

# AZ-305: Azure Services & Important Topics Guide

Microsoft Azure Solutions Architect Expert Certification

EXAM CODE: AZ-305

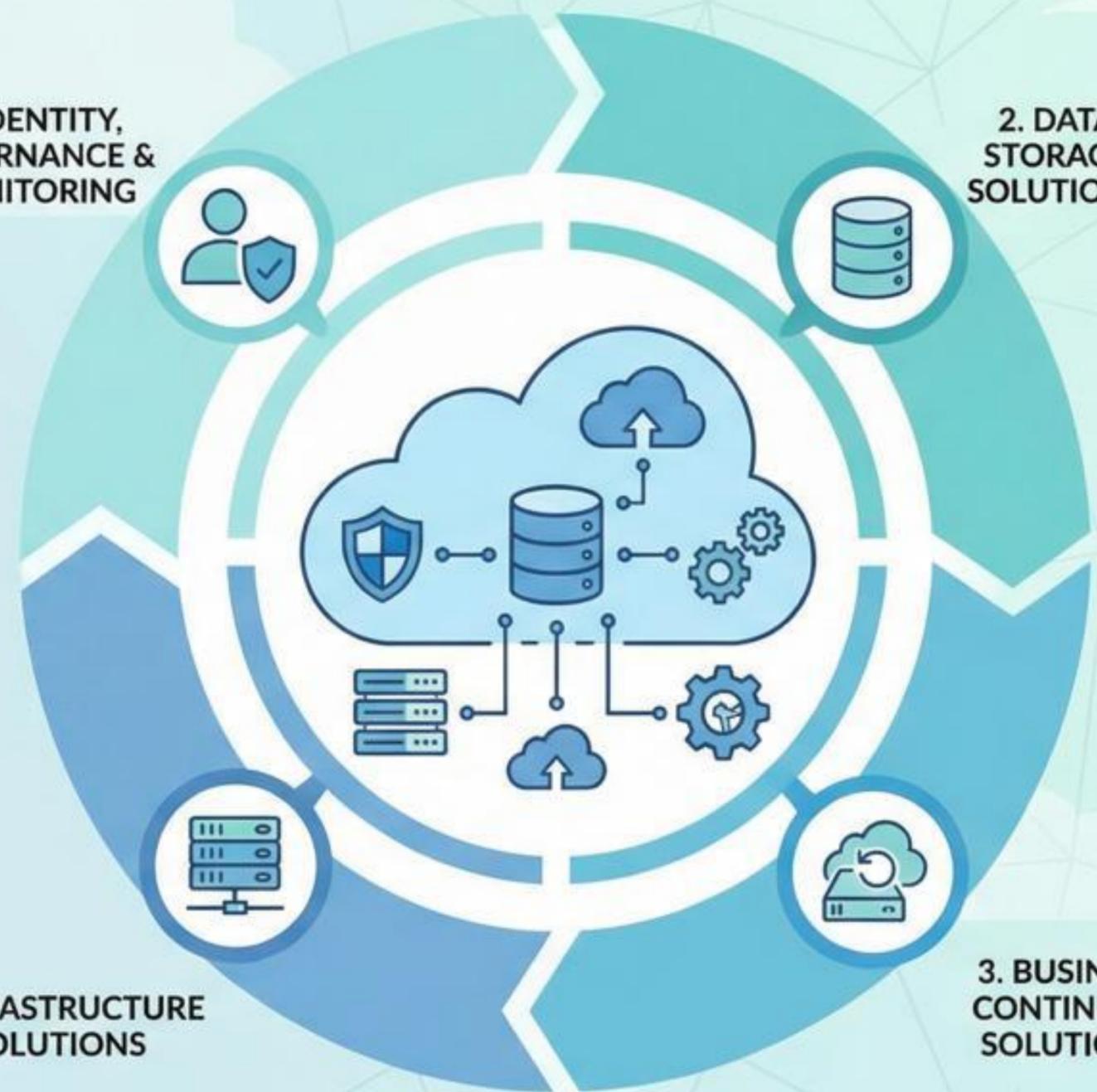
Last Updated: October 18, 2024

1. IDENTITY,  
GOVERNANCE &  
MONITORING

2. DATA  
STORAGE  
SOLUTIONS

3. BUSINESS  
CONTINUITY  
SOLUTIONS

4. INFRASTRUCTURE  
SOLUTIONS



# Presenter

## Mohammed Arif, PhD GenAI Architect & Data Scientist



Mohammed Arif has more than eighteen (18+) years of working experience in Information Communication and Technology (ICT) industry. The highlights of his career are more than nine (9) years of holding various senior management and/or C-Level and had six (6) years of international ICT consultancy exposure in various countries (APAC and Australia), specially on Big Data, Data Engineering, Machine Learning and AI arena.

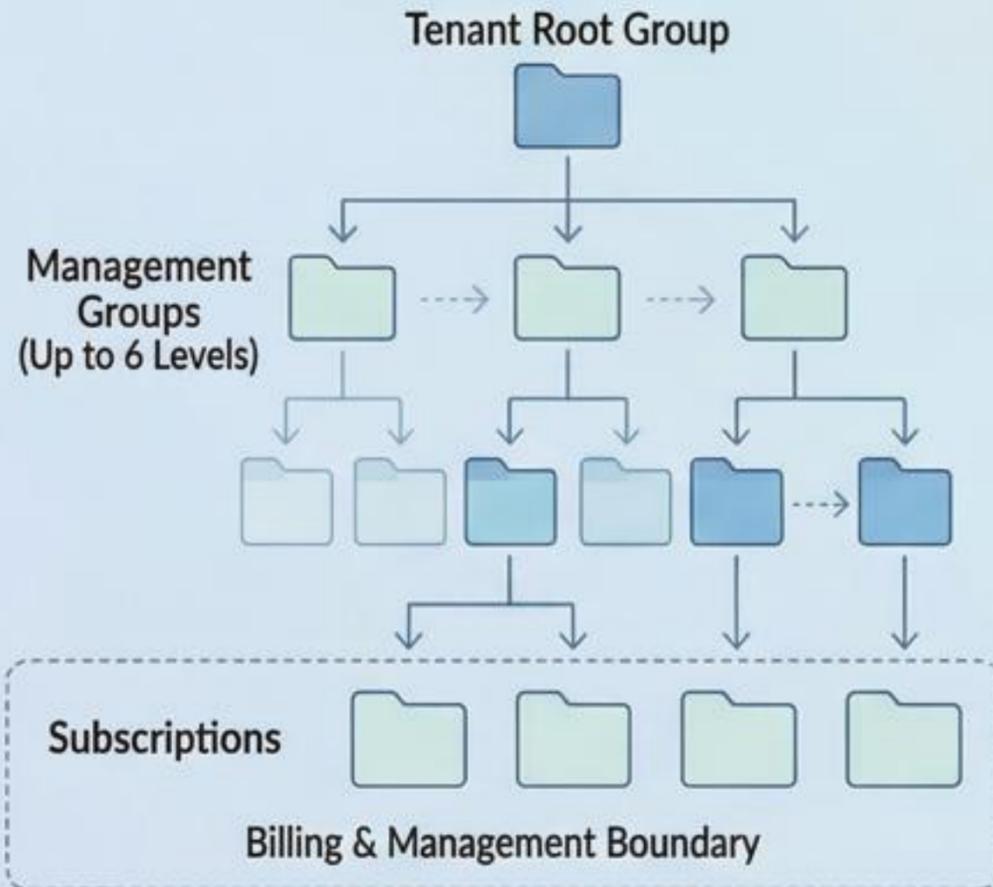
He is also Certified Trainer for Microsoft & Cloudera.



# AZ-305: Azure Governance & Compliance Solutions

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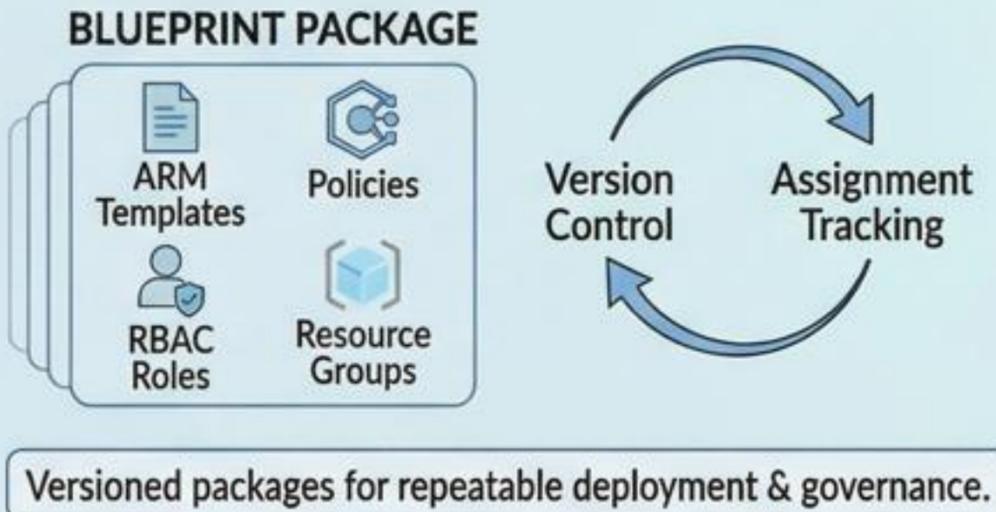
## MANAGEMENT GROUPS & SUBSCRIPTIONS



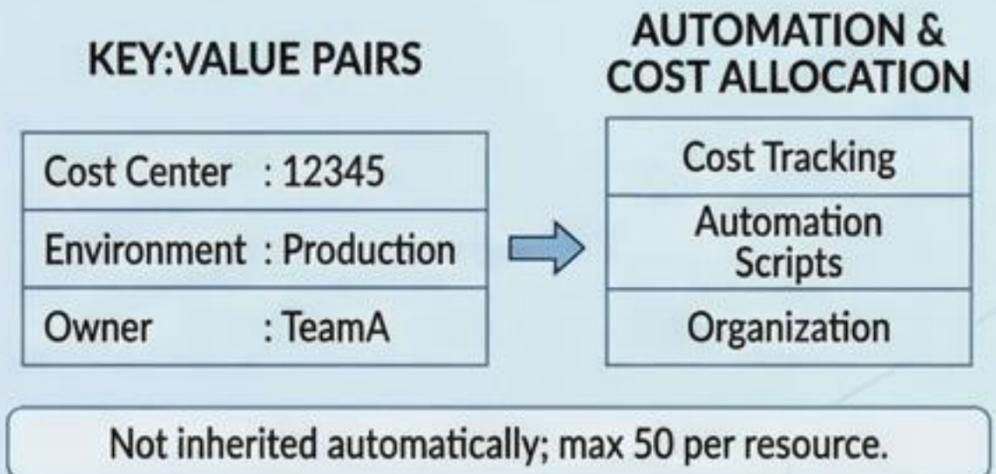
## INHERITED GOVERNANCE & POLICIES

Enforces RBAC and Policy inheritance across hierarchical scopes.

