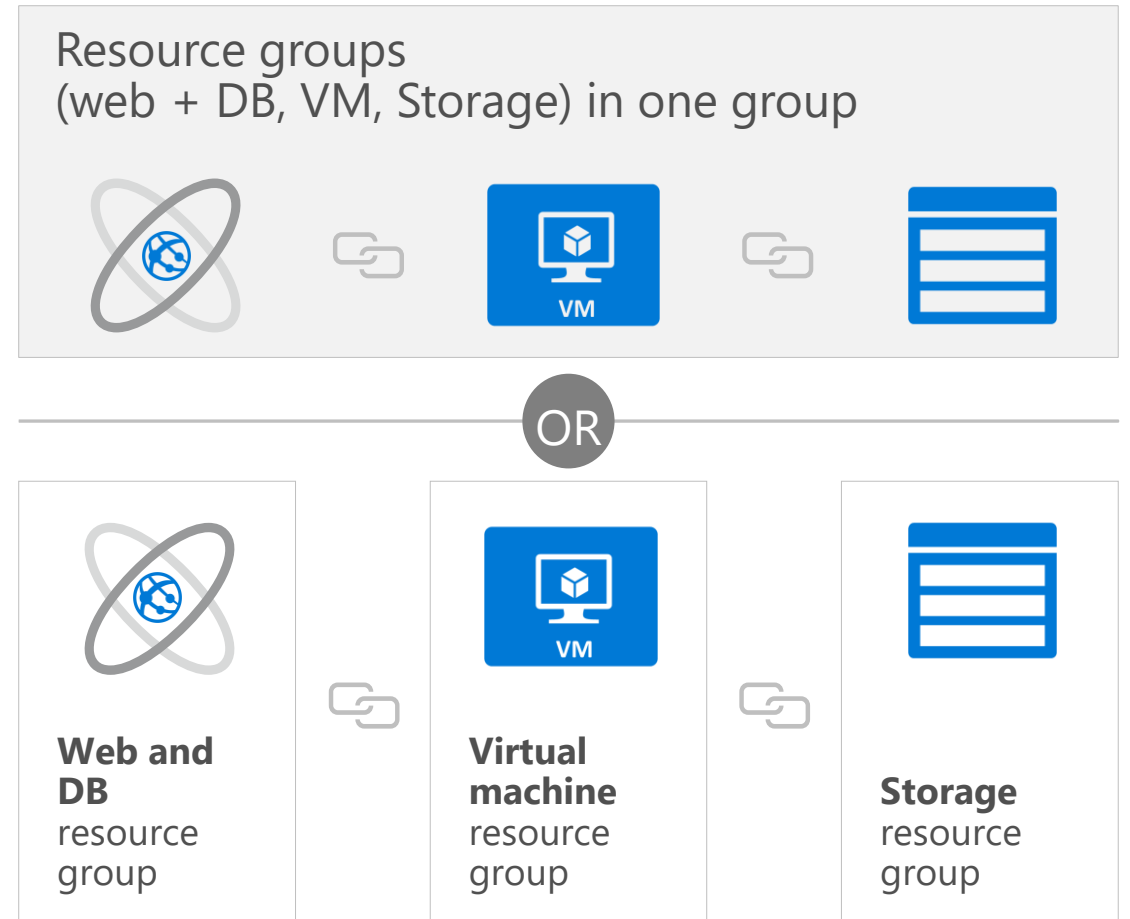
# Availability zones

- 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.



