

Intro to Cloud Computing

MODULE 1 - PUBLIC CLOUD PLATFORM

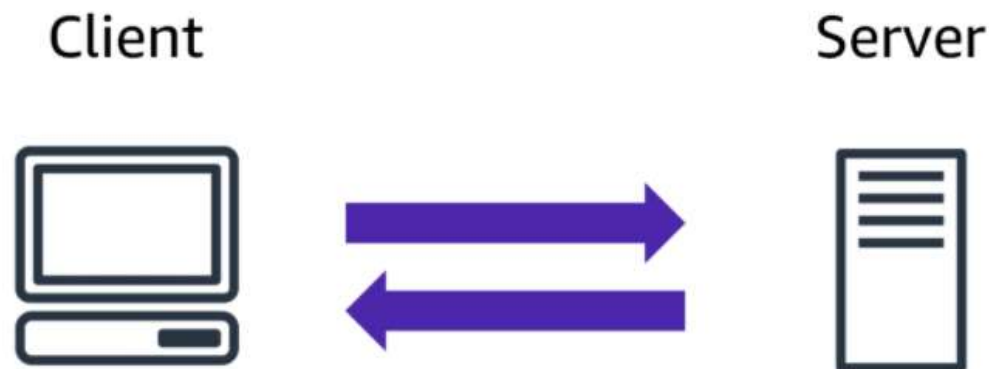


Cloud Concepts

Client-server model

In computing, a **client** can be a web browser or desktop application that a person interacts with to make requests to computer servers. A **server** can be services such as Amazon Elastic Compute Cloud (Amazon EC2), a type of virtual server.

For example, suppose that a client makes a request for a news article, the score in an online game, or a funny video. The server evaluates the details of this request and fulfills it by returning the information to the client.



Cloud Concepts

Cloud computing services are delivered over the internet which is known as the Cloud.

These services include:

- Servers
- Storage
- Databases
- Networking
- Software
- Analytics
- AI & Machine learning
- Security
- Business Applications
- Gaming
- IoT
- Intelligence

Cloud Concepts

Cloud computing is the delivery of computing services over the internet by using a pay-as-you-go pricing model. You typically pay only for the cloud services you use, which helps you:

- Lower your operating costs.
- Run your infrastructure more efficiently.
- Scale as your business needs change.

To put it another way, cloud computing is a way to rent compute power and storage from someone else's datacenter. You can treat cloud resources like you would your resources in your own datacenter. When you're done using them, you give them back. You're billed only for what you use.

Cloud Concepts

Instead of maintaining CPUs and storage in your datacenter, you rent them for the time that you need them.

The cloud provider takes care of maintaining the underlying infrastructure for you.

To power your services and deliver innovative and novel user experiences more quickly, the cloud provides on-demand access to:

- A nearly limitless pool of raw compute, storage, and networking components.
- Speech recognition and other cognitive services that help make your application stand out from the crowd.
- Analytics services that deliver telemetry data from your software and devices.

Renting these capabilities will give you more options than if you had to purchase these applications to load, configure and maintain in your own Data Center.

Public Cloud Platforms

The public cloud are computing services offered by third-party providers over the public Internet, making them available to anyone who wants to use or purchase them.

They may be free or sold on-demand, allowing customers to pay only per usage for the CPU cycles, storage, or bandwidth they consume.

Cloud platform services range from simple web services for hosting your business presence in the cloud to running fully virtualized computers for you to run your custom software solutions. Cloud platforms provide a wealth of cloud-based services like remote storage, database hosting, and centralized account management. There are new capabilities like AI and Internet of Things (IoT) being added to these platforms.

The most populate are:

- AWS from Amazon
- Azure from Microsoft
- GCP from Google

Cloud Services

What are some cloud computing advantages?

- **Reliability:** Depending on the service-level agreement that you choose, your cloud-based applications can provide a continuous user experience with no apparent downtime even when things go wrong.
- **Scalability:** Applications in the cloud can be scaled in two ways, while taking advantage of autoscaling:
 - **Vertically:** Computing capacity can be increased by adding RAM or CPUs to a virtual machine.
 - **Horizontally:** Computing capacity can be increased by adding instances of a resource, such as adding more virtual machines to your configuration.
- **Elasticity:** Cloud-based applications can be configured to always have the resources they need.
- **Agility:** Cloud-based resources can be deployed and configured quickly as your application requirements change.

Cloud Services (Cont.)

What are some cloud computing advantages?