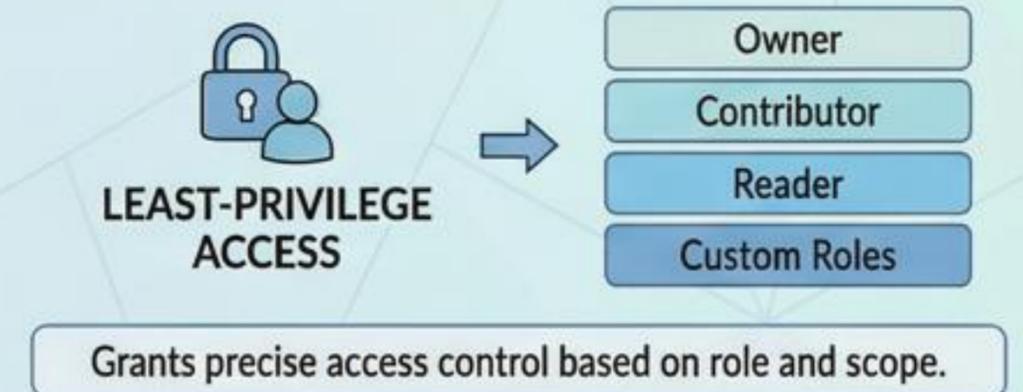
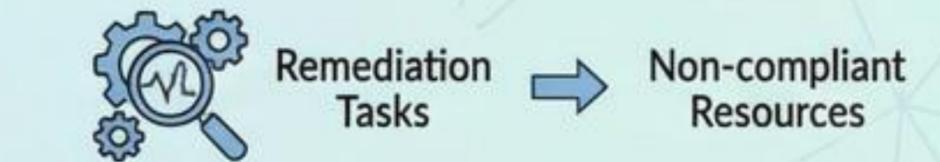
## AZURE BLUEPRINTS



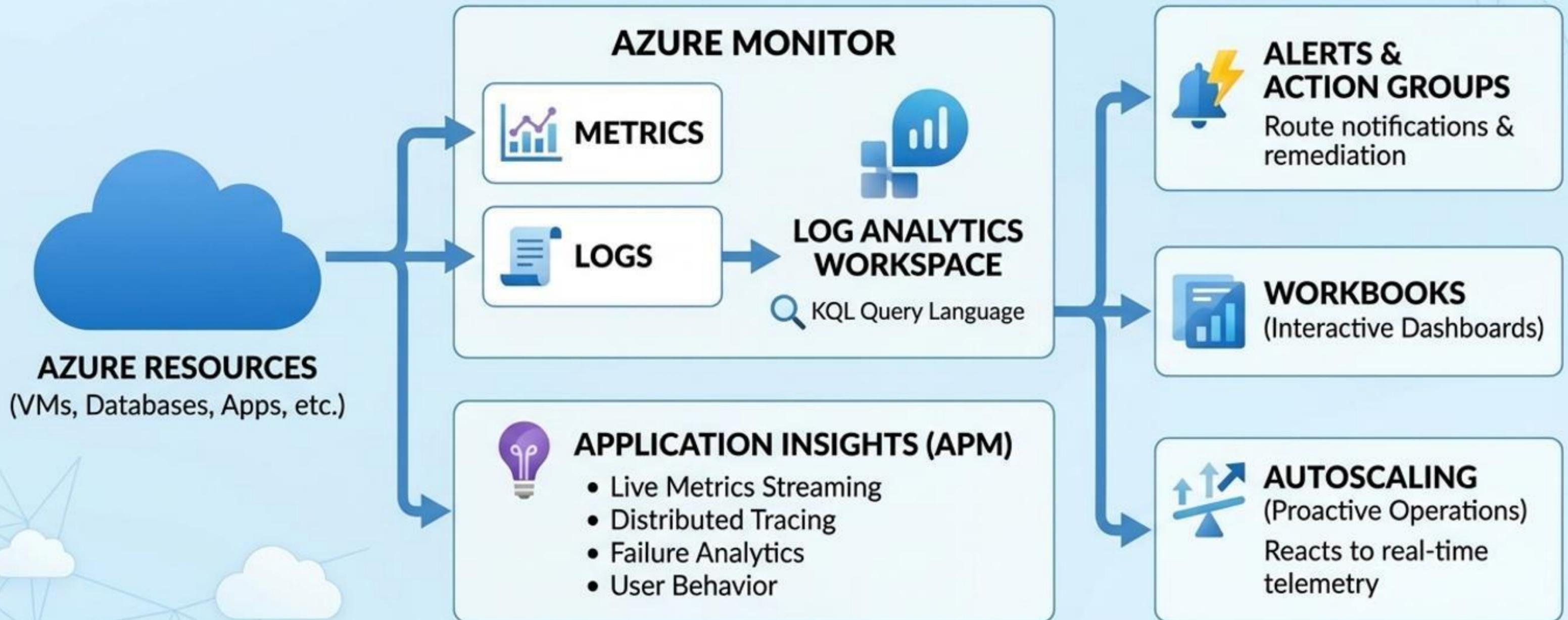
## RESOURCE TAGGING



## POLICY & RBAC



# 1.3 MONITORING SOLUTIONS: AZURE MONITOR & RELATED SERVICES



# 2.1 Relational Data Storage

Fully managed relational database services in Azure, offering high availability, security, and scalability for various workloads.



## Azure SQL Database

- **Fully Managed PaaS:** Single database, Elastic pools, & Managed Instance options.
- **High Availability:** Built-in 99.99% SLA, Point-in-Time Restore (PITR).
- **Advanced Security:** TDE, Always Encrypted, Intelligent Performance Tuning.
- **Elastic Scalability:** Dynamically scale compute and storage.



## Azure SQL Managed Instance

- **Lift-and-Shift Migration:** Near 100% SQL Server compatibility for easy migration.
- **Network Isolation:** VNet integration for secure connectivity.
- **Full Engine Features:** Supports cross-database queries & SQL Agent.
- **Managed Service:** Automated patching, backups, and high availability.



## Azure Database for PostgreSQL & MySQL

- **Fully Managed Open-Source:** Flexible Server deployment option.
- **High Availability:** Zone-redundant HA and automatic backups.
- **Performance & Scale:** Connection pooling, Read Replicas for offloading.
- **Built-in Security:** Advanced threat protection and compliance.

# AZURE STORAGE SOLUTIONS: GPv2 UNIFIED ACCOUNT & CORE SERVICES OVERVIEW



## GPv2 Accounts: Unified Foundation for Azure Storage

Host for all storage types, enabling centralized management, billing, and high-performance options.



### BLOB STORAGE (CONTAINERS)

#### Unstructured Data & Disks

- Block Blobs: Documents, media, backups (up to 4.75 TB).



Lifecycle Management Policies

- Page Blobs: Optimized for VHDs, backing Azure VM disks.



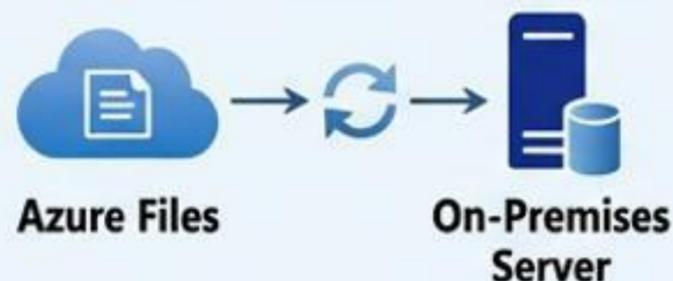
Supports Data Lake Storage Gen2.



### AZURE FILES

#### Managed File Shares & Sync

- Managed SMB & NFS shares, mountable on Windows, Linux, macOS.



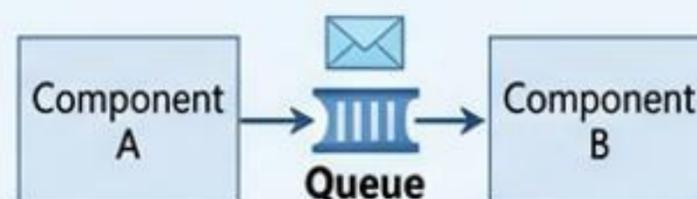
- Azure File Sync for hybrid access and cloud tiering.
- Snapshots for point-in-time recovery.



### QUEUE STORAGE

#### Asynchronous Messaging

- Decouples application components with reliable message queuing.



- Messages up to 64 KB, supports millions for high throughput.



Integration with Azure Functions.



### TABLE STORAGE

#### NoSQL Key-Value Store

- Schemaless design for semi-structured data at low cost.

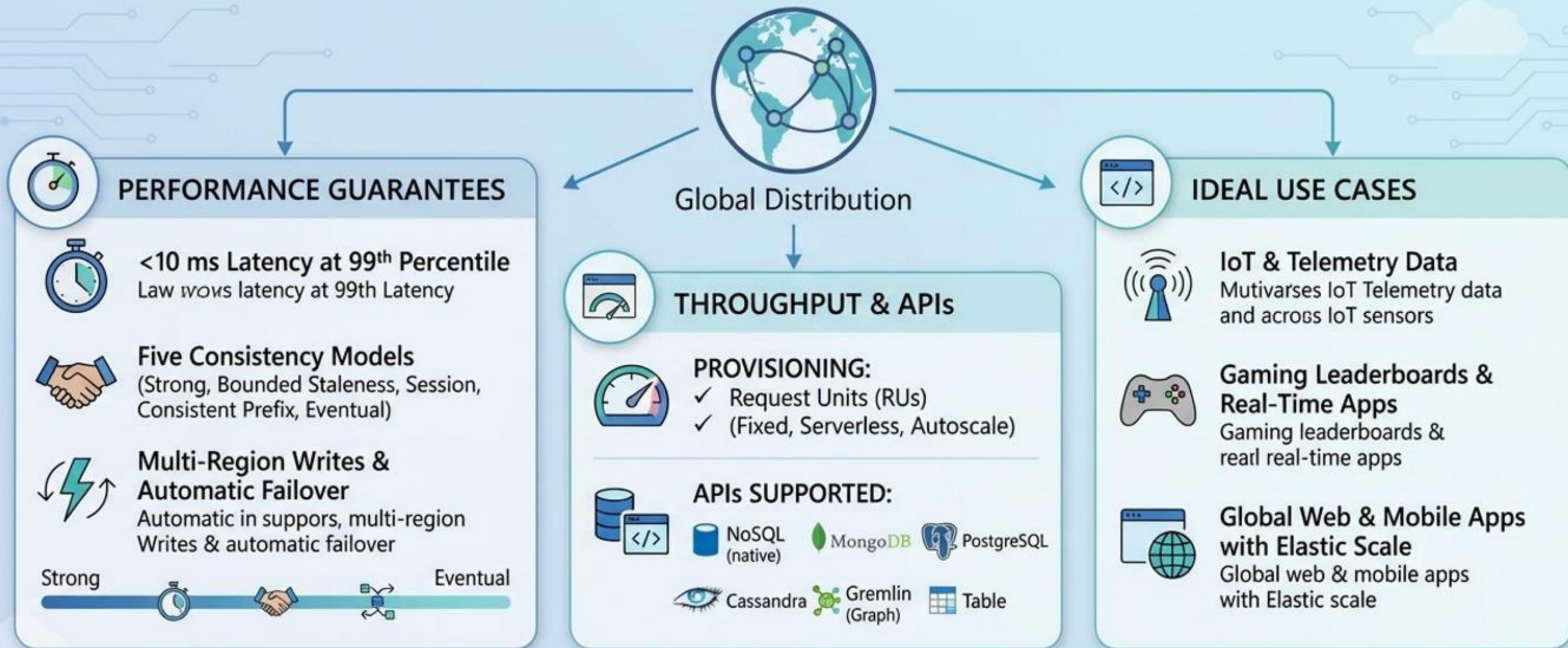
Partition Key	Row Key	Properties
FR	⋮	⋮
FR	⋮	...
FR	{..}	...

