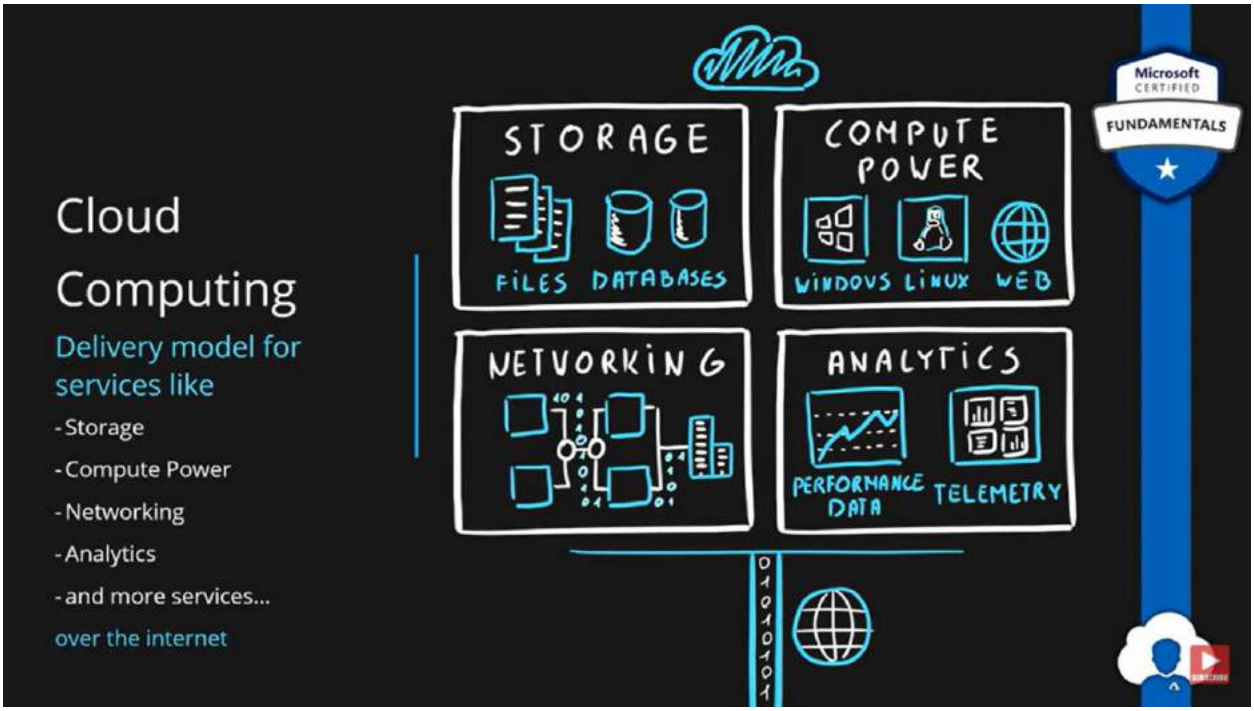
Azure -> **https://portal.azure.com/**

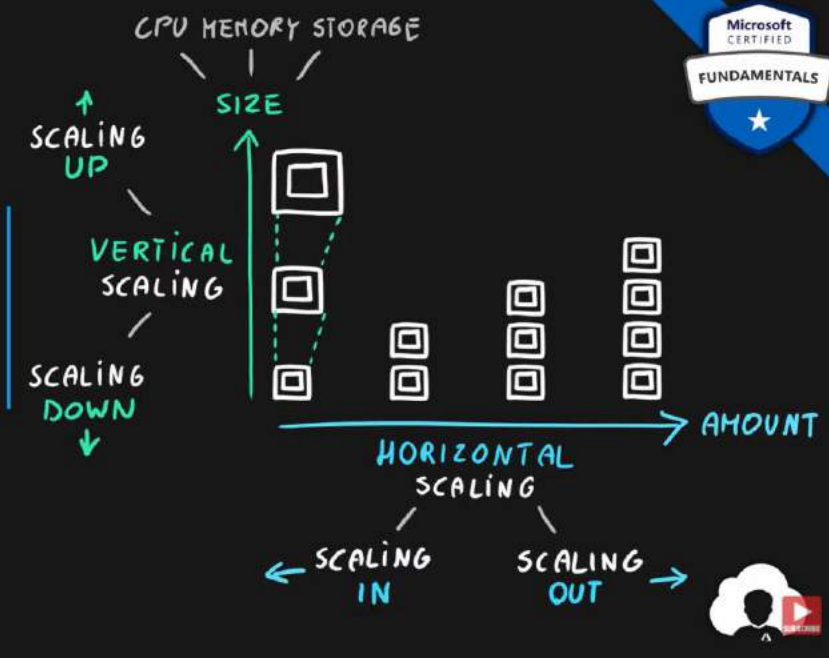
Episode 1 | Cloud Computing and Vocabulary



Cloud

Key Characteristics

- Scalability



Cloud

Key Characteristics

- Scalability

Scalability is the ability to scale

Scaling is a process of

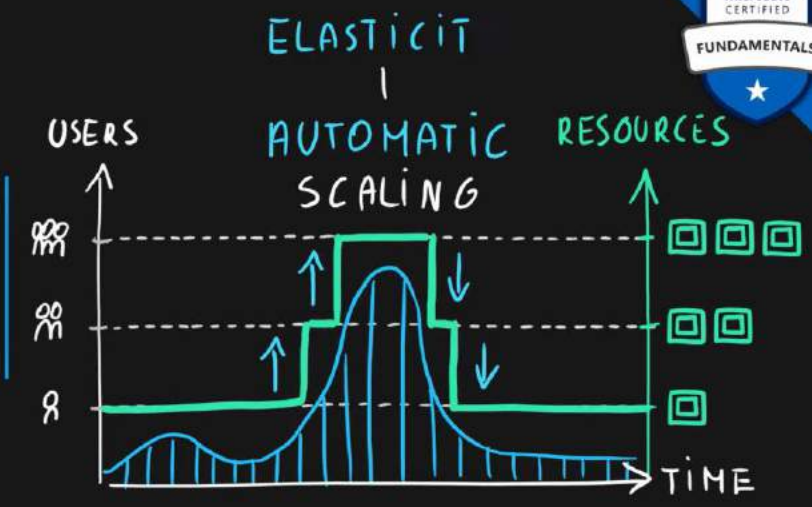
- allocating (adding) or
- deallocating (removing)

resources

Cloud

Key Characteristics

- Scalability
- Elasticity



Cloud

Key Characteristics

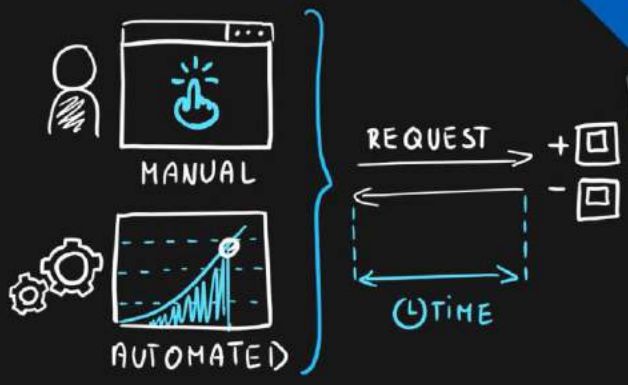
- Scalability
- Elasticity

Elasticity is the ability to scale dynamically

Cloud

Key Characteristics

- Scalability
- Elasticity
- Agility



CLOUD	ON-PREM
SECONDS MINUTES HOURS	DAYS WEEKS MONTHS

Cloud

Key Characteristics

- Scalability
- Elasticity
- Agility

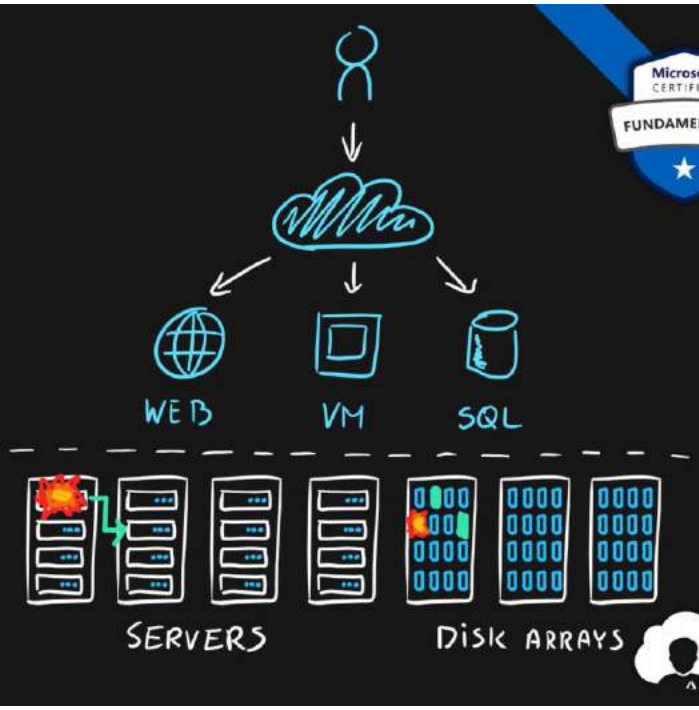
Agility is the ability to react quickly

Agility is the ability to
allocate and deallocate (scale)
resources quickly

Cloud

Key Characteristics

- Fault Tolerance



Cloud

Key Characteristics

- Fault Tolerance

Fault tolerance is the ability to remain up and running during component and service failures

Cloud

Key Characteristics

- Fault Tolerance

Disaster is a serious disruption of services caused by natural or human-induced causes

