

# An Overview on Cloud Computing, Its Types and Platform

Harshvardhan Singh Shekhawat\*, Manish Yadav\*, Kiran Ahuja\*\*, Anand Geet\*\*

\*B.Tech Student, Department of CSE, Arya Institute of Engineering & Technology, Kukas

\*\* Assistant Professor, Department of CSE, Arya Institute of Engineering & Technology, Kukas

## ABSTRACT

By using the internet instead of on-premises infrastructure, cloud computing enables users to access computing resources including processing power, storage, and software. By offering scalable and flexible solutions for their computing demands, this technology has completely changed how businesses function. Cloud computing is a cost-effective way to access computing resources, as users only pay for what they use, and there is no need for large upfront capital investment. Additionally, cloud computing offers customers increased mobility and freedom by allowing them to access their data and applications from any location in the world. With the growth of cloud computing, there has been a shift towards a more service-based approach to computing, where users can access a range of services on a pay-as-you-go basis. As a result, cloud service providers like Amazon Web Services, Microsoft Azure, and Google Cloud have emerged.

*Keywords* — SaaS, PaaS, IaaS, Public Cloud, Hybrid Cloud, Private Cloud, data storage

## I. INTRODUCTION

The way computing resources are delivered, delivered, and managed has undergone a paradigm shift thanks to cloud computing. Rather than from a local server or personal computer, it refers to the supply of computing services like storage, processing power, and apps through the internet. Users can now access these resources whenever they want, from anywhere, using any device. Due to its capacity to offer adaptable, scalable, and economical solutions for computing demands, cloud computing has grown in popularity in recent years.

In the early days of the internet, when remote computers were utilised to store and share data, the idea of cloud computing first emerged. But the phrase "cloud computing" didn't come into existence until the early 2000s, when the technology started to catch on. Since then, cloud computing has grown to be a crucial tool for enterprises of all sorts, from little startups to enormous global conglomerates.

Today, there are several cloud computing models, including Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). Each model offers a different level of abstraction and management of computing resources. Additionally, there are public, private, and hybrid cloud deployment models, each with its own set of benefits and drawbacks.

By giving organisations a flexible and scalable alternative to traditional computing infrastructure, cloud computing has revolutionised the way businesses run. It has made it possible for businesses to cut their IT expenses, boost their responsiveness and agility, and enhance their general effectiveness. As cloud computing continues to evolve, it is likely that we will see further innovation and new use cases emerge in the years to come.

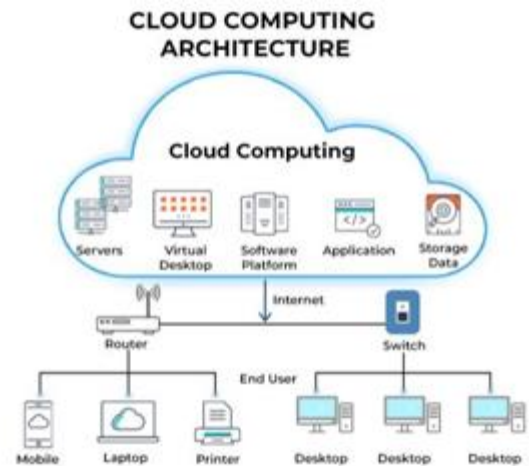


Figure 1. \_Cloud\_ Computing Architecture

## II. TYPES OF CLOUD

Public, private, and hybrid clouds are the three basic subtypes of cloud computing models. Different levels of flexibility, security, and control are provided by each type.

### A. *Public Cloud*

The public cloud is a subset of cloud computing in which internet-based third-party service providers provide and manage computing resources. Public cloud providers offer services such as computing power, storage, and customers can access applications using pay-per-use models. Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform are a few public cloud service providers. Public cloud computing offers a high level of scalability, flexibility, and cost-effectiveness. However, users have limited control over the infrastructure and may have to share resources with other users, which could result in performance issues.