- Fast access with partition and row keys for indexing.



Cost-effective for large datasets.

# Azure Cosmos DB: Global, Multi-Model NoSQL



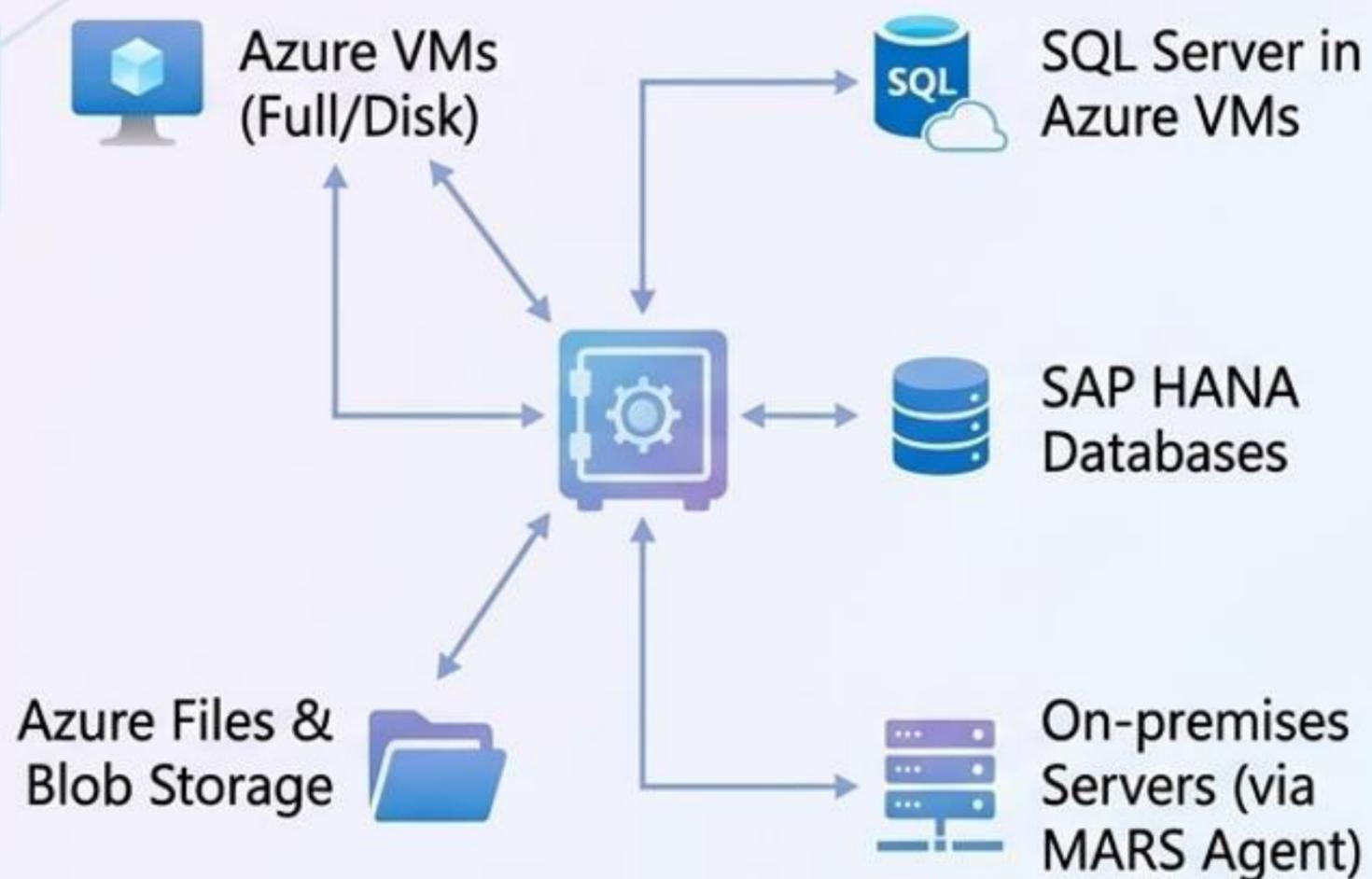
Turnkey global distribution, multi-model support, and instant scalability for demanding applications



# Azure Recovery Services Vault: Centralized Backup & Protection



## CENTRALIZED BACKUP FOR WORKLOADS

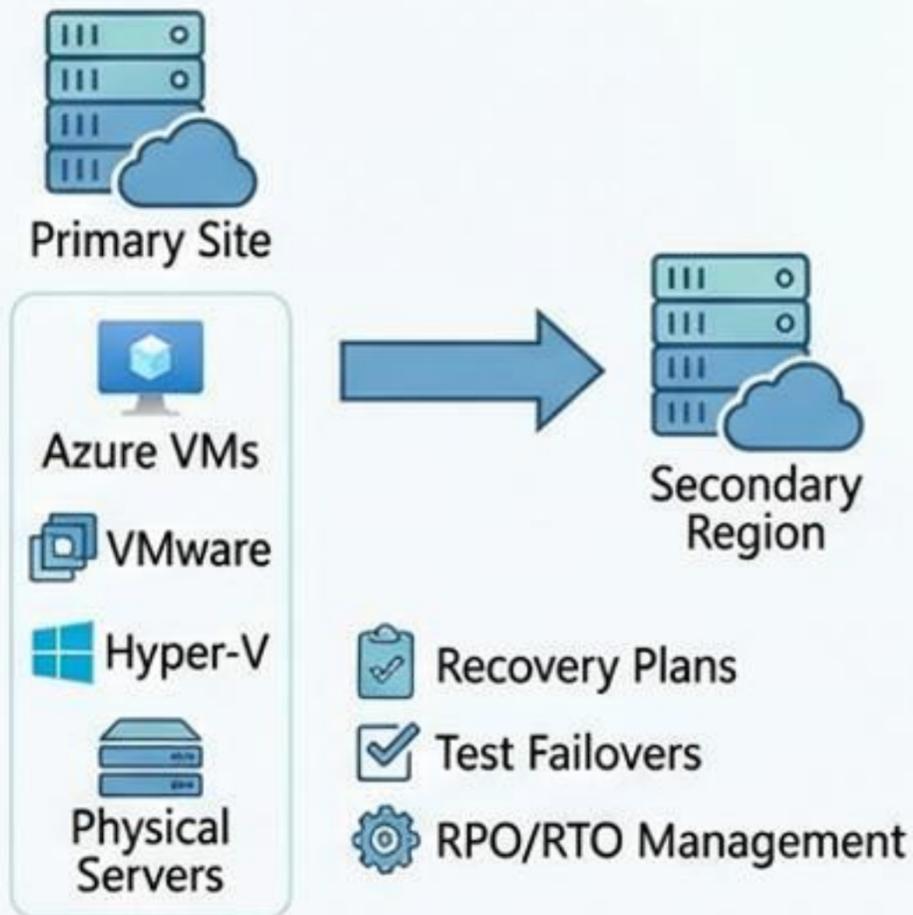


## BACKUP POLICIES & PROTECTION FEATURES

-  Flexible Retention Policies (Daily, Weekly, Monthly, Yearly)
-  Instant Restore Snapshots
-  Geo-Redundant Storage (GRS/RA-GRS)
-  Soft Delete for Accidental Deletion Protection
-  Cross-Region Backup Copy (Safeguards against Outages & Ransomware)

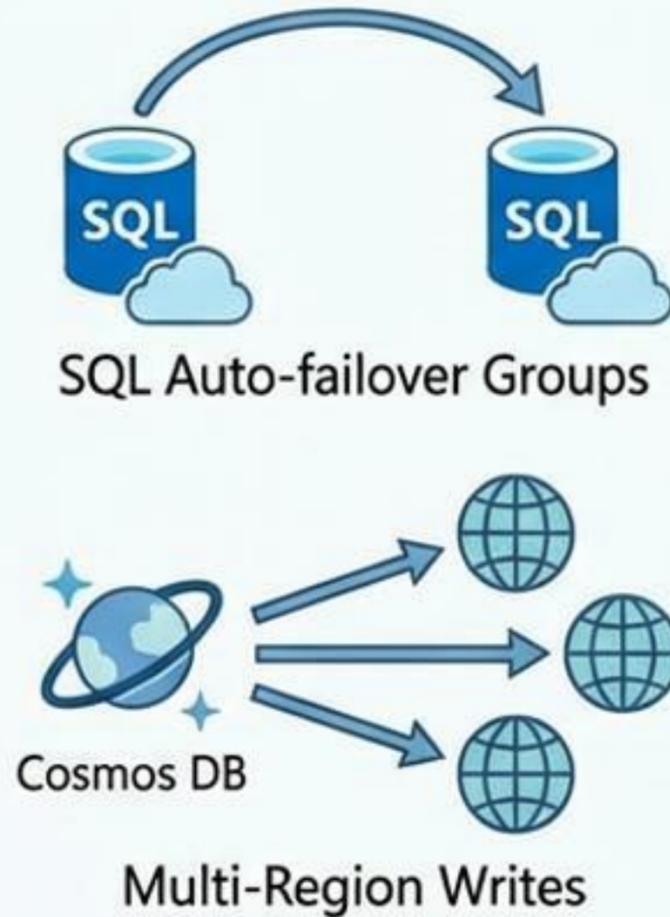
# Disaster Recovery & High Availability Strategies

## Azure Site Recovery



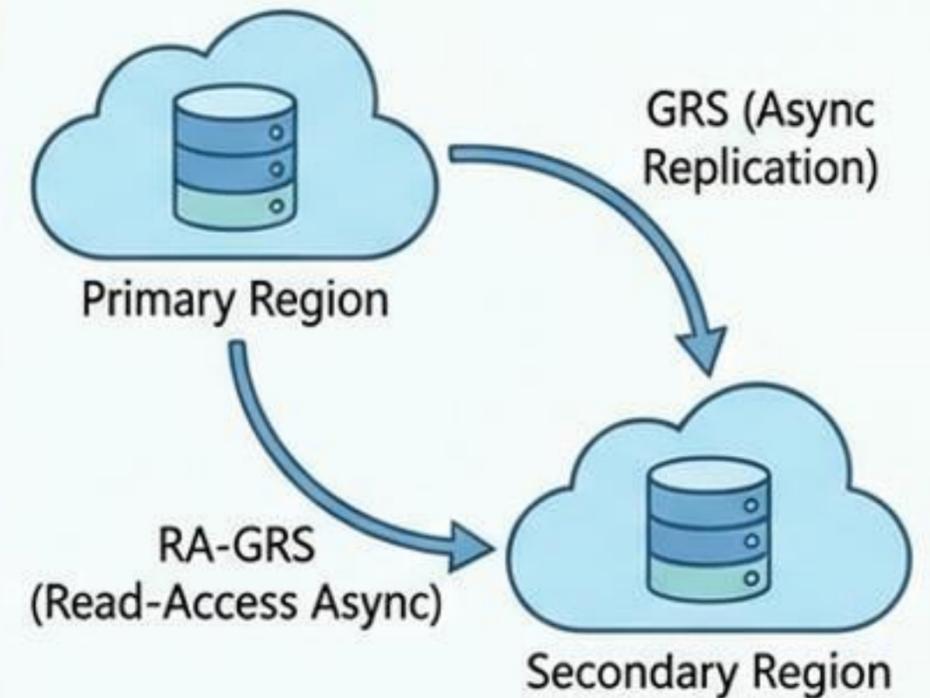
Replicates workloads to secondary regions. Supports customizable plans, non-disruptive testing, and flexible RPO/RTO.

