AZ-900: Microsoft Azure Fundamentals

Master cloud computing with Microsoft Azure

Learn the fundamentals of cloud computing, Azure services, security, pricing, and best practices. Designed for beginners to understand cloud concepts with real-world examples.

Cloud Concepts

Understand cloud computing fundamentals and models

Azure Services

Explore compute, storage, and networking services

Security

Learn about identity, access, and security

Cost Management

Optimize costs and manage resources

YOUR PRESENTER

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Course Resources

Access all course materials and supplementary resources

AZ-900

Course URL

https://arif.works/mbb/

Microsoft Learn Resources

AZ-900 Course
Official training course

Azure Fundamentals
Certification guide

Azure Documentation
Complete documentation

Azure Samples
Code samples & templates

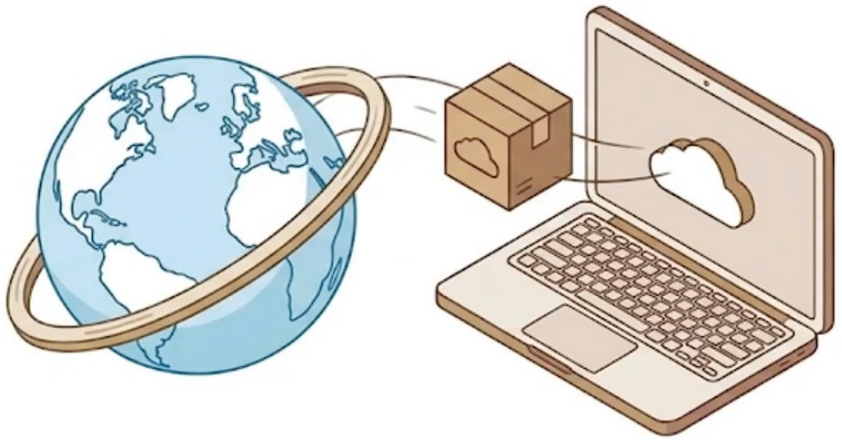
Video Tutorials
Step-by-step guides

FAQ & Support
Common questions

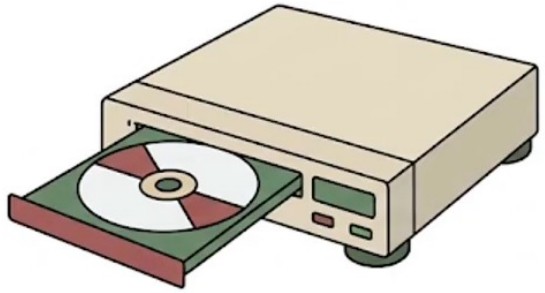
Access all resources through Microsoft Learn links

Delivery over the internet replaces local hardware

“Cloud computing is the delivery of computing services over the internet.”

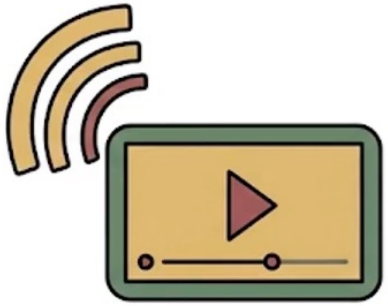


Learn more: Microsoft Learn - Cloud Concepts



Owning Hardware

The limitation of buying, storing, and maintaining physical media.

