Cloud Computing

What is Cloud?

Using someone else's server to host, process, or store data
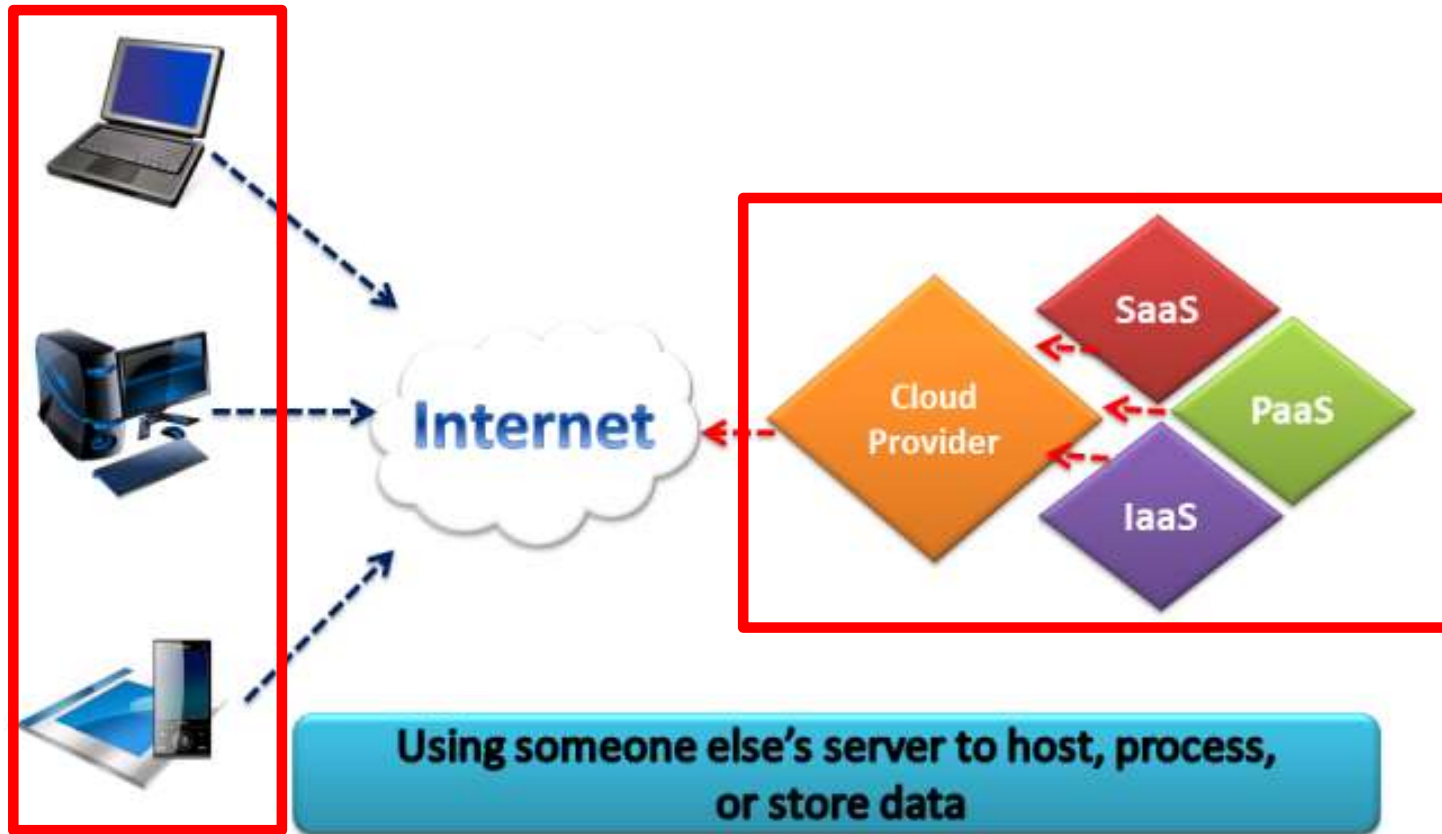
Characteristics

On-demand self-service

- Consumer can provision resourced as needed automatically
- No human interaction

Broad network access

- Are available over network

Resource pooling

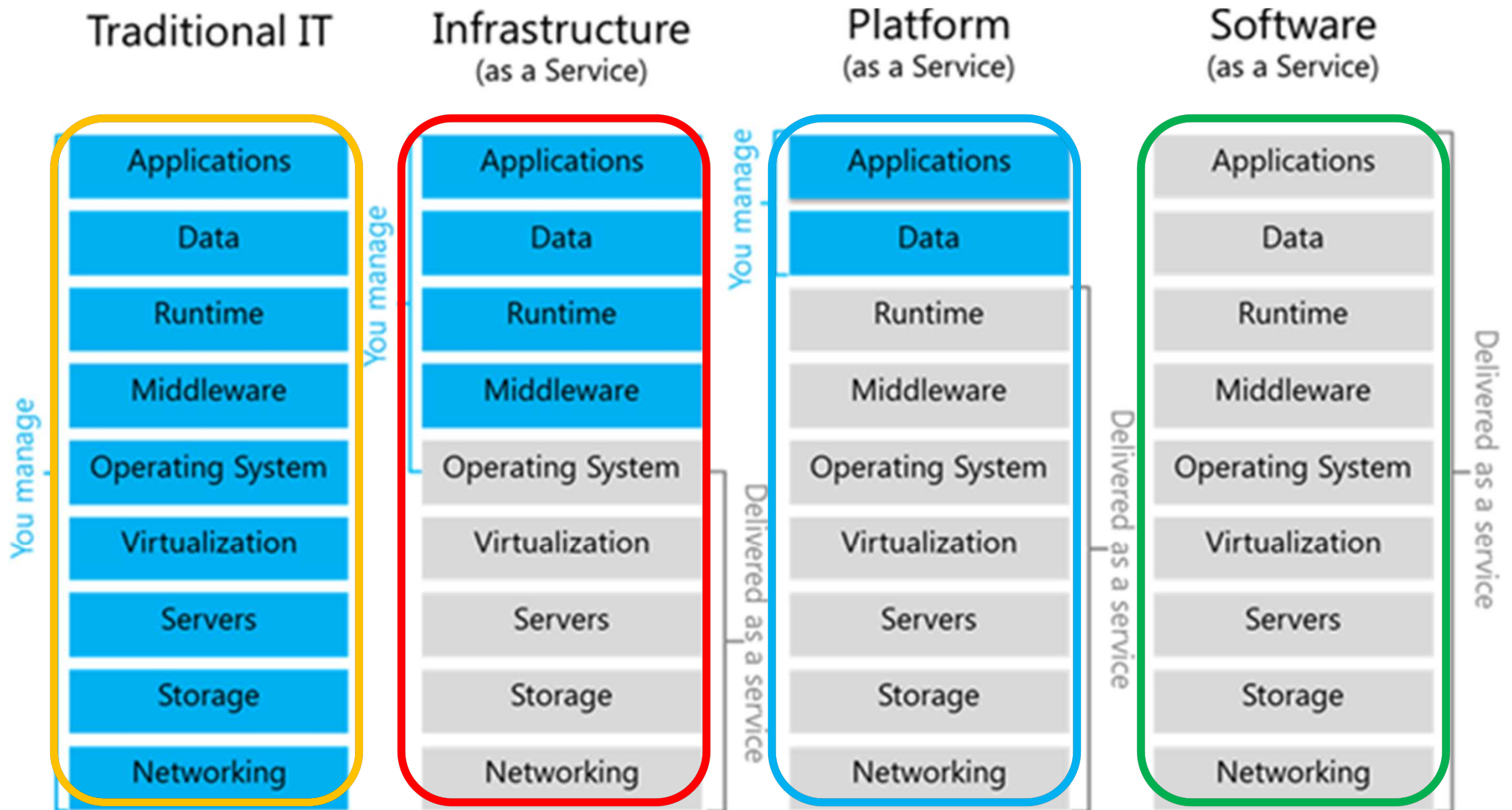- The provider's resources are pooled to serve multiple consumers