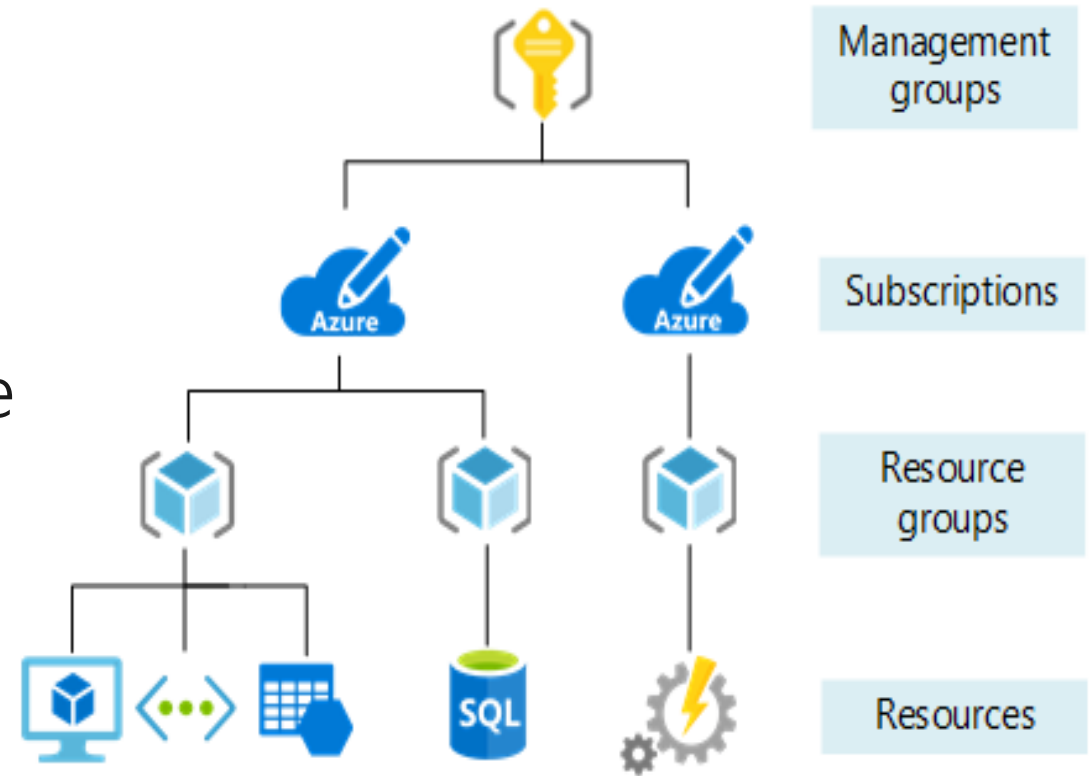
# Resource groups

- 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 Resource Manager

- Provide a management layer that enables you to create, update, and delete resources in your Azure subscription.
- Create, configure, manage and delete resources and resource groups.
- Organize resources.
- Control access and resources.
- Automate using different tools and SDKs.

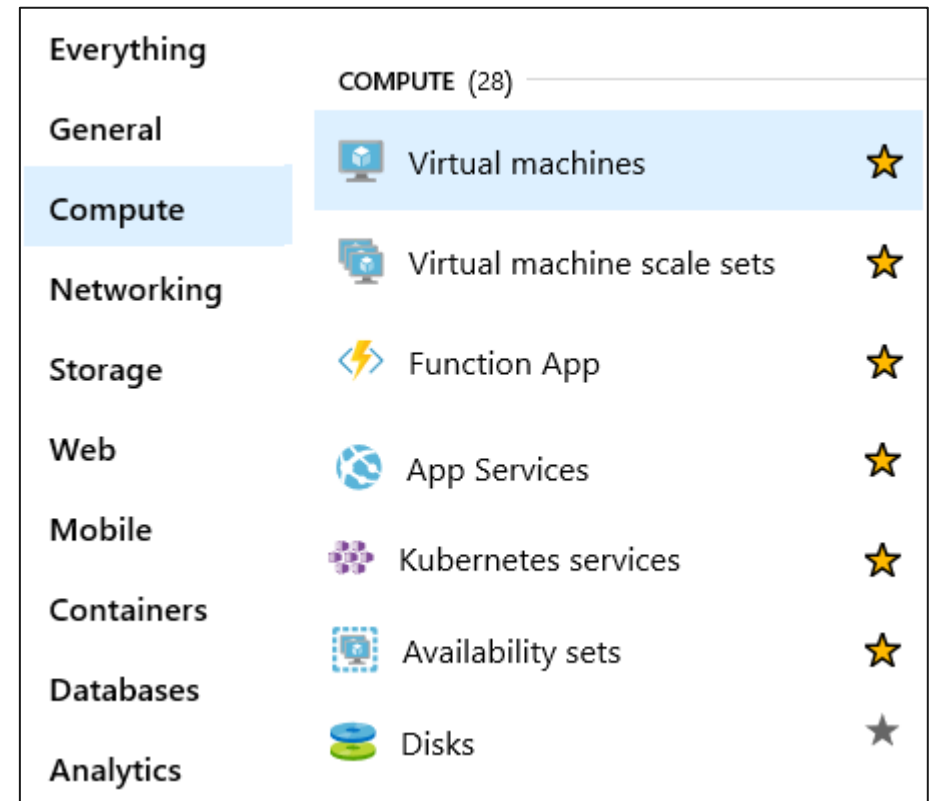


# Lesson 03: Core Azure services and products



# Azure compute

- On-demand computing service for running cloud-based applications.
- Provides computing resources such as disks, processors, memory, networking, and operating systems.
- Makes resources available in minutes or seconds.
- Lots of on-demand services.
- Pay-per-use.



# Azure compute services



- Azure VMs use Infrastructure as a Service (IaaS) to provide computing power in the cloud.



- VM scale sets are designed for automatic scaling of identical VMs.



- App services is a Platform as a Service (PaaS) offering to build, deploy, and scale enterprise-grade web, mobile, and API apps.



- Functions perform compute actions based on an event.

# Container services

*Containers* are a virtualization environment. However, unlike virtual machines, you do not manage an operating system. Containers are meant to be lightweight, and are designed to be created, scaled out, and stopped dynamically.



- **Azure Container Instances:** A PaaS offering that allows you to upload your containers, which it then will run for you.



- **Azure Kubernetes Service:** A container orchestrator service for managing large numbers of containers.



# Azure network services



- Azure Virtual Network provides secure communication between Azure resources.