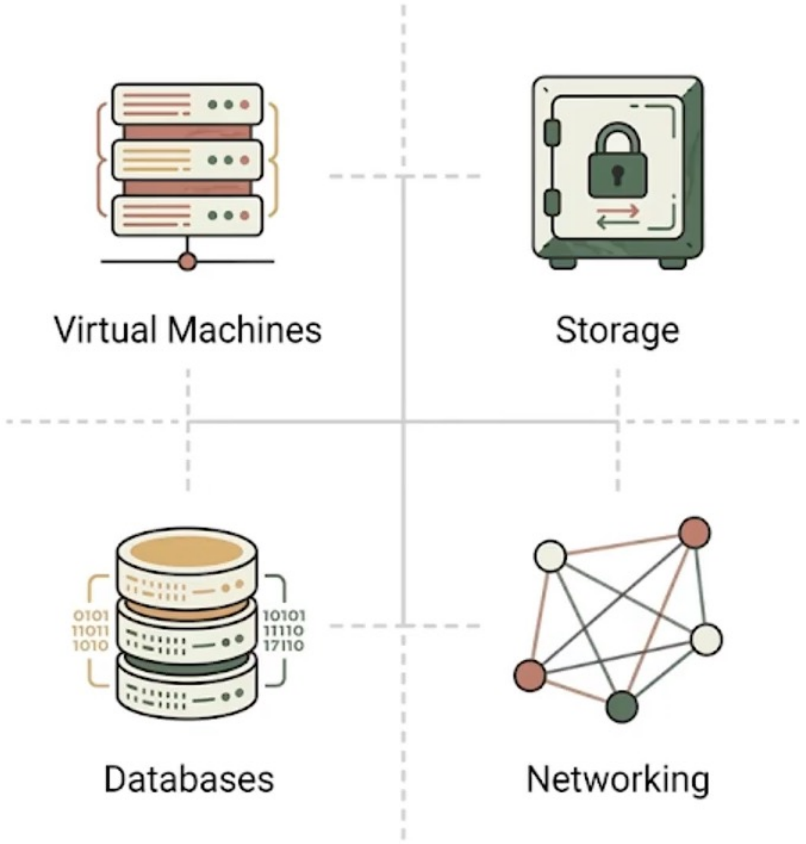


Consuming Services

The freedom of instantly streaming content on demand.

Just as consumer media moved from physical discs to instant streaming, enterprise IT is moving from physical servers to instant cloud infrastructure.

These four elements represent the standard, common IT infrastructure now delivered entirely online.



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Cloud Computing Fundamentals

Understanding the basics of cloud computing and service models

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What is Cloud Computing?

Cloud computing means accessing computing resources (servers, storage, databases) over the internet instead of owning and maintaining physical hardware. You pay only for what you use, like a utility bill.

Real Example: Netflix streams movies from cloud datacenters instead of sending DVDs. They can serve millions of users without building their own massive server farms.

5 Key Characteristics

- **On-demand self-service**
  Provision resources automatically
- **Broad network access**
  Available over the internet
- **Resource pooling**
  Shared resources for efficiency
- **Rapid elasticity**
  Scale up/down quickly
- **Measured service**
  Pay for what you use

Service Models

IaaS	PaaS	SaaS
Infrastructure	Platform	Software

IaaS: You manage OS, apps, data (VMs, storage)

PaaS: Provider manages infrastructure, you manage apps

SaaS: Everything managed by provider (email, CRM)

Key Benefits

- **Cost savings:** No upfront hardware investment
- **Scalability:** Handle traffic spikes easily
- **Reliability:** 99.9% uptime guarantees
- **Global reach:** Deploy worldwide instantly

Learn more: Microsoft Learn - Cloud Concepts

Cloud Computing Fundamentals

Understanding the basics of cloud computing and service models

What the Hotel Does (CSP)

Provides the room, bed, electricity, and water.

Cleans and maintains everything.

Keeps everything ready to use.

What You Do (User)

You just arrive and use the room.

No need to build or maintain anything.

