Microsoft Azure Administrator
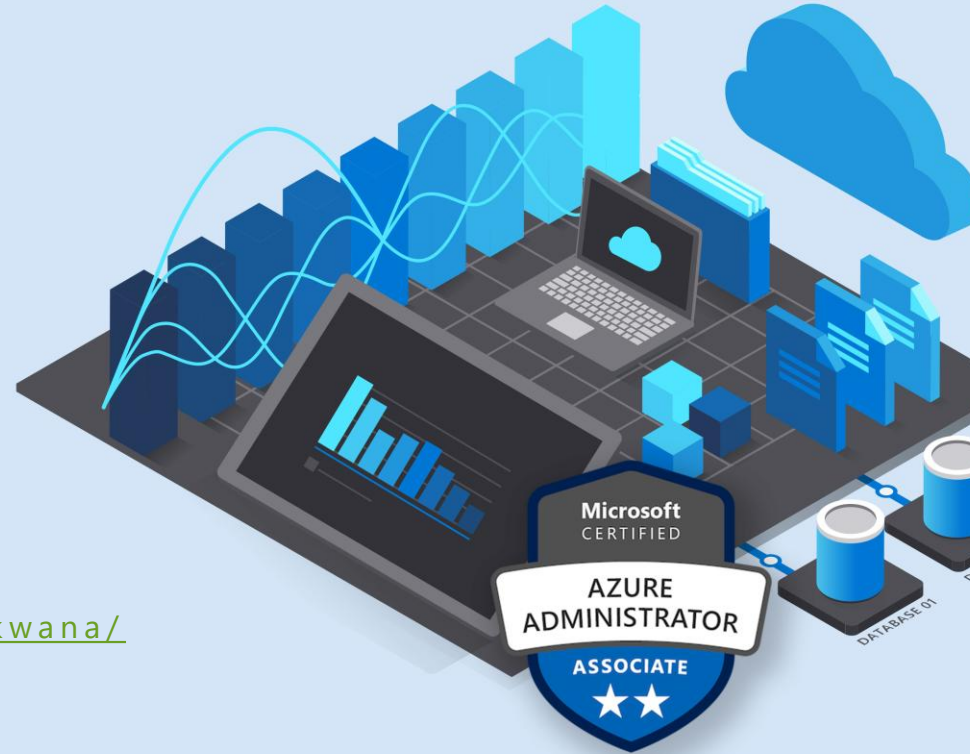
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9th June 2025

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About this course

Prerequisites

- Successful Azure Administrators start this role with experience on operating systems, virtualization, cloud infrastructure, storage structures, and networking

Azure Administrator Role

- Cloud Administrators manage the cloud services that span storage, networking and compute cloud capabilities, with a deep understanding of each service across the full IT lifecycle

- They take end-user requests for new cloud applications and make recommendations on services to use for optimal performance and scale, as well as provision, capacity, monitor and adjust as appropriate. This role requires communicating and coordinating with vendors

- Cloud Administrators use the Azure Portal and as they become more proficient, they use PowerShell and the Command Line Interface

Get ready for your Microsoft Certification exam

Exam AZ-104: Microsoft Azure Administrator

Understand the skills measured by the exam

Study area	Percentage
Manage Azure identities and governance	20 - 25%
Implement and manage storage	15 – 20%
Deploy and manage Azure compute resources	20 – 25%
Configure and manage virtual networking	15 - 20%
Monitor and backup resources	10 – 15%