Measured Service

- Resource usage can be monitored and controlled providing transparency.
- Used for billing

Rapid elasticity

- Scale rapidly outward and inward

Cloud Services Deployment Models

Traditional IT	Infrastructure (as a Service)	Platform (as a Service)	Software (as a Service)
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
Operating System	Operating System	Operating System	Operating System
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

You manage — Traditional IT

You manage / Delivered as a service — Infrastructure (as a Service)

You manage / Delivered as a service — Platform (as a Service)

Delivered as a service — Software (as a Service)

Virtual Machines

- VM technology allows multiple virtual machines to run on a single physical machine
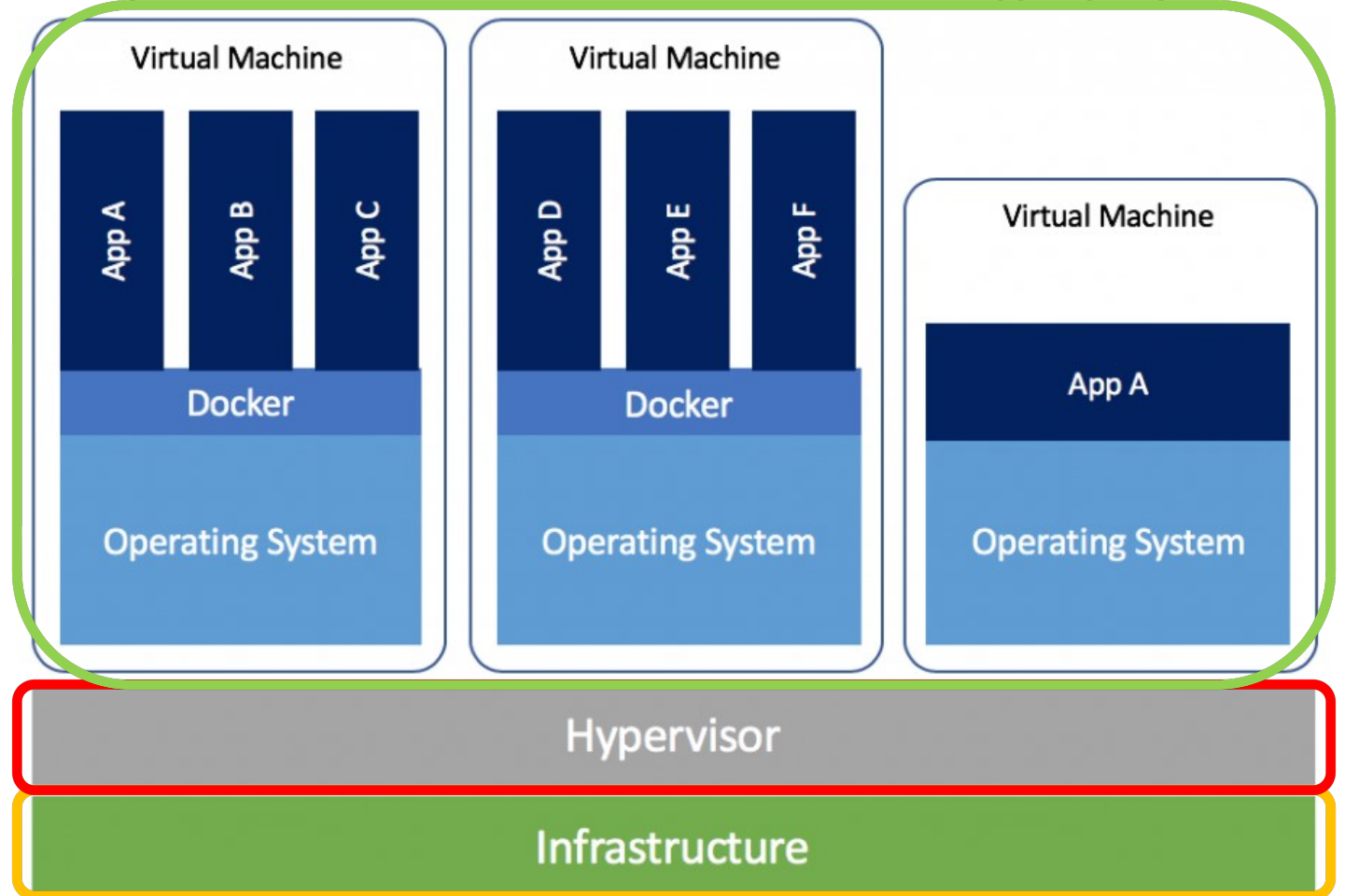
Microsoft Azure Fundamentals

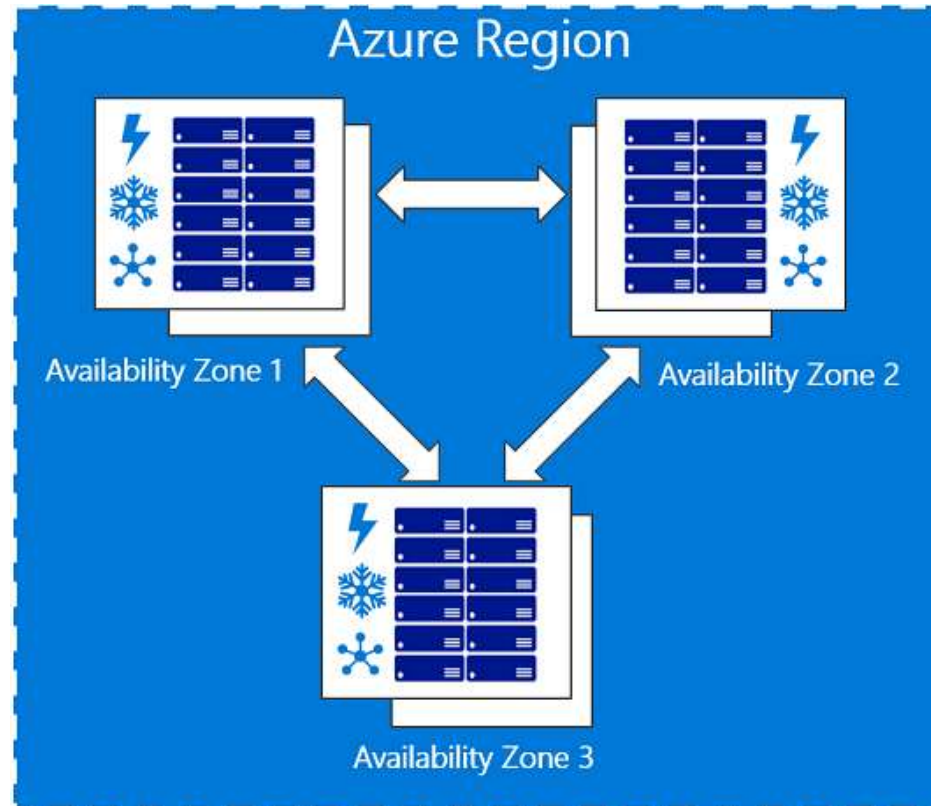# Introduction of Microsoft Azure

- Microsoft's public cloud platform

- Azure offers a large collection of services
  - PaaS
  - IaaS
  - managed database service capabilities