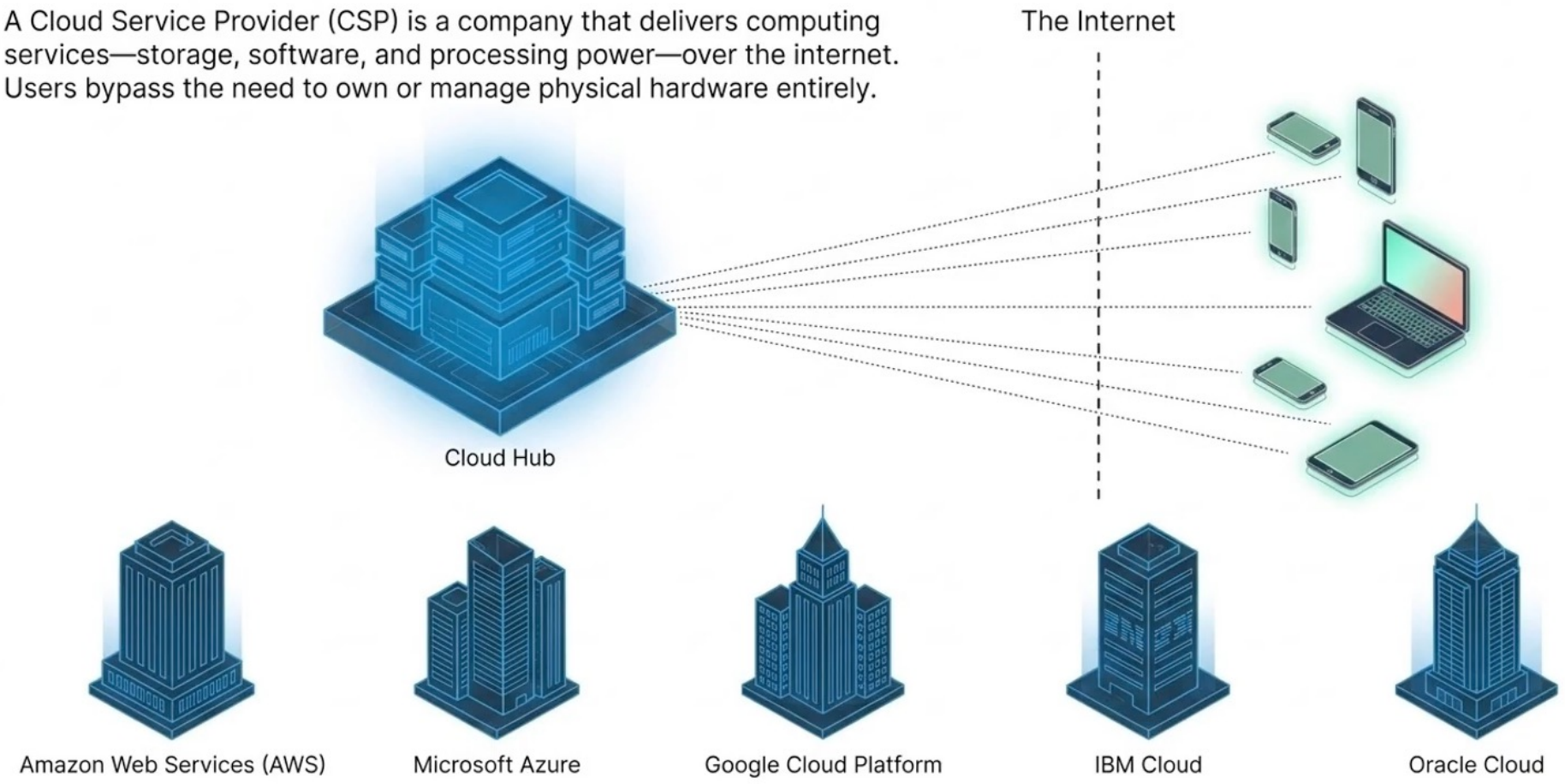
A Cloud Service Provider is like a hotel — it provides everything ready to use, and you just use the service without worrying about setup.

Learn more: Microsoft Learn - Cloud Concepts

Cloud Computing Fundamentals

Understanding the basics of cloud computing and service models

A Cloud Service Provider (CSP) is a company that delivers computing services—storage, software, and processing power—over the internet. Users bypass the need to own or manage physical hardware entirely.



