

PA200

Introduction to Microsoft Azure and Compute services in Microsoft Azure

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Azure Subscription

- **Azure Subscription** is a logical container for your resources. Each Azure resource is associated with only one subscription.
- **Azure Account** is the email address that you provide when you create an Azure subscription is the Azure account for the subscription
 - It is responsible for the monthly costs that are incurred by the resources in the subscription
 - You can use the same Azure account (email address) for multiple subscriptions
 - Each subscription is associated with only one Azure account.
- Subscription is associated to a specific **Azure Offer**

Azure Active Directory

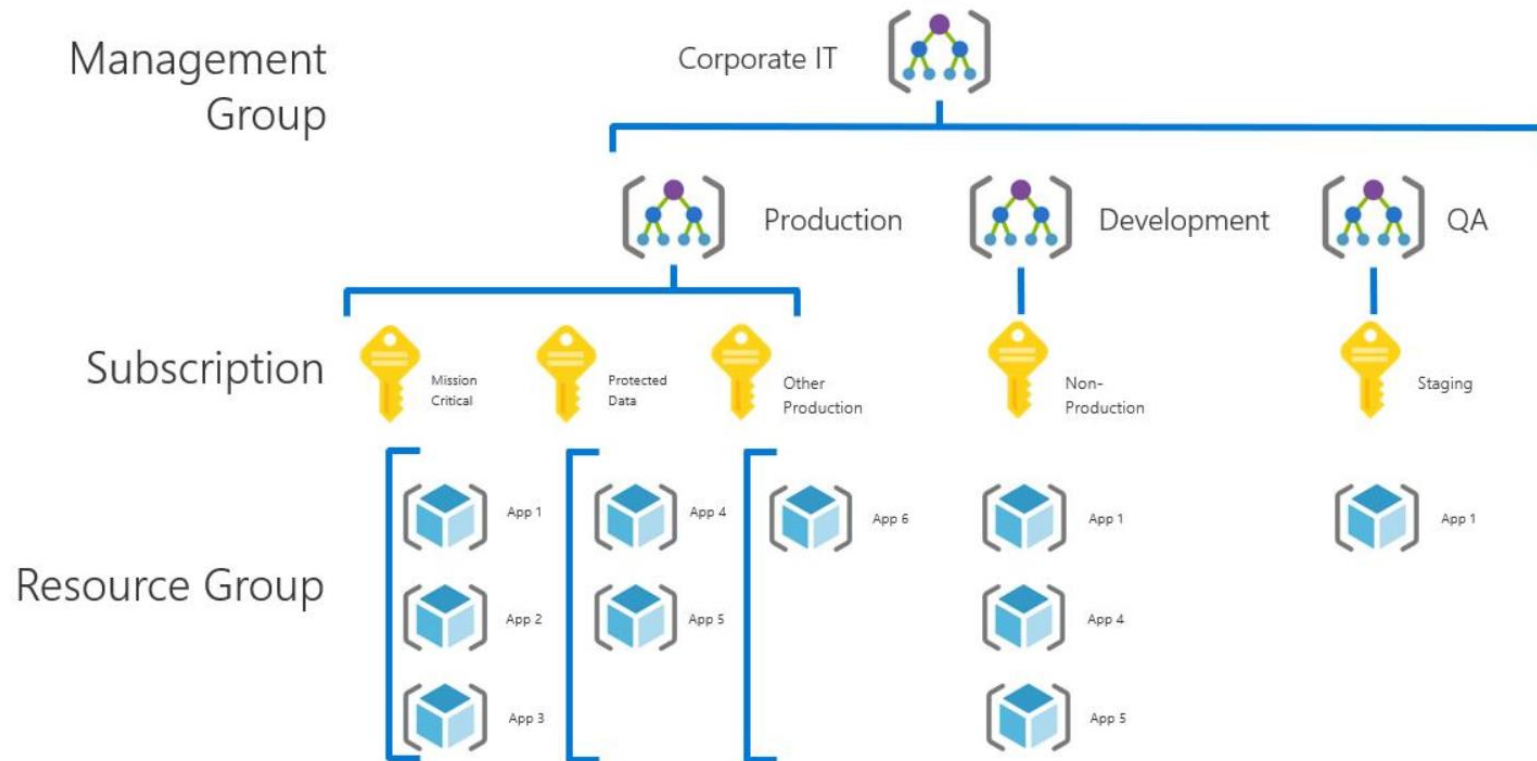
- **Azure Active Directory (Azure AD)** is the Microsoft cloud-based identity and access management service
 - It allows your users/applications to sign in and access resources.
- **Azure AD tenant** is a dedicated and trusted instance of Azure AD
 - An Azure AD tenant is automatically created when your organization first signs up for a Microsoft cloud service subscription
- Each Azure AD tenant has a single, dedicated, and trusted **directory**
 - It includes the tenant's users, groups, and applications.
 - The directory is used to perform identity and access management functions for tenant resources.
 - **A directory can be associated with multiple subscriptions, but each subscription is associated with only one directory.**