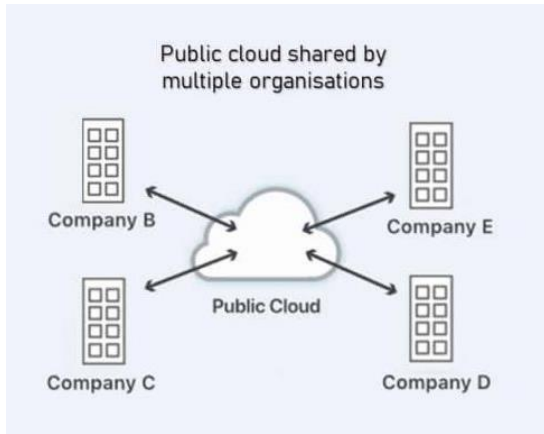


Figure 2. Public Cloud

**B. Private cloud**

A form of cloud computing known as the "privatecloud" is one in which computing resources are allocated solely to one organisation and are not shared with other organisations. Private cloud hosting options include on-premises hosting and third-party service providers. Financial institutions and healthcare facilities are two examples of organisations that frequently employ private clouds since they have strict security and compliance standards. High levels of control, security, and performance are provided by private cloud computing. However, it can be more expensive and not provide as much scalability and flexibility as public cloud computing.

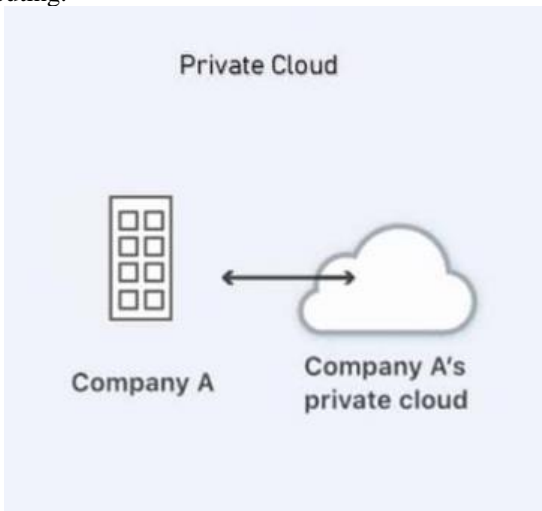


Figure 3. Private Cloud

**C. Hybrid Cloud**

The hybrid cloud is a type of cloud computing that combines elements of both public and private clouds. In a hybrid cloud model, some computing resources are hosted on-premises, while others are hosted by a third-party service provider. Hybrid cloud computing allows organizations to take advantage of the benefits of both public and private cloud computing while addressing the limitations of each. The hybrid cloud offers a high level of flexibility, scalability, and control. However, it can be more complex to manage and may require additional security measures to protect data across different environments.

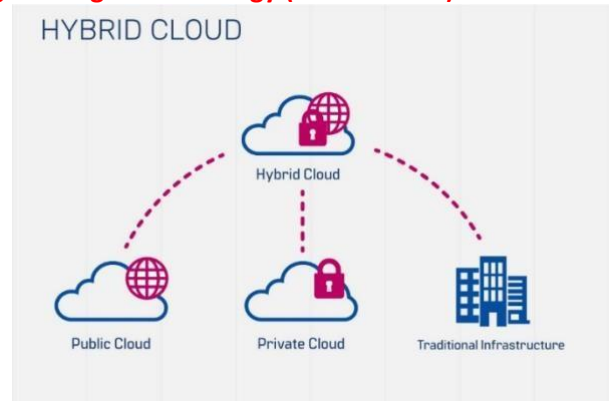


Figure 4. Hybrid Cloud

**III. CLOUD COMPUTING MODELS**

Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS) are the three main cloud computing paradigms.

**INFRASTRUCTURE-AS-A-SERVICE (IAAS)**

IaaS is a cloud computing paradigm where consumers rent computer equipment from a cloud service provider. This infrastructure includes virtual machines, storage, and networking. The customer is in charge of managing their applications and data, while the service provider is in charge of managing the underlying infrastructure, including hardware, operating systems, and virtualization. Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform are a few examples of IaaS providers. IaaS provides a high level of flexibility, as customers can scale their computing resources up or down as needed. It also offers a high degree of control, as customers can configure their virtual machines and networking to meet their specific needs. However, it requires more technical expertise to manage than other cloud computing models.