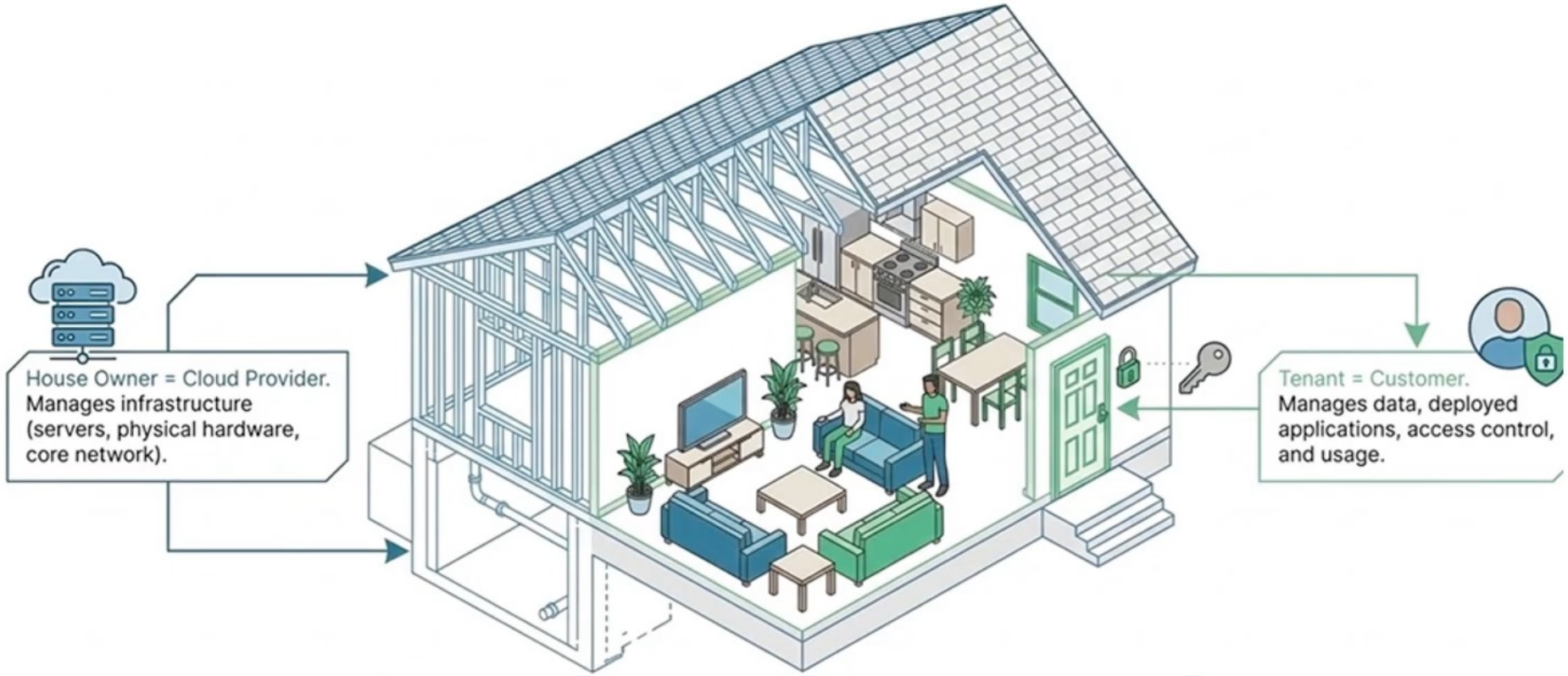
Learn more: Microsoft Learn - Cloud Concepts

While CSPs remove the burden of physical hardware, they do not manage your digital life for you. Moving to the cloud is not an outsourcing of all risk—it is a partnership.

Introducing the Shared Responsibility Model—the formal division of responsibilities between the cloud service provider and the customer.