## Database-Level DR



Ensures data resilience for SQL and Cosmos DB. Auto-failover groups and global distribution with multi-region writes.

## Storage Geo-Redundancy



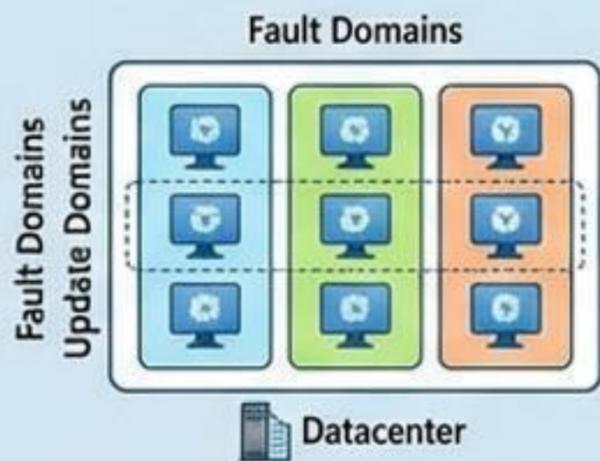
Maintains durable data copies in a secondary region. GRS and RA-GRS provide asynchronous geo-replication for durability.

# Azure High Availability (HA) Strategies & SLAs

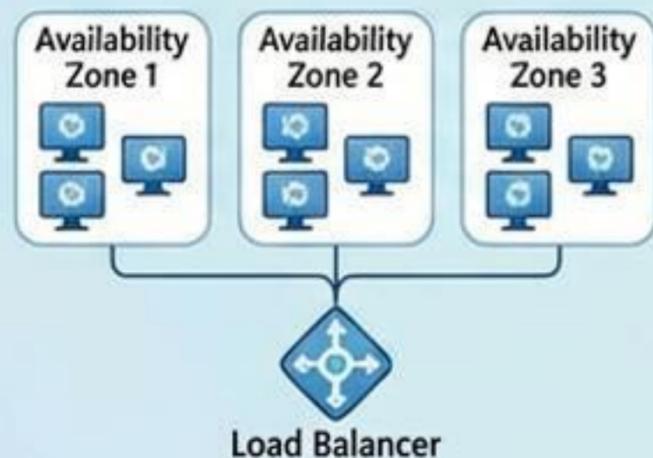


## Compute High Availability

- **Availability Sets (99.95% SLA)**
- **Availability Zones (99.99% SLA)**

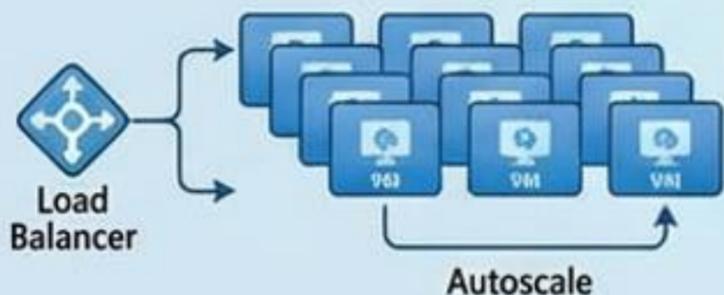


Spanning fault/update domains for resilience within a datacenter.



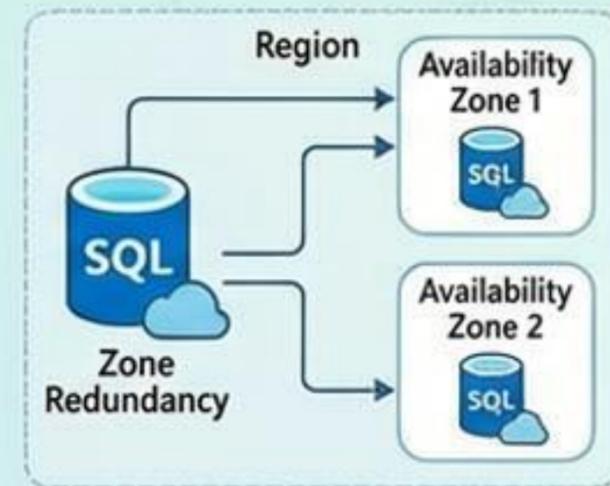
Zone-redundant deployment for protection against datacenter failures.

- **Virtual Machine Scale Sets**  
Autoscale behind load balancers for elastic capacity.

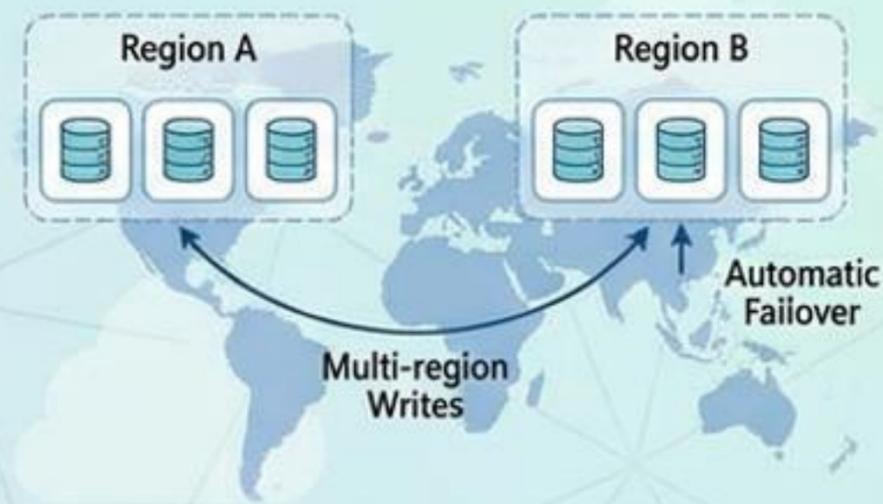


## Data & Database High Availability

- **Azure SQL Database**  
Built-in zone redundancy; compute and data tiers survive zone failures.



- **Azure Cosmos DB**  
Global distribution with multi-region writes and automatic failover.



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## 4.1 Compute Solutions: Azure Virtual Machines & Scale Sets



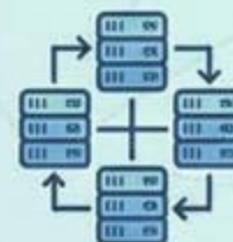
### Azure Virtual Machines (IaaS)

- Full OS control.
-  **Workload Optimization:** General Purpose, Compute Optimized, Memory Optimized, Storage Optimized, GPU.
-  **Managed Disks:** Standard HDD, Standard SSD, Premium SSD, Ultra SSD.



### Virtual Machine Scale Sets (VMSS)

- Deploy up to 1,000 identical VMs.
-  **Autoscaling:** Schedule-based or metric-based.
-  **Load balancer** integration.
-  **Rolling upgrades** support.



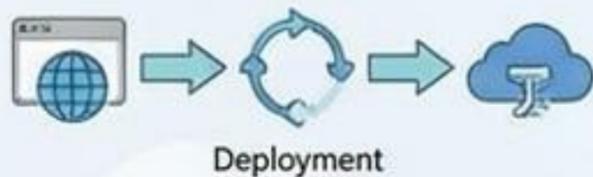
### High-Performance Clusters

- Ideal for stateless, high-performance workloads.
- Achieve **high availability** and **scalability**.

# Azure Compute Services: Web Apps, Serverless, and Containers

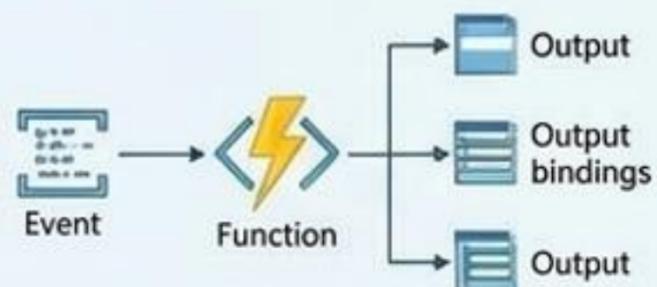
## App Service

- Hosts web apps, APIs, and containers
- Deployment slots for staging
- Custom domains and SSL certificates
- CI/CD integration



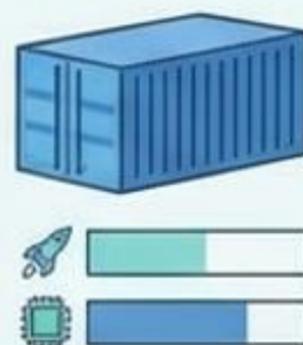
## Azure Functions

- Event-driven execution
- Hosting plans: Consumption, Premium, Dedicated
- Pay-per-execution model



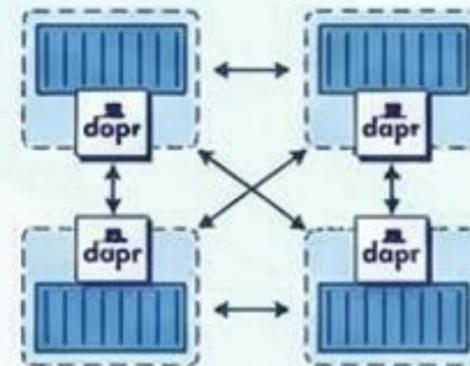
## Container Instances (ACI)

- Fastest way to run containers
- Per-second billing
- Isolated hypervisor-level security
- Custom CPU/memory allocation



