Microsoft Azure

Cloud concepts

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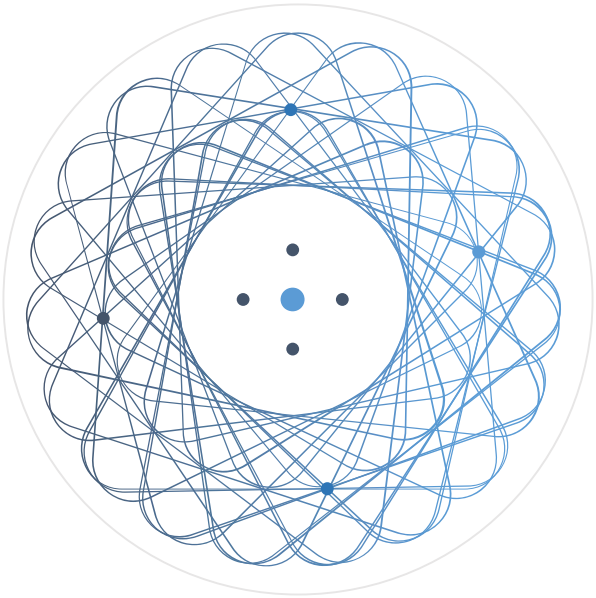


https://docs.microsoft.com/learn/paths/microsoft-azure-fundamentals-describe-cloud-concepts/

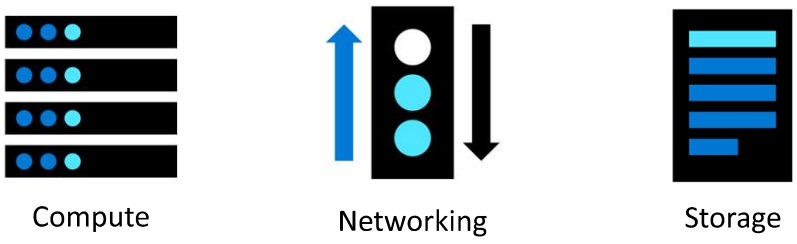
Cloud computing concepts

- Define cloud computing
- Describe the shared responsibility model
- Define cloud models, including public, private, and hybrid
- Identify appropriate use cases for each cloud model
- Describe the consumption-based model
- Compare cloud pricing models
- Describe Cloud Benefits
- Cloud Service Types (IaaS, PaaS, SaaS)
- Compare Cloud Service Types

https://docs.microsoft.com/learn/modules/describe-cloud-compute/2-introduction-cloud-compute

What is cloud computing?

Cloud Computing is the delivery of computing services over the internet, enabling faster innovation, flexible resources, and economies of scale.



https://docs.microsoft.com/learn/modules/describe-cloud-compute/3-what-cloud-compute

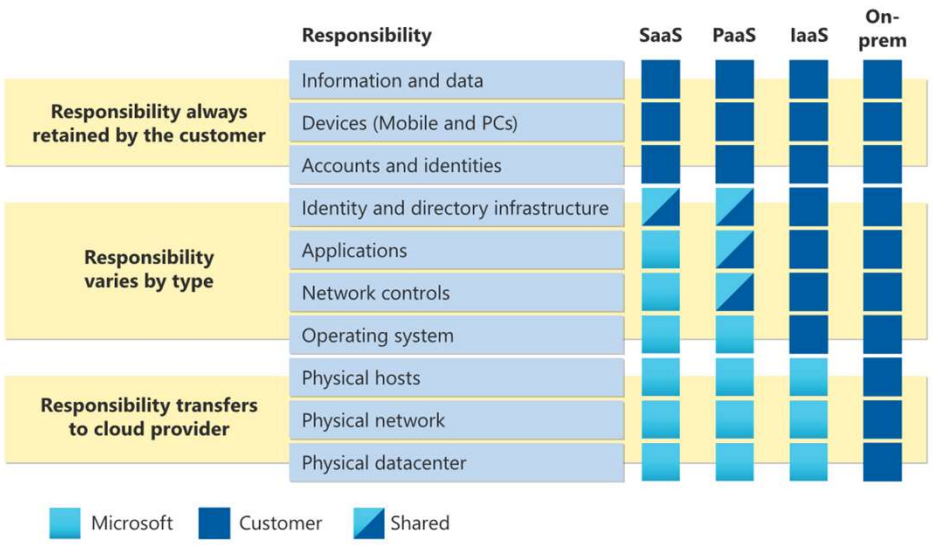
Cloud Computing is:

