

## Topic: Describe Cloud Computing

- ↳ cloud concepts
- ↳ Deployment models
- ↳ shared responsibility in cloud

### i) Intro to MS Azure Fundamentals :

— series of 3 Learning paths

AZ-900 domain Area

Cloud Concepts	25-30%
Azure architectures & services	35-40%
Azure management & governance	30-35%

### ii) Intro to Cloud Computing:

- Learn obj →
- Define cloud computing
  - Descr. shared responsibility model
  - Def cloud models, [public, prv, hybrid]
  - Identify appropriate use cases for each cloud model
  - Describe consumption based model
  - Compare cloud pricing model

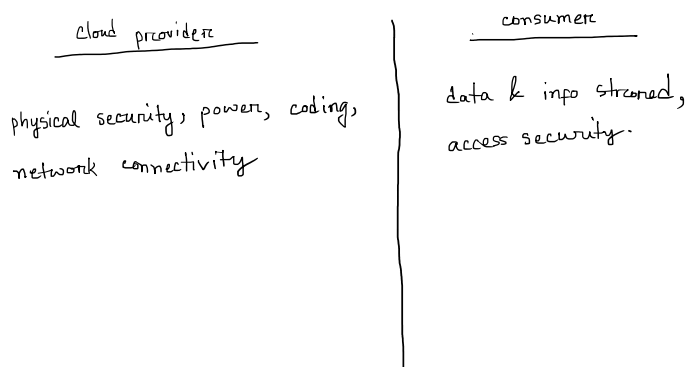
### iii) What's cloud Computing:

delivery of computing service over internet:

- ↳ common IT infrastructure
  - ↳ virtual machine, storage, database, networking
- ↳ traditional IT offerings to incl.
  - ↳ IOT, ML, AI

### iv) Describe Shared Responsibility Model:

responsibility get shared by cloud providers & consumers.



Shared responsibility model:

↳ Infrastructure as a service	— IaaS	[places most resp on consumer]
↳ Software	— SAAS	[ — on cloud provider]
↳ platform	— PAAS	[middle ground]

When using a cloud provider, you'll always be responsible for:

- The information and data stored in the cloud
- Devices that are allowed to connect to your cloud (cell phones, computers, and so on)
- The accounts and identities of the people, services, and devices within your organization

The cloud provider is always responsible for:

- The physical datacenter
- The physical network
- The physical hosts

Your service model will determine responsibility for things like:

- Operating systems
- Network controls
- Applications
- Identity and infrastructure

From <<https://learn.microsoft.com/en-us/training/modules/describe-cloud-compute/4-describe-shared-responsibility-model>>

v) Define Cloud models:

↳ define deployment type of cloud resources: private, public, hybrid

# private cloud:

- ↳ used by single entity
- ↳ greater cost, fewer of benefit
- ↳ maybe hosted from your on-site datacenter
- ↳ may also be hosted in dedicated off-site, 3rd party

# public cloud:

↳ built, controlled, maintained by 3rd party cloud provider

## # Public Cloud :

- ↳ built, controlled, maintained by 3rd party cloud provider
- ↳ anyone can buy cloud service & use res
- ↳

## # Hybrid Cloud :

- ↳ use both public & prt cloud in inter-connected env.
- ↳ can be used to provide extra layer of security
- ↳ user of pub prt which to deploy select app

Public cloud	Private cloud	Hybrid cloud
No capital expenditures to scale up	Organizations have complete control over resources and security	Provides the most flexibility
Applications can be quickly provisioned and deprovisioned	Data is not collocated with other organizations' data	Organizations determine where to run their applications
Organizations pay only for what they use	Hardware must be purchased for startup and maintenance	Organizations control security, compliance, or legal requirements
Organizations don't have complete control over resources and security	Organizations are responsible for hardware maintenance and updates	

From <<https://learn.microsoft.com/en-us/training/modules/describe-cloud-compute/5-define-cloud-models>>

## # Multi-Cloud :

- ↳ use multiple public cloud providers
- ↳ manage res & security in both env.

