Top 3 Cloud Computing Service Models: SaaS | PaaS | IaaS

Cloud Services are among the most in-demand services recently, with big organizations like Microsoft, Google, Amazon, Oracle driving the path for innovation development. Rather than depending on their own private servers, organizations incline toward contracting out the storage to reputable providers, ignoring the obligation regarding supporting the foundation and guaranteeing security.

What is Cloud Computing?

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services). This cloud model is composed of five essential characteristics, three service models, and four deployment models.

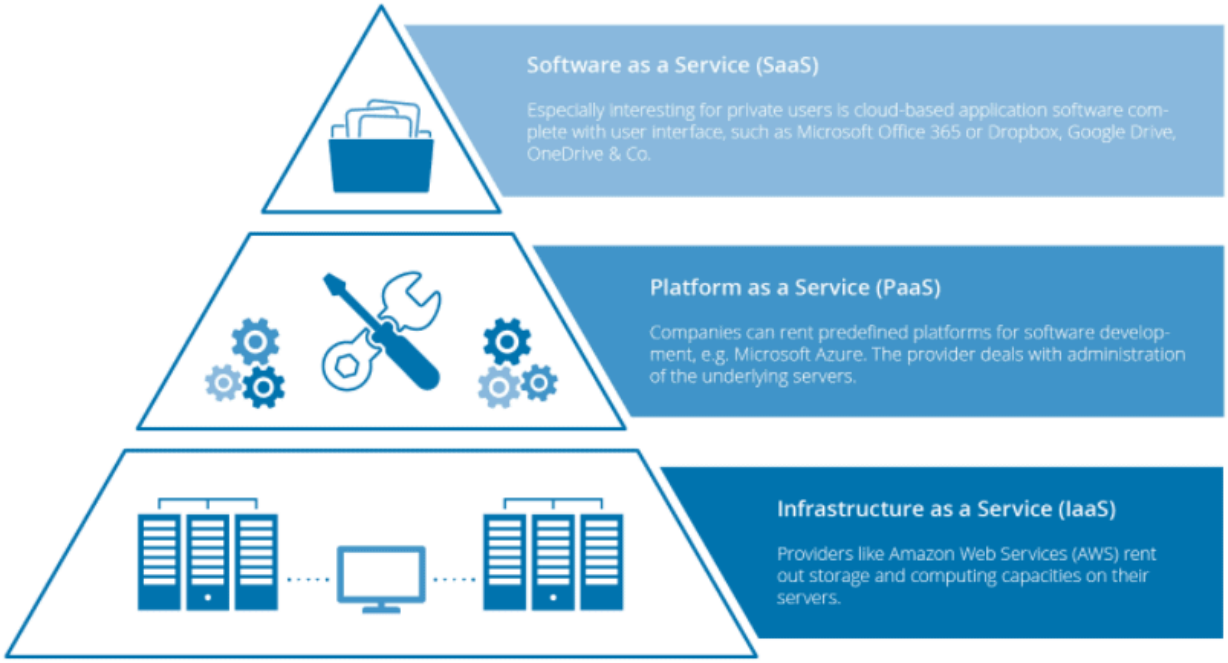
Cloud Computing Service Models

There are three main types of service models of cloud computing. Each type of cloud computing provides different levels of control, flexibility, and management so that you'll select the proper set of services for your needs.

Three Common Cloud Service Models

The **three Cloud Service Models** are as follows:

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)



1. Infrastructure As A Service (IaaS)

- It is the **most flexible** type of cloud service which lets you rent the hardware and contains the basic building blocks for cloud and IT.

- **It gives complete control over the hardware** that runs your application (servers, VMs, storage, networks & operating systems).
- It's an **instant computing** infrastructure, provisioned and managed over the internet.
- IaaS gives you the very best level of flexibility and management control over your IT resources.
- It is most almost like the prevailing IT resources with which many IT departments and developers are familiar.
- **Examples** of IaaS: **Virtual Machines** or **AWS EC2**, Storage or Networking.

Benefits of IaaS

IaaS is an efficient and cost-effective way to deploy, operate, and scale your IT infrastructure. It's easy to set up and configure, so you can start using it quickly. And because it's available as a service from an external provider, you don't have to worry about building and maintaining your own infrastructure. IaaS offers the following benefits:

Cost savings: IaaS is more cost-effective than building your own data center. You pay only for what you need — storage space, CPU power, bandwidth, and other resources. This makes it easier to scale up or down as needed.
On-demand access: You can instantly provision new resources whenever they're needed without having to invest in new hardware and software or hire additional IT staff members. The cloud provider takes care of all the maintenance and upgrades required to keep your servers online 24/7 with 99 percent uptime guarantees (or better).
Flexibility: With cloud computing, you can easily add more resources when demand increases without having to upgrade equipment or hire more IT professionals.