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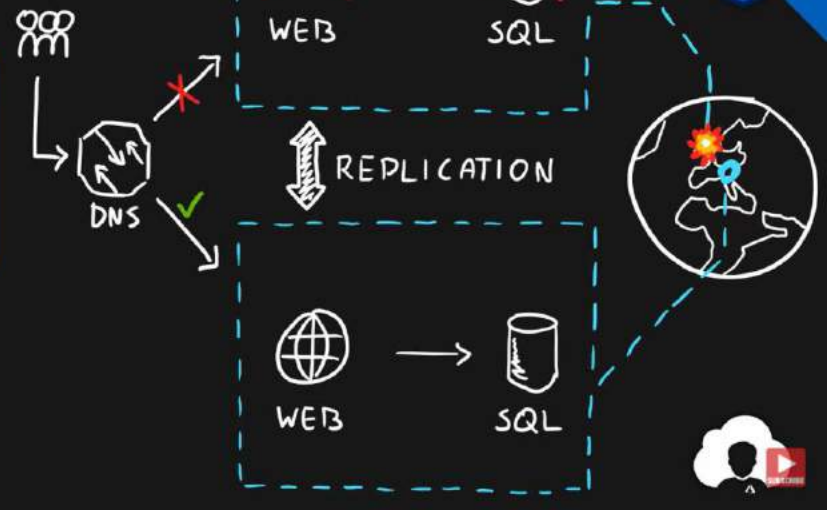
Cloud

Key Characteristics

- Fault Tolerance
- Disaster Recovery



Microsoft CERTIFIED FUNDAMENTALS

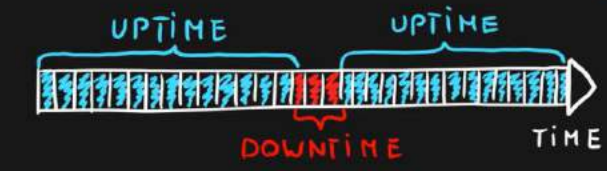
Cloud

Key Characteristics

- Fault Tolerance
- Disaster Recovery

Disaster is a serious disruption of services caused by natural or human-induced causes

Disaster recovery is the ability to recover from an event that has taken down the service (disaster)



Cloud

Key Characteristics

- Fault Tolerance
- Disaster Recovery
- High Availability

$$\text{AVAILABILITY} = \frac{\text{UPTIME}}{\text{UPTIME} + \text{DOWNTIME}}$$

AVAILABILITY	YEAR	MONTH	DAY
99%	3.65 DAYS	7.31 HOURS	14.4 MIN
99.9%	8.77 HOURS	43.83 MIN	1.44 MIN
99.99%	52.60 MIN	4.38 MIN	8.64 SEC

Cloud

Key Characteristics

- Fault Tolerance
- Disaster Recovery
- High Availability

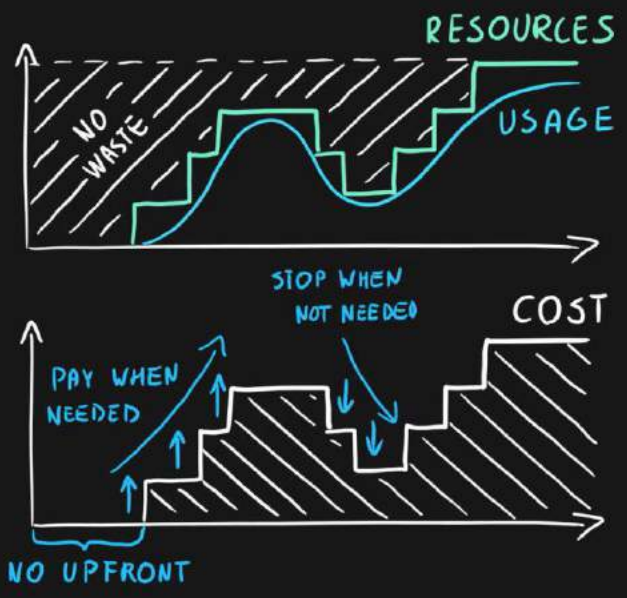
Availability is a measure of system uptime for users/services

High availability is the ability to keep services running for extended periods of time with very little downtime

