

# RECENT TRENDS AND DEVELOPMENT IN CLOUD COMPUTING

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**Abstract –Cloud Computing is an technology for providing computer service via Internet. It is based on the concept of virtualization, grid and utility computing. Instead of installing and storing the software in users PC's, cloud enable the user to use the resources through the Internet. It also ensures optimal usage of the available resources. Cloud computing is a completely internet dependent technology where client data is stored and maintain in the data centre of a cloud provider like Google, Amazon, and Microsoft etc. Limited control over the data may incur various security issues and threats, which include data leakage, insecure interface, sharing of resources, data availability and inside attacks. Due to low cost most of the IT Industries moved to cloud technology to meet their computational requirements. It is a technology where the users can use high-end services in form of software that reside on different servers and access data from all over the world. Recently the availability and popularity of cloud services has increased rapidly. This recent development helps the users who are unwilling and unable to maintain and produce their own computational infrastructure. Technological advancements in cloud computing due to increased connectivity and exponentially proliferating data has resulted in migration towards cloud architecture. Cloud computing delivers services for consumer and business needs in a simplified way, providing unbounded scale and differentiated quality of service. This paper deals with this recent development and new trends in Cloud Computing.**

**KEYWORDS:** Virtualization, Cloud provider, Need of Cloud, Cloud services, Cloud Computing Trends.

## 1. Introduction:

Cloud computing refers to a network of computers, connected through internet, sharing the resources given by cloud providers catering to its user's needs like scalability, usability, resource requirements. There are various reasons for organizations to move towards IT solutions that include cloud computing, as they are just required to pay for the resources on consumption basis. In addition, organizations can easily meet the needs of rapidly changing markets to ensure that they are always on the leading edge for their consumers [1]. Nowadays Internet has undergone several advancements. Utilization of unused resources in Internet is the focus of the many technologies like distributed and grid computing. Cloud computing allows users to access software applications and computing services. They might be stored off-site at locations rather than at local data centre or the user's computer [2]. Cloud computing is presented in academic area only but now recently it is now transferred into many industries by companies like Microsoft, Amazon etc. Cloud computing enables companies to consume compute resources as a utility -- just like electricity -- rather than having to build and maintain computing infrastructures in-house. Cloud computing is the successor of the Grid computing. In cloud, computing the user has no need the knowledge and has to be expertise in cloud technology. Cloud can be used as service in Internet with high scalability, higher throughput and high quality of service. Cloud computing is computing based on the internet. Where in the past, people would run applications or programs from software downloaded on a physical computer or server in their building, cloud computing allows people access the same kinds of applications through the internet. It is a solution growing in popularity, especially amongst SMEs. The CRN predicts that by 2014, small businesses will spend almost \$100 billion on cloud computing services. So many businesses are moving to the cloud. It is because cloud computing increases efficiency, helps improve cash flow and offers many more benefits. Cloud computing providers deliver common online business applications, which are accessed, from servers through web browser [3].

## 2. CLOUD COMPUTING SERVICES

Cloud computing has three important services that play a major role in the cloud computing. These three services are the basic services of the cloud computing they are i) INFRASTRUCTURE AS A SERVICE ii) SOFTWARE AS A SERVICE iii) PLATFORM AS A SERVICE

The Figure 2: shows about the services in the cloud computing.

These services are also called as the **LAYERED MODEL**. Based on the services provided to the end users the cloud-computing model has classified into layered models the three layers are Infrastructure Layer, Platform Layer and Application Layer.

A cloud infrastructure provides too many customers, which are managed by a third party, and exist beyond the company firewall. Multiple enterprises can work on the infrastructure provided, at the same time and users can dynamically provision resources. These clouds are fully hosted and managed by the cloud provider and fully responsible for installation, management,

provisioning, and maintenance. The cloud computing technology when merged with existing technologies of computing can revolutionize the ways of data communication and storage.