- A model for enabling on-demand access to a shared pool of configurable computing resources – servers, network, storage, applications, and services
- Ubiquitous, convenient, on-demand network access
- Rapidly provisioned and released with minimal management effort or service provider interaction

Definitions found at:

NIST definition - https://csrc.nist.gov/publications/detail/sp/800-145/final

Shared responsibility model

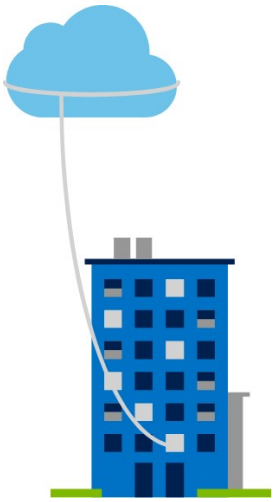


https://docs.microsoft.com/learn/modules/describe-cloud-compute/4-describe-shared-responsibility-model

IaaS, PaaS, and SaaS have dedicated topics, coming up.

Private cloud

- Organizations create a cloud environment in their datacenter.
- Organization is responsible for operating the services they provide.
- Does not provide access to users outside of the organization.



https://docs.microsoft.com/learn/modules/describe-cloud-compute/5-define-cloud-models

- Owned and operated by the organization that uses cloud resources.
- Organizations create a cloud environment in their datacenter.
- Self-service access to compute resources provided to users within the organization.
- Organization is responsible for operating the services they provide.

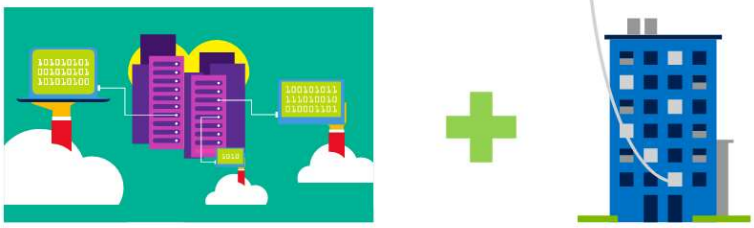
Public cloud

- Owned by cloud services or hosting provider.
- Provides resources and services to multiple organizations and users.
- Accessed via secure network connection (typically over the internet).

https://docs.microsoft.com/learn/modules/describe-cloud-compute/5-define-cloud-models

What are public, private, and hybrid clouds? - https://azure.microsoft.com/en-us/overview/what-are-private-public-hybrid-clouds/

Hybrid



- Combines **Public** and **Private** clouds to allow applications to run in the most appropriate location.

https://docs.microsoft.com/learn/modules/describe-cloud-compute/5-define-cloud-models

Hybrid cloud models have the following characteristics:

•**Resource location**. Specific resources run or are used in a public cloud, and others run or are used in a private cloud.
•**Cost and efficiency**. Hybrid cloud models allow an organization to leverage some of the benefits of cost, efficiency, and scale that are available with a public cloud model.
•**Control**. Organizations retain management control in private clouds.
•**Skills**. Technical skills are still required to maintain the private cloud and ensure both cloud models can operate together.