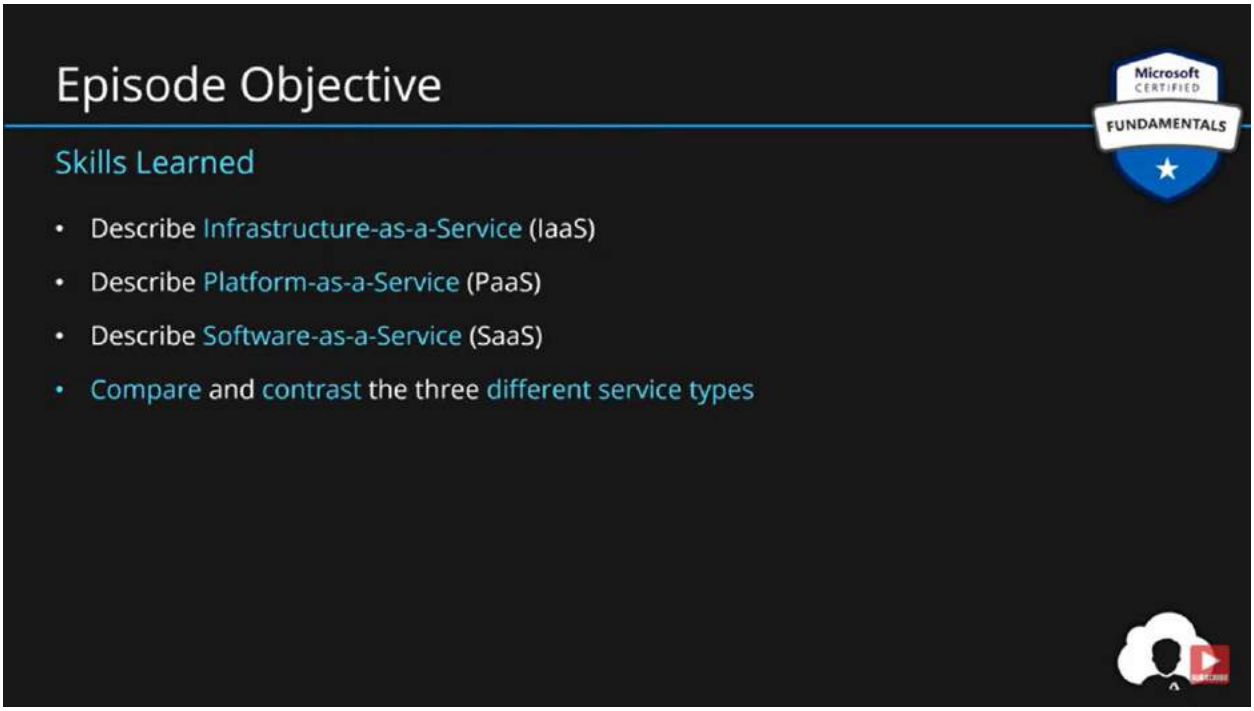
Consumption-based Model

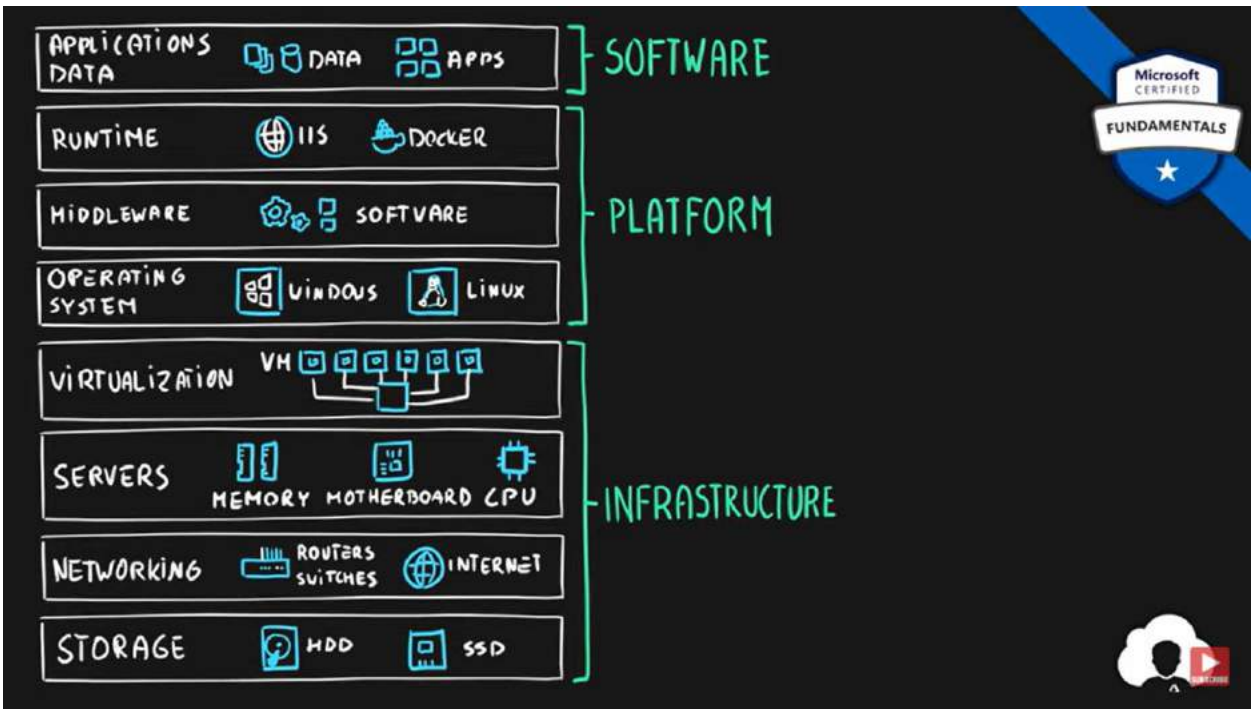
Key Characteristics

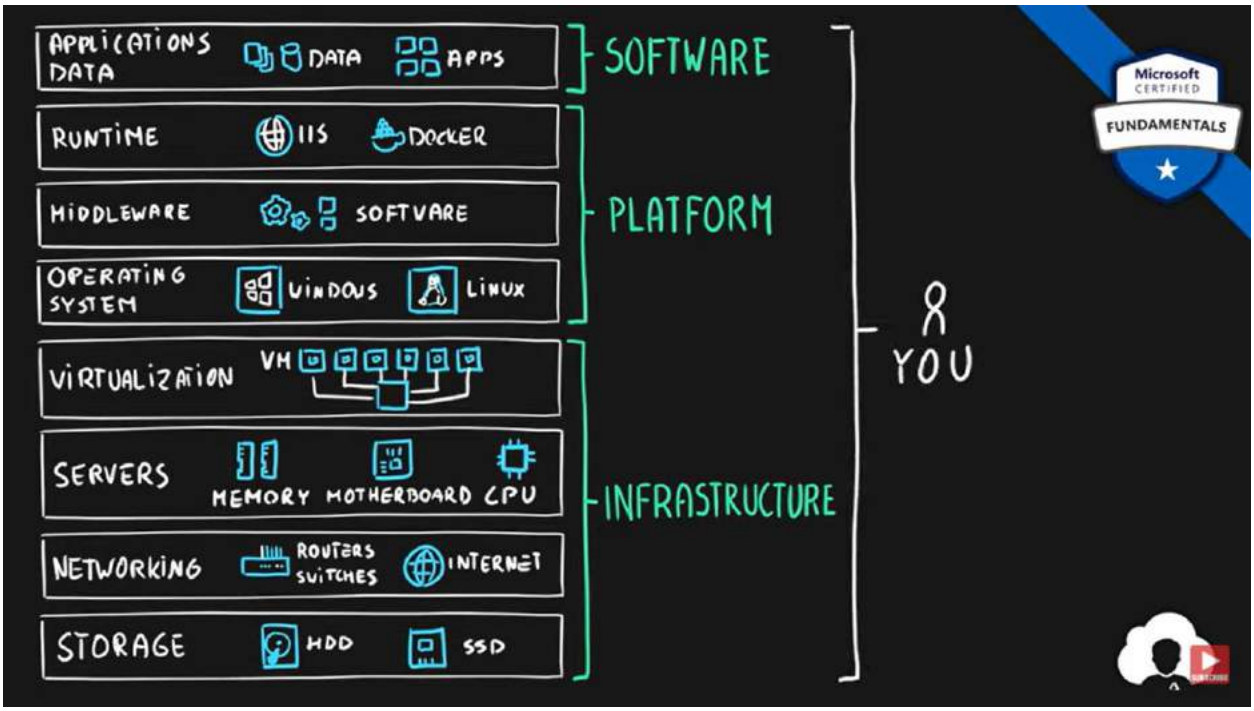
- No upfront costs
- No wasted resources
- Pay for additional resources when needed
- Stop paying at any time



Episode 5 | Cloud Service Models (IaaS vs PaaS vs SaaS cloud service models)





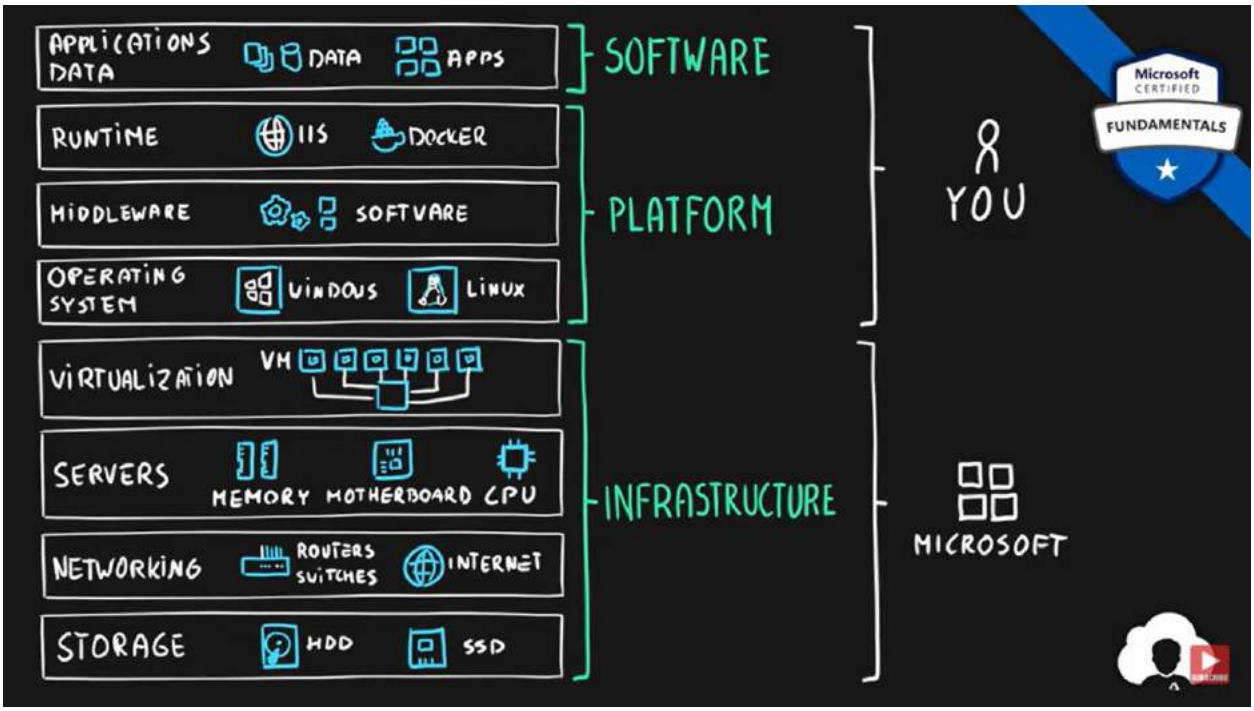


On-Premises

Key Characteristics

Ownership

- Cloud provider manages nothing
- You manage everything
  - Infrastructure – networking, hardware & virtualization
  - Platform – operating system, middleware, runtime
  - Software – data & applications



Infrastructure as a Service (IaaS)

Microsoft
CERTIFIED
FUNDAMENTALS

Key Characteristics

Ownership

- Cloud provider manages infrastructure
  - Infrastructure – networking, hardware & virtualization
- You manage platform & software
  - Platform – operating system, middleware, runtime
  - Software – data & applications

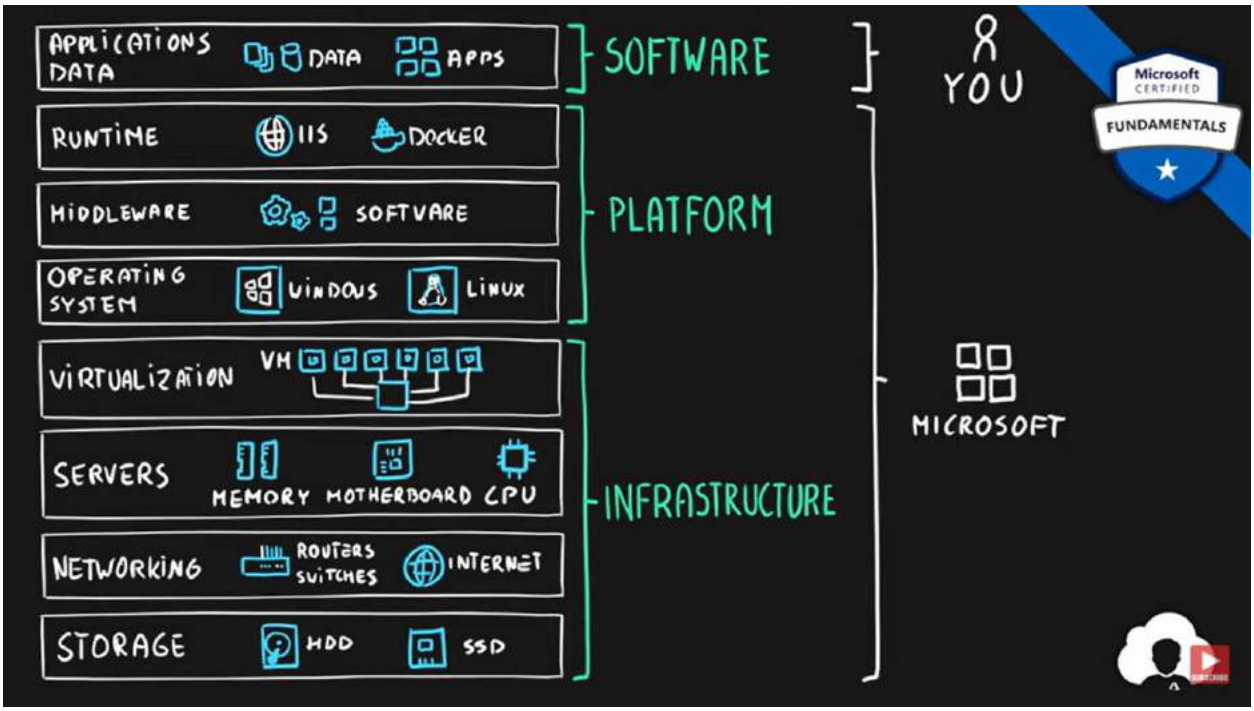
Use cases

- Migration of workloads
- Test & development
- Storage, backups and recovery

VIRTUAL MACHINE

VIRTUAL NETWORK

MANAGED DISK



Platform as a Service (PaaS)

