



What is Cloud computing?

Cloud computing is like renting space on the internet to store your files or run programs. Instead of keeping everything on your own computer, you use someone else's powerful computers (called servers) that are managed by a cloud service company. These companies take care of everything, so you don't have to worry about maintaining the hardware or software. You can access your data and programs online anytime you need them, without having to manage the actual physical machines.



Simply put, Cloud computing is the delivery of services through the internet.

History and Evolution of Cloud?

Early Beginnings (1950s - 1990s)

Cloud computing's roots trace back to the 1950s and 60s with time-sharing systems, where multiple users accessed a single mainframe. In the 1970s, virtualization allowed for multiple virtual machines on a single physical machine, setting the stage for cloud computing. The 1980s and 90s saw the rise of distributed computing, further developing the idea of shared resources.

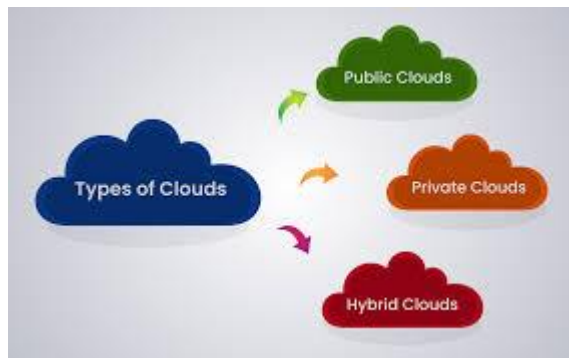
Emergence of Cloud Computing (2000s)

In the early 2000s, cloud computing gained momentum with the rise of web-based services. Amazon Web Services (AWS) launched Elastic Compute Cloud (EC2) in 2006, pioneering on-demand, scalable cloud services. This was followed by other major tech companies like Google and Microsoft entering the cloud market, accelerating its growth.

### Modern Cloud Computing (2010s - Present)

The 2010s saw rapid adoption of cloud computing, with businesses embracing hybrid and multi-cloud strategies. Emerging trends like edge computing and serverless architectures have further evolved the cloud landscape. Today, cloud computing is integral to the digital economy, with a future focused on decentralization, security, and advanced technologies like AI and quantum computing.

### Types of Cloud?

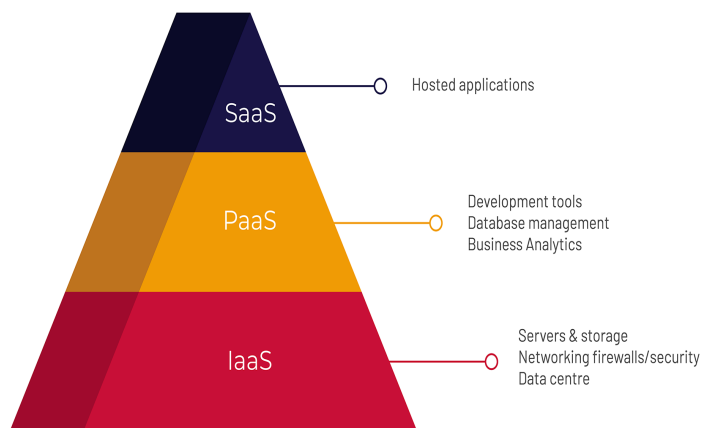


A **public cloud** is a type of cloud computing service where computing resources such as servers, storage, and applications are provided to multiple customers over the internet by a third-party provider. These resources are hosted and managed by the cloud provider in their data centers, and customers can access and use them on a pay-as-you-go basis or through a subscription model. Examples include Alibaba cloud, Aws, Google cloud, IBM.

Private cloud are loosely defined as cloud environments solely dedicated to a single end user or group, where the environment usually runs behind that user or group's firewall. When the underlying IT infrastructure is dedicated to a single customer and provides completely isolated access, it essentially becomes a private cloud. Example is Openstack.

Hybrid cloud uses a combination of public and private cloud features. The 'best of both worlds' cloud model allows a shift of workloads between private and public clouds as the computing and cost requirements change.

### Popular Deployment Cloud Model



Cloud deployment involves creating a virtual environment that defines how servers are utilized and managed. The three most popular cloud deployment models include:

1. **Software as a Service (SaaS)** : This model provides software applications over the internet. Users can access the software without worrying about the underlying infrastructure or platform. Examples include Google Workspace and Salesforce.
2. **Platform as a Service (PaaS)** : This model offers a platform that allows developers to build, test, and deploy applications. It abstracts much of the infrastructure management while offering a development framework. Examples include Google App Engine and Microsoft Azure.
3. **Infrastructure as a Service (IaaS)** : This model offers virtualized computing resources over the internet. Users can rent infrastructure (like servers, storage, and networking) and manage them as needed. Examples include Amazon Web Services (AWS) and Microsoft Azure IaaS.

These deployment models provide varying levels of control, flexibility, and responsibility, allowing businesses to choose the best option based on their needs.

Cloud computing benefits organizations in many ways. In fact, the benefits are so numerous that it makes it almost impossible not to consider moving business operations to a cloud-based platform. Below here, are top 4 benefits of cloud computing for all organizations considering adopting a cloud-based system.

1. **Accessibility anywhere, with any device.**

Each branch or office, regardless of location—whether in different states or countries—benefits from enhanced accessibility. This improvement isn't limited to employees; clients and customers can also log into their accounts to access their information. This ensures that everyone, whether in the office or on the move, has access to the most current information.

## 2. Ability to get rid off most or all hardware and software

With cloud computing, you're no longer required to have your own server, cables, network switches, backup generators, redundant routers, and so on. Depending on the cloud provider you choose, they can manage all of this for a monthly fee. Reducing expenses is essential in any business model and every cloud-based platform benefits from this factor alone.

## 3. Centralized data security

With cloud computing, data backups are centralized within the cloud provider's data centers, eliminating the need for users or teams to manage their own backups, whether onsite or offsite. This reduces the risk of data loss, as cloud providers can restore data from another copy stored in their system, which is continuously updated with every new piece of data.

Teams also benefit from advanced cloud security technologies, such as data encryption and two-factor authentication, providing greater privacy than relying on personal or office-based equipment. Oracle, for instance, utilizes a security-first cloud architecture with automated protection integrated from the ground up.

## 4. High performance and availability

By using cloud computing resources together simultaneously, you reap greater performance gains than by having your own dedicated server hardware. Cloud computing increases input/output operations per second (IOPS).

## Navigating the challenges of cloud computing

### 1. Data security and privacy

When working in Cloud environments, data security becomes a top priority. While Cloud providers offer robust services, the ultimate responsibility for protecting your data lies with you. Not all providers can guarantee complete privacy, making it essential to stay vigilant. By understanding your shared role in safeguarding information, you can better navigate the balance between convenience and security in the Cloud.

### 2. Interoperability and flexibility

When shifting applications between different Cloud environments, interoperability presents challenges. Common issues include:

- Rebuilding application stacks to match the target Cloud's specifications
- Managing services and applications within the new Cloud ecosystem
- Handling data encryption throughout the migration process
- Configuring networks to ensure seamless operations in the target environment

## The Futures of Cloud Computing



Gartner predicts that by 2027, cloud computing will be a central force behind business innovation and the dominant form of computing. The future of cloud computing appears promising, with a growing number of organizations adopting cloud infrastructure for its flexibility, scalability, data analytics capabilities, and continuous innovations.

The future of cloud computing is gaining momentum, with many upcoming advancements set to revolutionize how businesses operate in the cloud. It provides a dynamic yet user-friendly platform for data storage, development, and other essential business operations.

