Azure Fundamentals

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Peter De Tender

Azure Technical Trainer | DevOps Cloud Advocacy v-team Member

- +25 years background in Microsoft Technologies

- +12 years MCT, Former Azure MVP (5y)

- Last 8 years 100% focus on Azure

- Technical writer, book author and technical blogger

- HashiCorp Ambassador 2020-2022

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"...Bring me an audience, I give them Azure knowledge in return..."

Open Q&A

Resources

Microsoft Training and Certification overview

Microsoft.com/Learning

Microsoft Certification overview

aka.ms/MSTrainCert

Microsoft official curriculum

[aka.ms/MOC](aka.ms/MOC)

Microsoft Learn

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Certification poster

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■■ Microsoft Azure

Thank you!

Microsoft Azure

1. Understanding Cloud Concepts

2. Understanding Core Azure Services

3. Understanding Security, Compliance, Privacy

4. Understanding Cost Optimization

1. Understanding Cloud Concepts

Cloud computing characteristics

Ref: The NIST Definition of Cloud Computing
https://csrc.nist.gov/publications/detail/sp/800-145/final

On-demand
self-service

Geo-
distribution
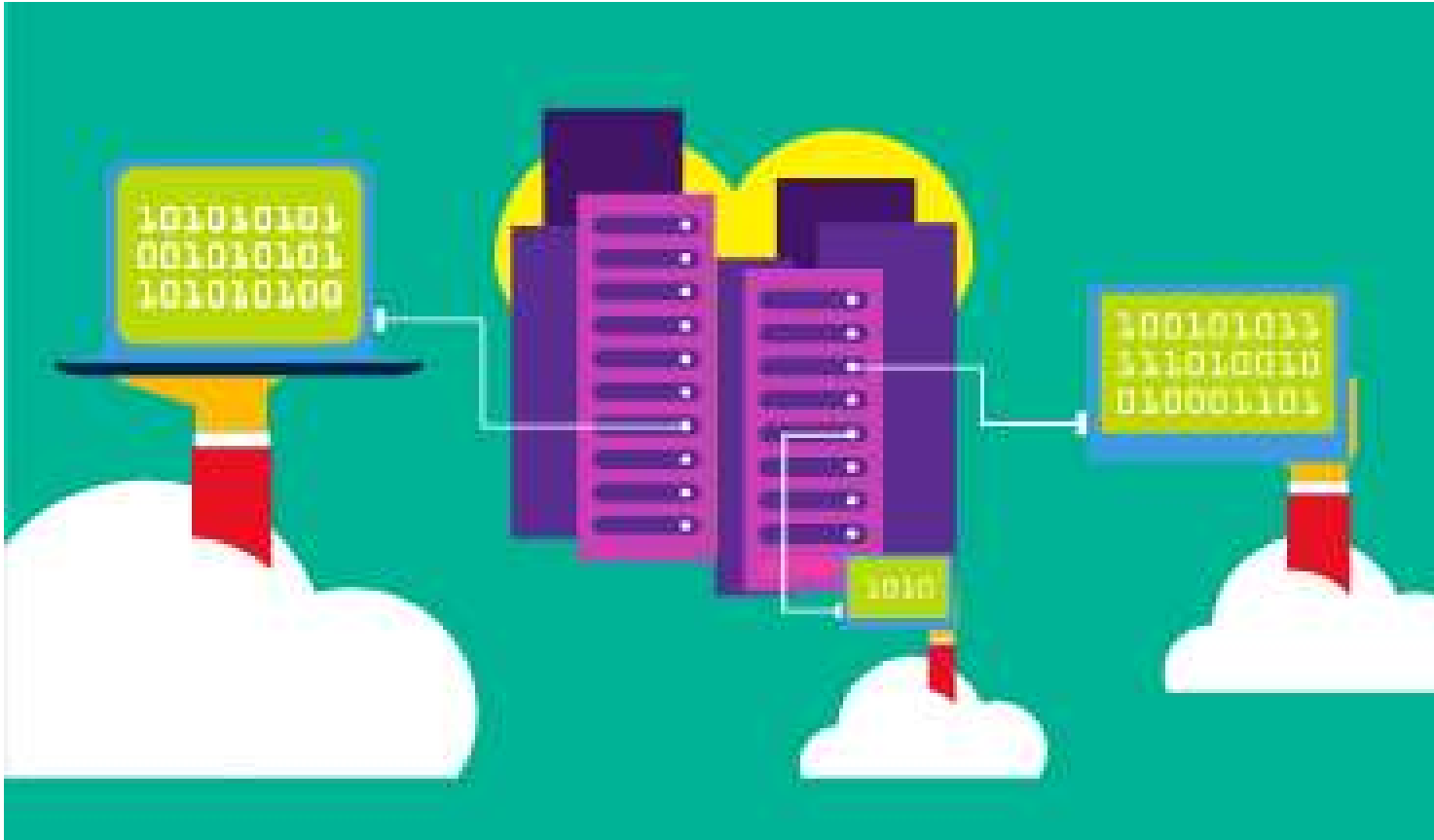
Scalability

Rapid
elasticity
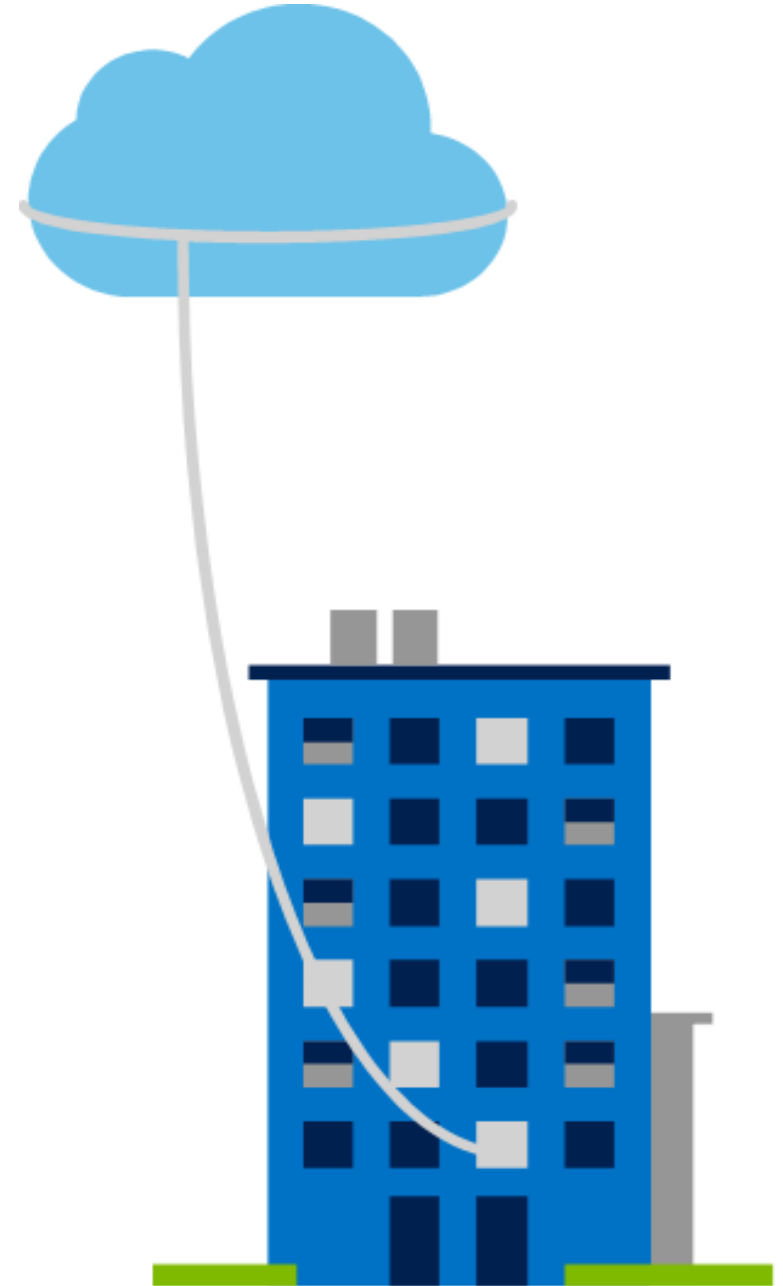
High
Availability

Cloud model comparison

Public cloud

A *public cloud* is owned by a cloud services provider (also known as a *hosting provider*).

Private cloud

A *private cloud* is owned and operated by the organization that uses the resources from that cloud.
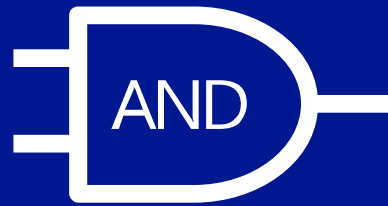
Hybrid cloud