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FUNDAMENTALS

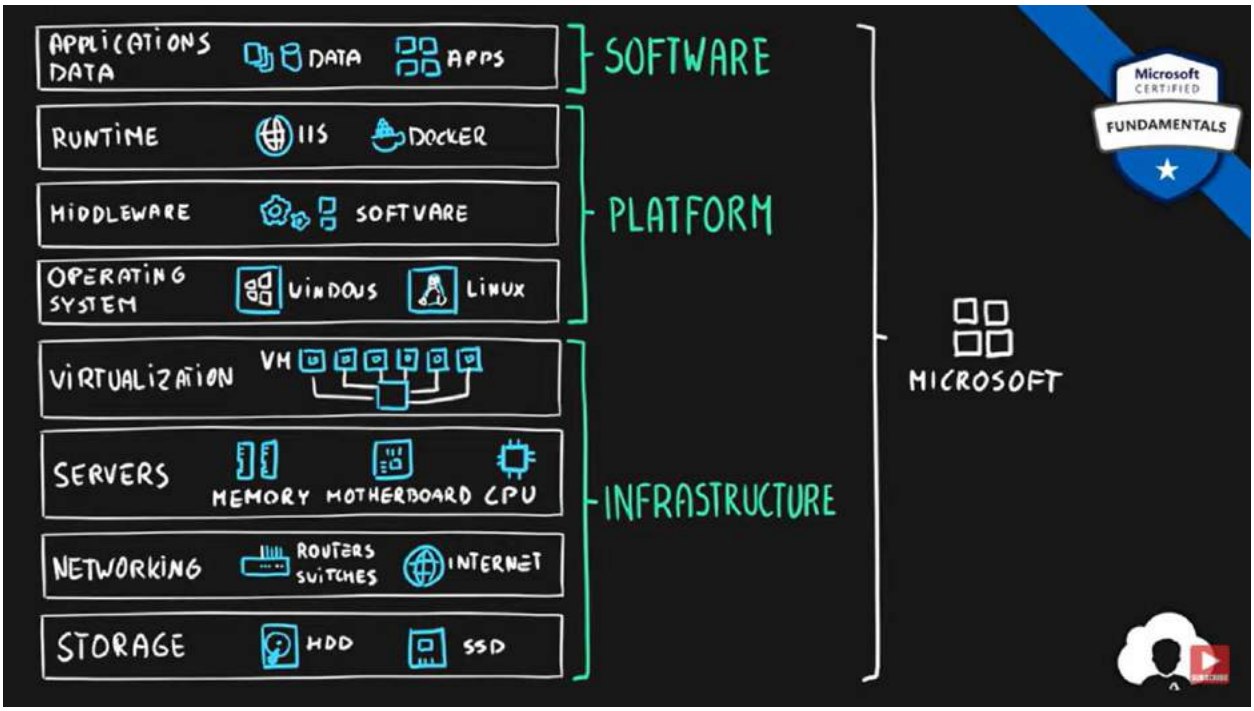
Key Characteristics

Ownership

- Cloud provider manages infrastructure & platform
  - Infrastructure – networking, hardware & virtualization
  - Platform – operating system, middleware, runtime
- You manage software
  - Software – data & applications

Use cases

- Development framework
- Analytics & business intelligence



Software as a Service (SaaS)

Microsoft
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FUNDAMENTALS

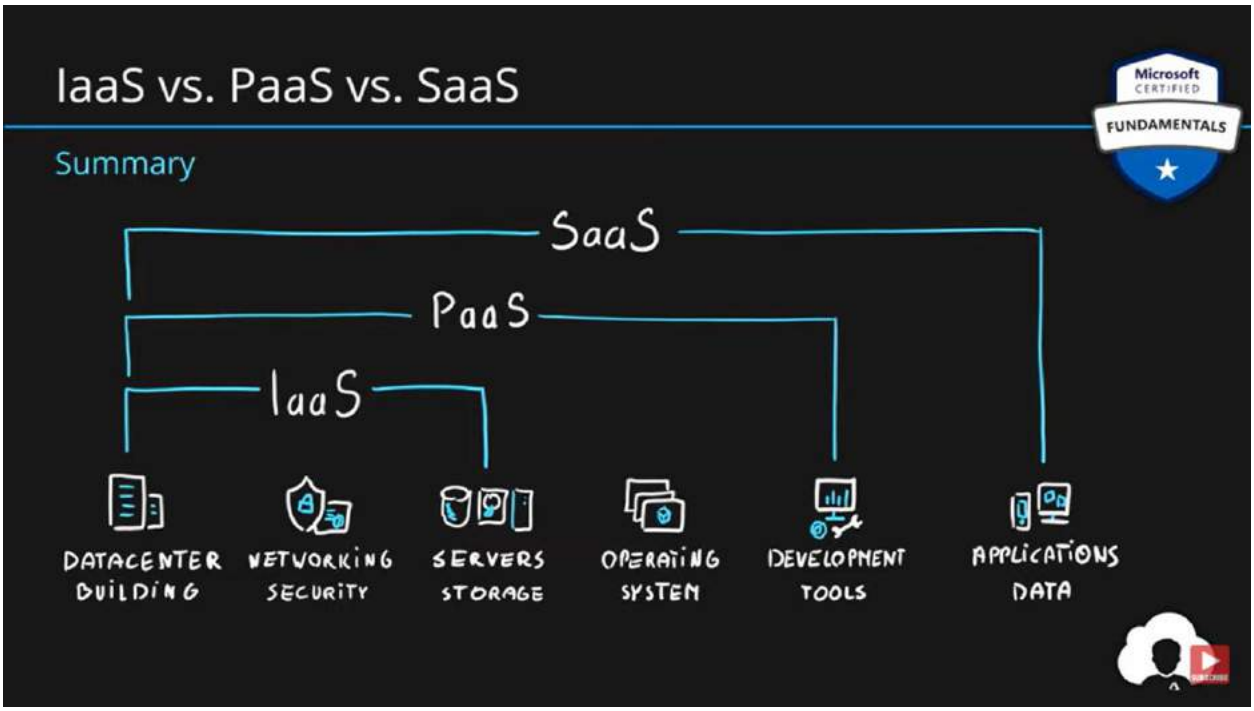
Key Characteristics

Ownership

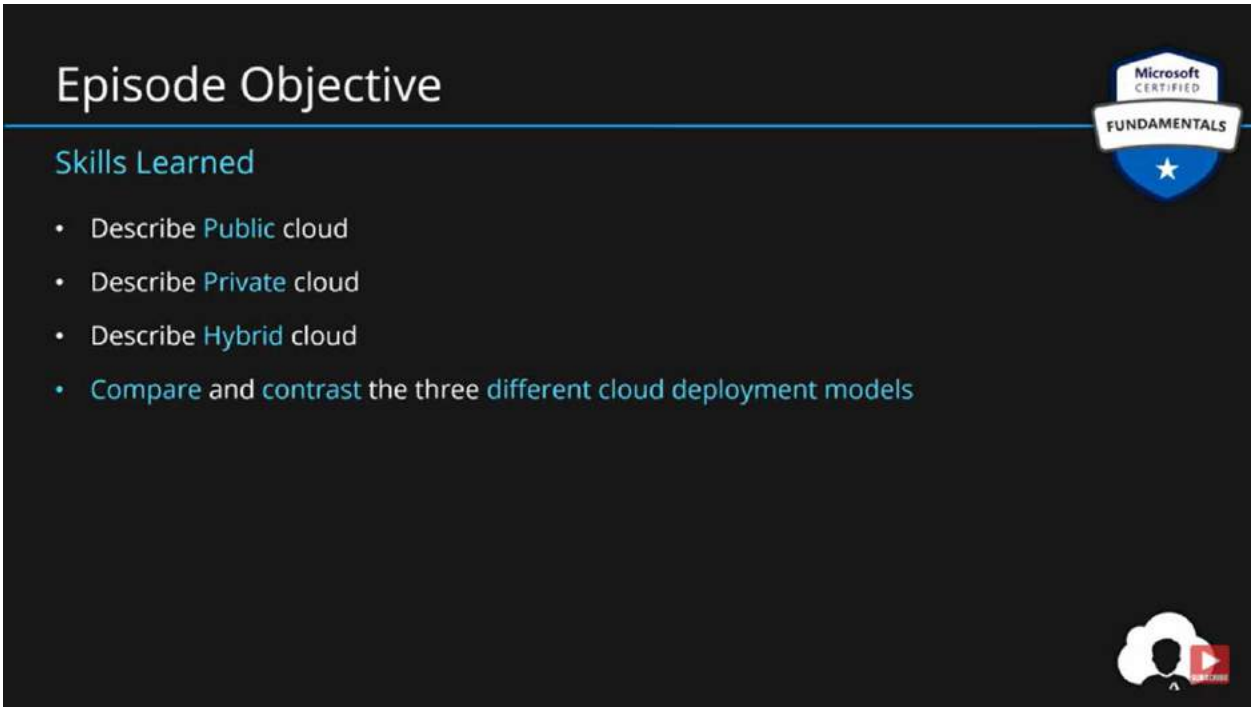
- Cloud provider manages infrastructure, platform & software
  - Infrastructure – networking, hardware & virtualization
  - Platform – operating system, middleware, runtime
  - Software – data & applications
- You manage nothing

Use cases

- Buying of-the-shell applications



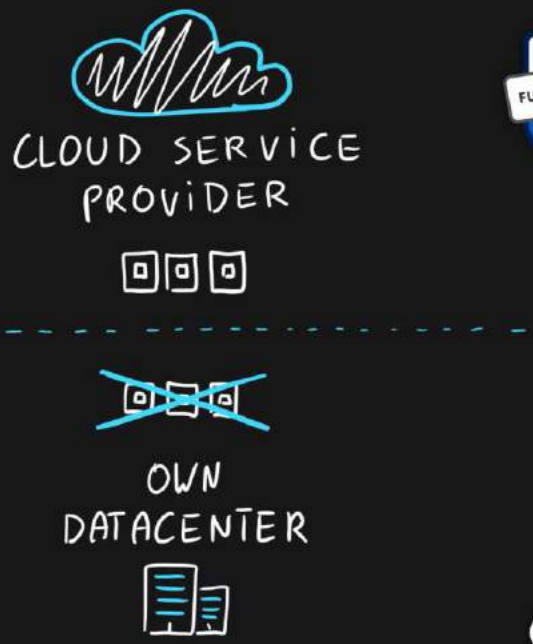
Episode 6 | Public, Private & Hybrid cloud deployment models