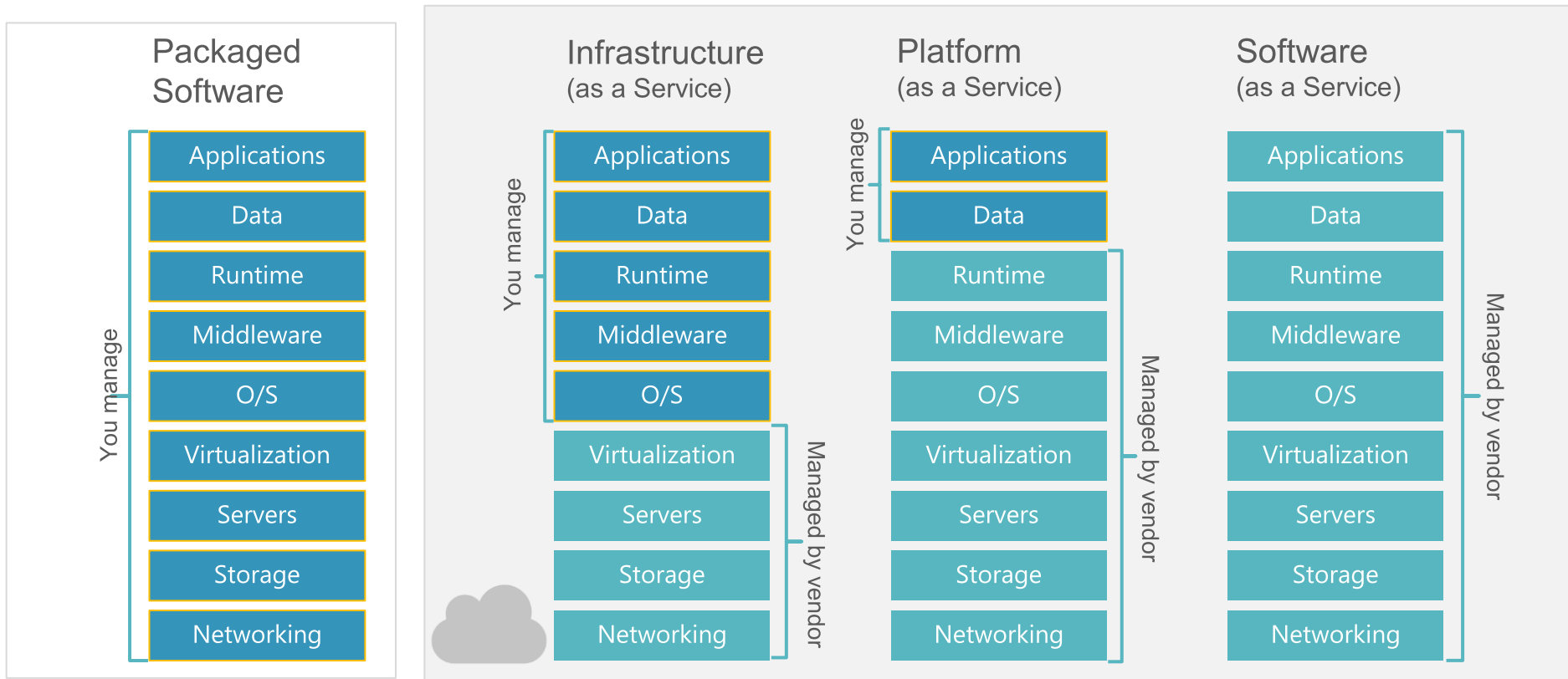**Build confidence in your skills**

Find in the exam page resources to help prepare

- Watch exam prep videos
- Review the exam study guide
- Demo the exam experience with the exam sandbox
- Take a practice assessment

Azure
Cloudshell
VNet
ARM templates

Resource group
Virtual Machine
ACI
IAAS

Azure Storage

App Service Plan
PAAS

VNet peering

BLOB

Azure Shared Responsibility Model

Packaged Software

You manage

- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

Infrastructure
(as a Service)

You manage

- Applications
- Data
- Runtime
- Middleware
- O/S

Managed by vendor

- Virtualization
- Servers
- Storage
- Networking

Platform
(as a Service)

You manage

- Applications
- Data

Managed by vendor

- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

Software
(as a Service)