A *hybrid cloud* combines both public and private clouds, allowing you to run your applications in the most appropriate location.
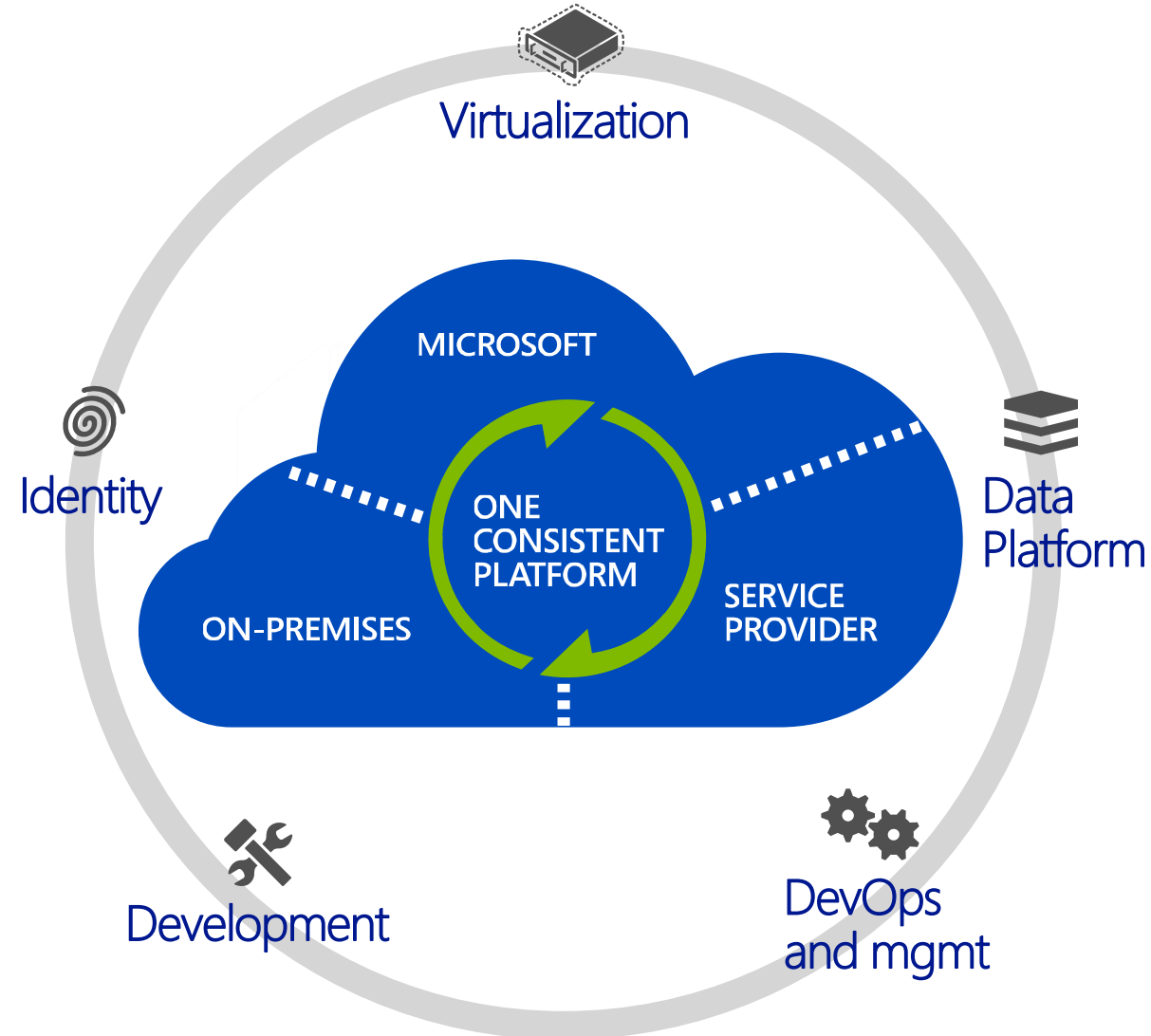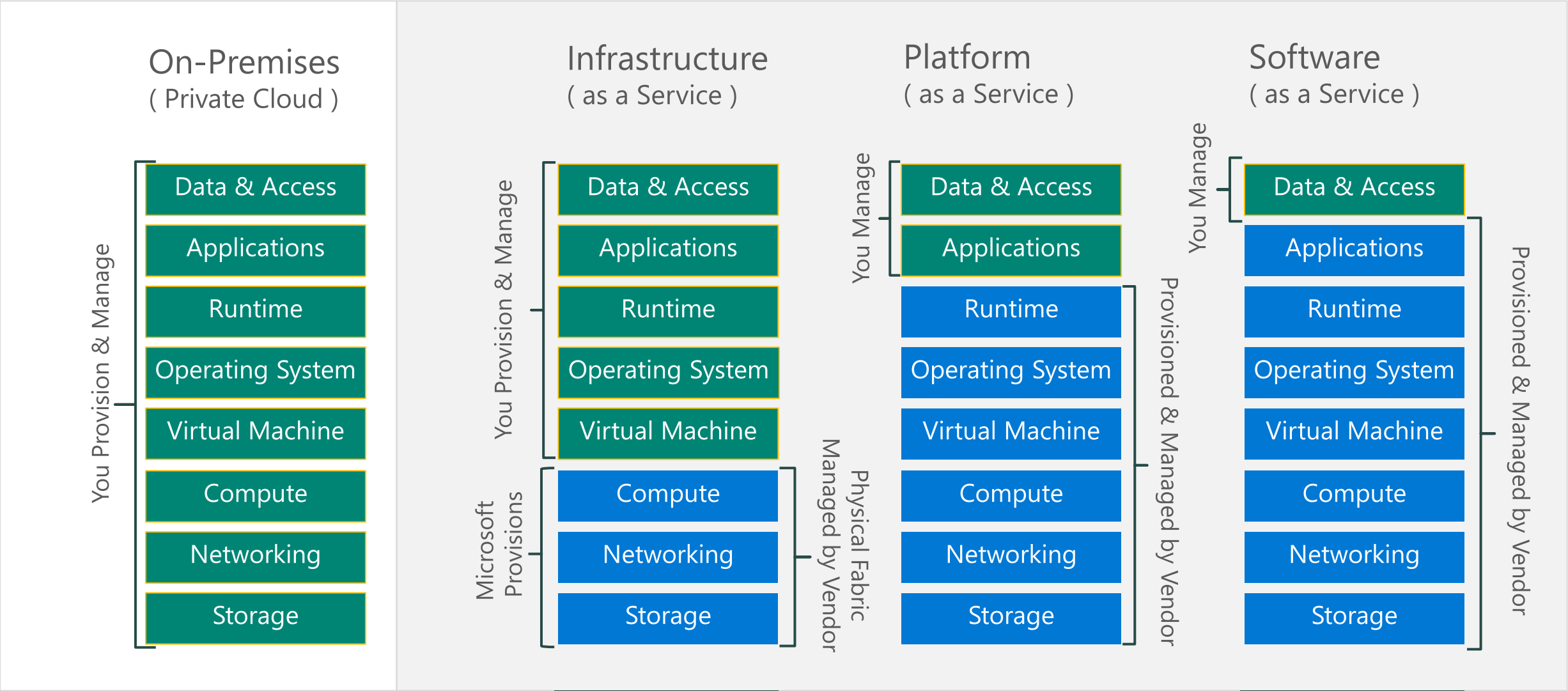
Cloud computing models and responsibilities