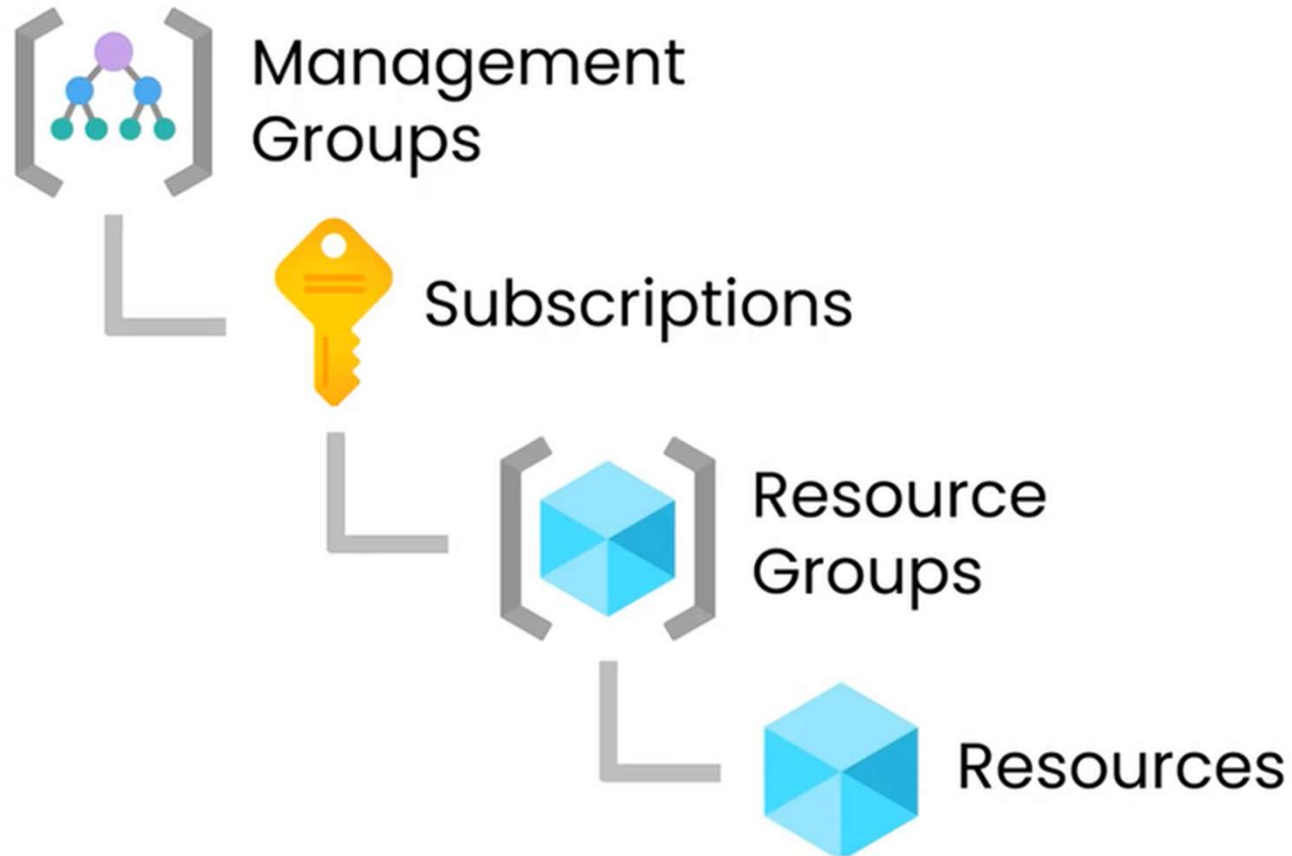# Concept of Region & Availability Zone
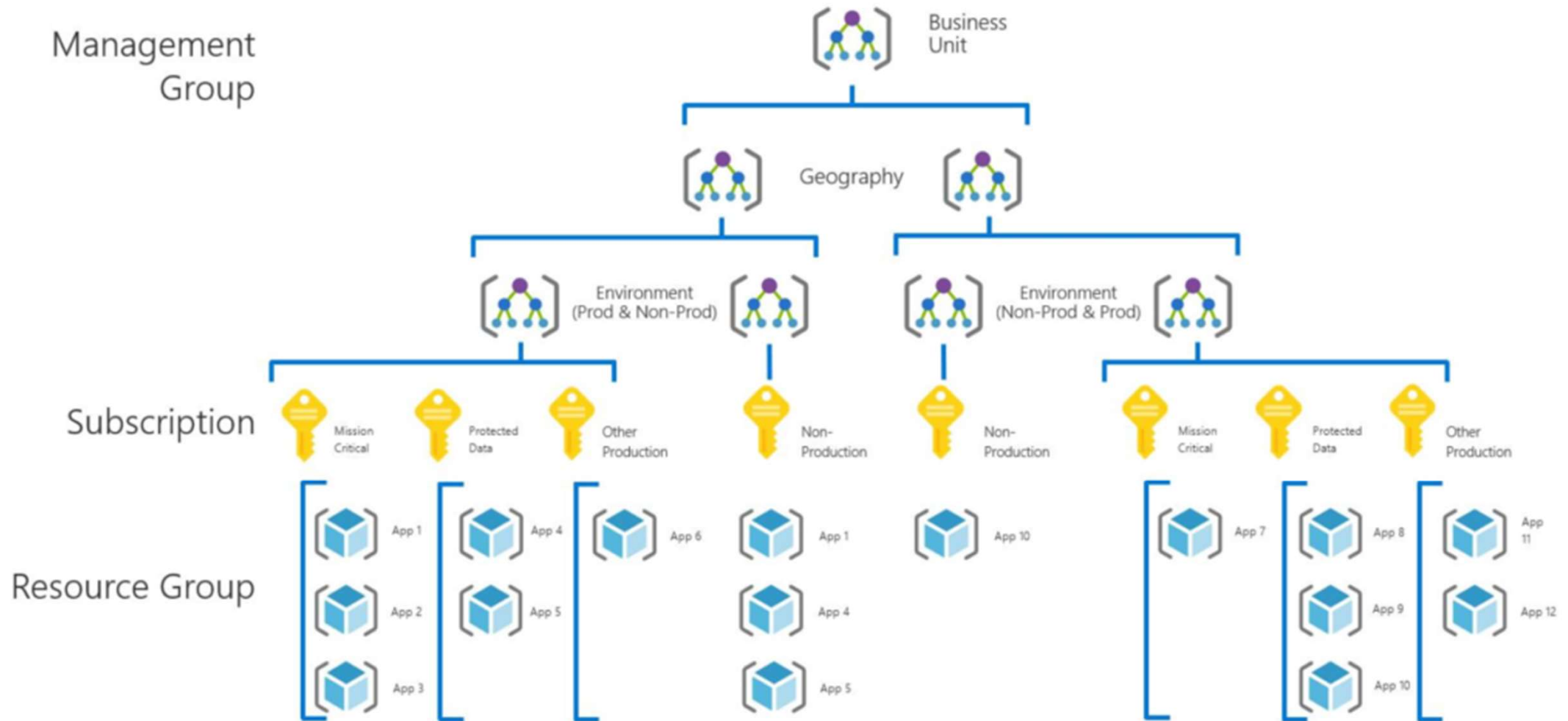
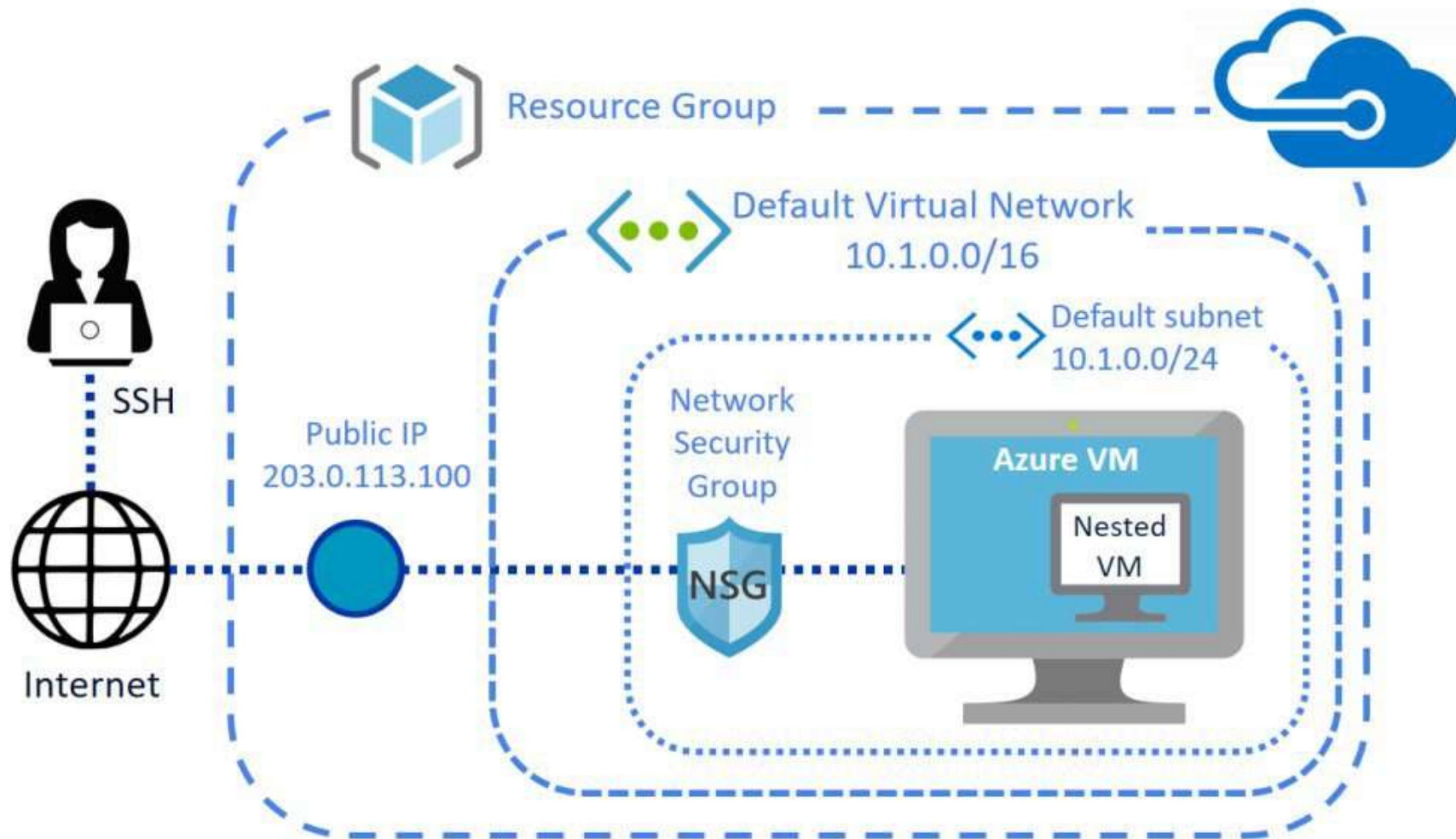# Concept of Region & Availability Zone