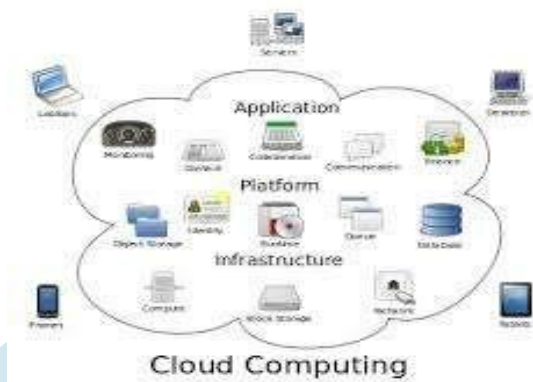


Fig 2: Services in cloud computing

**3. CLOUD MODELS:**

**Cloud:**

Cloud computing is a broad term which refers to a collection of services that offer businesses a cost-effective solution to increase their IT capacity and functionality. Depending on their specific requirements, businesses can choose where, when and how they use cloud computing to ensure an efficient and reliable IT solution. There are three main types of cloud environment, also known as cloud deployment models. Businesses can choose to run applications on public, private or hybrid clouds – depending on their specific requirements.

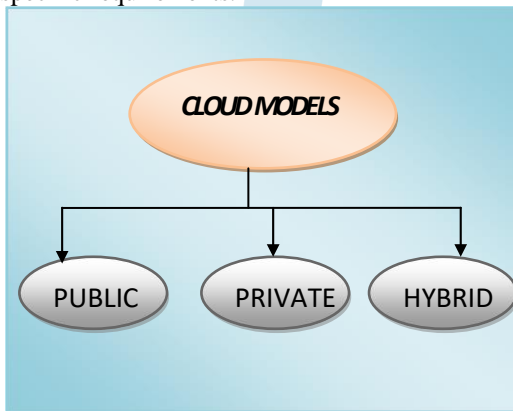


Fig 3 cloud models

**4. RECENT TRENDS IN CLOUD COMPUTING**

Cloud computing is acquiring more prominence and its applications on various fields of IT are growing in a fast pace from its infancy. The cloud computing technology when merged with existing technologies of computing can revolutionize the ways of data communication and storage. There are seven trends in the cloud computing they are

**4.1. Hybrid clouds:**

Hybrid cloud is the combination of public and private cloud. There has been an ongoing debate between the merits of public and private cloud models for quite some time now. Hybrid clouds feature an infrastructure that combines private cloud security with cost-effective, powerful and scalable public cloud attributes.

**4.2. BYOD:**

Since the vast majority of consumer electronics in the world are, "bring your own device" is more relevant than ever in the world of cloud computing. End users are using their mobile devices to put more and more of their own data into personal cloud services for streaming, storage, and syncing..

**4.3. Platform-as-a-Service (PaaS):**

PaaS solutions enable businesses to reduce their IT costs while increasing application development through more efficient testing and development methods.

**4.4. Big data analytics.**

Similar to the public and private cloud model debate, many organizations are realizing that it may be much simpler and more beneficial to combine big data analytics with cloud computing than to choose one over the other.

**4.5. Graphics as a service.**

Typically, running high-end graphics applications requires substantial hardware infrastructure investment. However, cloud computing is changing this reality.

#### 4.6. Identity management and protection.

Security has always been a major concern with cloud computing. As more businesses move more information and data into cloud servers, this concern is more important than ever.

#### 4.7. Web-powered apps.

With innovative initiatives such as famous bringing new life to HTML via JavaScript, it will not be long before the Internet becomes the main platform for these applications.

#### 5. Trends for the Future:

In the short to medium term, major external trends—namely, big data, IoT, and mobility—will create an explosion in the use of true hybrid clouds. The emphasis on this phase will also be to modernize the in-house applications and make them “cloud ready.” In the medium to long term, more sophisticated business processes will be developed, and as the public cloud matures, more of the enterprise wide processes will be transferred to the public cloud. Thus, the public cloud side of the hybrid cloud will continue to grow until a dynamic equilibrium between public and private cloud is established.

#### 6. Cloud Computing Trends: 2021 State of the Cloud Survey.

The cloud is more than an efficient storage solution—it’s a unique platform for generating data and innovative solutions to leverage that data. This intense focus on adaptability has facilitated a form of service-oriented thinking previously thought to be unattainable. The ability to specialize has expanded, allowing organizations to innovate their business models and processes in pursuit of their core competencies and business goals without compromising on agility.