On-Premises
(Private Cloud)

You Provision & Manage

- Data & Access
- Applications
- Runtime
- Operating System
- Virtual Machine
- Compute
- Networking
- Storage

Infrastructure
(as a Service)

You Provision & Manage

- Data & Access
- Applications
- Runtime
- Operating System
- Virtual Machine

Microsoft Provisions

Physical Fabric Managed by Vendor

- Compute
- Networking
- Storage

Platform
(as a Service)

You Manage

- Data & Access
- Applications

Provisioned & Managed by Vendor

- Runtime
- Operating System
- Virtual Machine
- Compute
- Networking
- Storage

Software
(as a Service)

You Manage

- Data & Access

Provisioned & Managed by Vendor

- Applications
- Runtime
- Operating System
- Virtual Machine
- Compute
- Networking
- Storage

Host   Develop   Consume

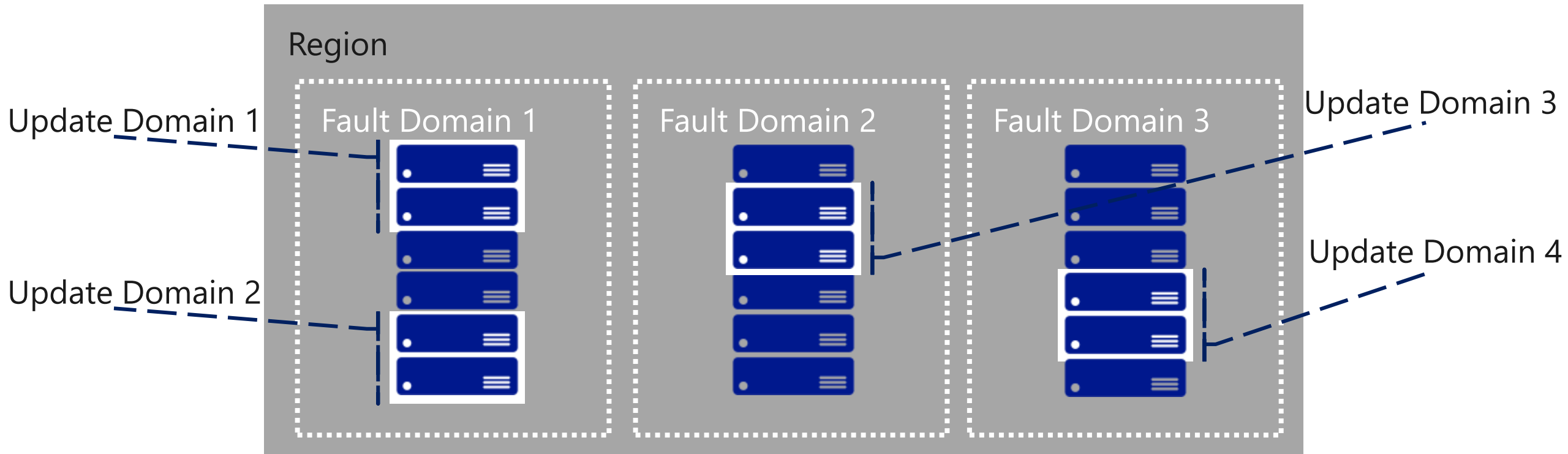# 2. Understanding Core Azure Services
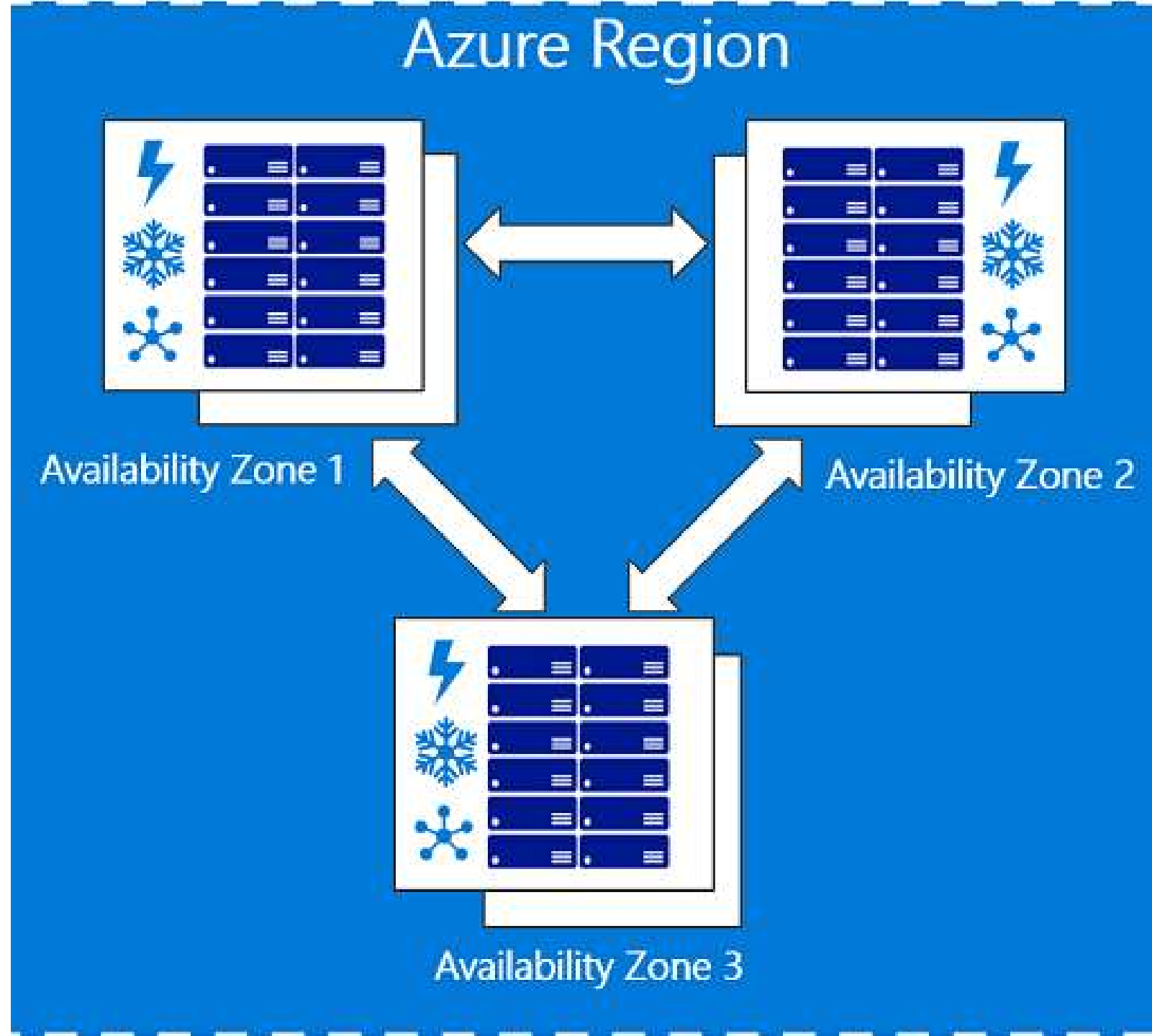
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Azure regions