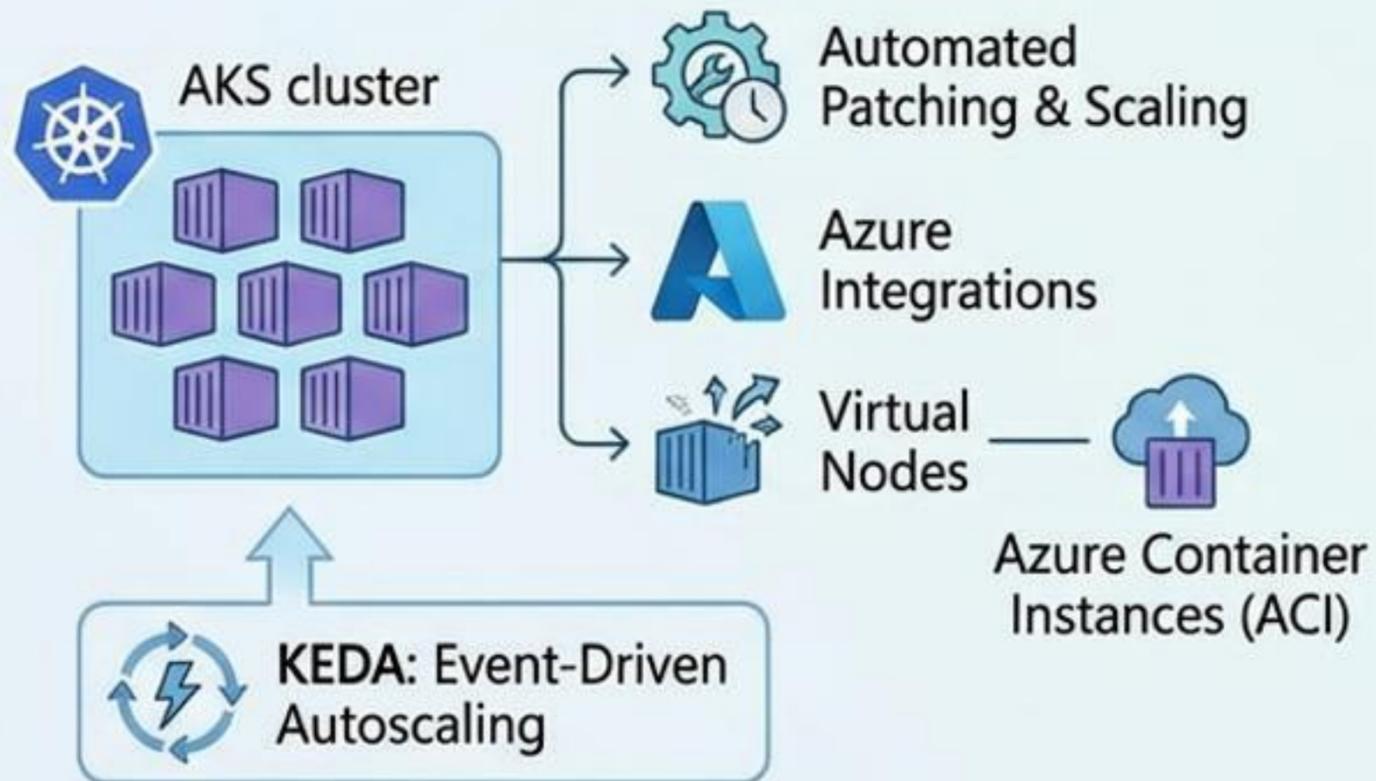
## Container Apps

- Serverless container platform
- Built on Kubernetes, no cluster management
- Dapr integration for microservices
- Automatic scaling to zero
- Built-in load balancing



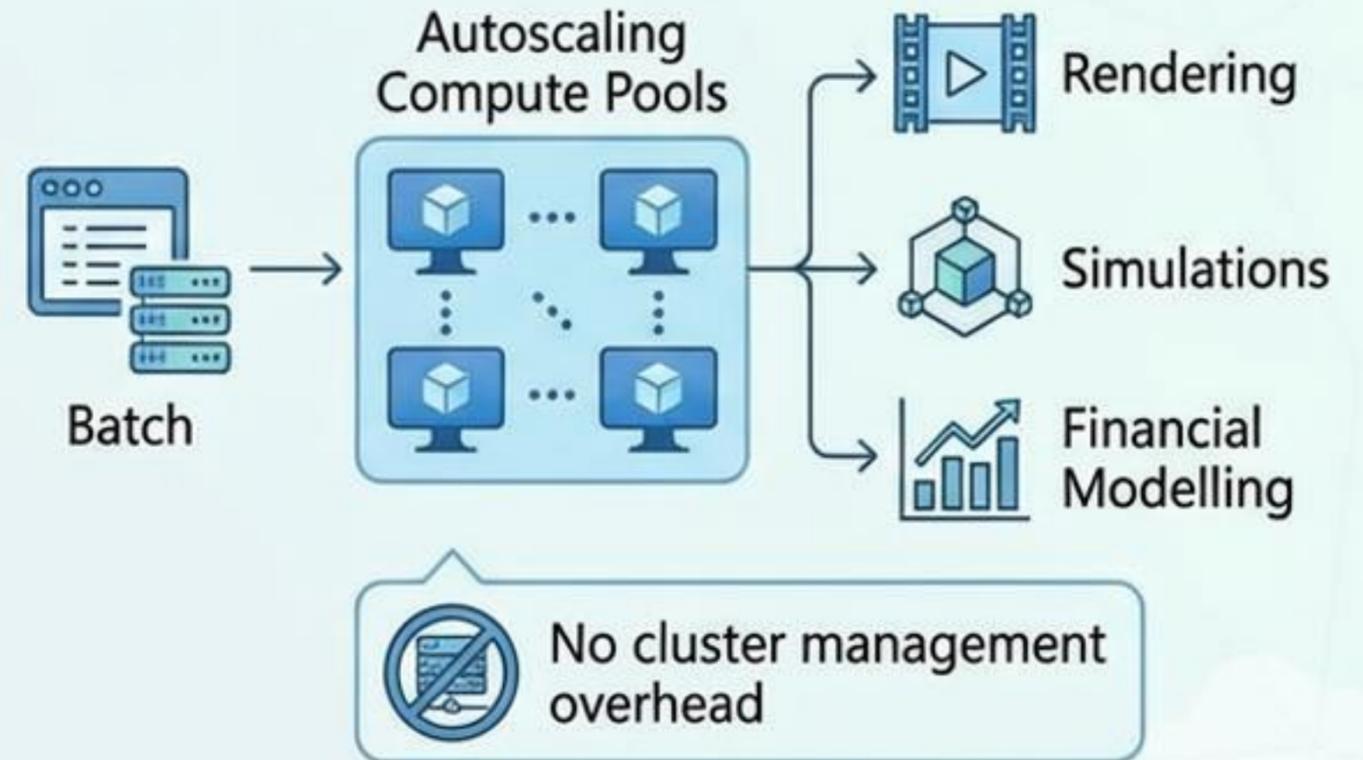
# Infrastructure Solutions: AKS & Batch

## Azure Kubernetes Service (AKS)



Managed Kubernetes, automated patching, scaling, and Azure integrations. Virtual Nodes burst into ACI; KEDA enables event-driven autoscaling.

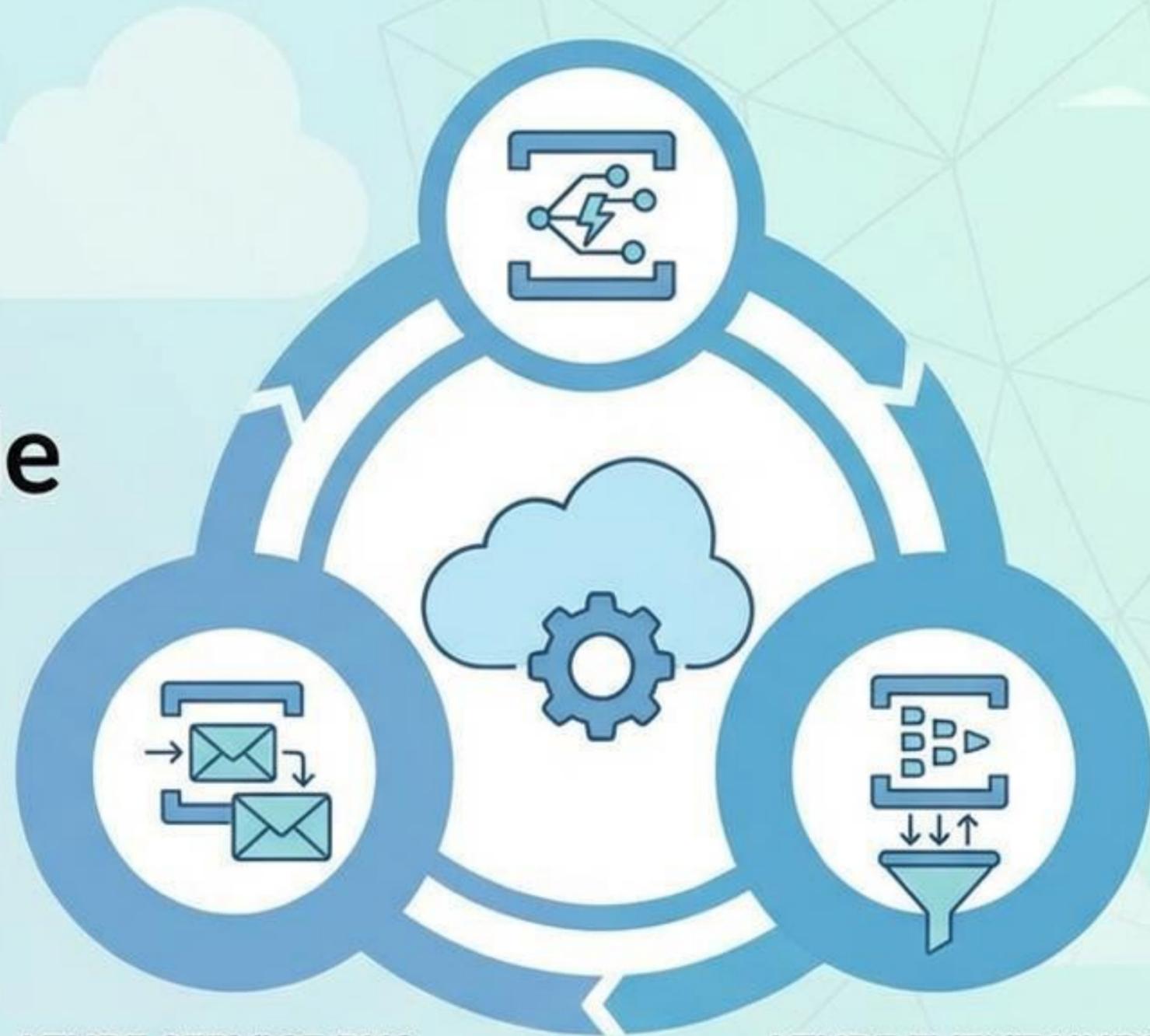
## Azure Batch



Schedules parallel and HPC jobs, autoscaling pools for rendering, simulations, and financial modelling without cluster management overhead.