Managed by vendor

- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

Describe the Core Architectural Components of Azure

Identify Regions

A region represents a collection of datacenters

Provides flexibility and scale

Preserves data residency

Select regions close to your users

Be aware of region deployment availability

There are global services that are region independent
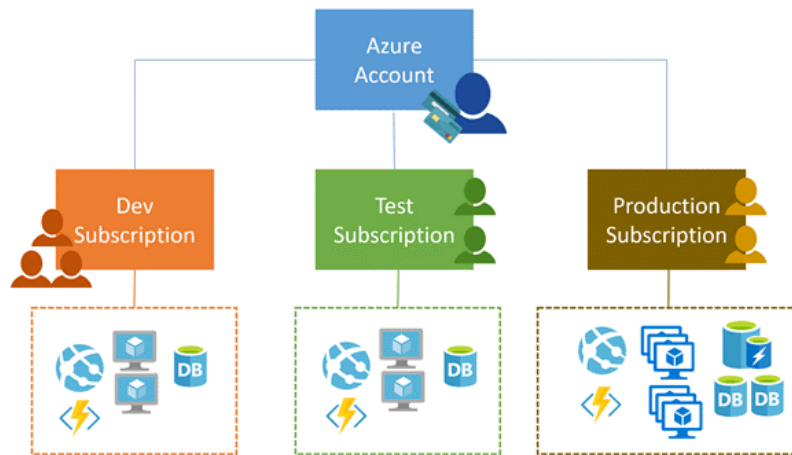
Most regions are paired for high availability

Worldwide there are 70+ regions representing 140 countries
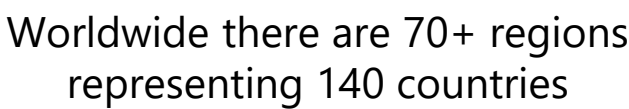
Implement Azure Subscriptions

Only identities in Entra ID, or in a directory that is trusted by Entra ID, can create a subscription

Logical unit of Azure services that is linked to an Azure account

Security and billing boundary*

Identify Subscription Usage

Subscription	Usage
Free	Includes a $200 credit for the first 30 days, free limited access for 12 months
Pay-As-You-Go	Charges you monthly
CSP	Agreement with possible discounts through a Microsoft Cloud Solutions Provider Partner – typically for small to medium businesses
Enterprise	One agreement, with discounts for new licenses and Software Assurance – targeted at enterprise-scale organizations
Student	Includes $100 for 12 months – must verify student access

Create Resource Groups

Resources can only exist in one resource group

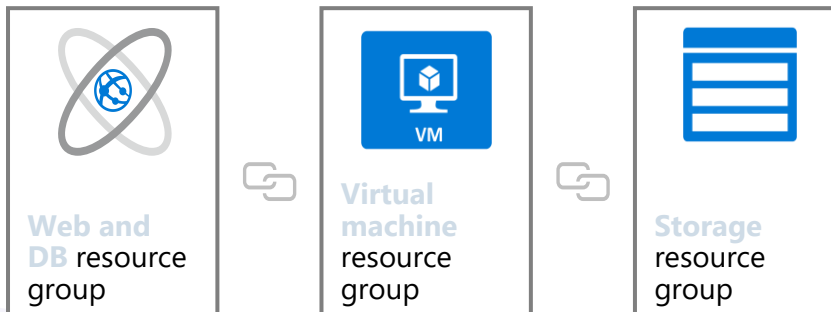Groups can have resources of many different types (services) and from many different regions

Groups cannot be renamed or nested

You can move resources between groups

Resources grouped
(Web + DB, VM, Storage) in one group

OR

Web and DB resource group

Virtual machine resource group

Storage resource group

Determine Service Limits and Quotas

ASC DEMO | Usage + quotas ☆ ⋯
Subscription

🔍 Search

Settings

🛍 Programmatic deployment
👁 Resource groups
⊞ Resources
➕ Preview features
≡ Usage + quotas
📄 Policies
📇 Management certificates
👤 My permissions