Read: **Azure DevOps Vs AWS DevOps**

IaaS Use-Cases

Here are some common IaaS use cases:

- IaaS is useful for backing up, storing, and recovering data and also helps in managing fluctuating storage needs.
- It is cheaper and faster to set up test and development environments with IaaS.
- Companies working with Big Data often use IaaS as it allows them to significantly increase their computing power.
- IaaS can be an optimal basis for some complex web projects particularly for sites with profoundly fluctuating traffic, as a website hosted in the cloud can profit from the verbosity rendered by a massive network of physical servers and demand scalability to manage unpredictable demands
- Due to its stability, IaaS can be a better alternative for complex tasks which include millions of variables or calculations and in general, might require the use of supercomputers or clusters.
- Users can easily access high-end apps with IaaS. They can run graphic-intensive applications without any latency issues as the cloud servers offer superior performance and in addition to this, they will have increased productivity because the app will run with great speed.
- The application deployment over the cloud can be done in less time with IaaS. You can scale up or down the apps based on unpredictable demands. Moreover, all your infrastructure and storage requirements are borne by the providers so that you can easily deploy the applications.

2. Platform As A Service (PaaS)

- PaaS is a cloud service model that gives a ready-to-use development environment where developers can specialize in writing and executing high-quality code to make customized applications.
- It helps to create an application quickly without managing the underlying infrastructure. For example, when deploying a web application using PaaS, you don’t have to install an operating system, web server, or even system updates. However, you can scale and add new features to your services.
- This cloud service model makes the method of developing and deploying applications simpler and it is more expensive than IaaS but less expensive than SaaS.
- This helps you be more efficient as you don’t get to worry about resource procurement, capacity planning, software maintenance, patching, or any of the opposite undifferentiated work involved in running your application.

- **Examples** of PaaS: Elastic Beanstalk or Lambda from AWS, WebApps, Functions or Azure SQL DB from Azure, Cloud SQL DB from Google Cloud, or Oracle Database Cloud Service

from Oracle Cloud.

Benefits of PaaS

PaaS is an easy way to build an application, and it offers a lot of benefits. Here are just a few:

Faster development time – You don't have to build infrastructure before you can start coding.
Reduced costs – Your IT department won't need to spend time on manual deployments or server management.
Enhanced security – PaaS providers lock down your applications so that they're more secure than traditional web apps.
High availability – A PaaS provider can make sure your application is always available, even during hardware failures or maintenance windows.

PaaS Use-Cases

There are multiple use cases for PaaS, in a wide range of business contexts. Some of them are:

- PaaS is useful for companies developing, running, and managing app programming interfaces and microservices. The same goes for the development of new APIs and complete API management.
- PaaS is suitable for setting up and managing an organization's database. It offers a scalable, secure, and on-demand platform to create, administer, and maintain databases.

- PaaS tools allow for advanced analysis of business data, to identify patterns, make predictions, and ultimately make more qualified and data-driven decisions. These tools can help companies predict behaviors and events for better planning.
- PaaS supports various programming languages, application environments, and tools, which allows connectivity and integrations required in IoT deployments.
- PaaS can be a delivery mechanism for communication and collaboration which means that features like voice, chat, and videos can be added to applications built on the PaaS cloud service model.

3. Software As A Service (SaaS)

- SaaS provides you with a complete product that is run and managed by the service provider.
- The software is hosted online and made available to customers on a subscription basis or for purchase in this cloud service model.
- With a SaaS offering, you don't need to worry about how the service is maintained or how the underlying infrastructure is managed. It would help if you believed how you'd use that specific software.
- **Examples** of SaaS: Microsoft Office 365, Oracle ERP/HCM Cloud, SalesForce, Gmail, or Dropbox.

Benefits of SaaS

The benefits of SaaS are numerous and varied. Many businesses have already made the switch to SaaS, but some are still skeptical about making the change. Here are some of the top reasons why you should consider switching to SaaS:

Lower Total Cost of Ownership: One of the biggest benefits of SaaS is that it lowers your total cost of ownership (TCO) by eliminating hardware expenses and maintenance costs. There is no longer a need to buy servers or hire IT professionals to maintain or monitor them, which results in fewer upfront costs and reduced maintenance fees over time.
Better Security: Another benefit of SaaS is improved security. Since most services are hosted on secure servers in data centers with 24/7 monitoring, there's less chance for hackers to gain access or steal your data. This makes SaaS a more secure option for storing sensitive information than other options like on-premise software or local servers. In fact, according to Gartner's 2017 Magic Quadrant report, "Software as a service (SaaS) offerings provide better security than self-hosted software does."