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## AZURE SERVICE BUS

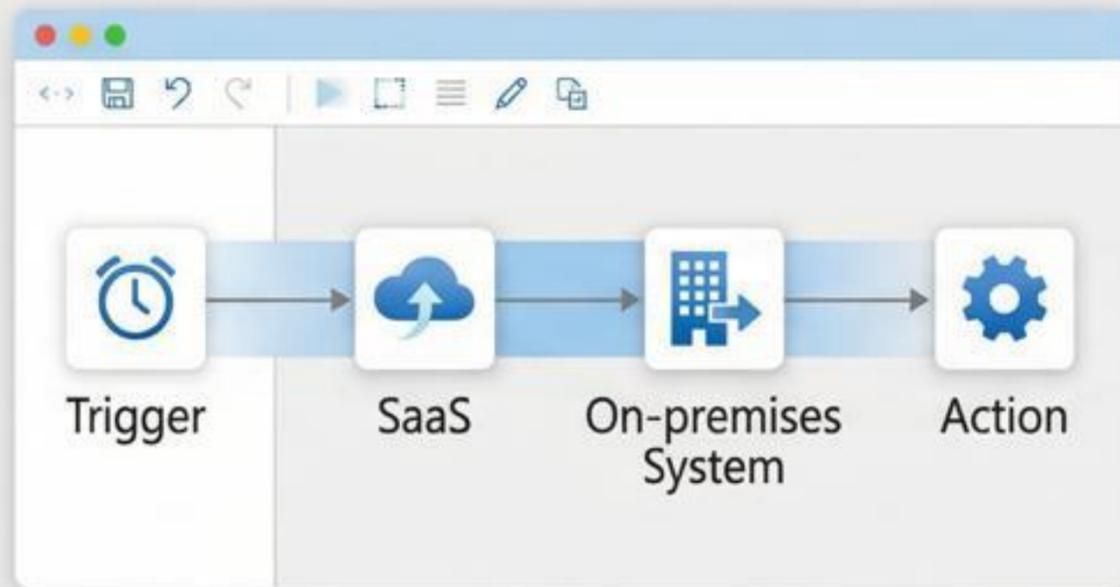
- Event Routing Service
- Azure & Custom Sources
- Subscribers & Filtering
- Retry Policies

## AZURE EVENT HUBS

- Ingests Millions Events/Sec
- Kafka Compatibility
- Capture to Data Lake
- Big Data Streaming

# Azure Logic Apps

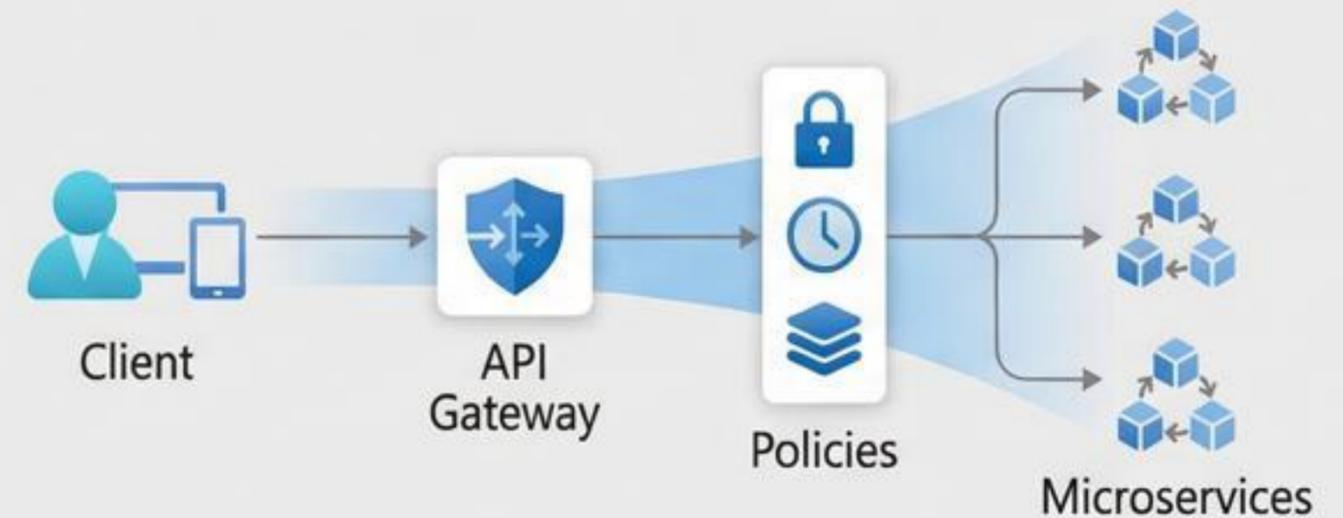
## Automate Business Workflows



-  400+ Connectors to SaaS & On-premises
-  Visual Designer for Workflows
-  Stateful & Stateless Workflows

# Azure API Management

## Fronts Microservices



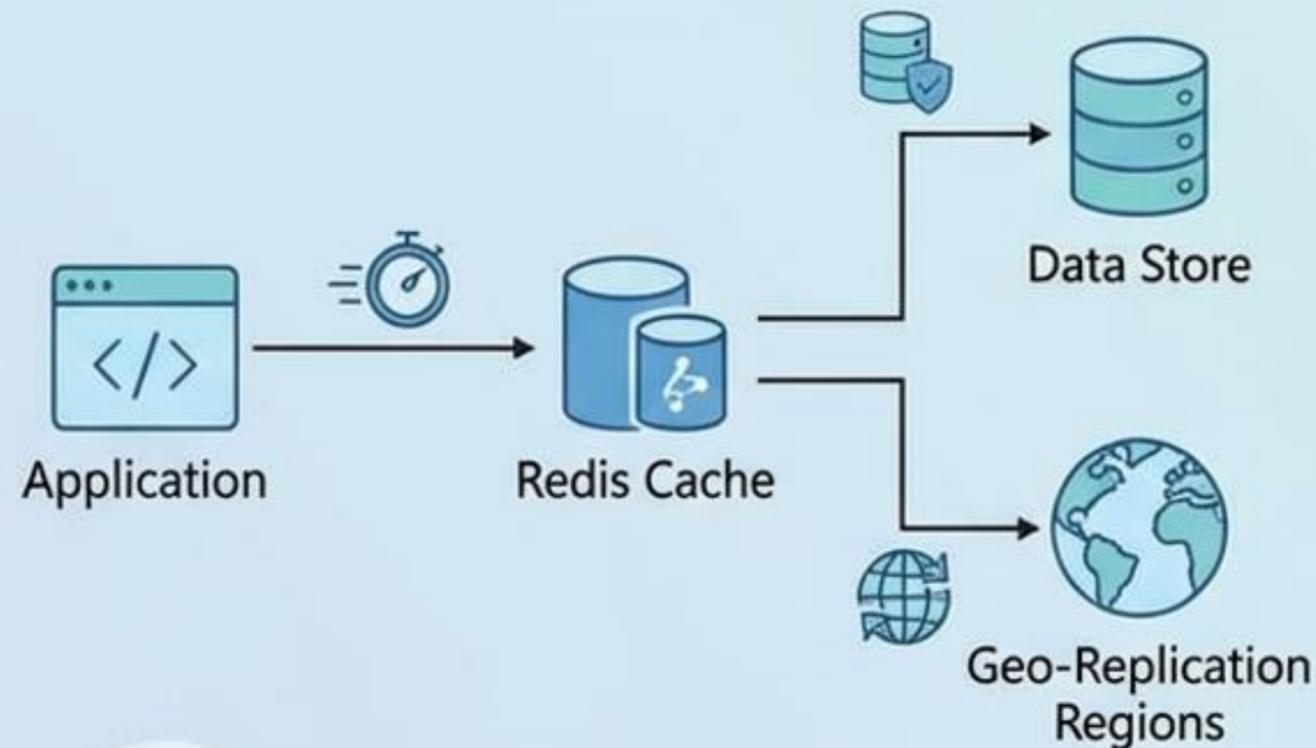
-  Versioning, Rate Limiting, Quotas
-  OAuth/JWT Validation & Caching
-  Developer Portal & Policies
-  Secure Backends

## 4.2 Application Architecture (continued): Cache & Configuration



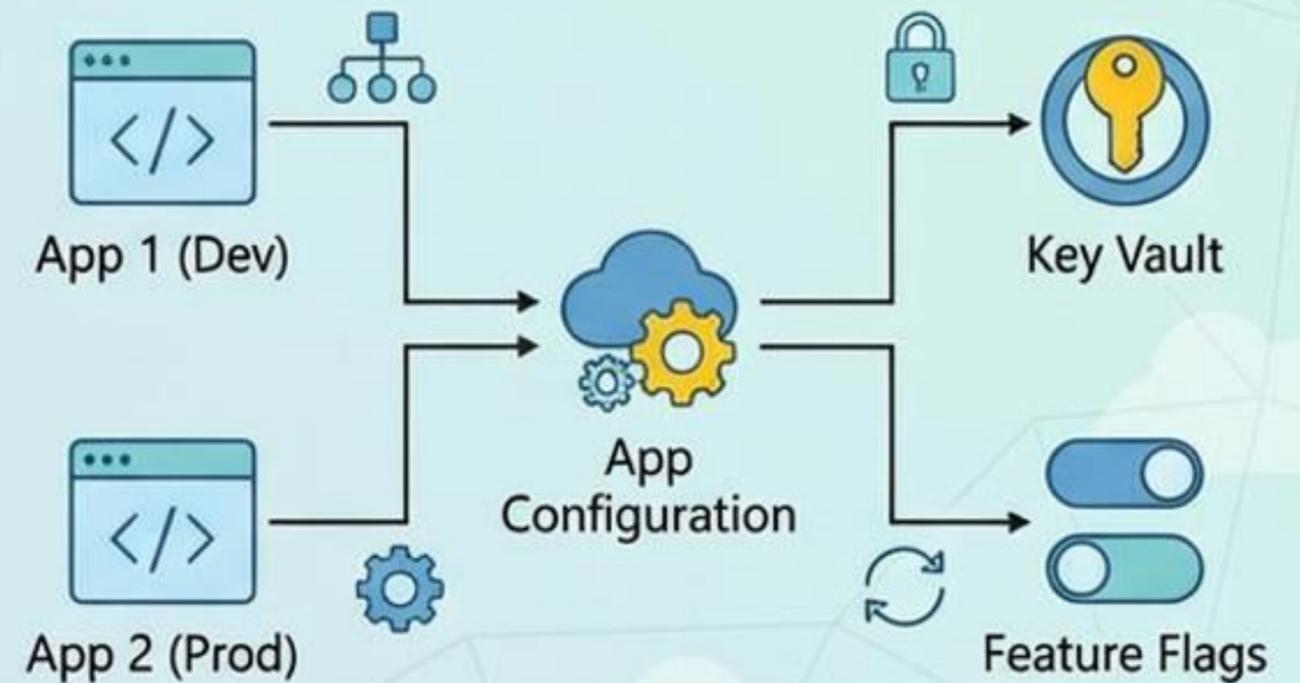
### Azure Cache for Redis

- Accelerates apps with in-memory data structures, persistence, geo-replication, and tiers from Basic to Enterprise cluster.