## # Azure Arc :

- ↳ set of techs that manage cloud env.

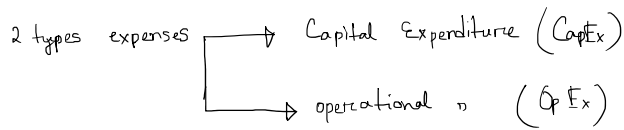
## # Azure VMware Soln :

What if you're already established with VMware in a private cloud environment but want to migrate to a public or hybrid cloud? Azure VMware Solution lets you run your VMware workloads in Azure with seamless integration and scalability.

From <<https://learn.microsoft.com/en-us/training/modules/describe-cloud-compute/5-define-cloud-models>>

## ∇ Describe Consumption-based model :

while comparing IT infrastructure model,



CapEx : one-time, upfront expenditure

OpEx : Spending money on service over time

Cloud Comp. falls under OpEx.

This consumption-based model has many benefits, including:

- No upfront costs
- No need to purchase and manage costly infrastructure that users might not use to its fullest potential.
- The ability to pay for more resources when they're needed.
- The ability to stop paying for resources that are no longer needed.

From <<https://learn.microsoft.com/en-us/training/modules/describe-cloud-compute/6-describe-consumption-based-model>>

you add/rmv virtual machines as needed.

## # Compare Cloud Pricing Model:

↳ pay-as-u-go pricing model

## Topic: Describe benefits of using cloud services

1) benefits of high availability & scalability in cloud —

=

### # High availability :

while deploying application, service, IT res, → must be available  
guarantees are part of service-level-agreement (SLA)

↳ formal agreement

100% availability → 100% uptime

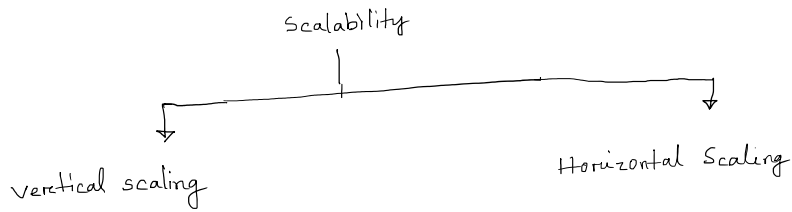
Each azure service has its own SLA.

### # Scalability :

↳ ability to adjust res to meet demands

## # Scalability =

- ↳ ability to adjust res to meet demands
- ↳ peak traffic ~~error~~ you can add more res



↳ if you were developing app, you could vertically scale up to add more CPU / RAM to virtual machine & vice versa

↳ if there's sudden steep jump in demand, we deployed res could be scaled out (auto / manu)

## 1) Describe benefit of reliability & predictability in cloud -

### # Reliability:

↳ ability of a system to recover from failures & continue to func.

### # Predictability:

↳ performance & cost > influenced by MS Azure well architected framework

Deploy a soln built around this framework & you have a soln whose cost & performance are predictable.

#### • performance :

→ focuses on predicting the res needed to deliver a positive exp for our customers.

→ Autoscaling, load balancing, and high availability are just some of the cloud concepts that support performance predictability.

From <<https://learn.microsoft.com/en-us/training/modules/describe-benefits-use-cloud-services/3-reliability-predictability-cloud>>

- \* suddenly more res ~~on~~, there's auto-scale.
- \* traffic heavy ~~area~~, load balancing will help redirect some of overload to less stressed areas.

## Cost

Cost predictability is focused on predicting or forecasting the cost of the cloud spend. With the cloud, you can track your resource use in real time, monitor resources to ensure that you're using them in the most efficient way, and apply data analytics to find patterns and trends that help better plan resource deployments. By operating in the cloud and using cloud analytics and information, you can predict future costs and adjust your resources as needed. You can even use tools like the Total Cost of Ownership (TCO) or Pricing Calculator to get an estimate of potential cloud spend.

