



# CLOUD COMPUTING: AN EMERGING CONCEPT

Ms Neha

Lecturer, Department of Computer Application, GDC Marh- Jammu

## Abstract

Cloud computing is an approach to information technology that involves over-the-Internet provisioning of dynamically scalable and often virtualized resources. This is in contrast to traditional client-server architectures in which applications are distributed across many machines connected by a local area network. Applications can scale outwards by adding more physical servers, so the overall size of the system can grow without concern about whether the additional capacity can be accommodated locally.

“Cloud” is a collective term for large numbers of developments and possibilities. They are not inventions, but rather practical innovations, combining several earlier inventions together into something new and compelling; much like the iPod is made up of several existing concepts and components (the Walkman, mp3 compression, a portable hard drive, etc.). Like the iPod, cloud computing merges several previously available technologies (high speed networks, virtualization, web 2.0 interactivity) into something new and compelling: cloud computing. Cloud computing enables tasks to get assigned to a combination of hardware and software over a network. This combination of hardware and software is called a cloud. Cloud computing can be used to expand and reduce the amount of hardware and software based on demand. An advanced cloud includes additional computing resources such as storage areas networks (SANs), firewalls, and other security devices.

Keywords: Cloud Computing, Security, Servers, Hardware, Reliability

## Introduction

Cloud computing is an approach to providing shared computer processing resources and data storage over a network as a utility. The term "cloud" refers to the concept of delivering hosted services over the Internet. The cloud can provide virtualized resources through technologies such as VMware vSphere, Microsoft Hyper-V, Amazon EC2, Google Compute Engine, and OpenStack. Cloud computing, the life time dream of computing as a utility, has the capacity to convert a huge part of the IT industry, making software even more attractive as a service and shaping the way IT hardware is designed and purchased. Developers with new invention ideas for new Internet services no longer require the huge capital outlays in hardware to deploy their service or the human expense to operate it. They need not be worried about over-provisioning for a service whose popularity does not meet their predictions, thus wasting costly resources, or under provisioning for one that becomes wildly popular, thus missing potential customers and revenue. In addition to, companies with huge batch-oriented tasks can get results as fast as their programs can scale, since using 1,000 servers for one hour costs no more than using

one server for 1,000 hours. Without paying a premium for large scale, is unprecedented in the history of IT, by this elasticity of resources.

A cloud environment typically consists of multiple interconnected layers, including infrastructure, platform, applications, and users. Simply put, Cloud working out is the distribution of Computing services-including servers, database, networking, storage, software, analytics and intelligence-over the Internet (“the Cloud“) to offer faster revolution, flexible resources, and economies of scale. Cloud working out is the delivery of computing services such as servers, storage, database, networking, software, analytics, intelligence, and more, over the Cloud (Internet).

## Benefits of cloud computing

1	Agility	The cloud gives you easy access to a broad range of technologies so that you can innovate faster and build nearly anything that you can imagine. You can quickly spin up resources as you need them- from infrastructure services, such as compute, storage and databases, to internet of things, machine learning, data lakes and analytics, much more.
2	Elasticity	With cloud computing, you don't have to over-provision resources up front to handle peak levels of business activity in the future. Instead, you provision the amount of resources that you actually need. You can scale these resources up or down to instantly grow and shrink as your business needs change.
4	Performance	The biggest cloud computing services run on a worldwide network of secure datacenters, which are regularly upgraded to the latest generation of fast and efficient computing hardware. This offers several benefits over a single corporate datacenter, including reduced network latency for applications and greater economies of scale.
5	Global scale	The benefits of cloud computing services include the ability to scale elastically. In cloud speak, that means delivering the right amount of IT resources—for example, more or less computing power, storage, bandwidth—right when it is needed and from the right geographic location.
6	Productivity	On-site datacenters typically require a lot of “racking and stacking”—hardware setup, software patching, and other time-consuming IT management chores. Cloud computing removes the need for many of these tasks, so IT teams can spend time on achieving more important business goals.
7	Reliability	Cloud computing makes data backup, disaster recovery and business continuity easier and less expensive because data can be mirrored at multiple redundant sites on the cloud provider's network.

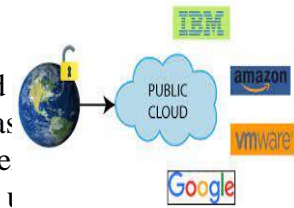
## Types of Cloud Computing

There are three types of cloud computing deployment models: Private cloud, Public cloud, and Hybrid cloud.