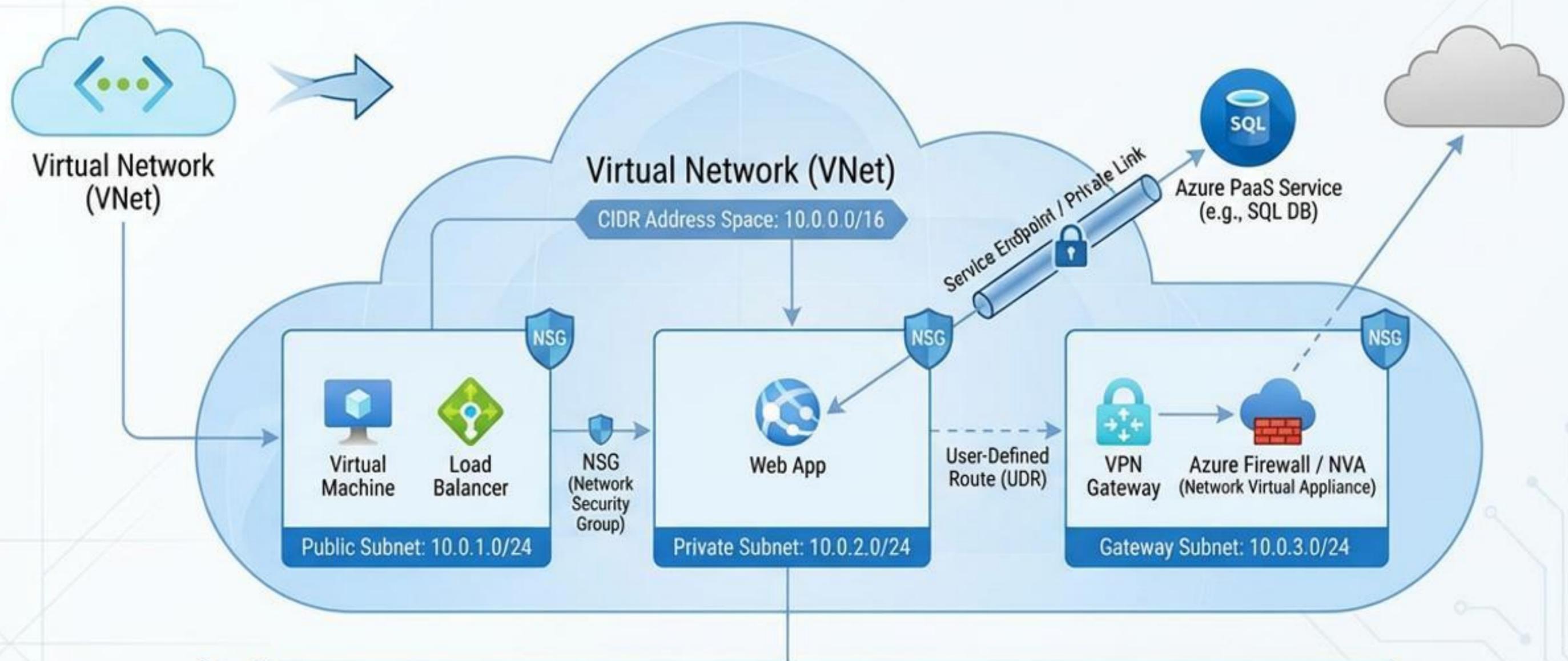
### Azure App Configuration

- Centralizes feature flags and key-values with label-based environments, dynamic refresh, and Key Vault references for secure, consistent application settings.



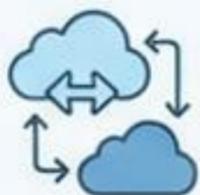
# Azure Networking Solutions: Secure Segmentation & Connectivity

Visualizing VNet Isolation, Private Access, and Zero-Trust Architectures.



  **Zero-Trust Network Architecture & Micro-Segmentation: Securing East-West and North-South Traffic.**

## 4.3 Networking Solutions: Connectivity Options



### VNet Peering

Links networks across regions with low-latency backbone traffic.

- Connect VNets in same/different regions.
- Low latency, high bandwidth.
- No downtime required.
- Traffic stays on Microsoft backbone.
- Global VNet peering.



### VPN Gateway

Delivers encrypted tunnels (S2S, P2S, VNet-to-VNet) up to 10 Gbps with BGP.

- IPsec/IKE encrypted tunnels.
- Site-to-Site (S2S): On-premises to Azure.
- Point-to-Site (P2S): Individual client to Azure.
- VNet-to-VNet: Between Azure VNets.
- Gateway SKUs, Active-active for HA, BGP support.



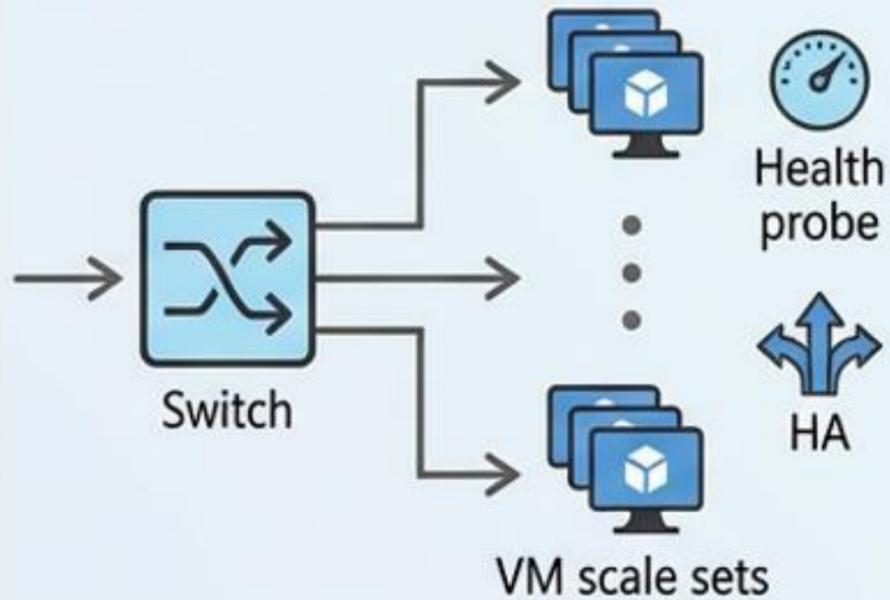
### ExpressRoute

Supplies private dedicated circuits up to 100 Gbps with Global Reach and Microsoft peering.

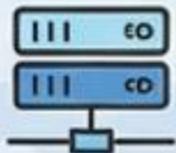
- Private dedicated connection (not internet).
- Higher bandwidth (up to 100 Gbps).
- Lower latency than VPN.
- Private and Microsoft peering (for Office 365).
- ExpressRoute Direct and Global Reach.

# Azure Load Balancing Solutions: Layer-4, Layer-7, and Global

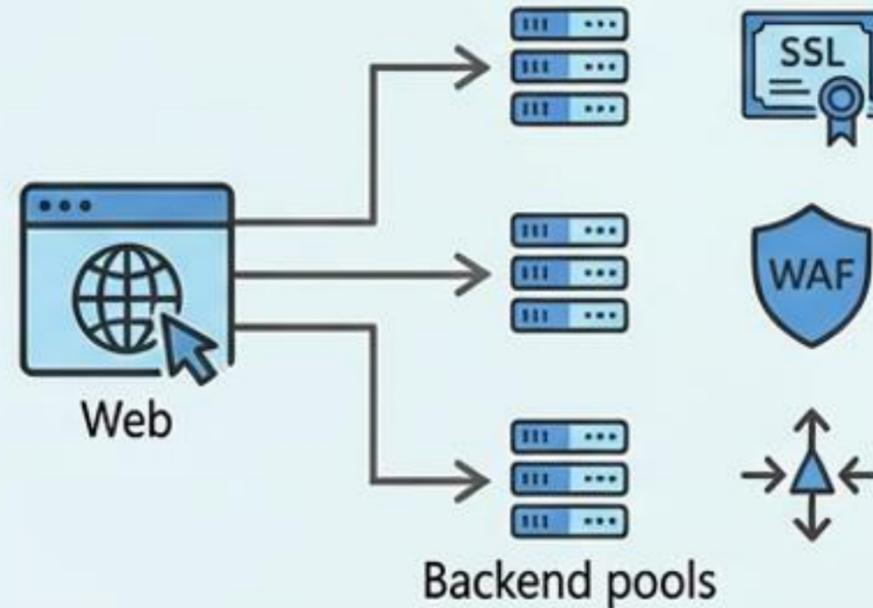
## Azure Load Balancer (Layer-4)



- Distributes TCP/UDP traffic
- Health probes & HA ports
- Regional scope



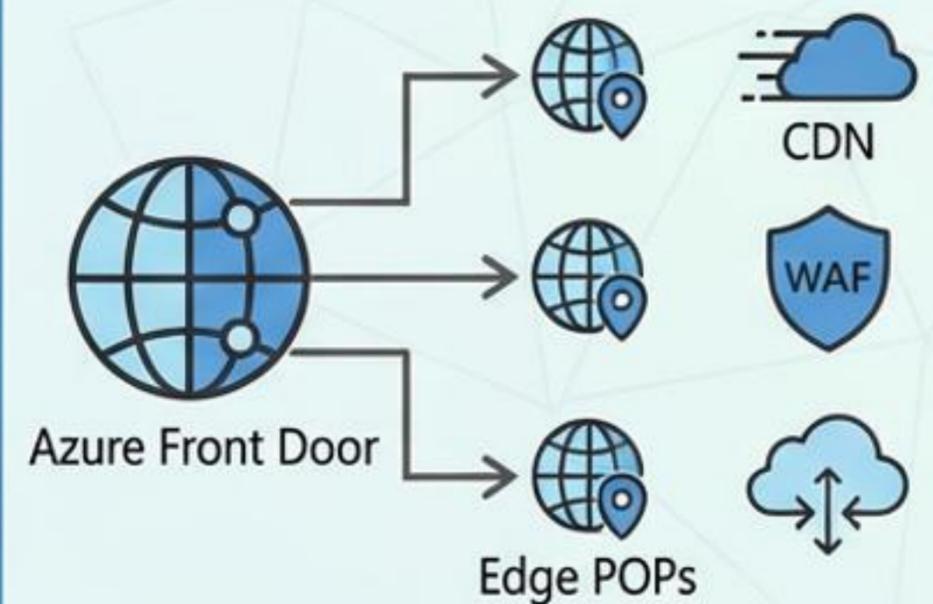
## Application Gateway (Layer-7)



- URL-based routing
- SSL offload & WAF
- Regional, with autoscaling



## Azure Front Door (Global HTTP)



- Anycast HTTP load balancing
- CDN caching & WAF at edge
- Global low-latency failover



# Azure Network Security: Core Services & Features

## Azure Firewall



- Filters outbound & inbound flows
- FQDN tags & threat intel
- SNAT & DNAT support



## NSGs & ASGs



- NSGs: 5-tuple rules (Src IP, Dst IP, Ports, Protocol)
- Applied to subnets or NICs
- ASGs: Group VMs logically



## DDoS Protection



- DDoS Protection Standard
- Mitigates volumetric attacks
- Cost protection included



## Azure Bastion

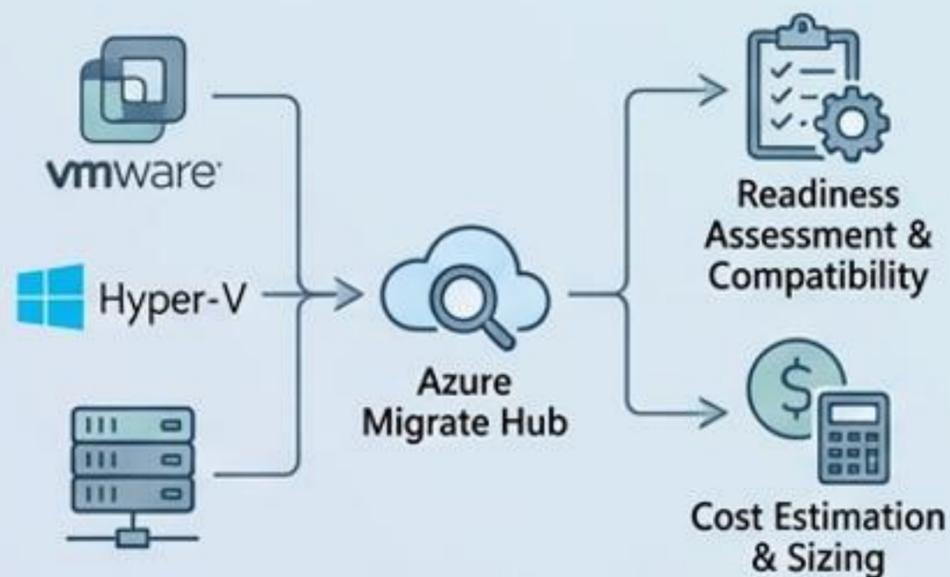
- Secure browser-based RDP/SSH
- No public VM IPs needed
- Integrated into VNet