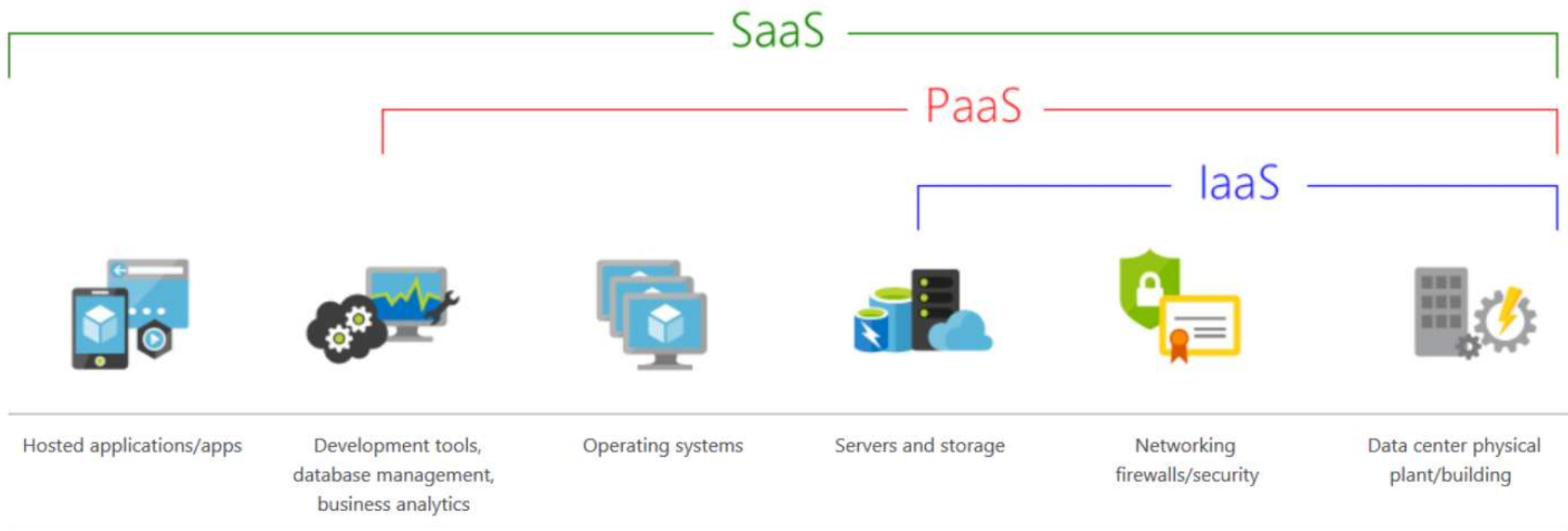
- **Geo-distribution:** Applications and data can be deployed to regional datacenters around the globe, so your customers always have the best performance in their region.
- **Disaster recovery:** By taking advantage of cloud-based backup services, data replication, and geo-distribution, you can deploy your applications with the confidence that comes from knowing that your data is safe in the event that disaster should occur.