Cloud model comparison

Public Cloud	• No capital expenditures to scale up. • Applications can be quickly provisioned and deprovisioned. • Organizations pay only for what they use.
Private Cloud	• Hardware must be purchased for start-up and maintenance. • Organizations have complete control over resources and security. • Organizations are responsible for hardware maintenance and updates.
Hybrid Cloud	• Provides the most flexibility. • Organizations determine where to run their applications. • Organizations control security, compliance, or legal requirements.

https://docs.microsoft.com/learn/modules/describe-cloud-compute/5-define-cloud-models

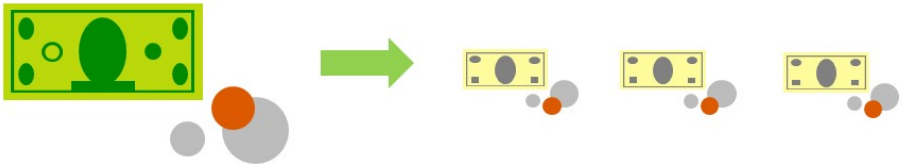
Compare CapEx vs. OpEx

Capital Expenditure (CapEx)

- The up-front spending of money on physical infrastructure.
- Costs from CapEx have a value that reduces over time.

Operational Expenditure (OpEx)

- Spend on products and services as needed, pay-as-you-go
- Get billed immediately



https://docs.microsoft.com/learn/modules/describe-cloud-compute/6-describe-consumption-based-model

Capital Expenditure (CapEx)

Spend on physical infrastructure upfront.
Deduct the expense from your tax bill.
High upfront cost, but the value of your 6investment reduces over time.

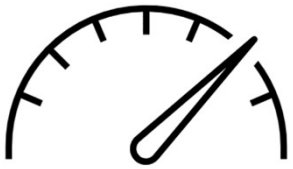
Operational Expenditure (OpEx)

Spend on services or products as needed.
Get billed immediately.
Deduct the expense from your tax bill in the same year.
No upfront cost, pay-as-you use.

Consumption-based model

- Cloud service providers operate on a consumption-based model, which means that end users only pay for the resources that they use. Whatever they use is what they pay for.

- Better cost prediction
- Prices for individual resources and services are provided
- Billing is based on actual usage



https://docs.microsoft.com/learn/modules/describe-cloud-compute/6-describe-consumption-based-model

This consumption-based model brings with it many benefits, including:

•No upfront costs.
•No need to purchase and manage costly infrastructure that they may or may not use to its fullest.
•The ability to pay for additional resources when they are needed.
•The ability to stop paying for resources that are no longer needed.

Cloud Benefits

https://docs.microsoft.com/learn/modules/describe-benefits-use-cloud-services/2-high-availability-scalability-cloud
https://docs.microsoft.com/learn/modules/describe-benefits-use-cloud-services/3-reliability-predictability-cloud
https://docs.microsoft.com/learn/modules/describe-benefits-use-cloud-services/4-security-governance-cloud
https://docs.microsoft.com/learn/modules/describe-benefits-use-cloud-services/5-manageability-cloud

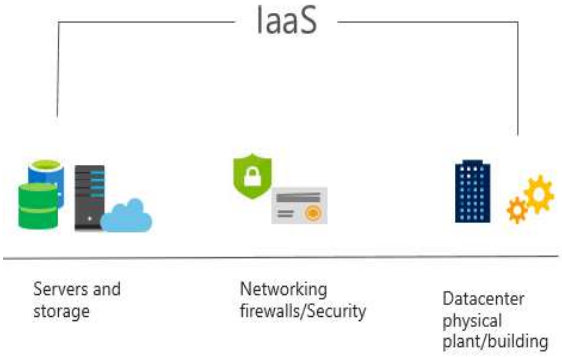
Cloud Services Types

- Describe Infrastructure as a Service (IaaS)
- Describe Platform as a Service (PaaS)
- Describe Software as a Service (SaaS)
- Identify appropriate use cases for each cloud service (IaaS, PaaS, SaaS)

https://docs.microsoft.com/learn/modules/describe-cloud-service-types/1-introduction

Infrastructure as a Service (IaaS)

- Build pay-as-you-go IT infrastructure by renting servers, virtual machines, storage, networks, and operating systems from a cloud provider.