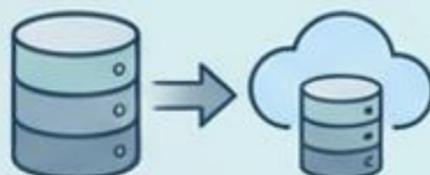
# 4.4 Migration Solutions: Streamlining Your Path to Azure



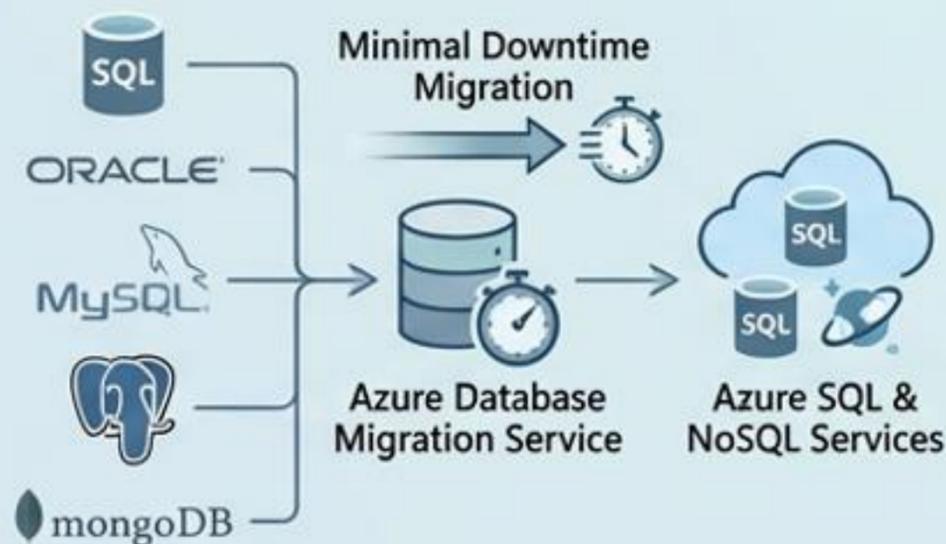
## Azure Migrate: Discovery & Assessment



Discovers and assesses on-premises VMware, Hyper-V, and physical servers for Azure readiness and cost.



## Azure Database Migration Service: Minimal Downtime



Performs minimal-downtime migrations from SQL Server, Oracle, MySQL, PostgreSQL, and MongoDB.



## Azure Data Box: Offline Large Data Transfer



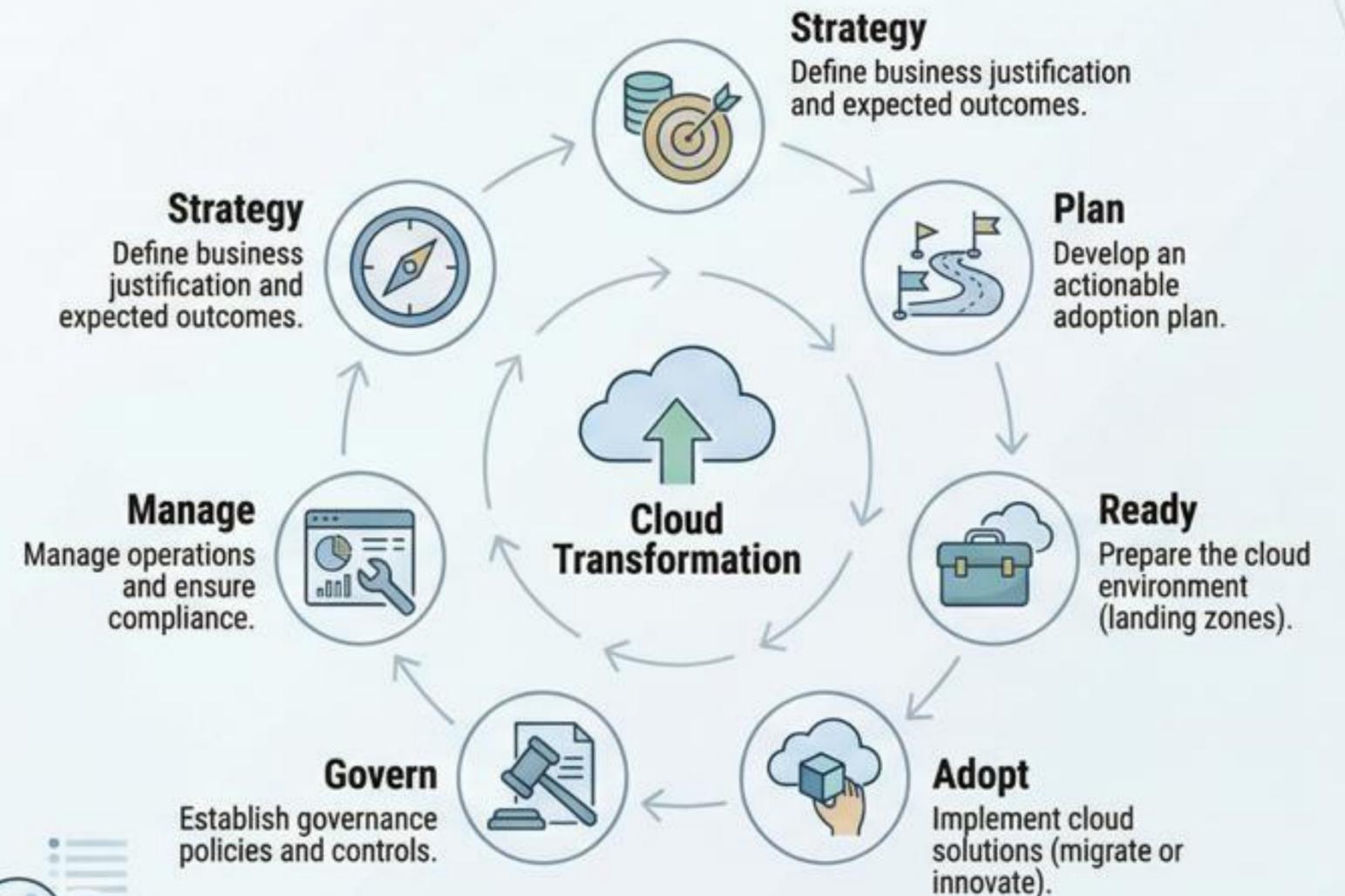
Ships encrypted TB–PB datasets offline when network transfer is impractical.

# Azure Frameworks: Well-Architected & Cloud Adoption

## 5.1 Azure Well-Architected Framework



## 5.2 Cloud Adoption Framework (CAF)



# AZ-305: Additional Important Topics - Cost & Security

## 5.3 COST MANAGEMENT



**Budgets & Alerts:** Track spend, set thresholds, receive notifications



**Reserved Instances:** Pre-purchase compute for significant discounts



**Spot VMs:** Access unused capacity at deep discounts



**Azure Advisor:** Rightsizing recommendations & savings opportunities

## 5.4 SECURITY BEST PRACTICES



### Microsoft Defender for Cloud:

- Cloud Security Posture Management (CSPM) & Workload Protection (CWPP)
- Secure Score & Compliance Dashboard
- Threat Detection & Alerts across Hybrid Resources



### Azure Sentinel:

- Cloud-native SIEM & SOAR
- AI-powered Analytics for Threat Detection
- Automated Incident Response Playbooks

# KEY DESIGN PRINCIPLES: Decision Criteria for Azure Services



## Compute Solutions



### Choose Virtual Machines when:

- Full OS control
- Legacy apps
- Specific software needs



### Choose App Service when:

- Web apps/APIs
- Managed PaaS
- No OS access needed



### Choose Azure Functions when:

- Event-driven
- Short tasks
- Serverless
- Pay-per-execution



### Choose Containers (ACI/AKS) when:

- Microservices
- Portability
- Orchestration needed



## Storage Solutions



### Choose Blob Storage when:

- Unstructured data (images, videos)
- Data Lake
- Content delivery



### Choose Azure Files when:

- Lift-and-shift apps
- SMB protocol
- Cross-platform sharing



### Choose SQL Database when:

- Relational data
- ACID
- Complex transactions
- SQL Server compatibility



### Choose Cosmos DB when:

- Global distribution
- Low latency
- Multi-model
- Massive scale



## Networking Solutions



### Choose VPN Gateway when:

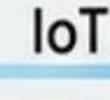
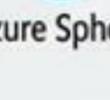
- Cost-effective encryption
- < 10 Gbps bandwidth
- Internet connection okay



### Choose ExpressRoute when:

- Private dedicated connectivity
- High bandwidth (up to 100 Gbps)
- Low latency
- Compliance

# Azure Services: Official Icon Cheat Sheet (50+ Quick Reference)

Compute		Storage		Networking		Security		Identity		Management	
 Virtual Machines	 App Service	 Blob Storage	 Disk Storage	 Virtual Network	 Load Balancer	 Azure Security Center (Microsoft Defender for Cloud)	 Azure Key Vault	 Azure Active Directory (Microsoft Entra ID)	 Azure AD B2C	 Azure Portal	 Azure Resource Manager
 Azure Kubernetes Service (AKS)	 Azure Functions	 File Storage	 Queue Storage	 Application Gateway	 VPN Gateway	 Azure Sentinel	 Azure DDoS Protection	 Azure AD Domain Services	 Log Analytics	 Azure Monitor	 Log Analytics
 Azure FaaS	 Batch	 Table Storage	 Azure Data Lake Storage Gen2	 ExpressRoute	 Azure DNS	 Web Application Firewall (WAF)	 Information Protection	 Multi-Factor Authentication (MFA)	 Azure Policy	 Azure Policy	 Azure Blueprints
 Cloud Services	 Service Fabric	 Managed Disks	 Storage Accounts	 Content Delivery Network (CDN)	 Azure Front Door	 Azure Synapse Analytics	 Managed Identities	 Conditional Access	 Cloud Shell	 Azure Sphere	 Time Series Insights
 Container Instances	 Service Fabric	 Azure Backup	 Azure Site Recovery	 Network Security Groups	 Azure Firewall	 Privileged Identity Management (PIM)	 Event Hubs	 Azure BI Embricks	 Azure Advisor	 IoT	 Azure Maps
 Virtual Machine Scale Sets				 Azure Explorer		 Azure Dedicated HSM		 Azure Stream Analytics	 Cost Management + Billing		

# 7. EXAM PREPARATION TIPS

## KEY SKILLS TO DEVELOP

- ✓ Master designing solutions from requirements
- ✓ Selecting appropriate SKUs
- ✓ Planning redundancy
- ✓ Optimizing cost
- ✓ Enforcing security



## EXAM FORMAT

-  **Duration:** 120-150 minutes
-  **Passing Score:** 700/1000
-  **Question Types:** Multiple choice, Case studies, Drag & drop, Multi-select

## STUDY RESOURCES



Microsoft Learn Paths



Microsoft Documentation



Hands-on Labs



Practice Exams