Public Cloud

Key Characteristics

- Everything runs on cloud provider hardware
- No local hardware
- Some services share hardware with other customers



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Public Cloud

Advantages and Disadvantages

Advantages	Disadvantages
No CapEx	Security & Compliance
High availability & Agility	Ownership
Pay as you go pricing	Specific scenarios with unique business req.
No hardware maintenance	
No deep technical skills required	

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Private Cloud

Key Characteristics

- Everything runs on your own datacenter
- Self-service should be provided
- You maintain the hardware

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Private Cloud

Advantages and Disadvantages

Advantages	Disadvantages
Can support any scenario	Initial CapEx
Control over security	Limited Agility
Can meet any security & compliance requirements	IT skills & expertise are mandatory

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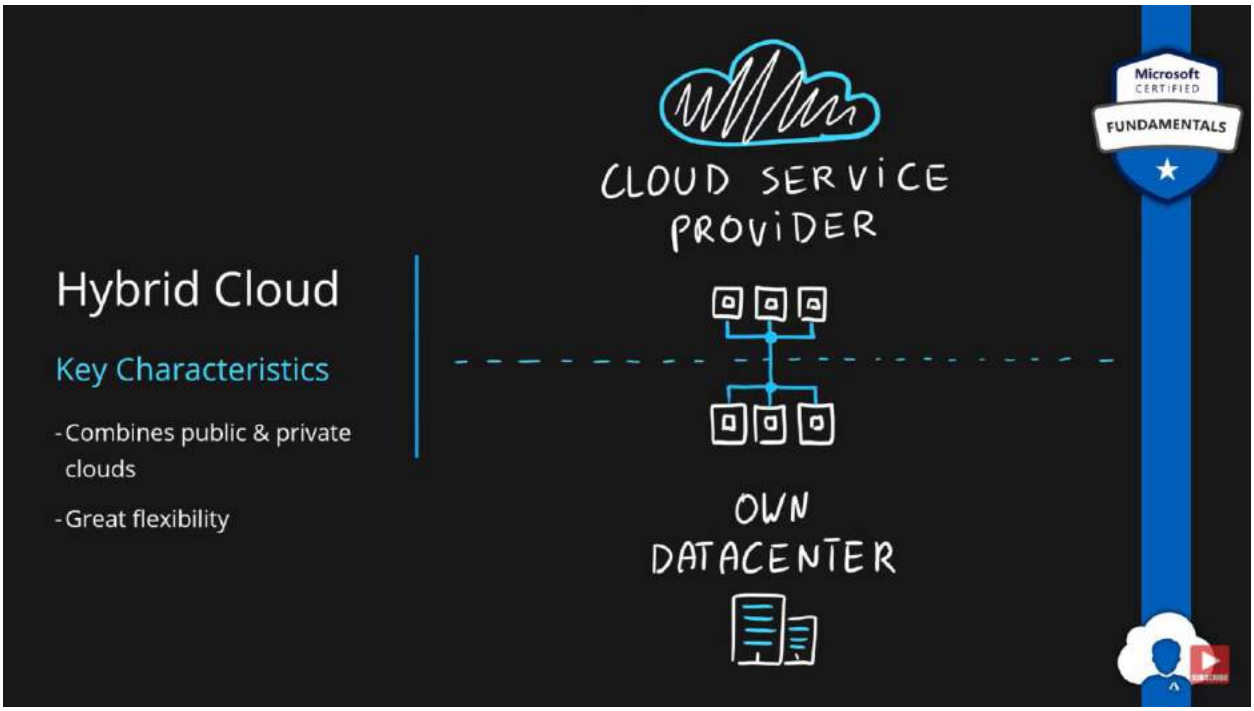
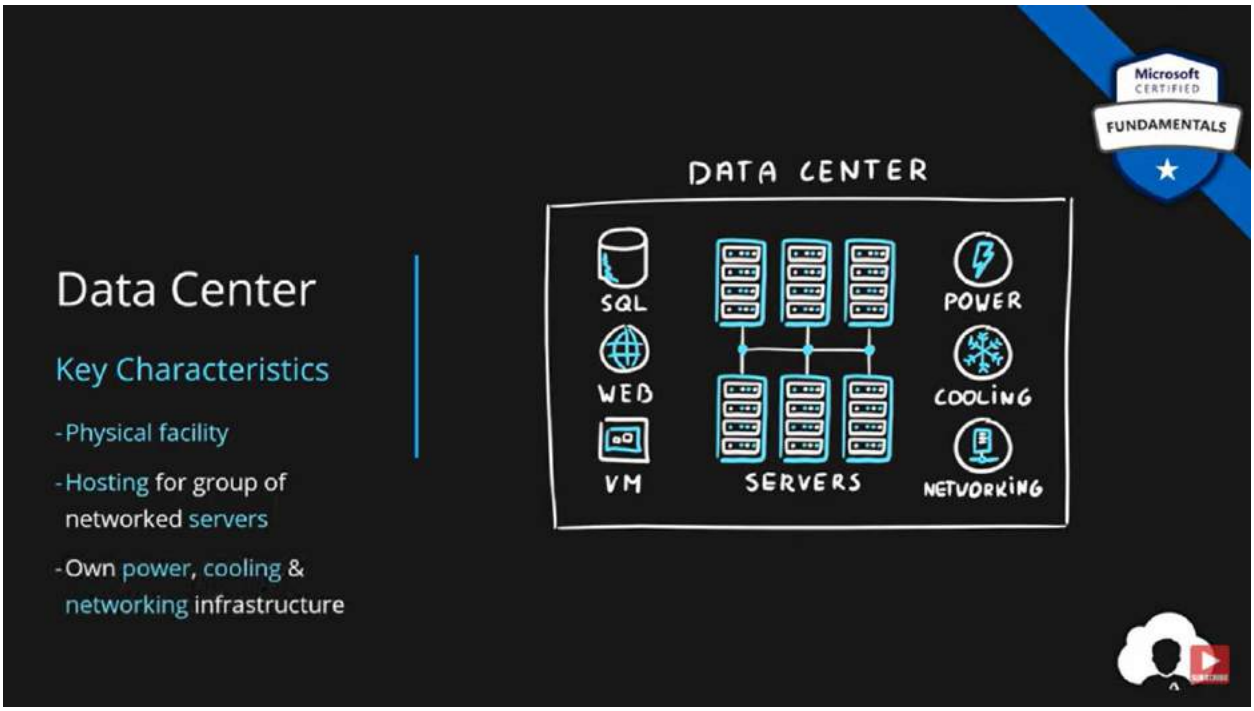
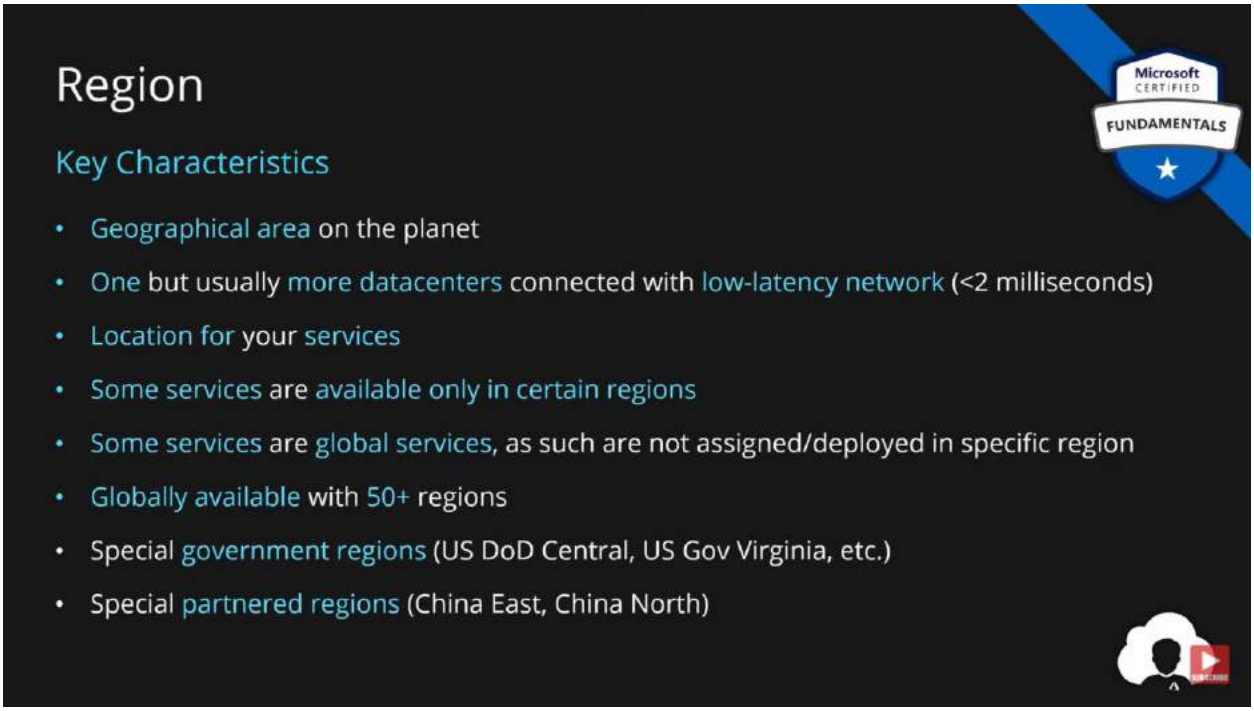