Azure Services

Developer Services

| Visual Studio Team Services | Azure DevTest Labs* | VS Application Insights* | HockeyApp | Developer Tools |

Management & Security

| Azure Portal | Scheduler | Automation | Log Analytics | Key Vault | Security Center* |

Compute	Web & Mobile	Data & Storage	Analytics	Internet of Things & Intelligence	Media & CDN	Identity & Management
Virtual Machines	Web Apps	SQL Database	Data Lake Analytics*	Azure IoT Suite	Media Services	Azure Active Directory
Virtual Machine Scale Sets	Mobile Apps	DocumentDB	Data Lake Store*	Azure IoT Hub	Content Delivery Network	B2C*
Cloud Services	Logic Apps*	Redis Cache	HDInsight	Event Hubs		Domain Se
Batch	API Apps	Storage: Blobs, Tables, Queues, Files and Disks	Machine Learning	Cortana Intelligence Suite		Multi-Facto Authentica
RemoteApp	API Management	StorSimple	Stream Analytics	Cognitive Services*		
Service Fabric	Notification Hubs	Search	Data Factory			
Azure Container Service	Mobile Engagement	SQL Data Warehouse*	Data Catalog			
	Functions*	SQL Server Stretch Database*	Power BI Embedded*			

Concept of Resource Group

Concept of Resource Group

Introduction of Azure Virtual Machine

Lab: Planning and implementing VM

Lab: Creating virtual Machine using Portal
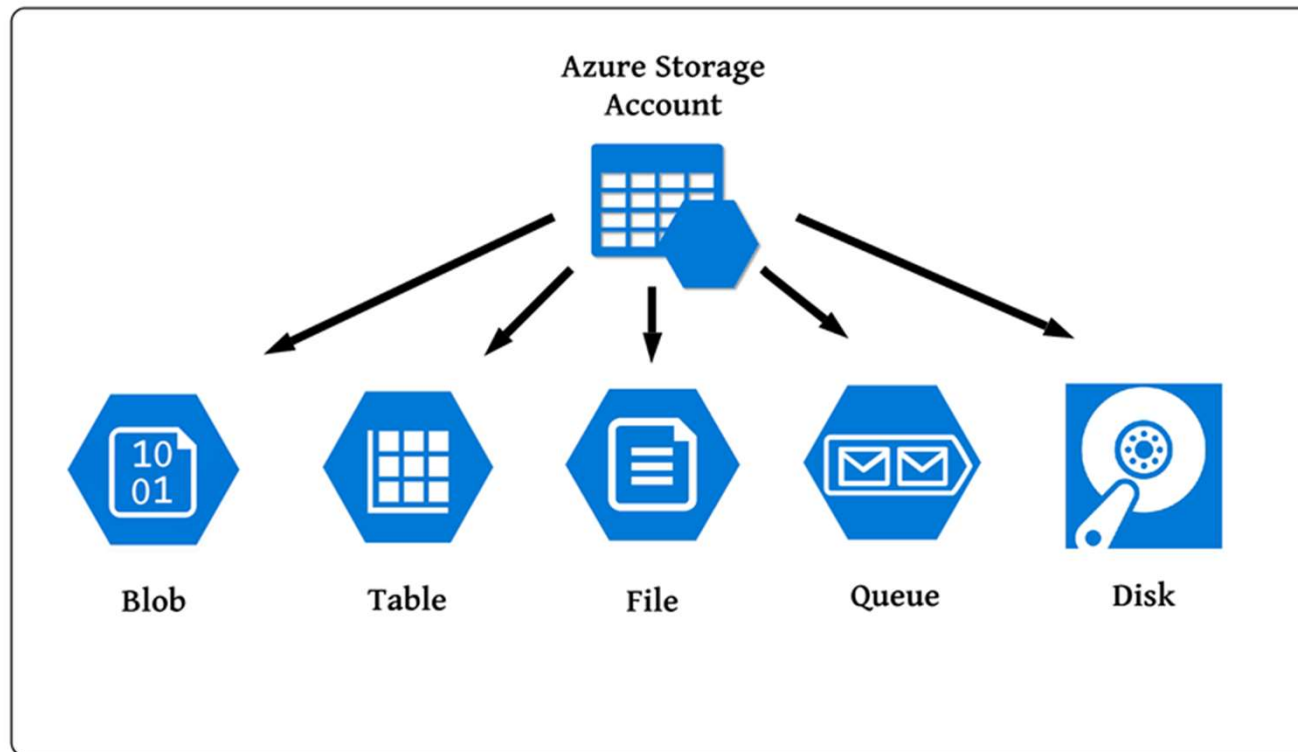
Lab: Creating virtual Machine using CLI

- Commands
  - az group create --name rgAtinGupta --location eastus
  - az vm create --resource-group rgAtinGupta --name vmAtinGuptaCLI --image win2016datacenter --public-ip-sku Basic --admin-username azureuser

Azure Storage Account

Introduction to Storage Account

- Provides a unique namespace in Azure for data

Core Storage Services

Azure Storage Account Services

Blobs

Block: Text or binary data (.log, .exe, .jpg, etc.). Up to 200GB.