Cloud Computing Fundamentals

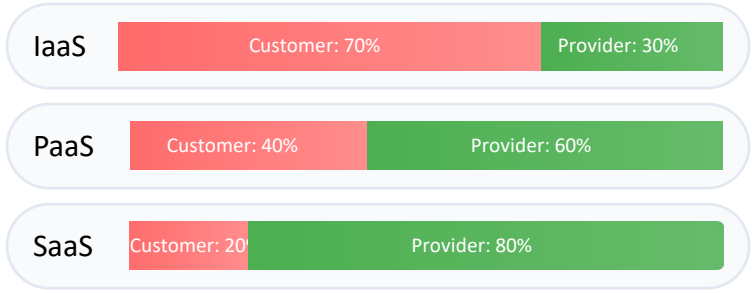
Understanding the basics of cloud computing and service models



The Shared Responsibility Model is like renting a house — the provider manages the building, while the user is responsible for what they do inside.

Learn more: Microsoft Learn - Cloud Concepts

Shared Responsibility Model



Key Points:

- **IaaS:** You manage OS, middleware, applications
- **PaaS:** Provider manages infrastructure
- **SaaS:** Provider manages everything

Learn more: Azure Cloud Adoption Framework

Deployment Models

Public
Shared infrastructure
Pay-as-you-go

Private
Dedicated infrastructure
Enhanced security

Hybrid
Best of both worlds
Flexibility

CapEx vs OpEx Comparison

CapEx

Upfront costs for hardware
✓ Full ownership
✗ High initial investment

OpEx

Pay-as-you-go model
✓ No upfront costs
✓ Scalable

Impact

Budget flexibility
✓ Predictable costs
✓ Agility

Cloud Computing Fundamentals

Understanding the basics of cloud computing and service models

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Scenario	Answer
1. A bank needs to store highly confidential financial data securely	
2. A startup wants scalable resources without investing in hardware	
3. An e-commerce company wants a public website but secure payment processing	
4. A hospital managing sensitive patient records	
5. A developer wants to quickly create and delete testing environments	
6. A company wants both data security and scalability for applications	
7. A student wants to host a project website at low cost	
8. A government organization handling confidential citizen data	
9. A business experiences sudden traffic spikes during big sales	
10. A university provides online classes but keeps student records secure	

Learn more: Microsoft Learn - Cloud Concepts

3 Key Cloud Benefits

High Availability

99.99% uptime SLA with redundant infrastructure across multiple data centers.

Real example: Netflix never goes down - 99.99% uptime

99.99% SLA

Scalability

Scale resources up or down based on demand with auto-scaling capabilities.

Real example: Instagram handles millions of photos daily

Auto-scale

Security & Compliance

Enterprise-grade security with compliance certifications (ISO, SOC, GDPR).

Real example: Banks trust Azure with sensitive data

Enterprise

Agility

Faster time to market with rapid deployment and development capabilities.

Real example: Deploy apps in minutes not months

Fast Deploy

Global Reach

Deploy applications globally with 60+ Azure regions worldwide.

Real example: Serve customers worldwide with low latency

60+ Regions

Cost Savings

Pay only for what you use with consumption-based pricing.

Real example: Pay only for what you use

Pay-as-you-go

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Azure Compute Services Overview

4 Services

2 Azure Compute Services

Virtual Machines

Full OS control, lift-and-shift

Complete control over the operating system with full virtualization capabilities. Perfect for migrating existing on-premises workloads to the cloud.

Real-world example:

Run Windows/Linux servers like traditional datacenter - ideal for legacy applications that need full OS control

- ✓ Full OS control
- ✓ Lift-and-shift
- ✓ Custom images

App Service

PaaS web hosting

Managed platform for building, deploying, and scaling web apps and APIs. Supports multiple programming languages and frameworks.