How to get your subscription

- Free Azure Subscription can be created using following offers:
- **Azure Free Trial**
 - Free trial account - \$200 credit for 30 days, 12 months of free services
 - Requires credit card, supports **spending limit**
 - <https://azure.microsoft.com/en-us/free/>
- **Azure for Students**
 - Free student account (requires university validations)
 - \$100 credit for one year, free services
 - Does not require credit card
 - <https://azure.microsoft.com/en-us/free/students/>

Resource hierarchy

- Subscriptions can be grouped into **Management Groups**
- Resources in a subscription are grouped into **Resource Groups**

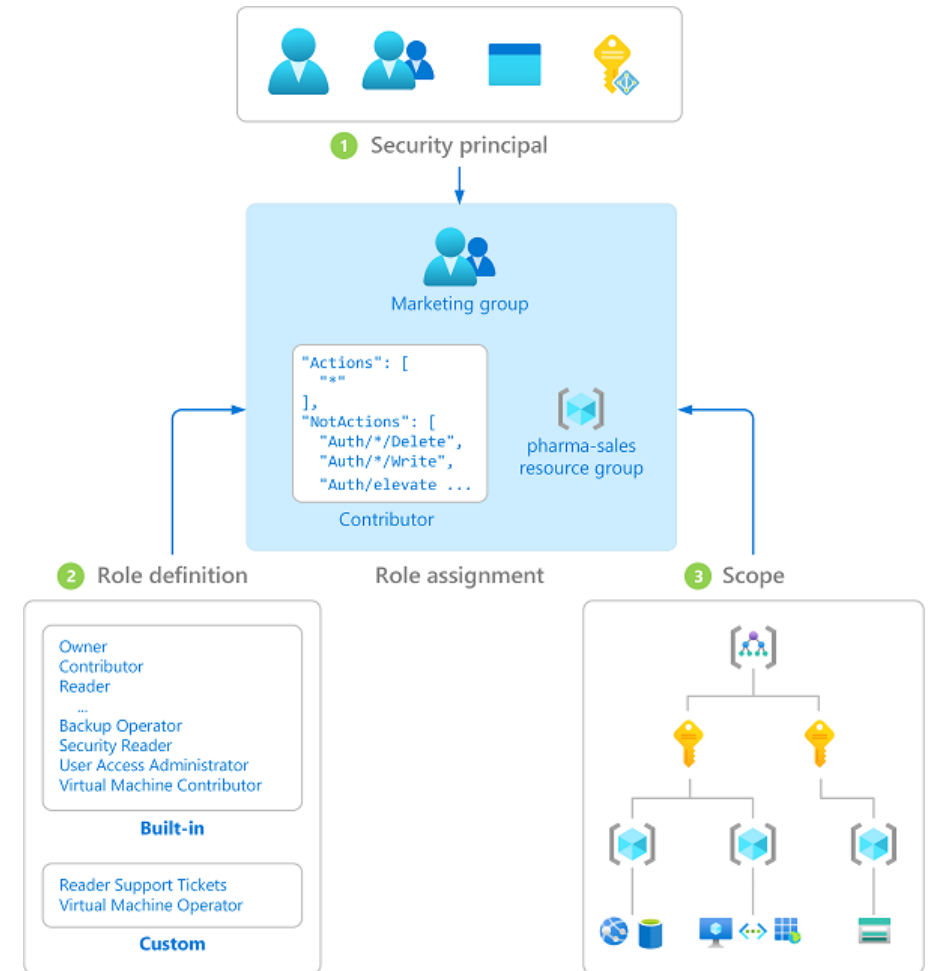


Resource Group

- Logical containers that you use to group related resources in a subscription