Episode 7 | Geographies, Regions & Availability Zones





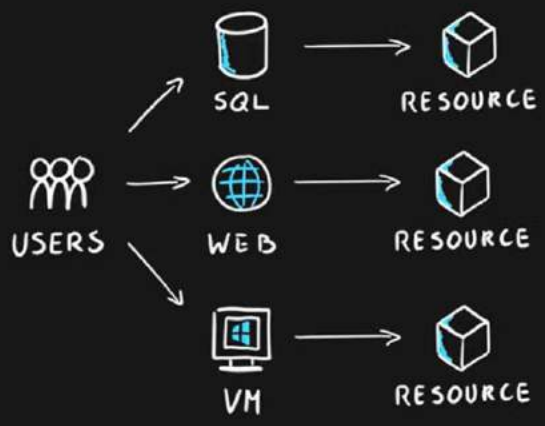
Episode 8 | Resources, Resource Groups & Resource Manager

***** Resource Group is a Logical Containers for all your Resources**

Resources

Key Characteristics

- Objects used to manage services in Azure
- Represent service lifecycle

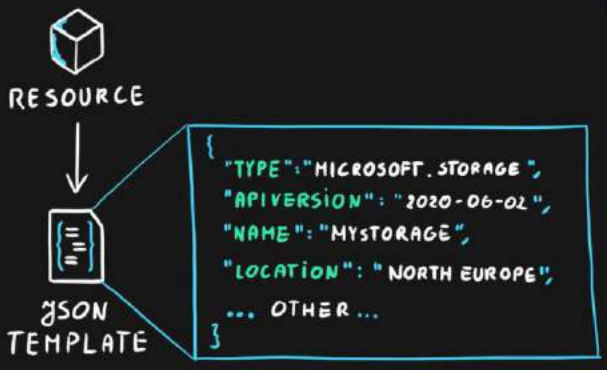


Microsoft CERTIFIED FUNDAMENTALS

Resources

Key Characteristics

- Objects used to manage services in Azure
- Represent service lifecycle
- Saved as JSON definition



Microsoft CERTIFIED FUNDAMENTALS

Resource Groups

Key Characteristics

- Grouping of resources
- Holds logically related resources

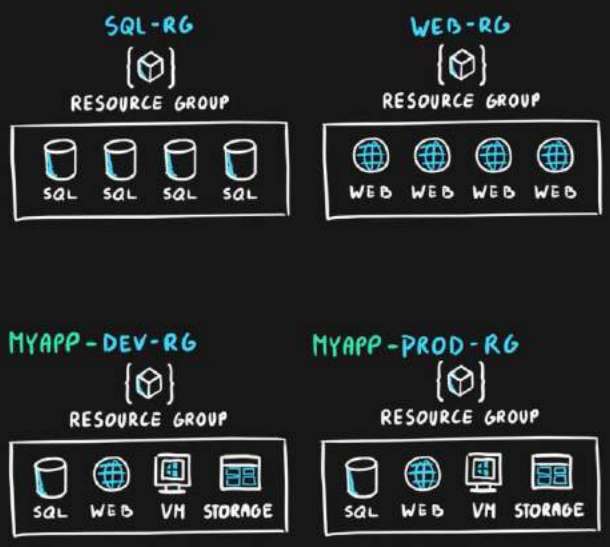
Microsoft CERTIFIED FUNDAMENTALS

Resource Groups

Key Characteristics

Organizing by

- Type
- Lifecycle (app, environment)
- Department
- Billing, Location or combination of those



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Resource Groups

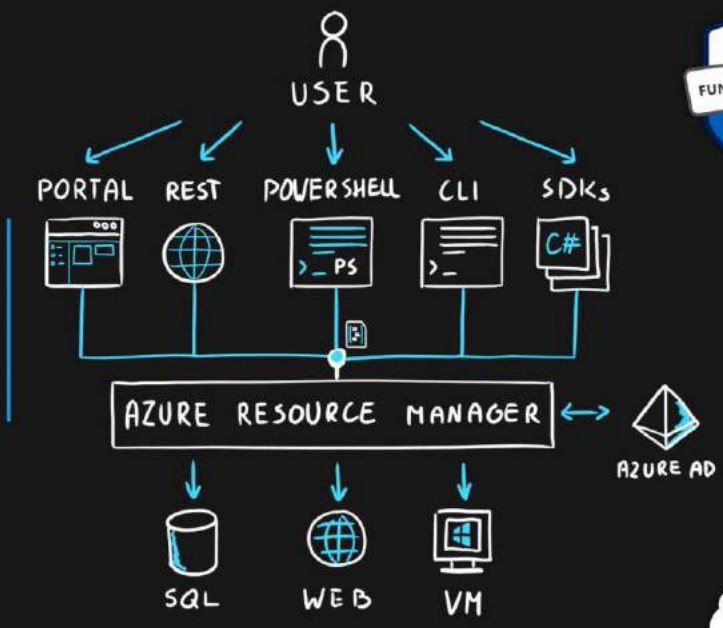
Additional information

- Each resource must be in one, and only one resource group
- Resource groups have their own location assigned
- Resources in the resource groups can reside in a different locations
- Resources can be moved between the resource groups
- Resource groups can't be nested
- Organize based on your organization needs but consider
  - Billing
  - Security and access management
  - Application Lifecycle