New Quota Request ∨   ↻ Refresh   ⬇ Download ∨

Quota name	Region	Subscription	Current Usage ↓		Adjustable
Total Regional vCPUs	West Europe	ASC DEMO	▬▬▬ 21%	21 of 100	Yes ✏
Total Regional vCPUs	East US	ASC DEMO	▬▬▬ 19%	19 of 100	Yes ✏
Standard Dv2 Family vCP...	West Europe	ASC DEMO	▬▬▬ 16%	16 of 100	Yes ✏
Total Regional vCPUs	North Europe	ASC DEMO	▬▬ 13%	13 of 100	Yes ✏
Total Regional vCPUs	Central US	ASC DEMO	▬▬ 13%	13 of 100	Yes ✏
Standard BS Family vCPUs	North Europe	ASC DEMO	▬▬ 12%	12 of 100	Yes ✏
Standard DSv2 Family vC...	Central US	ASC DEMO	▬▬ 10%	10 of 100	Yes ✏
Total Regional vCPUs	West US	ASC DEMO	▬▬ 8%	8 of 100	Yes ✏

Resources have a default
limit - a subscription quota

Helpful to track current usage,
and plan for future use

You can open a free support case
to increase limits to published
maximums

Create an Azure Resource Hierarchy

Management groups provides a level of scope above subscriptions

Target policies and spend budgets across subscriptions and inheritance down the hierarchies

Implement compliance and cost reporting by organization (business/teams)
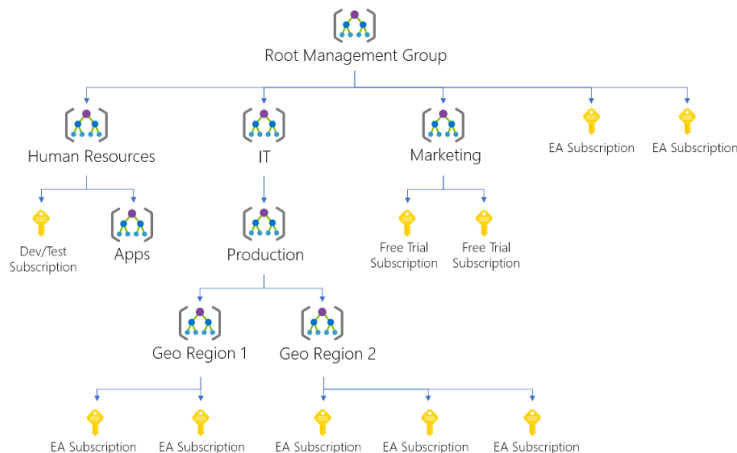
* To prevent changes, apply resource locks at the subscription, resource group, or resources level
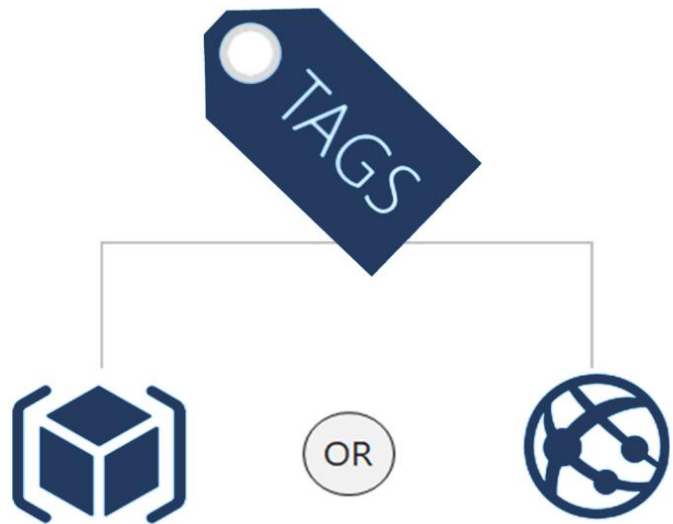
Apply Resource Tagging

Provides metadata for your Azure resources

Logically organizes resources

Consists of a name-value pair

Very useful for rolling up billing information

Owner: Joe
Department: marketing
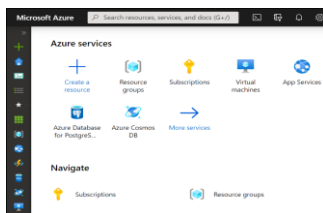Environment: production