Page: Optimized for disks (.vhd). Supports random read-write. Up to 1TB.

Append Blob: Writes to end of the blob (4MB max) up to 50k times (~195GB)

File Shares

Supports SMB 3.0 protocol.

Can be accessed like a traditional file share.

Share files between multiple Virtual Machines.

A single file share can be up to 5TB.

Tables

NoSQL storage of structured data (entities).

Key/value storage.

A single entity can have up to 255 properties and be up to 1MB.

Queues

Durable messaging.

Provides asynchronous communication between application tiers and components.

A single message can be up to 64KB.

Microsoft

Types of Storage Accounts

Storage Account Type	Supported Services	Supported Performance Tiers	Replication Options
BlobStorage	Blob (block blobs and append blobs only)	Standard	LRS, GRS, RA-GRS
General-purpose VI	Blob, File, Queue, Table, and Disk	Standard premium	LRS, GRS, RA-GRS
General-purpose V2	Blob, File, Queue, Table, and Disk	Standard premium	LRS, GRS, RA-GRS, ZRS, ZGRS (preview), RA-ZGRS (preview)
Block blob storage	Blob (block blobs and append blobs only)	premium	LRS, ZRS (limited regions)
FileStorage	Files only	premium	LRS, ZRS (limited regions)

Securing the Data
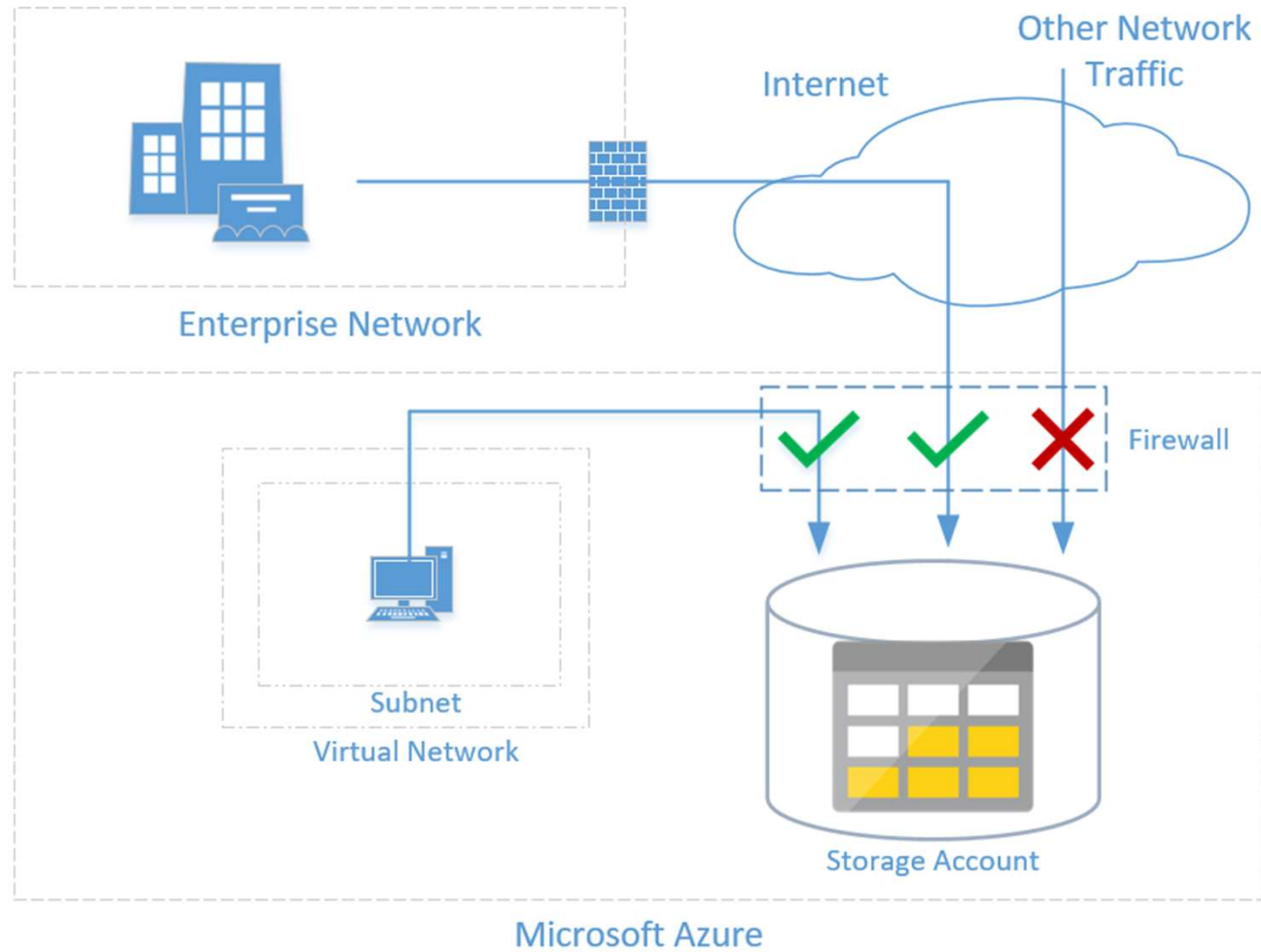
Lab : Planning and implementing storage