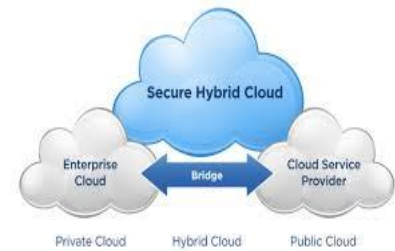
**Private cloud:** - Private cloud provides a proprietary cloud environment dedicated to a single business entity, with physical components stored on-premises or at a datacenter. Because the private cloud is only accessible to a single business, it offers a high degree of control. Advantages include customized architecture, security protocols, and the ability to extend computing resources in an environment as needed. In many cases, an organization maintains a private infrastructure on-site while delivering cloud computing services to internal users on an intranet. In other instances, the organization contracts with a third-party cloud vendor to host and maintain exclusive servers off site.



**Public cloud** uses the internet to store and manage access to data and applications. It's completely virtualized, providing an environment where shared resources are leveraged as needed. Because these resources are delivered over the web, the public cloud deployment model allows organizations to scale more easily. The ability to pay for cloud resources as needed is a huge advantage over local servers. In addition, public cloud service providers offer robust security measures to protect data from being accessed by other tenants.

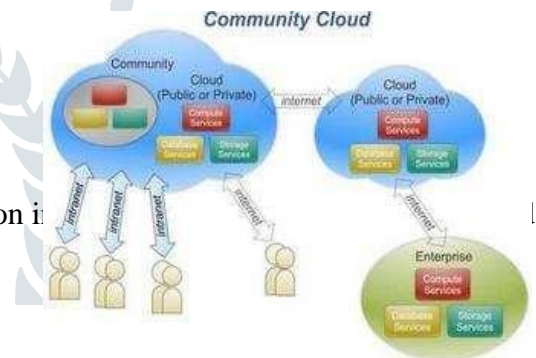


**Hybrid cloud** combines private and public cloud models, allowing organizations to leverage the benefits of shared resources while using existing IT infrastructure to meet security requirements. The hybrid cloud model allows companies to store data internally and access it via applications running in the public cloud. To comply with regulations, for example, an organization could store sensitive user data in a private cloud and perform resource-intensive computation in the public cloud.



In addition, businesses can choose to take a multi-cloud approach, which means they use more than one public cloud service. This approach can be used to distribute workloads across multiple cloud platforms, allowing organizations to optimize their environments for performance, flexibility, and cost savings.

**D. Community Cloud (or Group Cloud)** In this Consumption model several organizations together construct and share cloud infrastructure as well as policies, necessities, values, and concerns. The cloud community forms into a degree of financial equilibrium. The cloud infrastructure can be hosted by a third-party retailer or within one of the organizations used by many social networking websites like Facebook, Orkut, etc.



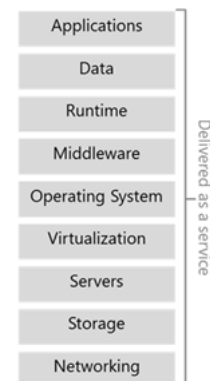
## Examples of Cloud Computing

While cloud computing can take many forms, the majority falls into three key areas. Each type of cloud computing provides its own set of advantages.

### ➤ Software as a Service (SaaS)

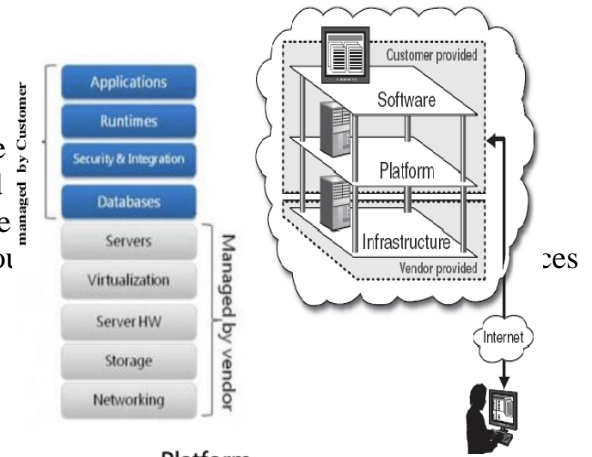
Traditionally, software was installed directly on each individual device. With the software as a service (SaaS) computing model, web applications are hosted in the cloud to reduce costs through pay-as-you-go pricing. End users can easily connect to the cloud application through a web browser or mobile device, and there's no need for IT departments to get involved with management or maintenance. Examples include Gmail, Salesforce CRM, and RightSignature, as well as cloud storage services like OneDrive and Dropbox.

### Software (as a Service)



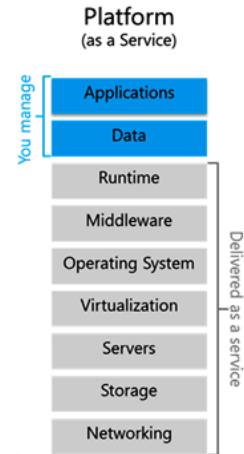
### ➤ Infrastructure as a Service (IaaS)

The infrastructure as a service (IaaS) computing model moves an organization's entire datacenter to the cloud. The business rents virtual machines (VMs), virtual servers, operating systems, and other IT infrastructure on a pay-as-you-go basis. The cloud service provider is responsible for maintaining all data storage servers and networking hardware, eliminating the need for a resource-intensive on-site installation. Examples include Microsoft Azure, Google Cloud (AWS).