- Each resource can exist in only one resource group
 - Most of the resources can be moved between resource groups
- Resource groups allow for more granular grouping within a subscription, and are commonly used to represent:
 - A collection of assets required to support a workload, application, or specific project within a subscription
- Resource group can be deleted including all resources
 - **Use locks to prevent accidental deletitions (they are unrecoverable)**

Role-based Access Control (RBAC)

- Azure RBAC is an authorization system built on Azure Resource Manager that provides fine-grained access management of Azure resources
- Using Azure RBAC you can allow other users manage resources in your subscription



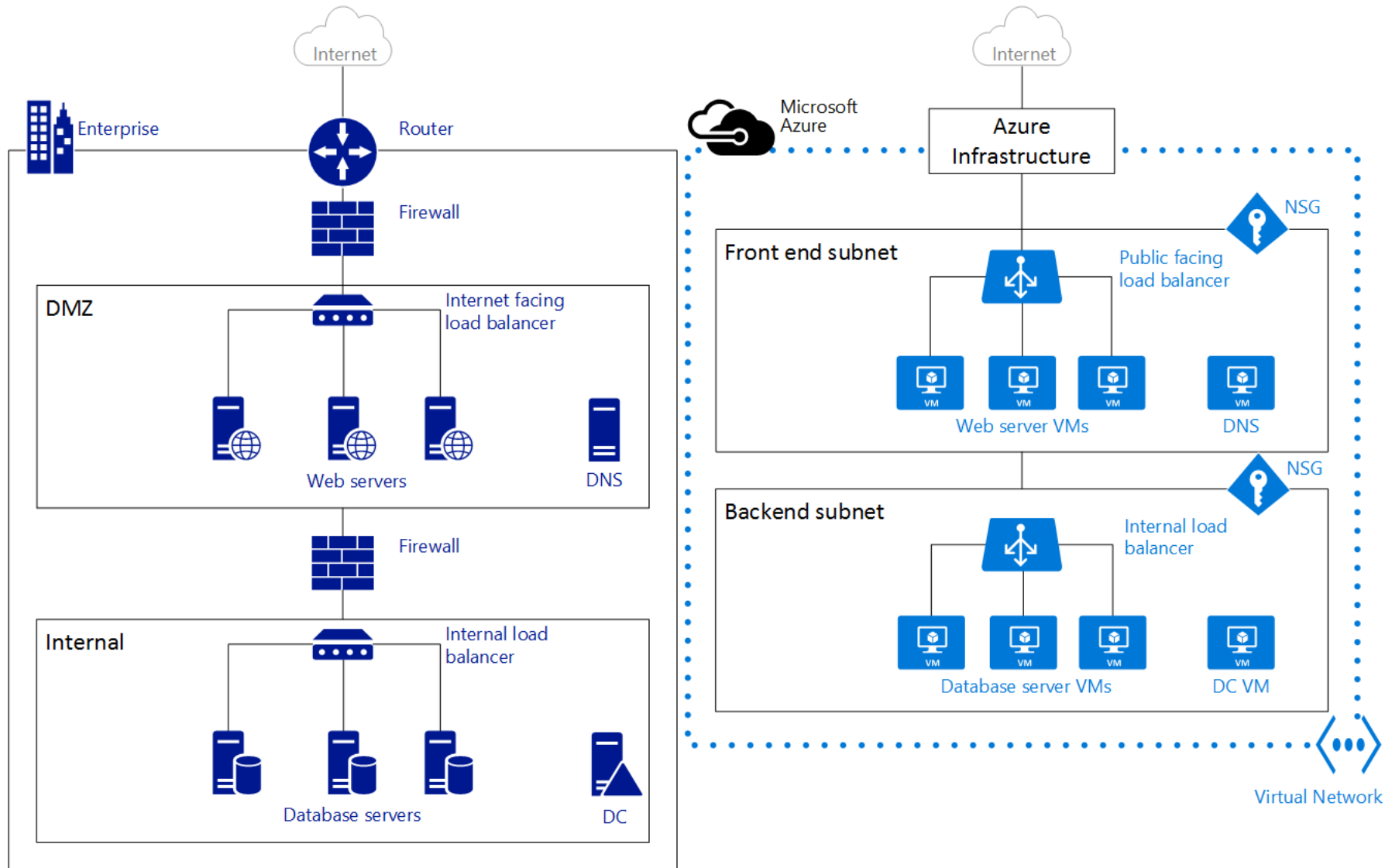
Azure Virtual Machines (IaaS)