Lab: Creating and manage Storage Accounts

Lab: Create and manage containers

Lab: Create & manage Blobs, Queues, Files & Tables

Azure Networking

Introduction of VNet and Security Group

- Fundamental building block for private network in Azure
- Enables many types of Azure resources to securely communicate with each other
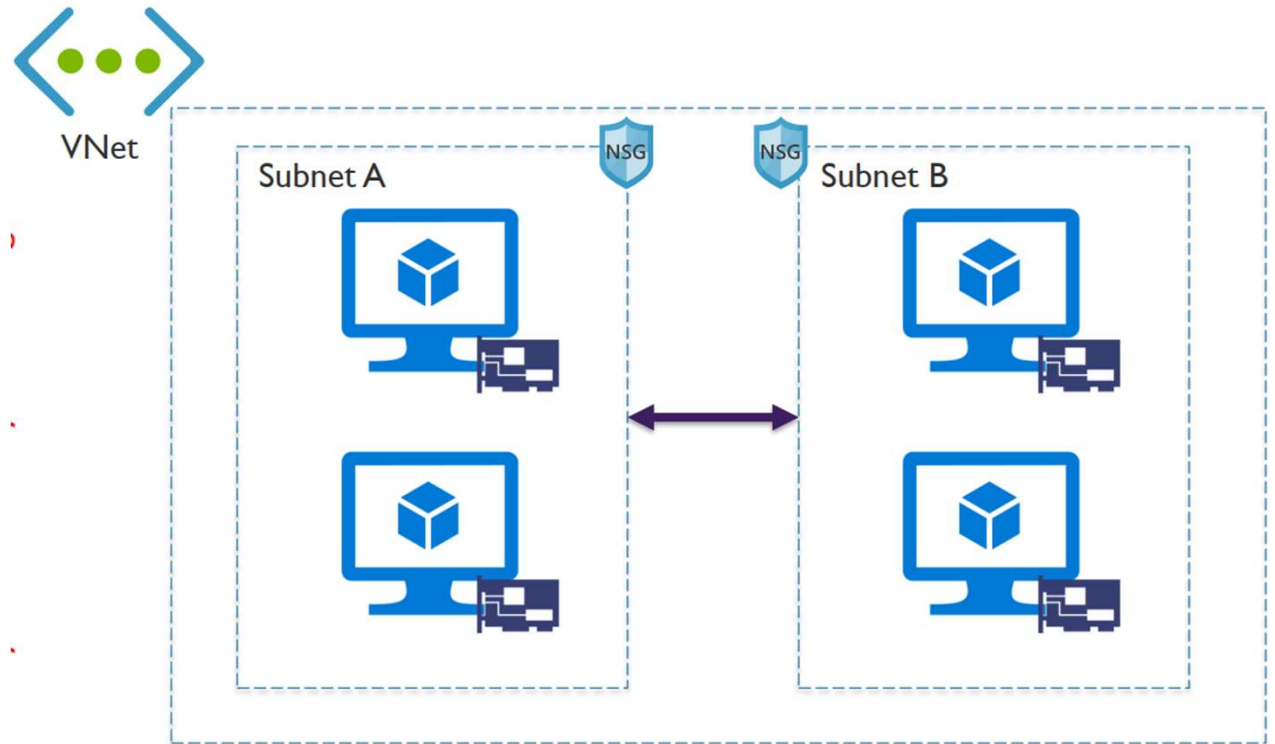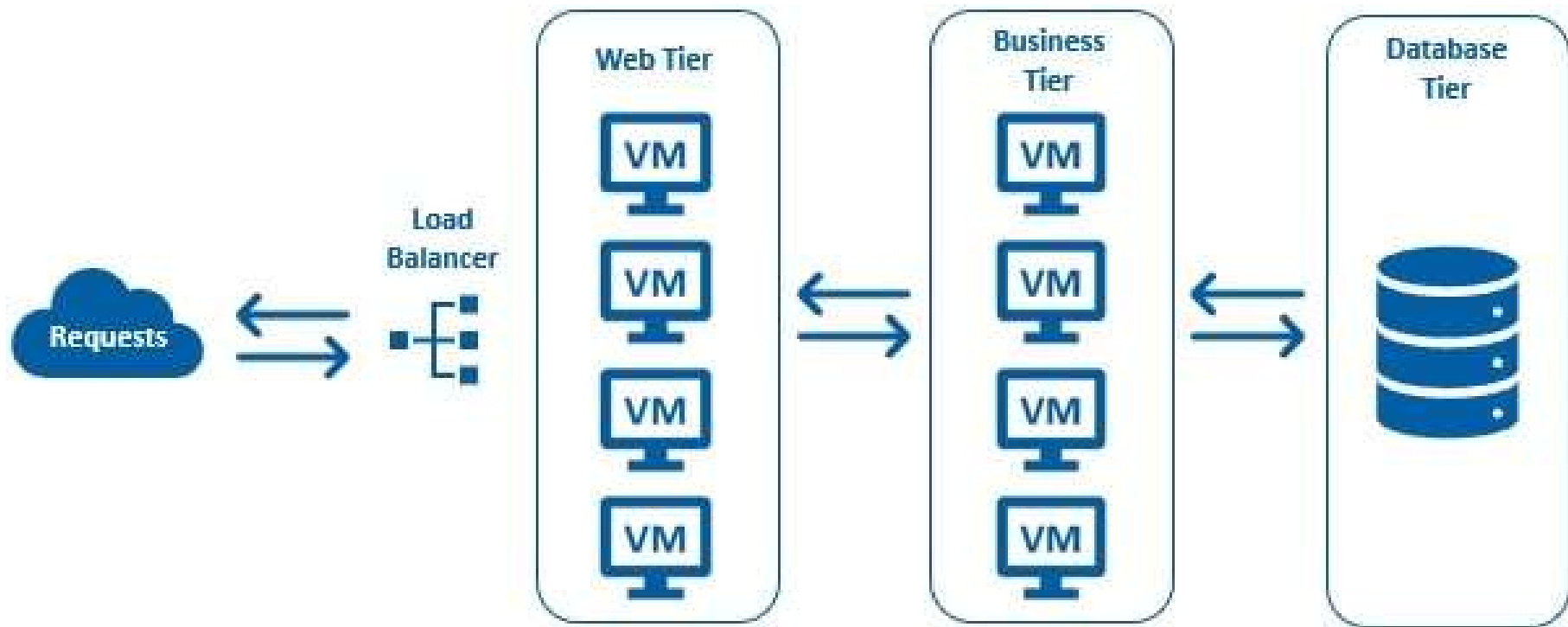
Concept of azure load balancer

- Layer 4 load-balancing service
- Built to handle millions of requests per second

TCP Port 80

80   80   80

VM   VM   VM
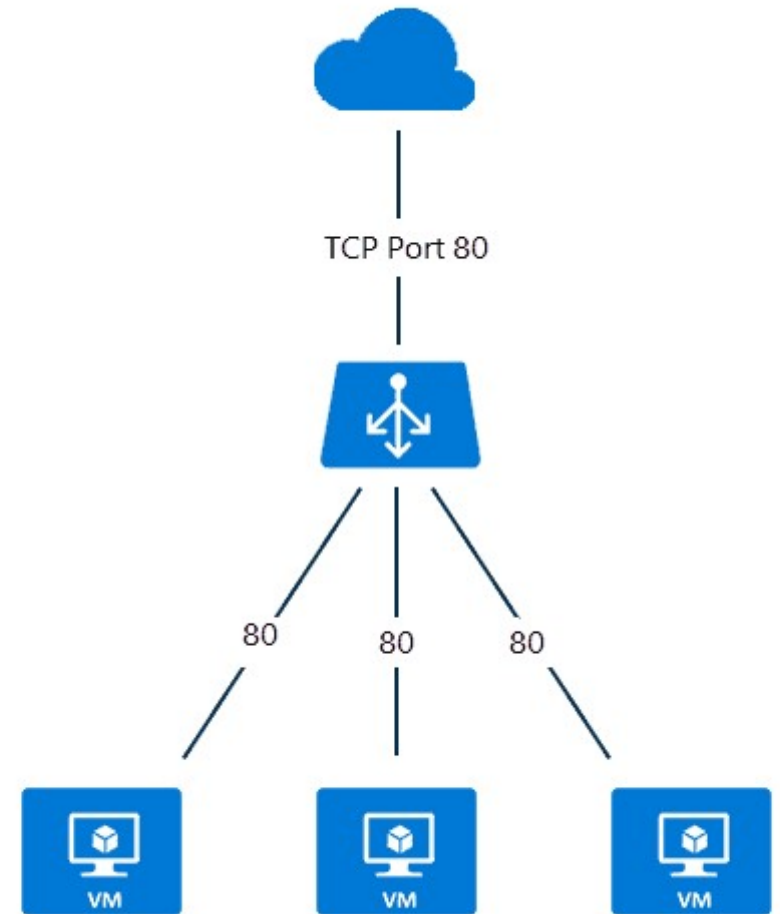
Azure Virtual Machine Scale

- To create and manage a group of load balanced VMs
- The number of VM instances can automatically increase or decrease in response to demand or a defined schedule

