AWS Cloud Computing Concepts

What is cloud computing?

Cloud computing is the on-demand delivery of compute power, database, storage, applications,
and other IT resources through a cloud services platform via the internet with pay-as-you-go
pricing.

- With cloud computing, you don't need to make large upfront investments in hardware and spend a lot of time on the heavy lifting of managing that hardware. Instead, you can provision exactly the right type and size of computing resources you need to power your newest bright idea or operate your IT department.
- You can access as many resources as you need, almost instantly, and only pay for what you use.
- Cloud computing provides a simple way to access servers, storage, databases and a broad set of application services over the internet.

Six advantages of cloud computing

- **Trade fixed expense for variable expense** – Instead of having to invest heavily in data centers
  and servers before you know how you're going to use them, you can pay only when you consume computing resources, and pay only for how much you consume.
- **Benefit from massive economies of scale** – By using cloud computing, you can achieve a lower
  variable cost than you can get on your own. Because usage from hundreds of thousands of
  customers is aggregated in the cloud, providers such as AWS can achieve higher economies of
  scale, which translates into lower pay as-you-go prices.
- **Stop guessing capacity** – Eliminate guessing on your infrastructure capacity needs. When you

make a capacity decision prior to deploying an application, you often end up either sitting on
expensive idle resources or dealing with limited capacity. With cloud computing, these problems go away. You can access as much or as little capacity as you need, and scale up and down as required with only a few minutes' notice.

- **Increase speed and agility** – In a cloud computing environment, new IT resources are only a
click away, which means that you reduce the time to make those resources available to your
developers from weeks to just minutes. This results in a dramatic increase in agility for the
organization, since the cost and time it takes to experiment and develop is significantly lower.
- **Stop spending money running and maintaining data centers** – Focus on projects that
differentiate your business, not the infrastructure. Cloud computing lets you focus on your own
customers, rather than on the heavy lifting of racking, stacking, and powering servers.
- **Go global in minutes** – Easily deploy your application in multiple regions around the world with
just a few clicks. This means you can provide lower latency and a better experience for your
customers at minimal cost.

Types of Cloud Deployment Models

There are 3 common types of cloud deployment :

1. **Public Cloud** – e.g. AWS, Microsoft Azure, Google Cloud Platform (GCP).
2. **Hybrid Cloud** – a mixture of public and private clouds.
3. **Private Cloud (on-premises)** – a cloud managed in your own data center, e.g. Hyper-V, OpenStack, VMware.

Cloud

A cloud-based application is fully deployed in the cloud and all parts of the application run in
the cloud. Applications in the cloud have either been created in the cloud or

have been migrated
from an existing infrastructure to take advantage of the benefits of cloud computing. Cloudbased applications can be built on low-level infrastructure pieces or can use higher level services
that provide abstraction from the management, architecting, and scaling requirements of core
infrastructure.

Private cloud (on-premises)

The deployment of resources on-premises, using virtualization and resource management tools, is
sometimes called the private cloud. On-premises deployment doesn't provide many of the benefits
of cloud computing but is sometimes sought for its ability to provide dedicated resources. In
most cases, this deployment model is the same as legacy IT infrastructure while using application
management and virtualization technologies to try and increase resource utilization. For more
information on how AWS can help, refer to Use case: Cloud services on-premises.