### ➤ Platform as a Service (PaaS)

The platform as a service computing model gives organizations the power to develop software without needing to maintain the backend environment. PaaS vendors optimize environments for each tenant's unique needs, and often include supplemental development tools such as storage resources, compile services, and version control.



### Is Cloud computing secure?

Cloud providers take cloud security very seriously. Vendors have developed complex security protocols based on encryption and authentication, and take steps to ensure tenants can't access their neighbor's data.

In general, servers are regulated by the laws of the country they reside in. That means data stored on a European server will be regulated differently than a server in the U.S. Organizations that handle private user data need to be aware of all regulations that may apply to their cloud solutions.

### Citrix solutions for cloud computing

Cloud computing has gained popularity at a rapid pace because it offers a number of benefits. It's more cost-effective than on-site server installations and can provide faster service than a traditional installation.

In addition, cloud computing models are easy to scale. The cloud extends alongside an organization's fluctuating needs, making it easy to accommodate real-time changes in computing power needs. The cloud is also very reliable, offering dependable data backup for disaster recovery and business continuity. Businesses that leverage cloud environments do not need to maintain complex hardware, nor do they need to build solutions from scratch. The cloud allows teams to get projects up and running as soon as they receive executive sign off.

### Uses of cloud computing

You are probably using cloud computing right now, even if you don't realise it. If you use an online service to send email, edit documents, watch movies or TV, listen to music, play games or store pictures and other files, it is likely that cloud computing is making it all possible behind the scenes. The first cloud computing services are barely a decade old, but already a variety of organisations—from tiny startups to global corporations, government agencies to non-profits—are embracing the technology for all sorts of reasons.

Here are a few examples of what is possible today with cloud services from a cloud provider:

## Create cloud-native applications

Quickly build, deploy and scale applications—web, mobile and API. Take advantage of cloud-native technologies and approaches, such as containers, Kubernetes, microservices architecture, API-driven communication and DevOps.

## Test and build applications

Reduce application development cost and time by using cloud infrastructures that can easily be scaled up or down.

## Store, back up and recover data

Protect your data more cost-efficiently—and at massive scale—by transferring your data over the Internet to an offsite cloud storage system that is accessible from any location and any device.

## Analyse data

Unify your data across teams, divisions and locations in the cloud. Then use cloud services, such as machine learning and artificial intelligence, to uncover insights for more informed decisions.

## Stream audio and video

Connect with your audience anywhere, anytime, on any device with high-definition video and audio with global distribution.

## Embed intelligence

Use intelligent models to help engage customers and provide valuable insights from the data captured.

## Deliver software on demand

Also known as software as a service (SaaS), on-demand software lets you offer the latest software versions and updates around to customers—anytime they need, anywhere they are.

## References

Al Noor, S., Mustafa, G., Chowdhury, S., Hossain, Z. and Jaigirdar, F. "A Proposed Architecture of Cloud Computing for Education System in Bangladesh and the Impact on Current Education System" *International Journal of Computer Science and Network Security (IJCSNS)*, Vol.10 No.10. 2010.

B. Rimal, E. Choi, and I. Lumb, "A taxonomy and survey of cloud computing systems," in Proc. IEEE Fifth International Joint Conference on INC, IMS and IDC, 2009, pp. 44–51.

Barrie Sisisky, "Cloud Computing Bible". John Wiley & Sons, January 11, 2011.

Bhosale, S. S. (2021, April). Research Paper on Cloud Computing. *Contemporary Research in India*, 87-92.

Introduction to Cloud Computing Architecture, White paper, SUN, Microsystems, 1st edition, June 2009.

Justin, C., Ivan, B., Arvind, K. and Tom, A. "Seattle: A Platform for Educational Cloud Computing" SIGCSE09, March 37, 2009, Chattanooga, Tennessee, USA. 2009.

M.Rajendra Prasad, D. B. (2013). Cloud Computing : Research Issues and Implications. *International Journal of Cloud Computing and Services Science*, 2, 134-139.

R. Muhleman, P. Kim, V. J. Homan, & J. Breese-Vitelli, (2012), "Cloud Computing: Should I Stay or Should I Cloud?", presented at the Conference on Information Systems Applied Research, New Orleans Louisiana, USA.

Raj Gaurav, Lovely Professional University, Phagwara, Punjab, India “An Efficient Broker Cloud Management System” in ACAI 2011, July 21–22, 2011, Rajpura, Punjab, India.

S. Subashini & V. Kavitha, (2010), “A Survey on Security Issues in Service Delivery Models of Cloud Computing”, Journal of Network and Computer Applications, Vol. 34, No.1, pp1 -11.