VNet Peering

- Enables to seamlessly connect two or more Virtual Networks in Azure
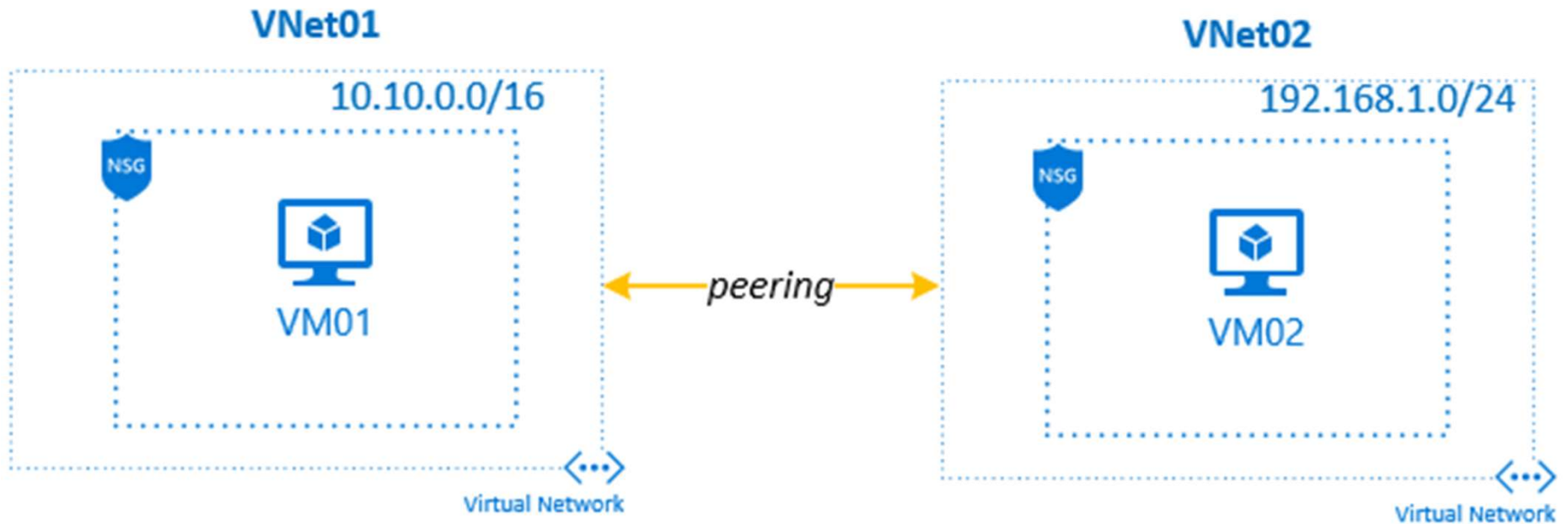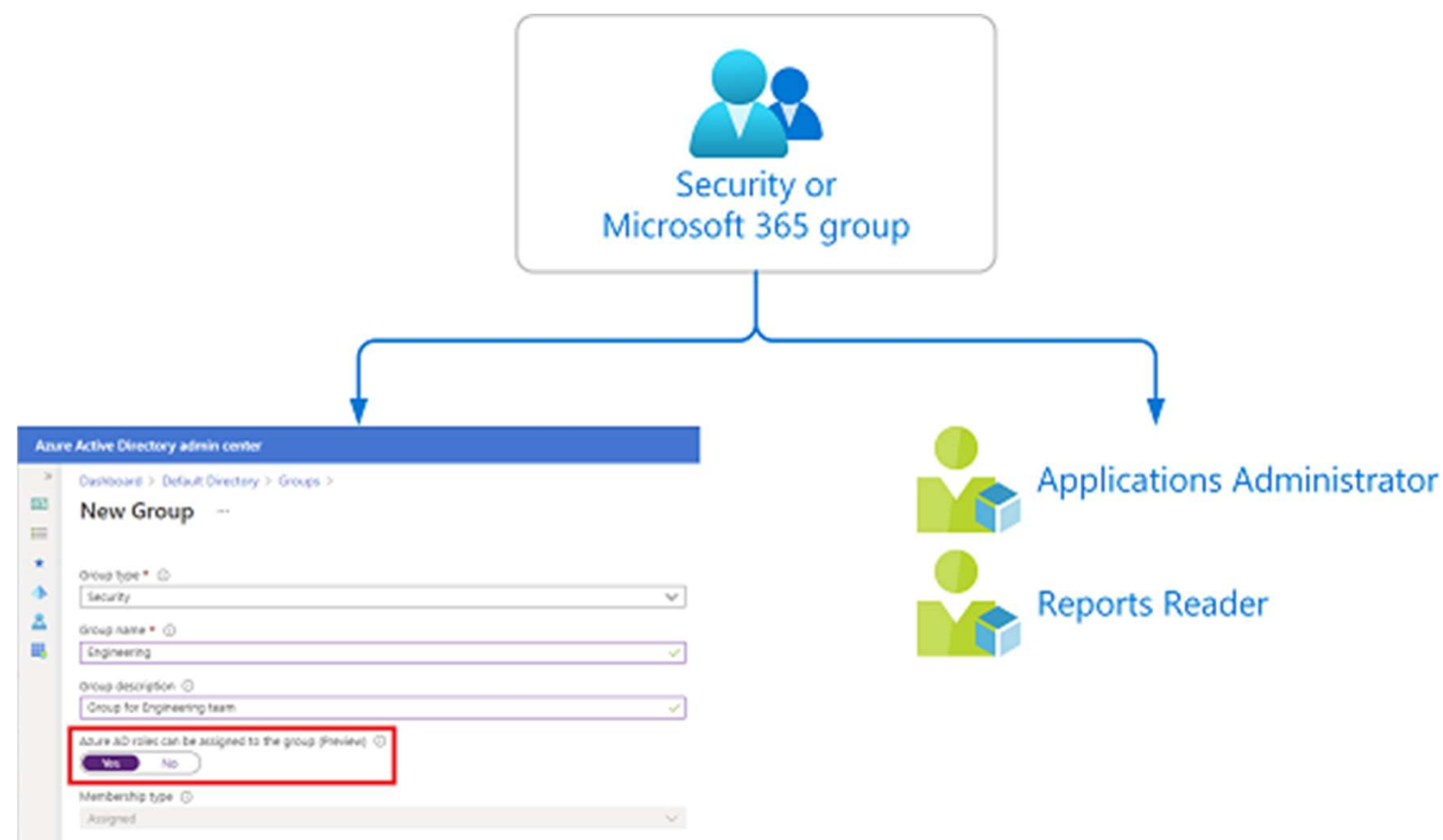
Lab: Azure Networking

Lab: Implementation of VNet

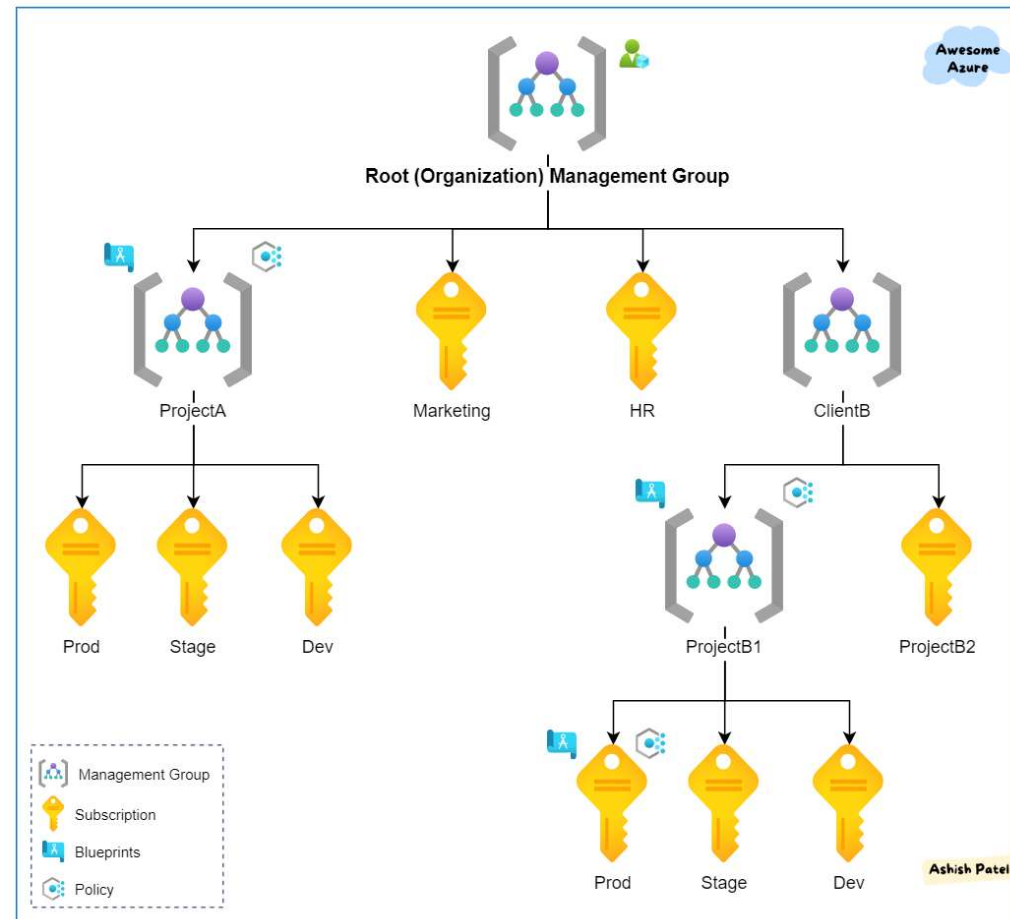# Azure AD Authentication

What is Azure Active Directory?