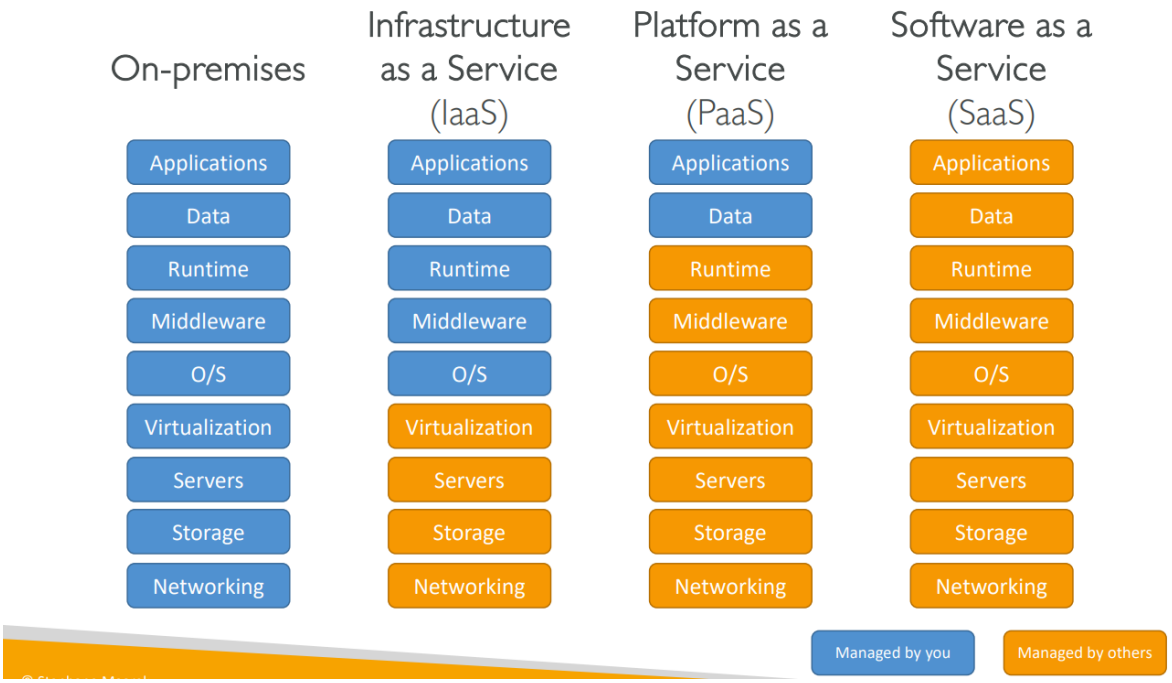
Hybrid

A hybrid deployment is a way to connect infrastructure and applications between cloud-based
resources and existing resources that are not located in the cloud. The most common method
of hybrid deployment is between the cloud and existing on-premises infrastructure to extend,
and grow, an organization's infrastructure into the cloud while connecting cloud resources to the
internal system. For more information on how AWS can help you with your hybrid deployment, visit
our Hybrid Cloud with AWS page.

Cloud Computing Models

There are 3 common types of cloud computing model :

1. Infrastructure as a service (IaaS).
2. Platform as a service (PaaS).
3. Software as a service (SaaS).



- ***Infrastructure as a Service (IaaS)***

Infrastructure as a Service (IaaS) contains the basic building blocks for cloud IT and typically provide access to networking features, computers (virtual or on dedicated hardware), and data storage space.

IaaS provides you with the highest level of flexibility and management control over your IT resources and is very similar to the existing IT resources that many IT departments and developers are familiar with today.

- ***Platform as a Service (PaaS)***

Platform as a Service (PaaS) removes the need for your organization to manage the underlying infrastructure (usually hardware and operating systems) and allows you to focus on the deployment and management of your applications.

This helps you be more efficient as you don't need to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other undifferentiated heavy lifting involved in running your application.

- ***Software as a Service (SaaS)***

Completed product that is run and managed by the service provider

Example of Cloud Computing Types

- ***Infrastructure as a Service:***
  - Amazon EC2 (on AWS)
  - GCP, Azure, Rackspace, Digital Ocean, Linode
- ***Platform as a Service:***
  - Elastic Beanstalk (on AWS)
  - Heroku, Google App Engine (GCP), Windows Azure (Microsoft)
- ***Software as a Service:***
  - Many AWS services (ex: Rekognition for Machine Learning)
  - Google Apps (Gmail), Dropbox, Zoom