- IaaS service which allocates a virtual machine in cloud provider's datacenter
- Provides a full access to a virtual machine with Windows or Linux OS preinstalled
- **It is important to select type of VM based in application's requirements**
 - Different ratio CPU/RAM, performance of storage, GPU availability
 - General Purpose / Compute / Memory / Storage Optimized
- Local storage is ephemeral
 - For persistent storage use Azure Disk service

Azure Storage Managed Disk

- Primary persistent storage for Azure Virtual Machines
 - Other storages of the VM are deleted when the VM is redeployed
- The service provides various performance tiers:
 - Premium SSD Managed Disks
 - Standard SSD Managed Disks
 - Standard HDD Managed Disks
 - Ultra Disk

Azure Virtual Network



Azure App Service (PaaS)

- Web/application servers managed by the cloud provider (PaaS)
 - App Service automatically patches and maintains the OS and language frameworks for you
- Developer selects required runtime and then deploys its application using supported deployment method
 - Supported runtimes: ASP.NET, ASP.NET Core, Java, Ruby, Node.js, PHP, or Python
 - Common support for Continuous Integration and Deployment
- Support for vertical and horizontal scalability (autoscale)
- Built-in high availability

Azure App Service plan

- In App Service an app always runs in an App Service plan
- It defines a set of compute resources for a web app to run
- One or more apps can be configured to run on the same computing resources (or in the same App Service plan)
- It determines:
 - Region (West Europe, East US, etc.)
 - Number of VM instances
 - Size of VM instances (Small, Medium, Large)
 - Pricing tier

Kudu

- Kudu is the engine behind a number of features in Azure App Service related to source control based deployment, and other deployment methods like Dropbox and OneDrive sync
- **Useful for troubleshooting of your application**
 - **Access to:** App settings, Connection strings, Environment variables, Server variables, HTTP headers
 - Run commands in the Kudu console
 - Browse filesystem of the webserver
- To access open URL: <https://<app-name>.scm.azurewebsites.net>

Managed Containers (PaaS)

- Cloud provider provisions and manages compute infrastructure for deployment and operations of applications in containers
- Developer creates a Docker container with application and stores it in a container registry
- The service downloads the application container from a container registry and runs it
- Available Microsoft Azure container services:
 - [Azure Kubernetes Service \(AKS\)](#), [Azure Red Hat OpenShift](#), [Azure Service Fabric](#)
 - [Azure Container Apps](#) – Serverless containers
 - [Azure Container Instances](#) – Hypervisor isolated containers
 - [Web App for Containers](#)

Serverless Computing (PaaS/FaaS)

- **Function as a Service (FaaS)** is a new trend, when developers deploy not applications but functions (methods with code) that are triggered based in selected trigger
- The function is automatically hosted and also scaled
- Commonly billed based on consumed CPU time and memory
- Supported triggers: HTTP call, time, message in queue, new file
- Services:
 - [Azure Functions](#), [Azure Container Apps](#)
 - [Azure SQL Database Serverless](#), [Azure Cosmos DB Serverless](#)
 - Azure Storage, [Azure Service Bus](#), [Azure Event Grid](#)