From <<https://learn.microsoft.com/en-us/training/modules/describe-benefits-use-cloud-services/3-reliability-predictability-cloud>>

## iv) Benefits of security & governance in the cloud —

↳ ~~deployed~~ can update all deployed res to new standard as change.

• security side =

IAAS → if u want max control of security, it provides physical res bt lets u manage OS & installed software incl. patches & maintenance.

PAAS → patches & maintenance will be taken care of automatically.

## v) benefits of manageability in cloud —

# Management of cloud:

### Management of the cloud

Management of the cloud speaks to managing your cloud resources. In the cloud, you can:

- Automatically scale resource deployment based on need.
- Deploy resources based on a preconfigured template, removing the need for manual configuration.
- Monitor the health of resources and automatically replace failing resources.
- Receive automatic alerts based on configured metrics, so you're aware of performance in real time.

### Management in the cloud

Management in the cloud speaks to how you're able to manage your cloud environment and resources. You can manage these:

- Through a web portal.
- Using a command line interface.
- Using APIs.
- Using PowerShell.

All units complete:

From <<https://learn.microsoft.com/en-us/training/modules/describe-benefits-use-cloud-services/5-manageability-cloud>>

# # Topic: Describe cloud Service Types

## II) Describe Infrastructure as Service (IAAS)

↳ flexible category of cloud services

↳ provide max control on resources

provider → hardware, network conn., physical security

consumer → OS install, config & maintenance, network config, database & storage config

with IAAS, you're renting hardware in cloud datacenters, but what you do with hardware is upto you.

Responsibility		SaaS	PaaS	IaaS	On-prem
Responsibility always retained by the customer	Information and data	Customer	Customer	Customer	Customer
	Devices (Mobile and PCs)	Customer	Customer	Customer	Customer
	Accounts and identities	Customer	Customer	Customer	Customer
Responsibility varies by type	Identity and directory infrastructure	Shared	Shared	Customer	Customer
	Applications	Customer	Customer	Customer	Customer
	Network controls	Customer	Customer	Customer	Customer
	Operating system	Customer	Customer	Customer	Customer
Responsibility transfers to cloud provider	Physical hosts	Customer	Customer	Customer	Customer
	Physical network	Customer	Customer	Customer	Customer
	Physical datacenter	Microsoft	Microsoft	Microsoft	Customer

Legend: Microsoft (light blue), Customer (dark blue), Shared (diagonal split)

### \* 2 common Scenarios where IAAS might be useful:

I) Lift & Shift migration → It involves moving existing applications & data from an on-premises data center to cloud based IAAS.

II) It can be used to quickly create & manage development & test environments, allowing for rapid deployment and scaling.

## III) Describe Platform as Service (PAAS)

↳ middle ground bet<sup>n</sup> (IAAS) and SAAS.

↳ cloud provider maintains: physical infrastructure, physical security, internet connection, OS, middleware, development tools,

### \* Scenario :

↳ provides framework that developers can build upon to create & customize cloud based application.

↳ simplifies development by providing pre-built software components & cloud features like scalability, high-availability, multi-tenant capability, reducing amount of coding.

↳ . Analytics or business intelligence: Tools provided as a service with PaaS allow organizations to analyze and mine their data, finding insights and patterns and predicting outcomes to improve forecasting, product design decisions, investment returns, and other business decisions.

From <<https://learn.microsoft.com/en-us/training/modules/describe-cloud-service-types/3-describe-platform-service>>

## # Describe Software As Service (SAAS):

↳ most complete cloud service model

↳ we're running/using fully developed application.

↳ implementation: email, financial software, msg app,

### \* Scenarios:

Common Scenarios for SAAS —

1. Email & messaging
2. Business productivity app
3. Finance & expense tracking

Audio recording started: 10:29 PM Saturday, October 19, 2024