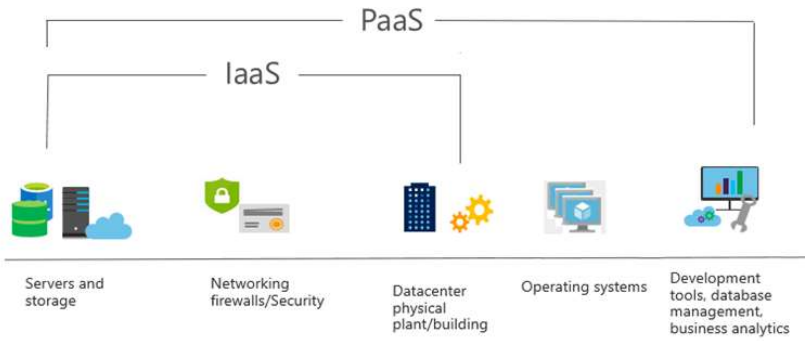
https://docs.microsoft.com/learn/modules/describe-cloud-service-types/2-describe-infrastructure-service

For more information on IaaS, visit https://azure.microsoft.com/en-us/overview/what-is-iaas/

- Most basic cloud computing services category.
- Build pay-as-you-go IT infrastructure by renting servers, virtual machines, storage, networks, and operating systems from a cloud provider.
- Instant computing infrastructure, provisioned and managed over the internet.

Platform as a Service (PaaS)

- Provides environment for building, testing, and deploying software applications; without focusing on managing underlying infrastructure.



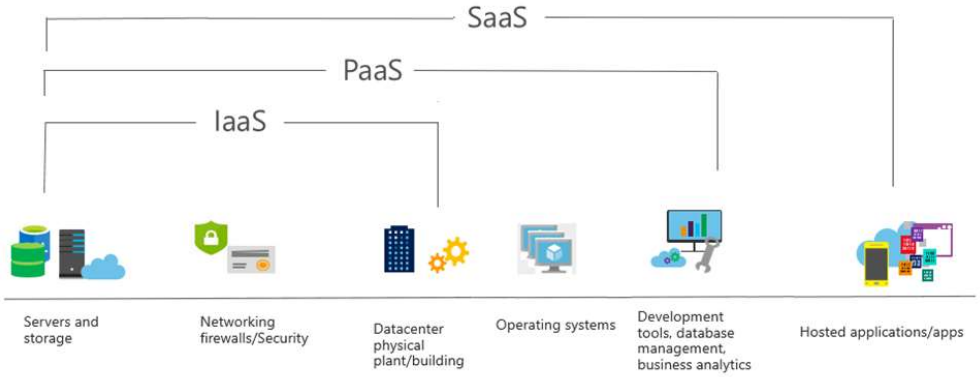
https://docs.microsoft.com/learn/modules/describe-cloud-service-types/3-describe-platform-service

For more information on PaaS, see https://azure.microsoft.com/en-us/overview/what-is-paas/

- Provides environment for building, testing, and deploying software applications.
- Helps create applications quickly, without focusing on managing underlying infrastructure.

Software as a Service (SaaS)

Users connect to and use cloud-based apps over the internet: for example, Microsoft Office 365, email, and calendars.



https://docs.microsoft.com/learn/modules/describe-cloud-service-types/4-describe-software-service

Common usage scenarios:

- Examples of Microsoft SaaS services include Microsoft Office 365, Skype, and Microsoft Dynamics CRM Online.

For more information on SaaS, see https://azure.microsoft.com/en-us/overview/what-is-saas/

Cloud service comparison

IaaS	PaaS	SaaS
The most flexible cloud service.	Focus on application development.	Pay-as-you-go pricing model.
You configure and manage the hardware for your application.	Platform management is handled by the cloud provider.	Users pay for the software they use on a subscription model.