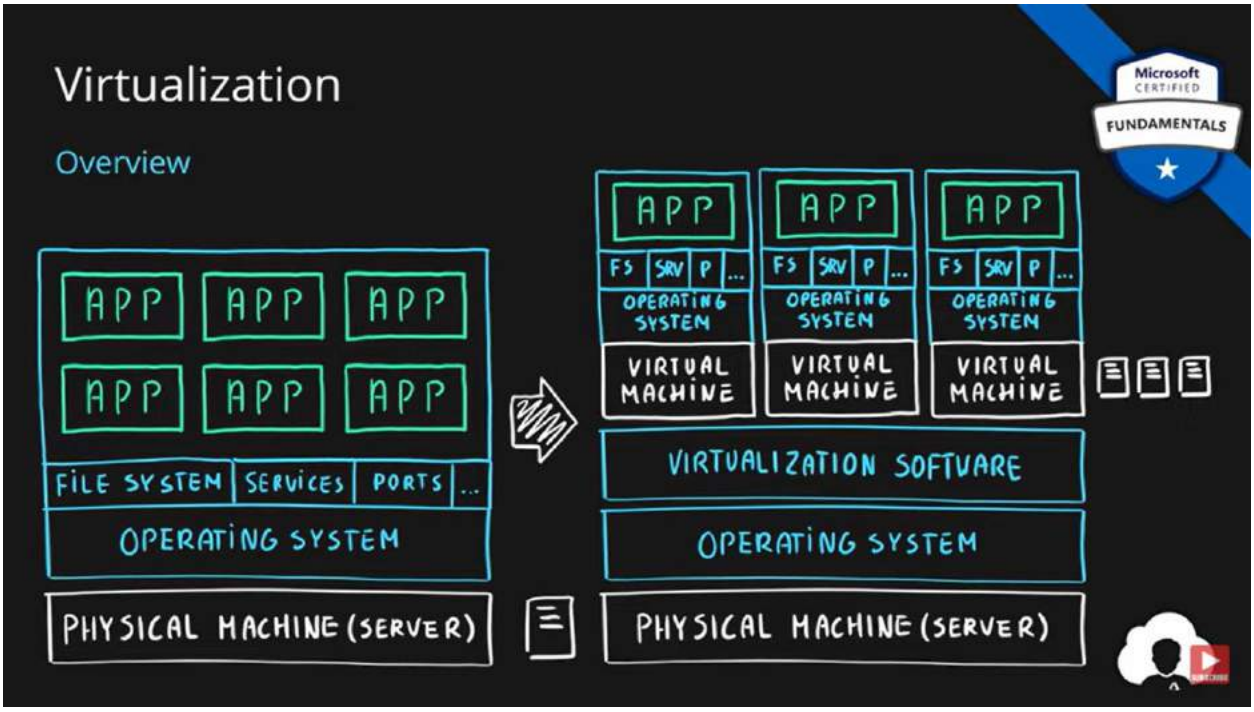
Resource Manager

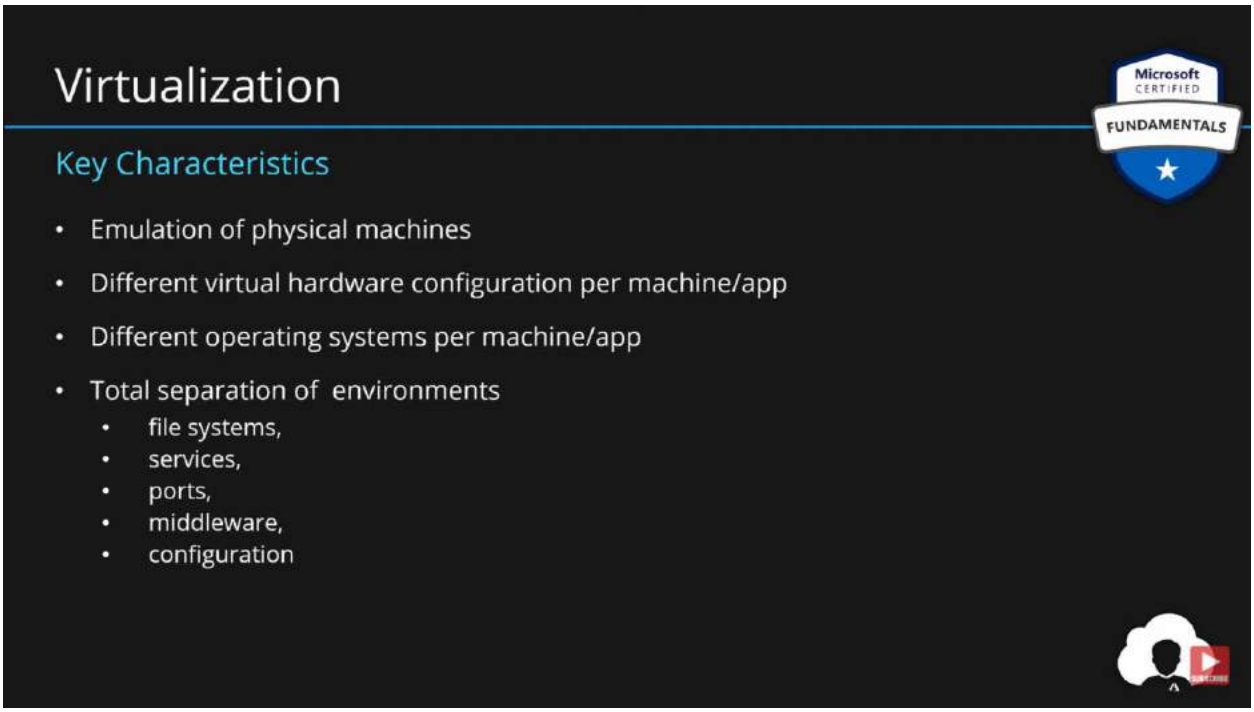
Key Characteristics

- Management Layer for all resources and resource groups
- Unified language

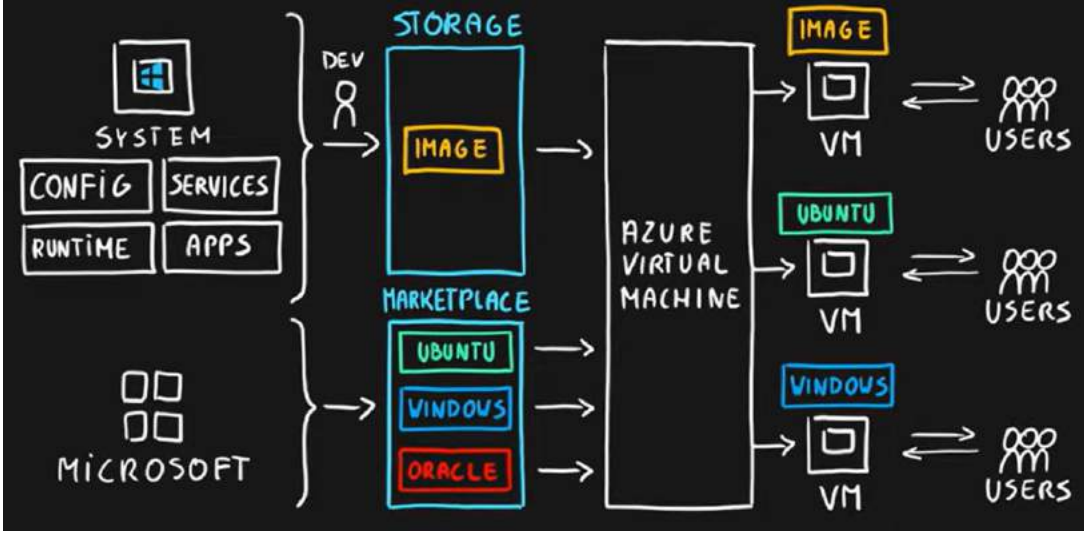


Episode 9 | Compute Services | VMs, VM Scale Set, App Service, Functions, ACI, AKS





Azure Virtual Machines



Virtual Machines

Key Characteristics

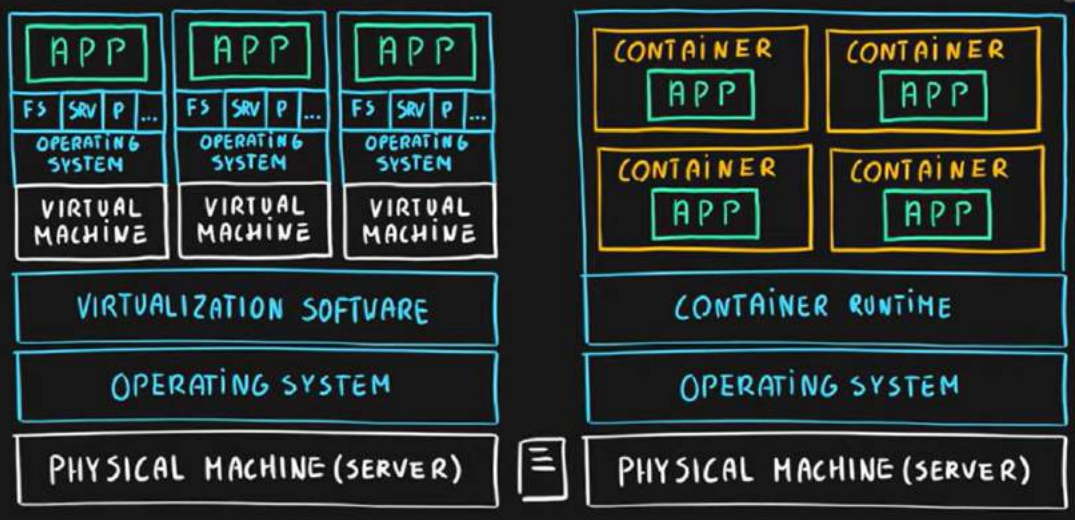
- Infrastructure as a Service (IaaS)
- Total control over the operating system and the software
- Supports marketplace and custom images
- Best suited for
  - Custom software requiring custom system configuration
  - Lift-and-shift scenarios
- Can run any application/scenario
  - web apps & web services,
  - databases,
  - desktop applications,
  - jumpboxes,
  - gateways, etc.

Azure Compute Services

Summary

Service	Configuration Control / Maintenance	Autoscaling	Min Nodes	Max Nodes	Scalability
Virtual Machines	☆☆☆☆☆	No	1	1	☆

Containers vs VMs

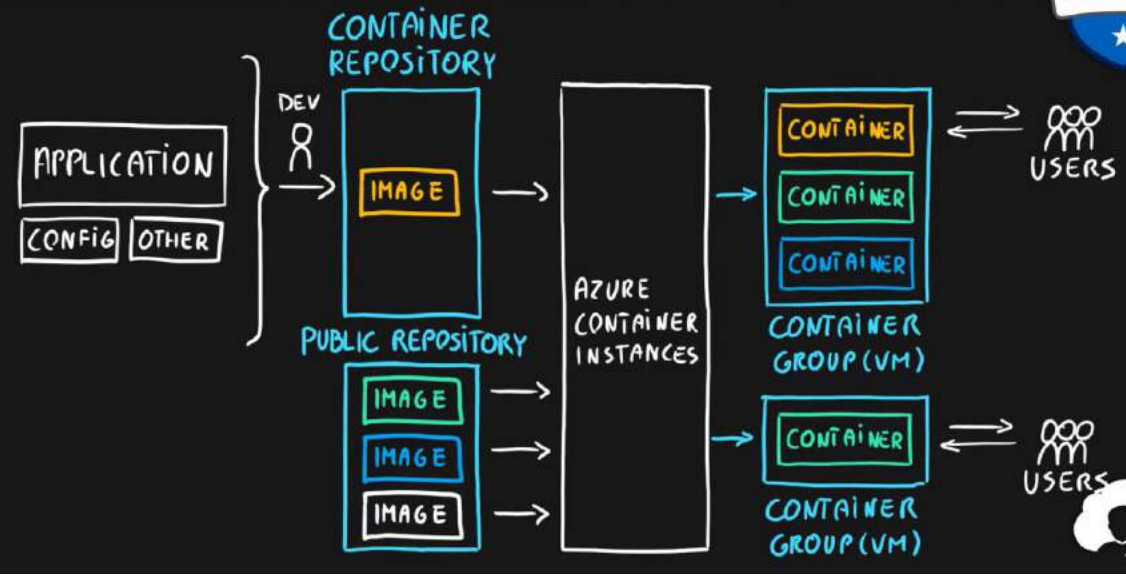


Containers

Key Characteristics

- Use host's operating system
- Emulate operating system (VMs emulate hardware)
- Lightweight (no O/S)
  - Development Effort
  - Maintenance
  - Compute & storage requirements
- Respond quicker to demand changes
- Designed for almost any scenario

Azure Container Instances

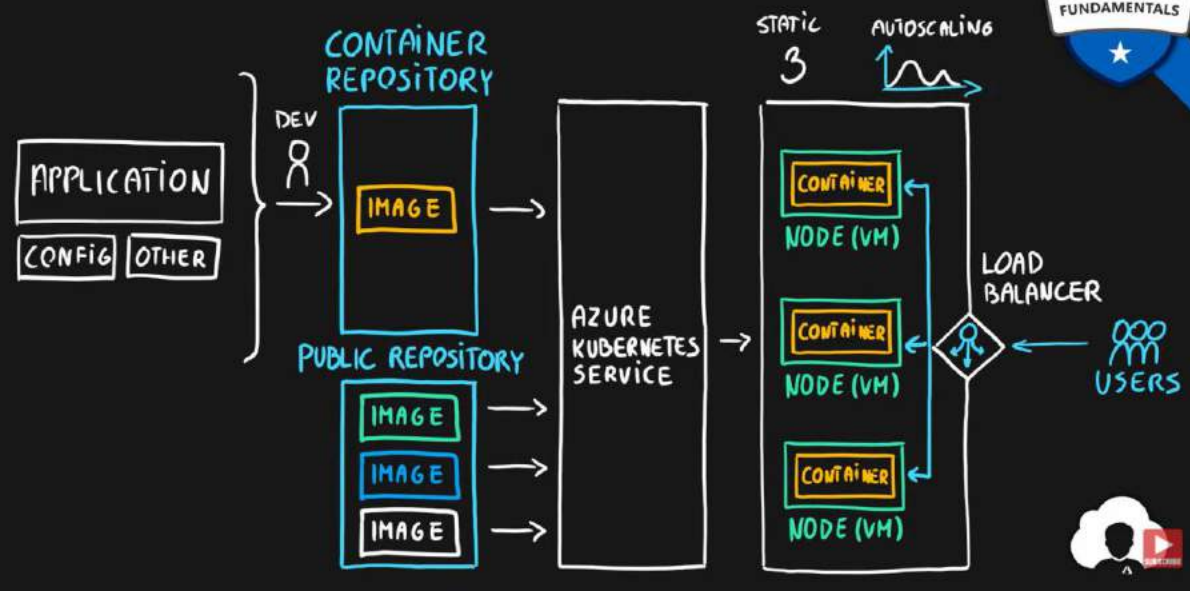


Azure Container Instances

Key Characteristics

- Simplest and fastest way to run a container in Azure
- Platform as a Service
- Serverless Containers
- Designed for
  - Small and simple web apps/services
  - Background jobs
  - Scheduled scripts