- Cloud-based identity and access management (IAM) solution
- Provides
  - Single sign-on
  - Conditional access to guard against 99.9 percent of cybersecurity attacks.
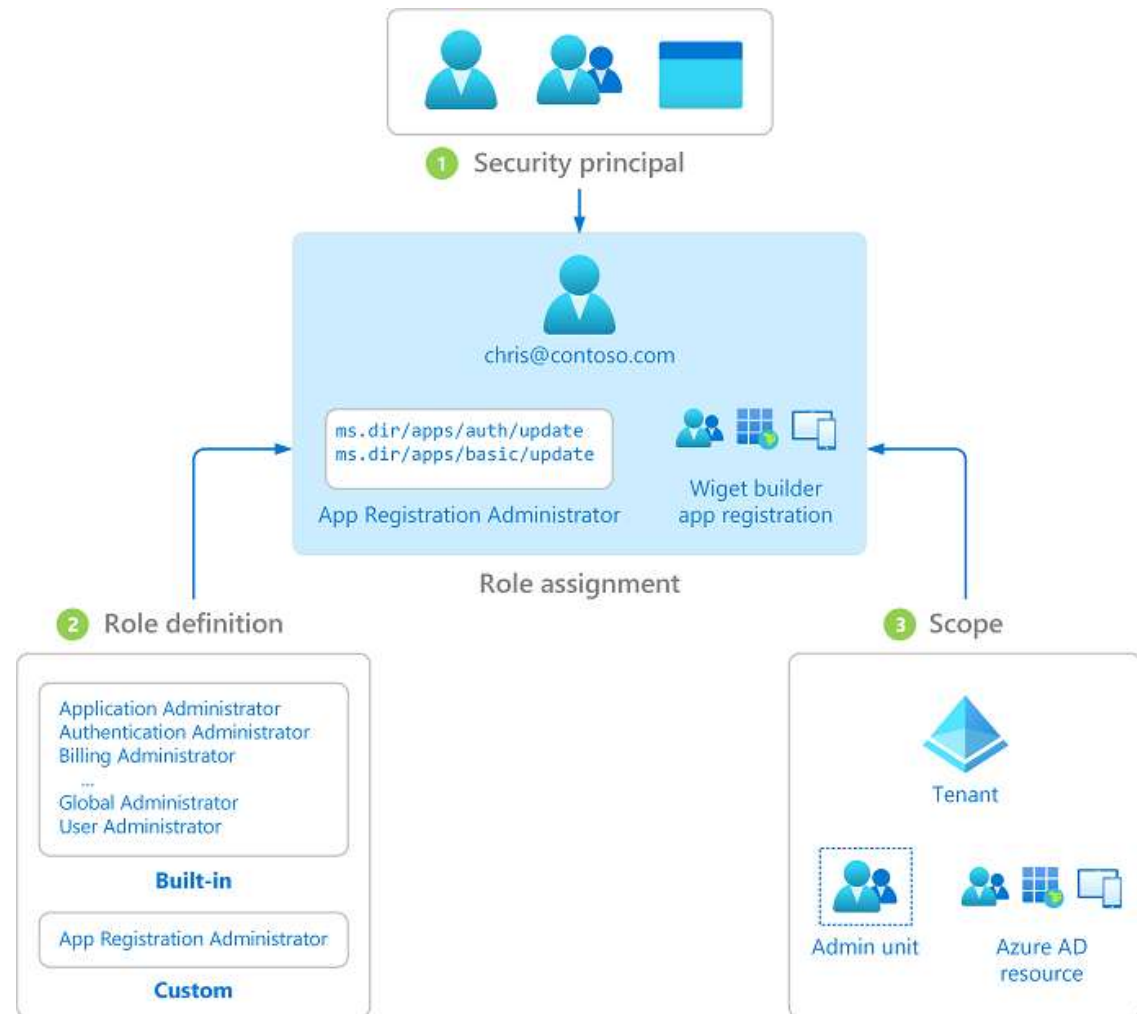 - Multifactor authentication
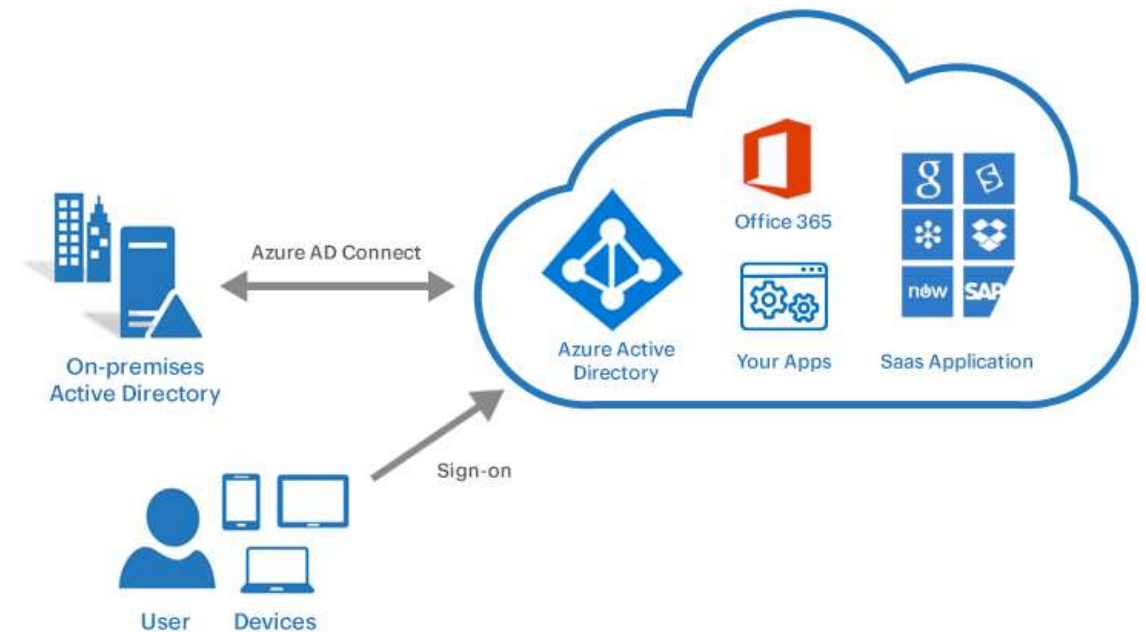
User and Groups

Manage Subscriptions

Role Base Access Control (RBAC)

- Provides fine-grained access management of Azure resources.

- Segregates duties within team and grant only the amount of access to users that they need to perform their jobs

Lab : Azure AD Authentication

- Lab: How to create user and groups?

- Lab: Implementation of permission

Thanks