Real-world example:

Host websites like company portal without managing servers - perfect for web applications and APIs

- ✓ Managed hosting
- ✓ Auto-scaling
- ✓ CI/CD support

Containers

AKS/ACI microservices

Container orchestration with Azure Kubernetes Service (AKS) or Azure Container Instances for microservices architecture.

Real-world example:

Run microservices like Uber's backend - scalable, portable, and efficient containerized applications

- ✓ AKS
- ✓ ACI
- ✓ Microservices

Serverless

Functions/Logic Apps

Event-driven computing with Azure Functions and Logic Apps. Pay only for execution time, scale automatically.

Real-world example:

Process image uploads automatically - triggers on events, scales to zero when idle

- ✓ Event-driven
- ✓ Auto-scale
- ✓ Pay-per-use

Compute Options Comparison

Feature	Virtual Machines	App Service	Containers	Functions
Control Level	Full OS Control Complete control over VM	Platform Managed PaaS - Limited OS access	Container Control Container-level control	Serverless No infrastructure management
Setup Time	15-30 minutes Manual VM configuration	5-10 minutes Quick deployment	10-15 minutes Container setup	2-5 minutes Instant deployment
Scaling	Manual/Auto VM scale sets	Auto-scale Built-in scaling	Auto-scale Kubernetes scaling	Serverless Event-driven scaling
Cost Model	Predictable $0.008/hour + storage	Moderate $0.013/hour + storage	Variable $0.007/hour + storage	Pay-per-use $0.000016/execution
Best For	Legacy apps, Full control	Web apps, APIs	Microservices, DevOps	Event-driven, Serverless
Example	Netflix streaming servers Need full control for custom software	Company website Simple web hosting without management	Uber backend Microservices architecture	Image processing Triggered by uploads

Azure compute services comparison - Choose based on your application needs

Microsoft Learn: Compute Comparison

3 Azure Storage Services

Blob Storage

Object storage for unstructured data like images, videos, and documents.

Example: Store videos like YouTube

Object Storage

File Storage

SMB/NFS shares for file-based workloads and legacy applications.

Example: Shared folders like network drives

SMB/NFS

Disk Storage

Persistent disks for VMs with different performance tiers.

Example: VM hard drives

VM Disks

Archive Storage

Long-term, low-cost storage for rarely accessed data.

Example: Old tax documents, rarely accessed

Archive

Queue Storage

Message queuing for reliable communication between components.

Example: Message passing between apps

Messaging

Table Storage

NoSQL key-value storage for structured data.

Example: Structured data storage

NoSQL

Learn more: Azure Storage Overview

1 Azure Networking Services Overview

Virtual Network (VNet)

Your private network in the cloud, like an office LAN. Create isolated network environments with custom IP addressing.

Real Example:

Like having your own private office network in the cloud, where you control who can access what resources.

VPN Gateway

Connect your office to Azure securely over the internet, like a private tunnel through the web.

Real Example:

Similar to a secure VPN connection you use for remote work, but connecting your entire office to Azure.

Load Balancer

Distribute traffic across multiple VMs, like having multiple checkout counters at a store.

Real Example:

Like a busy supermarket with multiple checkout lanes to handle customer traffic efficiently.

Azure DNS

Translate domain names to IP addresses, like a phone book for the internet.

Real Example:

Just like looking up a phone number in a phone book, but for websites and servers.

CDN

Deliver content fast globally by caching it at edge locations, like having local copies everywhere.

Real Example:

Like having local copies of Netflix shows in every country for faster streaming.

Front Door

Global load balancing with Web Application Firewall for enhanced security.

Real Example:

Like a smart traffic controller that directs users to the closest and fastest server.

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Part 4 — Identity Guard

Security Identity

1 Azure Active Directory - Identity Management

Azure Active Directory

Cloud-based identity and access management service. Like Google login for your apps - single sign-on experience.

Real Example:

Like having a master key for all your office doors - one login, access to everything.