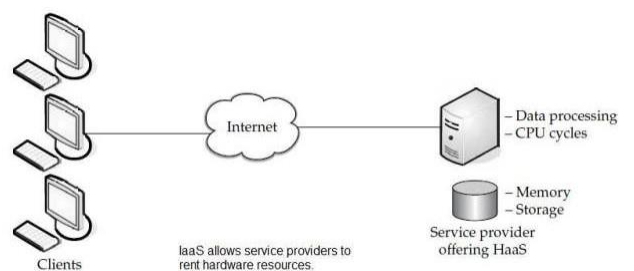


Figure 5. Infrastructure as a service

**PLATFORM-AS-A-SERVICE (PAAS)**

PaaS is a cloud computing model where customers rent a computing platform, such as a development environment or a database, from a cloud service provider. The customer is in charge of managing their applications and data, while the service provider is in charge of managing the underlying infrastructure, including hardware, operating systems, and middleware. Google App Engine and Microsoft Azure App Service are two examples of PaaS vendors.

A high level of abstraction offered by PaaS enables users

to concentrate on creating and deploying their apps without having to worry about the underlying infrastructure.

Additionally, it provides a high level of scalability because users may easily add or subtract computer resources as needed. It might not offer the same level of control and may be less adaptable than IaaS.

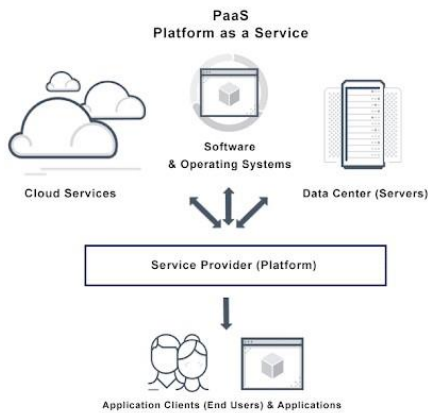


Figure 6. Platform as a service

**SOFTWARE-AS-A-SERVICE(SAAS)**

SaaS is a cloud computing model where customers rent a software application from a cloud service provider. The service provider manages the underlying infrastructure, including hardware, operating systems, and applications, while the customer simply accesses the software through a web browser or mobile app. Examples of SaaS providers include Salesforce, Microsoft Office 365, and Google Workspace. **A.**

SaaS provides the highest level of abstraction, as customers do not have to manage any infrastructure or applications. It is also the easiest to use and requires no technical expertise. However, it may be less customizable than other cloud computing models, and customers may have less control over their data and applications. **B.**

PaaS is a cloud computing model where customers rent a computing platform, such as a development environment or a database, from a cloud service provider. The customer is in charge of managing their applications and data, while the service provider is in charge of managing the underlying infrastructure, including hardware, operating systems, and middleware. Google App Engine and Microsoft Azure App Service are two examples of PaaS vendors. **C.**



Figure 7. Software as a service

- **MANIFESTATION:** This involves breaking text into individual words, phrases, or sentences to facilitate

further analysis.

- **PART-OF-SPEECH TAGGING:** This involves identifying the grammatical parts of speech of each word in a sentence, such as nouns, verbs, adjectives, and so on.
- **NAMED ENTITY RECOGNITION:** This involves identifying and categorizing named entities in text, such as people, places, and organizations.
- **SENTIMENT ANALYSIS:** This involves analysing the tone or sentiment expressed in text, such as positive, negative, or neutral.
- **MACHINE TRANSLATION:** This involves translating text from one language to another using machine learning techniques.
- **CHATBOTS:** This involves creating computer programs that can simulate human conversation, often used for customer service or other types of interactions.
- **TEXT SUMMARIZATION:** This involves creating summaries of longer texts, such as news articles or research papers.

**IV. PLATFORMS OF CLOUD COMPUTING**

Cloud computing platforms are the underlying infrastructure and software that provide the services and resources needed to support cloud computing. There are several major cloud computing platforms available, including: All title and author details must be in single-column format and must be centered.

**AMAZON WEB SERVICE(AWS)**

Amazon offers AWS, a sophisticated cloud computing platform. Cloud computing power, storage, databases, networking, analytics, and machine learning are just a few of the many services it provides. One of the most well-known cloud platforms is AWS, which has a sizable ecosystem of tools and services from outside sources.

**MICROSOFT AZURE**

Microsoft provides a cloud computing platform called Azure. In addition to processing power, storage, databases, networking, analytics, and machine learning, it also offers a variety of cloud services. Azure also provides a selection of developer services and tools, some of which integrate with Visual Studio.