Azure Kubernetes Service (AKS)



Azure Kubernetes Service (AKS)

Key Characteristics

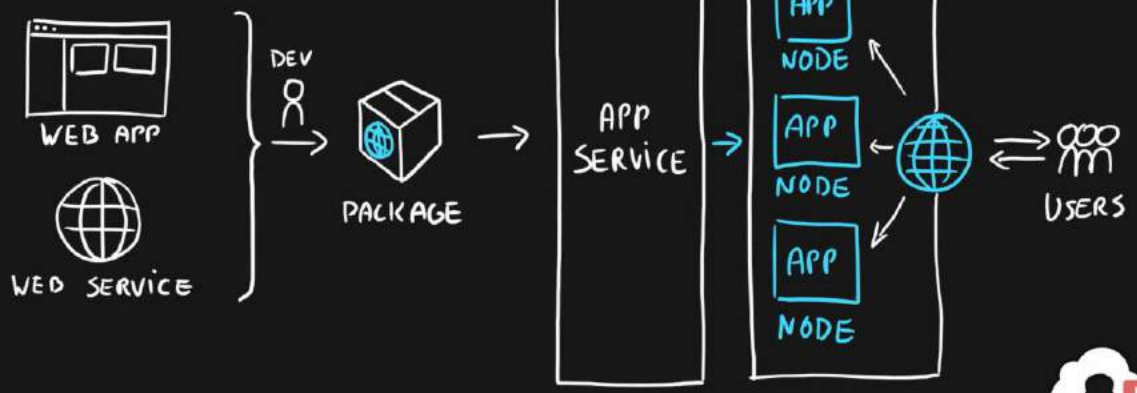
- Open-source container orchestration platform
- Platform as a Service
- Highly scalable and customizable
- Designed for high scale container deployments (anything really!)

Azure Compute Services

Summary

Service	Configuration Control / Maintenance	Autoscaling	Min Nodes	Max Nodes	Scalability
Virtual Machines	☆☆☆☆☆	No	1	1	☆
VM Scale Sets	☆☆☆☆☆	Yes	1	1000/600	☆☆☆☆☆
Container Instances	☆☆☆	No	0	20	☆☆
Kubernetes Service	☆☆☆☆	Yes	3	100	☆☆☆☆

App Service



App Service

Key Characteristics

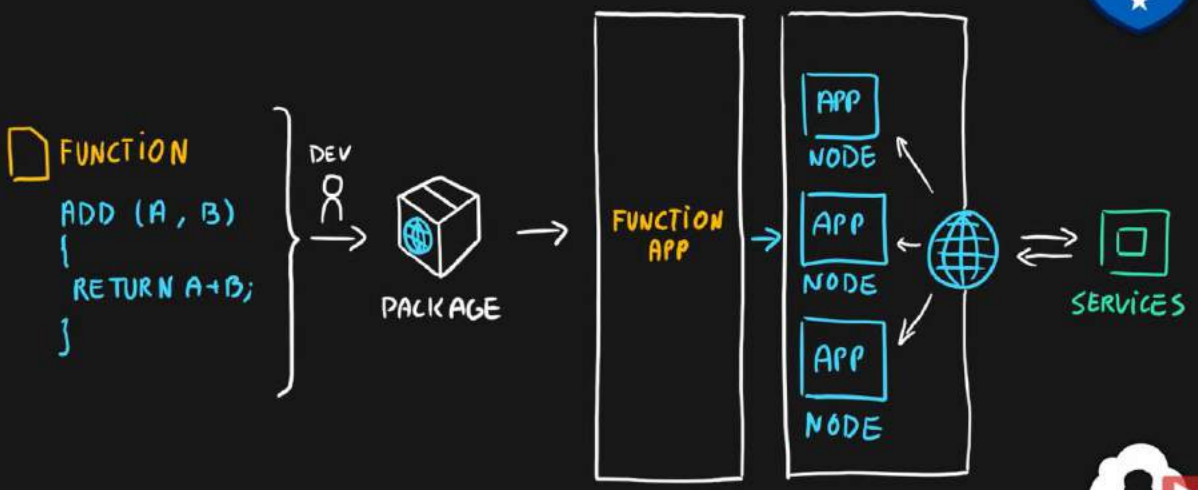
- Designed as enterprise grade web application service
- Platform as a Service
- Supports multiple programming languages and containers

Azure Compute Services

Summary

Service	Configuration Control / Maintenance	Autoscaling	Min Nodes	Max Nodes	Scalability
Virtual Machines	☆☆☆☆☆	No	1	1	☆
VM Scale Sets	☆☆☆☆☆	Yes	1	1000/600	☆☆☆☆☆
Container Instances	☆☆☆	No	0	20	☆☆
Kubernetes Service	☆☆☆☆	Yes	3	100	☆☆☆☆
App Service	☆☆	Yes	1	20/100	☆☆☆

Azure Functions (Function Apps)



Azure Functions (Function Apps)

Key Characteristics

- Platform as a Service
- Serverless
- Two hosting/pricing models
  - Consumption-based plan
  - Dedicated plan
- Designed for micro/nano-services

Azure Compute Services

Summary

Service	Configuration Control / Maintenance	Autoscaling	Min Nodes	Max Nodes	Scalability
Virtual Machines	☆☆☆☆☆	No	1	1	☆
VM Scale Sets	☆☆☆☆☆	Yes	1	1000/600	☆☆☆☆☆
Container Instances	☆☆☆	No	0	20	☆☆
Kubernetes Service	☆☆☆☆	Yes	3	100	☆☆☆☆
App Service	☆☆	Yes	1	20/100	☆☆☆
Functions	☆	Yes	0	200	☆☆☆☆

Azure Compute Services

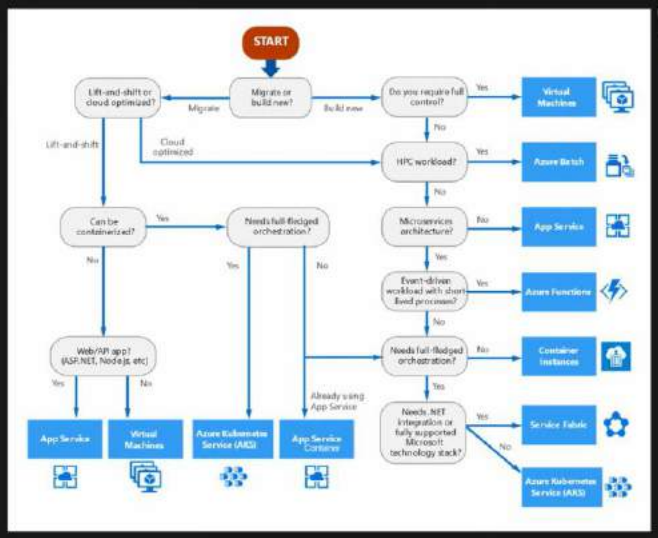
Summary

- Virtual Machines (IaaS)
  Custom software, custom requirements, very specialized, high degree of control
- VM Scale Sets (IaaS)
  Auto-scaled workloads for VMs
- Container Instances (PaaS)
  Simple container hosting, easy to start
- Kubernetes Service (PaaS)
  Highly scalable and customizable container hosting platform
- App Services (PaaS)
  Web applications, a lot of enterprise web hosting features, easy to start
- Functions (PaaS) (Function as a Service) (Serverless)
  micro/nano-services, excellent consumption-based pricing , easy to start

Compute Decision Flow

Documentation

- Microsoft materials are great!



Important Links:

https://www.youtube.com/watch?v=inaXkN2UrFE&list=PLGjZwEtPN7j-Q59JYso3L4_yoCjj2syrM&index=10

Azure Logic App

https://www.youtube.com/watch?v=ZvsOzji_8ow

Azure App Service(Web Apps)

https://www.youtube.com/watch?v=4BwyqmRTrx8

Azure Function Apps(Introduction for Serverless programming)

https://www.youtube.com/watch?v=Vxf-rOEO1q4

Azure Cosmos DB(Globally distributed NoSQL database)

https://www.youtube.com/watch?v=R_Fi59j6BMo

Azure SQL database(Relational Database in Azure)

https://www.youtube.com/watch?v=BgvEOkcR0Wk

Azure Event Grid

https://www.youtube.com/watch?v=TujzkSxJzIA

Azure Container Instances(Serverless containers in cloud)

https://www.youtube.com/watch?v=jAWLQFi4USk

Azure Storage| Introduction to Blob, Queue, Table & File Share

https://www.youtube.com/watch?v=UzTtastcBsk

Azure In Deep Dive Link-

Azure -> https://portal.azure.com/

Microsoft Azure Fundamentals (AZ-900)

https://www.youtube.com/watch?v=inaXkN2UrFE&list=PLGjZwEtPN7j-Q59JYso3L4_yoCjj2syrM&index=10

Azure Logic Apps

https://www.youtube.com/watch?v=ZvsOzji_8ow&list=PLGjZwEtPN7j_nFYA1qc7cWumNr89PkfAX

Azure Storage

https://www.youtube.com/watch?v=UzTtastcBsk&list=PLGjZwEtPN7j9hIHIQJ1Uh6IxEImhWZkPy

Azure Storage Account

https://www.youtube.com/watch?v=UzTtastcBsk&list=PLGjZwEtPN7j9hIHIQJ1Uh6IxEImhWZkPy