- Identity Platform for users, apps, devices
- Single Sign-On (SSO) experience

Authentication

Prove who you are with credentials. Like showing your ID at the bank to verify your identity.

Real Example:

Like entering your PIN at an ATM - proves you are who you claim to be.

- OAuth2/OpenID Connect
- Passwordless authentication

Authorization

What you can access after authentication. Like an office key card - determines which rooms you can enter.

Real Example:

Like a hotel key card - only opens your room, not others.

- RBAC (Role-Based Access Control)
- App permissions management

MFA - Multi-Factor Auth

Two-factor authentication for extra security. Like bank OTP - something you know + something you have.

Real Example:

Banking apps use MFA to protect your account from unauthorized access.

- SMS, Email, Authenticator app

Conditional Access

Context-based security policies. Like IP blocking - restricts access based on location, device, or risk level.

Real Example:

Like blocking access from unknown countries or suspicious IP addresses.

- Risk-based policies

Privileged Identity Management

Just-in-time access for privileged roles. Like temporary admin access with approval workflow.

Real Example:

Like getting temporary access to a secure area with supervisor approval.

- Just-in-time access

Cost & Governance

Cost Management

- **Budget Tracking:** Monitor spending like a credit card statement
- **Alerts:** Get notified when spending reaches 80% of budget
- **Cost Analysis:** Identify where money is being spent

Example: Set $1000 monthly budget, alert at 80% ($800)

$1,200	$850
Monthly Budget	Current Spend

Azure Policy

- **Rule Enforcement:** Automatically enforce "no expensive VMs"
- **Compliance:** Ensure resources meet standards
- **Guardrails:** Prevent unauthorized changes

Example: Block creation of VMs larger than D4s_v3

15	98%
Policies Active	Compliance

Resource Organization

- **Tags:** Label resources like folder labels
- **RBAC:** Control access like file permissions
- **Management Groups:** Organize by department

Example: Tag "Environment:Production" for billing

245	12
Resources Tagged	RBAC Roles

Learn more: Azure Cost Management

6 Deployment and Monitoring Process

Step 1 Define

- ARM/Bicep/Terraform
- Infrastructure as Code
- Template deployment

Tool:	ARM/Bicep/TF
Scope:	Resource groups

Real Example:
Like writing a recipe - define your infrastructure once, deploy it many times

Step 2 Deploy

- Azure DevOps
- GitHub Actions
- CI/CD pipelines

Tool:	DevOps/GitHub
Type:	CI/CD

Real Example:
Automated deployment like one-click install - 5 min vs manual 2 hours

Step 3 Monitor

- Azure Monitor
- Log Analytics
- Alerts & Dashboards

Tool:	Monitor/Analytics
Scope:	All resources

Real Example:
Watch app health like fitness tracker - real-time monitoring

Step 4 Optimize

- Azure Advisor
- Autoscale
- Cost optimization

Tool:	Advisor/Autoscale
Goal:	Performance

Real Example:
Auto-scale like thermostat - adjusts based on demand

Learn more: Azure Monitor Documentation

Summary & Next Steps

Complete your AZ-900 journey with these key takeaways and resources

Key Takeaways

Cloud Basics Understand on-demand resources, scalability, and cost models (CapEx vs OpEx)

Compute Services Choose between VMs, App Service, Containers, and Functions

Storage Types Blob, File, Disk, Archive - know when to use each

Security Azure AD, MFA, RBAC for identity protection

Cost Management Budgets, alerts, and optimization strategies

DevOps Automate deployment with CI/CD pipelines

Next Steps

1. **Complete Microsoft Learn Path**
   Finish all modules in the AZ-900 learning path
2. **Get Free Azure Account**
   Sign up for $200 credit and 12 months free services
3. **Take Practice Exams**
   Test your knowledge with sample questions
4. **Join Azure Community**
   Connect with other learners and experts

All resources are official Microsoft documentation

Microsoft Learn Azure Docs