Availability sets

- Fault Domains
  - Segments clusters within a region (Up to 3)
- Update Domains
  - Segments updates and patches to clusters (Up to 20)

Availability zones

· Separate locations
· Independent
    · Power
    · Cooling
    · Networking
· Isolation Boundary

Azure Portal demo

Azure Services

Compute (Servers & Apps)

- VMs, Availability Sets & Zones, Scale sets, App services, Azure Functions, Containers

Networking

- vNets, Load Balancers, Application Gateways, VPN Gateways, CDN, ExpressRoute

Databases

- CosmosDB, Azure SQL, Azure Database Migration service

Big Data & Analytics

- Azure SQL Data Warehouse, HDInsight, Data Lake Analytics

AI & IoT

- IoT Central & Hub, Azure Machine Learning

Azure Services demo

https://azure.microsoft.com/en-us/services/

https://azureservices.io

3. Understanding Security, Privacy, Compliance, and Trust

Shared responsibility

Migrating from customer-controlled to cloud-based data centers shifts the responsibility for security.

Security becomes a shared concern between cloud providers and customers.

Responsibility	On-premises	IaaS	PaaS	SaaS
Data governance and Rights Management	Customer	Customer	Customer	Customer
Client endpoints	Customer	Customer	Customer	Customer
Account and access management	Customer	Customer	Customer	Customer
Identity and directory Infrastructure	Customer	Customer	Microsoft/ Customer	Microsoft/ Customer
Application	Customer	Customer	Microsoft/ Customer	Microsoft
Network controls	Customer	Customer	Microsoft/ Customer	Microsoft
Operating system	Customer	Customer	Microsoft	Microsoft
Physical hosts	Customer	Microsoft	Microsoft	Microsoft
Physical network	Customer	Microsoft	Microsoft	Microsoft
Physical datacenter	Customer	Microsoft	Microsoft	Microsoft

Azure Security Services

- Azure Firewall
  - Managed cloud service
  - Grants or denies access to network resources
  - Built-in high availability, scalability, filtering rules, and Azure Monitor logging

- Azure DDoS Protection
  - Protects against DDoS attacks
  - Monitors network traffic at Azure edge, protecting services

- Network Security Groups
  - Fine-grained network traffic filtering
  - Packet filter, not a firewall

Azure Active Directory

Azure AD

- Cloud-based identity
- SSO
- B2B (Federation)
- B2C (Consumer)

Multi-factor authentication

- Something you know + have + are

Conditional Access

- Define conditions/policies to allow/block devices, users, apps,…

Azure Policy

Stay compliant with your corporate standards and service level agreements (SLAs) by using policy definitions to enforce rules and effects for your Azure resources.

Azure Policy features :

- evaluates and identifies Azure resources that do not comply with your policies.

- provides built-in policy and initiative definitions, under categories such as Storage, Networking, Compute, Security Center, and Monitoring.

Role-based access control (RBAC)

Fine-grained access management control over your Azure resources.

Available to *all* Azure subscribers, at no additional cost.

Example uses of Azure RBAC :

- Grant specific access rights to particular users for certain jobs. One user can manage VMs, while another manages virtual networks.

- Allocate particular database types to certain database administration groups.

Azure Monitoring

- Azure Monitor
  - Collects and analyzes telemetry from cloud and on-prem resources
  - Enable 'Diagnostics' on resources to enhance collection
- Azure Service Health
  - Azure Status
  - Service Health
  - Azure Resource Health
- Azure Advisor
  - Provides security recommendations and security governance
- Azure Sentinel

4. Understanding Azure Cost Optimization

CapEx vs. OpEx

Azure Subscriptions

Multiple subscriptions per account

Provides access and boundaries between products and services

- Billing boundaries
- Access control boundaries with Azure Policy

Various subscription types

- Free
- Pay-as-you-go
- Enterprise Agreement

Create management hierarchy with Management Groups

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