**GOOGLE CLOUD PLATFORM(GCP)**

Google's cloud computing platform is known as GCP. In addition to processing power, storage, databases, networking, analytics, and machine learning, it also offers a variety of cloud services. Along with connectivity with well-known technologies like Kubernetes, GCP also provides a variety of developer tools and services.

**IBM CLOUD**

A cloud computing platform provided by IBM is called IBM Cloud. In addition to processing power, storage, databases, networking, analytics, and machine learning, it also offers a variety of cloud services. A variety of developer tools and services are also available through IBM Cloud, including connectivity with well-known tools like GitHub and Jenkins.

**ORACLE CLOUD INFRASTRUCTURE(OCI)**

Oracle provides OCI, a cloud computing platform. In addition to processing power, storage, databases, networking, analytics, and machine learning, it also offers a variety of



cloud services. OCI also provides a selection of developer services and tools, some of which integrate with well-known programmes like Terraform.

#### **ALIBABA CLOUD**

The Alibaba Group provides the cloud computing platform known as Alibaba Cloud. Cloud computing power, storage, databases, networking, analytics, and machine learning are among the services it provides. With data centres spread out over Asia, Alibaba Cloud is especially well-liked there.

#### **DIGITAL OCEAN**

A cloud computing platform called Digital Ocean focuses on offering developers with straightforward and reasonably priced infrastructure. It provides a variety of cloud services, such as networking, storage, and virtual machines. The simple price structure and user-friendly interface of DigitalOcean are well known.

#### **HEROKU**

Heroku is a cloud computing platform that focuses on providing a platform for developing and deploying web applications. It offers a range of developer tools and services, including support for popular programming languages such as Ruby, Node.js, and Python. Heroku is particularly popular with startups and small businesses.

#### **RACKSPACE**

A variety of cloud services, including processing power, storage, databases, networking, and security, are available through the cloud computing platform Rackspace. Additionally, Rackspace provides managed services, allowing clients to delegate maintenance of their cloud infrastructure to Rackspace's professionals.

#### **VMWARE CLOUD**

A cloud computing platform made available by VMware is called VMware Cloud. It offers a variety of cloud services, such as processing power, storage, and networking, and is especially well-liked by clients wishing to move their current workloads and applications to the cloud.

## **V. CONCLUSIONS**

The way that organisations and individuals use and access technology resources has been revolutionised by cloud computing. Public, private, and hybrid clouds are some of the several kinds of clouds that are available to meet various needs. Customers have varied degrees of control and flexibility over their cloud environments thanks to cloud computing models like Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). Additionally, there are several major cloud computing platforms available, each with their own unique features and benefits. Choosing the right cloud computing platform depends on a variety of factors, including the specific needs and goals of the customer. Overall, cloud computing has provided an efficient and scalable way for businesses and individuals to access technology resources and innovate at a faster pace.

The capacity of cloud computing to scale resources up or down in response to demand is one of its main advantages. This means that without spending money on costly hardware or infrastructure, organisations and people can quickly and inexpensively acquire more computing power, storage, or other resources as needed.

Additionally, users of cloud computing can access their resources and apps from any location with an internet

connection, increasing their flexibility and accessibility. In the contemporary global climate, remote work and cooperation have become increasingly crucial.

The ability to just pay for the resources that are actually used by users, as opposed to having to buy and maintain their own gear and infrastructure, is another benefit of cloud computing. Because of this, cloud computing is a desirable alternative for organizations and people of all sizes.

However, there are also some potential drawbacks to consider, such as security and data privacy concerns. Storing sensitive data in the cloud requires a high level of trust in the cloud provider, and there have been instances of data breaches and other security incidents in the past. It is important for users to carefully evaluate their cloud provider's security measures and take appropriate steps to protect their data.

Overall, cloud computing has transformed the way we consume and access technology resources, offering a scalable, flexible, and cost-effective solution for businesses and individuals. With the increasing adoption of cloud computing, it is likely to continue to play a significant role in the future of technology.

Furthermore, there is a growing field of research on multimodal AI, which combines different modes of input, such as text and images, to create more complex and meaningful outputs. This field has the potential to lead to new applications of both NLP and AI image generation, such as generating images that correspond to complex descriptions or generating text descriptions that accurately convey the content of an image.

Overall, while AI image generation and NLP are distinct fields, there is potential for overlap and collaboration between them. The development of new techniques and applications in multimodal AI will likely continue to push the boundaries of what is possible in both fields.

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