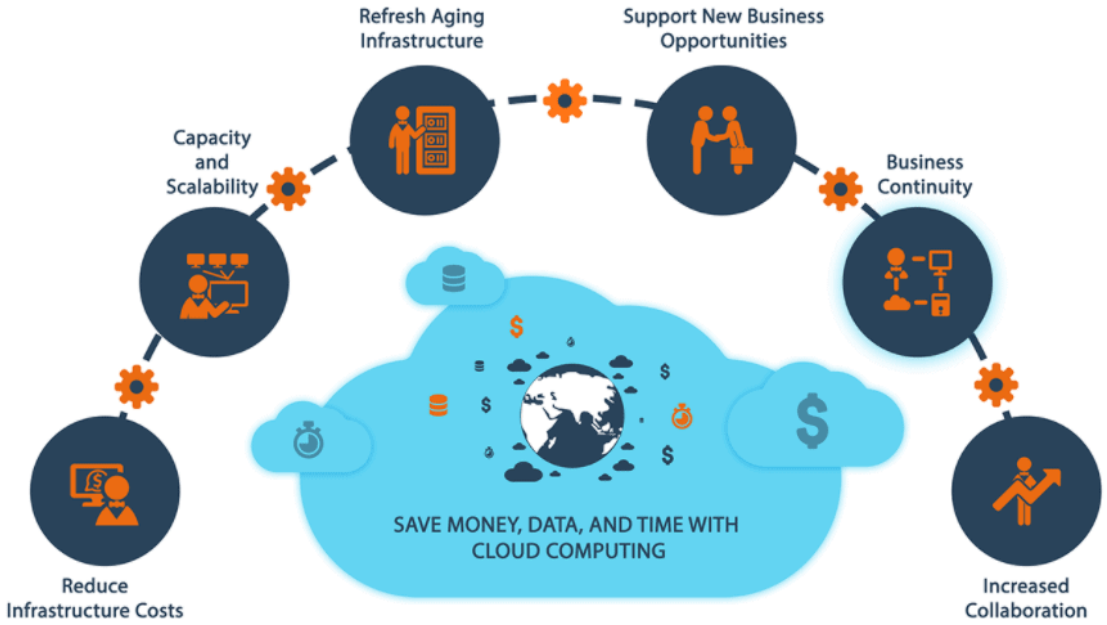
SaaS Use-Cases

- Pop-up live events are well-suited to SaaS models, specifically live sports and esports tournaments, where the event's temporary nature only requires services for a few hours a day in a week.
- SaaS brings new benefits for content owners looking to take their content directly to the consumer (D2C), with deployments covering everything from the Customer Management Systems (CMS), subscriber management systems, and user experience.
- SaaS helps in delivering applications that can be widely distributed and accessed. For example, Google's Gmail which is a fully managed email-based application and is most easily accessed over the internet without requiring you to install any software on your local device to be able to use it.

Characteristics Of Service Model of cloud computing

- **Multi-Tenant**: Multi-tenancy is an architecture in which a single instance of a software application serves multiple customers. Each customer is called a **tenant**.
- **Self-Sevice**: Self-service cloud computing is a private cloud service where the customer provisions storage and launches applications without an external cloud service provider. With a self-service cloud, users access a web-based portal to request or configure servers and launch applications.
- **Elastic (Scale-Up | Scale-Down)**: Elasticity is the ability to grow or shrink infrastructure resources dynamically as needed to adapt to workload changes in an autonomic manner, maximizing the use of resources. This can result in savings in infrastructure costs overall.
- **Web-Based**: It means you can access your resources via Web-Based applications.
- **Automated**: Most of the things in the Cloud are automated, and human intervention is less.
- **Pay As You Go Model**: You only have to pay when utilizing cloud resources.
- **Modern Web-Based Integration**: It allows you to configure multiple application programs to share data in the cloud. In a network that incorporates cloud integration, diverse applications communicate either directly or through third-party software.
- **Secure:** Cloud services create a copy of the data that you want to store to prevent any form of data loss. If one server loses the data by any chance, the copy version is restored from the

other server.



Which Cloud Service Model To Learn?

One of the most common questions I get from my students is **which Cloud Computing Service Model I should learn?**

- So, If you are System Administrator, you should learn both **Infrastructures as a Service (IaaS) and Platform as a Service (PaaS).** The reason is that whatever you are building or deploying is over Infrastructure as a Service, ie. PaaS always runs on top of IaaS. That's the reason you should know both.
- If you are working as a consultant such as a financial consultant or working on a packaged application such as HRMS, SAP, etc., you should learn **Software as a Service (SaaS).**

Cloud Shared Responsibility Model

The shared responsibility model defines cloud security, but it changes for IaaS, PaaS, and SaaS.