2020 has been a pivotal year for the cloud as it played a lead role in facilitating remote work solutions. It allowed organizations to fuse existing organizational processes with novel cloud technologies to allow for greater flexibility during these uncertain times. **COVID-19 has facilitated a focus on cloud capabilities** as companies compete to thrive in this new remote work environment. The cloud has become an essential part of continuing business and is the key to unlocking organizational growth. Worldwide spending on public cloud services is even forecast to grow 18.4 percent in 2021.

#### 7. Benefits Of Cloud Computing:

##### 7.1. Flexibility

The second a company needs more bandwidth than usual, a cloud-based service can instantly meet the demand because tonnes of names and formats.

Cloud computing keeps all the files in one central location, and everyone works off of one central copy. Employees can even chat to each other whilst making changes together. This whole process makes collaboration stronger, which increases efficiency and improves a company’s bottom line.

**7.2. Security**This can have some serious monetary implications, but when everything is stored in the cloud, data can still be accessed no matter what happens to a machine.

##### 7.3. Competitiveness

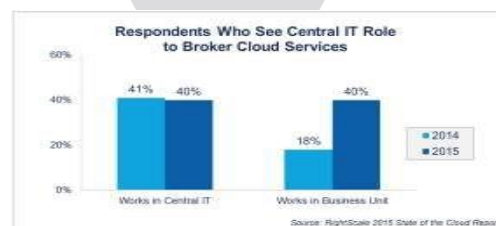
The cloud grants SMEs access to enterprise-class technology. It also allows smaller businesses to act faster than big, established competitors. study onre covery eventually concluded that companies that didn’t use the cloud had to rely on tape backup methods and complicated procedures to recover – slow, laborious things which cloud users simply don’t use, allowing David to once again out-manoeuvre Goliath.

##### 7.4. Environmentally friendly

Businesses using cloud computing only use the server space they need, which decreases their carbon footprint. Using the cloud results in at least 30% less energy consumption and carbon emissions than using on-site servers. And again, SMEs get the most benefit: for small companies, the cut in energy use and carbon emissions is likely to be 95%.

See how Salesforce.com is making a difference with carbon savings.

This figure shows the fourth annual state survey of cloud service



#### Uses Of Cloud Computing:

**7.5 Reduction of costs**—unlike on-site hosting the price of deploying applications in the cloud can be less due to lower hardware costs from more effective use of physical resources.

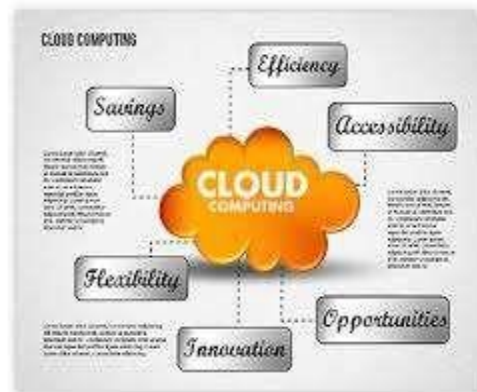
**7.6 Universal access**- cloud computing can allow remotely located employees to access applications and work via the internet.

**7.7 Up to date software** - a cloud provider will also be able to upgrade software keeping in mind feedback from previous software releases.

**7.8 Choice of applications.** This allows flexibility for cloud users to experiment and choose the best option for their needs. Cloud computing also allows a business to use, access and pay only for what they use, with a fast implementation time

**7.9 Potential to be greener and more economical** - the average amount of energy needed for a computational action carried out in the cloud is far less than the average amount for an on-site deployment. This is because different organisations can share the same physical resources securely, leading to more efficient use of the shared resources.

**7.10 Flexibility** – cloud computing allows users to switch applications easily and rapidly, using the one that suits their needs best. However, migrating data between applications can be an issue.



### Diagrammatic Representation of Cloud benefits

### 8. Trends for the Future:

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### 9. CONCLUSION:

Cloud computing is an emerging technology which can bring revolutionary changes in the usage of internet. Cloud computing is a combination of various computing technologies and it can play a major role in bringing significant improvement in data transfer and communication. This paper provides a basic understanding of cloud computing which includes the cloud architecture, services and types of clouds. This paper also elaborates the recent trends in cloud computing. major external trends—namely, big data, IoT, and mobility—will create an explosion in the use of true hybrid clouds. The emphasis on this phase will also be to modernize the in-house applications and make them “cloud ready.”

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