OR

Cost-center: Marketing
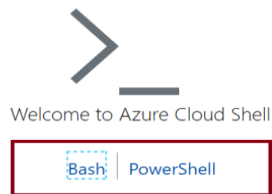
AZ-104T00A
Administer
Azure Resources
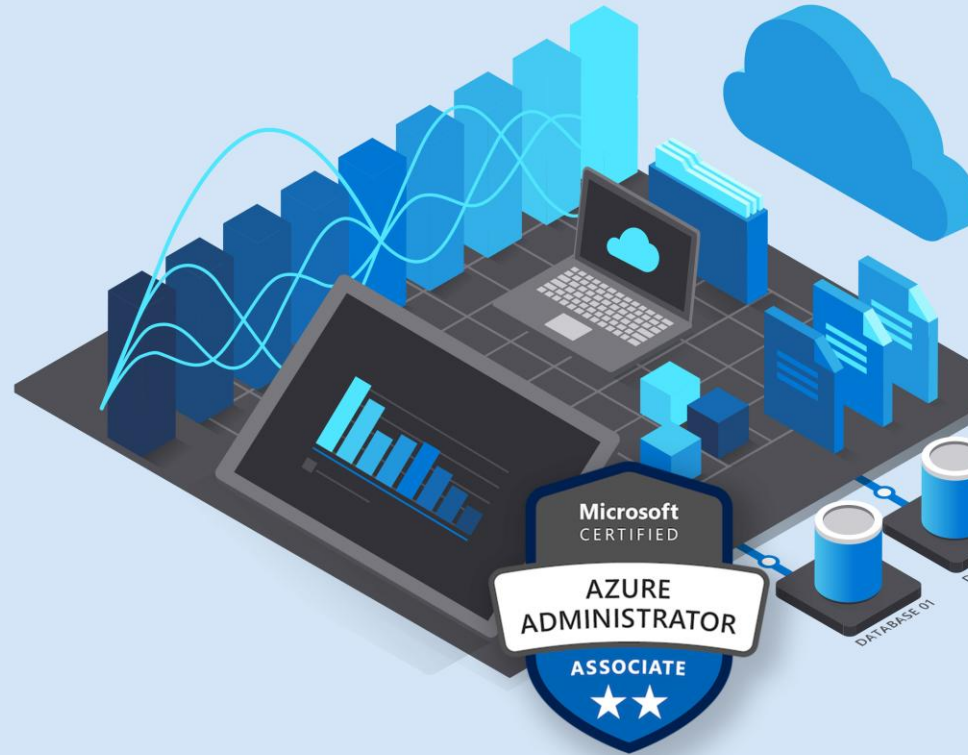
Compare Administrator tools

Azure Portal

- View and manage resources
- Visual interface
- Unified hub – training and documentation
- Personalize your experience
- Mobile app
- Access the Cloud Shell
- One-off creation scenarios

Azure Cloud Shell

Welcome to Azure Cloud Shell

Bash | PowerShell

- Interactive and browser-accessible with file storage
- Offers Bash or PowerShell
- Authenticates automatically
- Provided on a per-session and per-user basis
- Temporary - times out after 20 minutes

Azure PowerShell and CLI

az vm restart -g MyResourceGroup -n MyVm

- Command line programs
- Interactive and scripting modes
- Cross-platform
- Good for repeatable deployments
- Familiar coding experience

Review ARM Template Advantages

Improves consistency and promotes reuse

Reduce manual, error prone, and repetitive tasks

Express complex deployments

Express requirements through code

Provides validation tasks

Modular and can be linked

Simplifies orchestration

ARM
Template

Development

Production

Quality
Assurance

Explore the JSON Template Schema

Defines all the Resource manager resources in a deployment

Written in JSON

A collection of key-value pairs

Each key is a string

Each value can be a string, number, Boolean expression, list of values, object

```
{
    "$schema":
            "http://schema.management.
            azure.com/schemas/2019-04-
            01/deploymentTemplate.json#"
    ,
    "contentVersion": "",
    "parameters": {},
    "variables": {},
    "functions": [],
    "resources": [],
    "outputs": {}
}
```