- Azure Load Balancer automatically scales to create highly-available access to applications or resources.



- VPN Gateway is a platform managed scalable and highly available application delivery controller.



- Azure Application Gateway provides for the management of traffic to web applications.



- Content Delivery Network provides a distributed network of servers that efficiently deliver web content in their local region.

# Azure data categories

	Schema	Data relationships	Examples
<b>Structured data</b>	Adheres to a schema, with the same data fields or properties.	Storable in relational database tables, with rows and columns.	Sensor data and financial data.
<b>Semi-structured data</b>	Has an ad hoc schema with less organized fields and properties.	Non-relational or NoSQL data, not storable in tables, rows and column.	Books, blogs, JSON, HTML documents.
<b>Unstructured data</b>	Has no designated schema or data structure.	Non-relational or blob data, with no restrictions on the kinds of data blobs contain.	PDFs, JPGs, videos.

# Azure storage services

## IaaS

### Disks

- Persistent disks for Azure IaaS VMs.
- Premium Storage.
- Disks option: SSD based, high IOPS, low latency.
- Lift and shift operations.

### Files

- SMB and REST access.
- Access from anywhere.
- Secure access.

## PaaS

### Containers

- Unstructured data – text or binary.
- Block Blobs.
- Page Blobs.
- Append Blobs.

### Tables

- NoSQL data store - structured data.
- Dynamic scaling based on load.
- Scales to petabytes of data.
- Fast key/value lookups.

### Queues

- Store and retrieve messages.
- Highly scalable.
- Messages can be processed asynchronously.

**Built on an unified distributed storage system**

Durability, Encryption at rest, Strongly consistent replication, fault tolerance, auto load-balancing

# Azure database services



- Azure Cosmos DB is a globally-distributed database service that enables you to elastically and independently scale 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 Migration is a fully-managed service designed to enable seamless migrations from multiple database sources to Azure data platforms with minimal downtime.

These are just a few of our database offerings.

# Azure Marketplace

- Connects end users with Microsoft partners, Independent Software Vendors (ISVs), and start-ups that offer solutions and services for Azure.
- Azure customers, IT professionals and cloud developers can find, try, purchase, and provision Azure applications and services from certified service providers.
- Includes close to 10,000 product listings.



# Lesson 04: Azure solutions



# Internet of Things



- Azure IoT Central is a fully-managed global IoT SaaS solution that makes it easy to connect, monitor, and manage your IoT assets at scale.



- Azure IoT Hub is a managed service hosted in the cloud that acts as a central message hub for bidirectional communication between your IoT application and the devices it manages.

These are just two of our IoT offerings. Use the IoT Product Selector to determine which product is best for your situation.

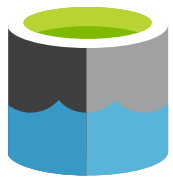
# Big data and analytics



- Azure SQL Data Warehouse is a cloud-based Enterprise Data Warehouse that leverages massively parallel processing to run complex queries quickly across petabytes of data.



- Azure HDInsight is a fully-managed, open-source analytics service for enterprises. It is a cloud service that makes it easier, faster, and more cost-effective to process massive amounts of data.



- Azure Data Lake Analytics is an on-demand analytics job service that simplifies big data. Instead of deploying and tuning hardware, you write queries to transform your data and extract valuable insights.



# Artificial Intelligence



- Azure Machine Learning service provides a cloud-based environment used to develop, train, test, deploy, manage, and track machine learning models.



- Azure Machine Learning Studio is a collaborative, drag-and-drop visual workspace where you can build, test, and deploy machine learning solutions without needing to write code.

# Serverless computing



- Azure Functions is code running your service and not the underlying platform or infrastructure. Creates infrastructure based on an event.



- Azure Logic Apps is a cloud service that helps you automate and orchestrate tasks, business processes, and workflows when you need to integrate apps, data, systems, and services.



- Azure Event Grid is a fully-managed, intelligent event routing service that uses a publish-subscribe model for uniform event consumption.

# DevOps



- Azure DevOps services provides development collaboration tools including pipelines, Git repositories, Kanban boards, and extensive automated and cloud-based load testing.



- Azure DevTest Labs allows you to quickly create environments in Azure while minimizing waste and controlling cost.

# Azure App Service

Quickly and easily build web and mobile apps for any platform or device.

- Multiple languages and frameworks.
- DevOps optimization.
- Global scale with high availability.
- Connections to SaaS platforms and on-premises data.
- Security and compliance.
- Application templates.
- Visual Studio integration.
- API and mobile features.
- Serverless code.

# Lesson 05: Azure management tools



# Azure management tools



- Azure portal



- Azure PowerShell and Azure Command-Line Interface (CLI)



- Azure Cloud Shell



- Azure mobile app



- Azure REST API

# Azure Advisor



- Analyzes your deployed Azure resources and recommends ways to improve availability, security, performance, and costs.
- Get proactive, actionable, and personalized best practice recommendations.
- Improve the performance, security, and availability of your resources.
- Identify opportunities to reduce your Azure costs.