Cloud Service Models

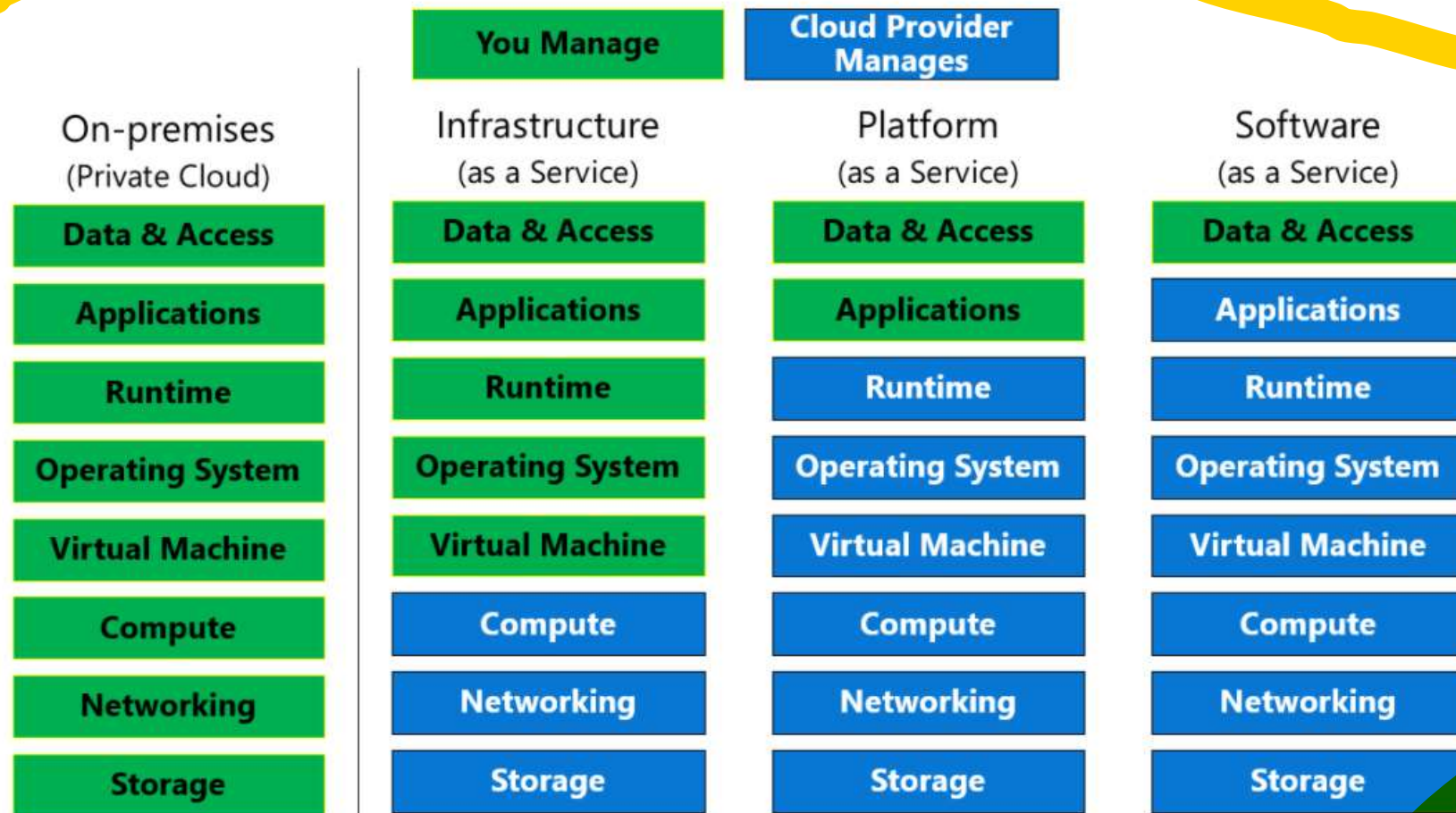
Cloud computing falls into one of the following computing models.

Computing model	Description
IaaS	This cloud service model is the closest to managing physical servers. A cloud provider keeps the hardware up to date, but operating system maintenance and network configuration is left to the cloud tenant. For example, Virtual Machines are fully operational virtual compute devices running in Microsoft's datacenters. An advantage of this cloud service model is rapid deployment of new compute devices. Setting up a new virtual machine is considerably faster than procuring, installing, and configuring a physical server.
PaaS	This cloud service model is a managed hosting environment. The cloud provider manages the virtual machines and networking resources, and the cloud tenant deploys their applications into the managed hosting environment. For example, Cloud App Services provides a managed hosting environment where developers can upload their web applications without having to deal with the physical hardware and software requirements.
SaaS	In this cloud service model, the cloud provider manages all aspects of the application environment, such as virtual machines, networking resources, data storage, and applications. The cloud tenant only needs to provide their data to the application managed by the cloud provider. For example, Office 365 provides a fully working version of Office that runs in the cloud. All that you need to do is create your content, and Office 365 takes care of everything else.

Cloud Service Models



Cloud Service Models



Cloud Service Models

What is serverless computing?

Overlapping with PaaS, serverless computing enables developers to build applications faster by eliminating the need for them to manage infrastructure.

With serverless applications, the cloud service provider automatically provisions, scales, and manages the infrastructure required to run the code.

Serverless architectures are highly scalable and event-driven. They use resources only when a specific function or trigger occurs.

In understanding the definition of serverless computing, it's important to note that servers are still running the code.

The serverless name comes from the fact that the tasks associated with infrastructure provisioning and management are invisible to the developer.

Public Cloud Platforms

Power of the leaders in the industry offer a Global Wide-Area Network (WAN) and Points of Presence (PoPs) along with Fiber

These providers offer access to:

- 200+ Countries
- 60+ Cloud regions
- 75+ zones
- 150+ network edge locations

Google Cloud Platform (GCP)

Microsoft Azure

Amazon Web Service (AWS)

Public Cloud Platforms

All three Cloud providers offer very similar solutions and capabilities

All offer free accounts and even free credits as an introductory period

Be aware of any charge services – example would be creating a VM

These platforms offer great access to tools and environments inaccessible to many without direct Data Center access

Public Cloud Platforms

Google Cloud Platform (GCP)

<https://cloud.google.com/>

Public Cloud Platforms

Microsoft Azure

<https://azure.microsoft.com/en-us/>

Public Cloud Platforms

Amazon Web Service (AWS)

<https://aws.amazon.com/>

Assessment

Cloud Computing Module 1