Explore the JSON Template Parameters

- Specifies which values are configurable when the template runs

- This example has two parameters: one for a VM's username (adminUsername), and one for its password (adminPassword)

```
"parameters": {
  "adminUsername": {
    "type": "string",
    "metadata": {
      "description": "Username for the VM."
    }
  },
  "adminPassword": {
    "type": "securestring",
    "metadata": {
      "description": "Password for the VM."
    }
  }
}
```

Consider Azure Bicep Files

Simpler syntax for writing templates

Smaller module files you can reference from a main template

Automatically detect dependencies between your resources

Visual Studio Code extension with validation and IntelliSense

Bicep file

```
resource storageAccount
'Microsoft.Storage/storageAccounts@2021-01-01'
= {
  name: storageAccountName
  location: location
  tags: {
    displayName: storageAccountName
  }
  kind: 'StorageV2'
  sku: {
    name: 'Standard_LRS'
  } }
```
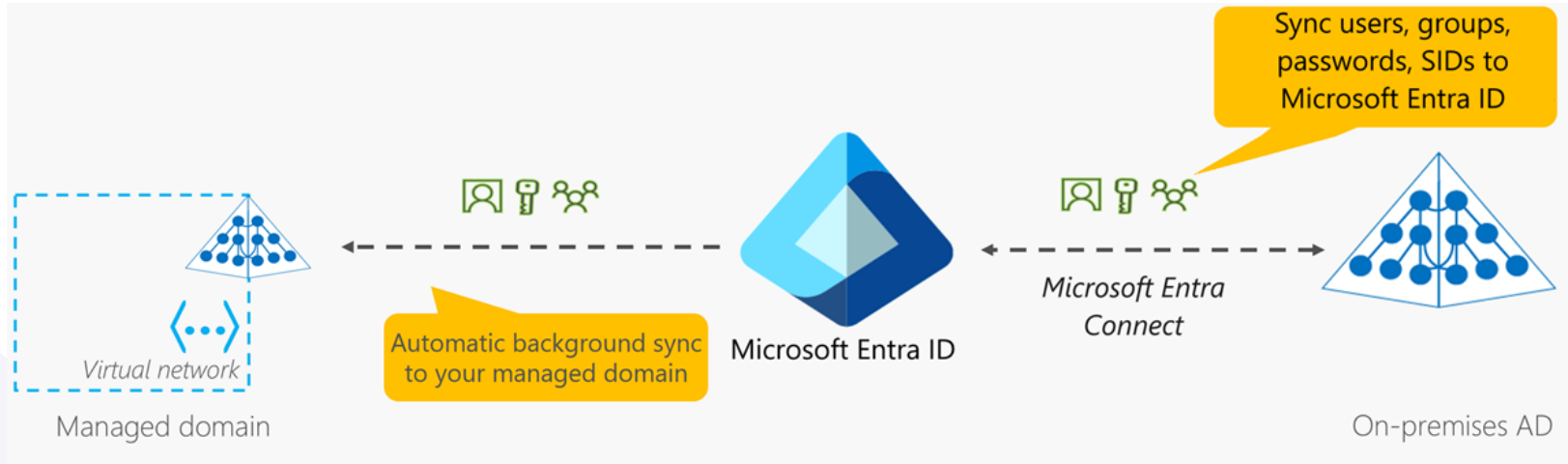
JSON

Understand
Microsoft Entra ID

Examine Microsoft Entra ID

- Configure access to applications, including single sign-on
- Manage and provision users and groups
- Providing an identity management solution, including federation
- Implement security features like multi-factor authentication and conditional access

Describe Microsoft Entra ID Concepts

Concept	Description
Identity	An object that can be authenticated
Account	An identity that has data associated with it
Microsoft Entra ID account	An identity created through Microsoft Entra ID or another Microsoft cloud service
Tenant/directory	A dedicated and trusted instance. A tenant is automatically created when your organization signs up for a Microsoft cloud service subscription. • Additional instances can be created • Microsoft Entra ID is the underlying product providing the identity service • The term *Tenant* means a single instance representing a single organization • The terms *Tenant* and *Directory* are often used interchangeably
Azure subscription	Used to pay for Azure cloud services

Compare Microsoft Entra ID to Active Directory Domain Services

Microsoft Entra ID is primarily an identity solution

Queried using the REST API over HTTP and HTTPS

Uses HTTP and HTTPS protocols such as SAML, WS-Federation, and OpenID Connect for authentication (and OAuth for authorization)

Includes federation services, and many third-party services (such as Facebook)

Microsoft Entra ID users and groups are created in a flat structure, and there are no Organizational Units (OUs) or Group Policy Objects (GPOs)

Compare Microsoft Entra ID plans

Feature	Free	Microsoft ID P1	Microsoft ID P2	Microsoft Entra Suite
Single Sign-On (unlimited)	✓	✓	✓	
Cloud and Federated authentication	✓	✓	✓	
Advanced group management		✓	✓	
Self-service account management portal	✓	✓	✓	
Multifactor authentication (MFA)	✓	✓	✓	
Conditional access		✓	✓	
Risk-based Conditional Access (sign-in risk, user risk)			✓	
Automated user and group provisioning to apps		✓	✓	✓
Privileged identity management (PIM)			✓	✓
Advanced identity governance				✓

What is self-service password reset in Microsoft Entra ID?

1. Determine who can use self-service password reset

2. Choose the number of authentication methods required and the methods available (email, phone, questions)

3. You can require users to register for SSPR (same process as MFA)

Create, configure, and manage identities

Create User Accounts

Users | All users
Microsoft

| New user | New guest user | Bulk operations ⌄ | Refresh | Reset password | Multi-Factor Authentication | Delete user |

- All users
- Deleted users
- Password reset
- User settings
- Diagnose and solve problems

Name	User principal name	↑↓	User type	Directory synced
C Retail Crisis Notifications	▓▓@microsoft.com		Member	Yes
S Rumon Sinha	▓▓▓▓@microsoft.onmicrosoft.com		Guest	No
R Momir Radojkovic	▓▓▓▓@microsoft.onmicrosoft.com		Guest	No
-N Mika Robertson	▓▓▓▓@microsoft.onmicrosoft.com		Member	No

All users must have an account	The account is used for authentication and authorization	Each user account has additional properties

Manage User Accounts

New user | New guest user | Bulk create | Bulk invite | Bulk delete | Download users | Refresh | Reset password | Multi-Factor Authentication | ...

New user
Microsoft

Create user

Create a new user in your organization. This user will have a user name like alice@Microsoft.onmicrosoft.com.

I want to create users in bulk

Invite user

Invite a new guest user to collaborate with your organization. The user will be emailed an invitation they can accept in order to begin collaborating.

I want to invite guest users in bulk

| Must be Global Administrator or User Administrator to manage users | User profile (picture, job, contact info) is optional | Deleted users can be restored for 30 days | Sign in and audit log information is available |

Create Group Accounts

Search groups		Add filters

Name ↑↓	Group Type	Membership Type
MA Managers	Security	Assigned
VM Virtual Machine Administrators	Security	Assigned
VN Virtual Network Administrators	Security	Assigned

Group Types
- Security groups
- Microsoft 365 groups

Membership Types
- Assigned
- Dynamic User
- Dynamic Device (Security groups only)

Assign Licenses to Users and Groups

Azure is a cloud service that provides many built-in services for free.

- Microsoft Entra ID comes as a free service

- Gain additional functionality with a P1 or P2 license

Additional Services (like O365 are paid cloud services)

- Microsoft paid cloud services require licenses

- Licenses are assigned to those who need access to the services

- Each user or group requires a separate paid license

- Administrators use the Microsoft 365 Admin portal and Microsoft Graph PowerShell cmdlets to manage licenses

❑ View license plans and plan details
❑ Set the Usage Location parameter
❑ Assign licenses to users and groups
❑ Change license plans for users and groups
❑ Remove a license