Cloud computing

TOPICS

1) INTRODUCTION TO CLOUD COMPUTING

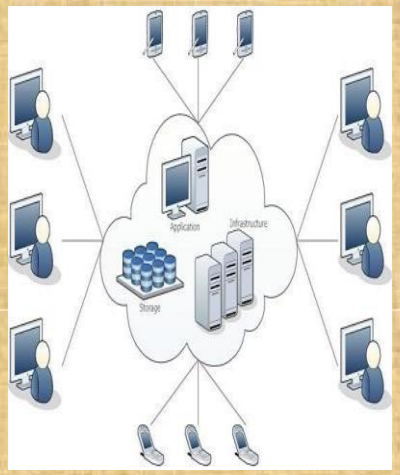
2) HISTORY OF CLOUD COMPUTING

Dr P Yellamma

What is Cloud ?

The term Cloud refers to a Network or Internet. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over network, i.e., on public networks or on private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, customer relationship management (CRM), all run in cloud.

• *What is Cloud Computing?*



- The term cloud refers to a network or the internet.
- It is a technology that uses remote servers on the internet to store, manage, and access data online rather than local drives.
- The data can be anything such as files, images, documents, audio, video, and more.
- Cloud computing, often referred to as simply “the cloud,” is the delivery of on-demand computing resources — everything from applications to data centers — over the internet on a pay-for-use basis.
- Allows users to deal with the software without having the hardware.
- Everything is done by remote, nothing is saved locally.

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Operations that we can do using Cloud Computing

- Developing new applications and services
- Storage, back up, and recovery of data
- Hosting blogs and websites
- Delivery of softwares, platforms or virtual machines on demand
- Analysis of data
- Delivery of Desktop on demand

Why Cloud Computing?

- Small as well as large IT companies, follow the traditional methods to provide the IT infrastructure.

- That means for any IT company, we need a Server Room that is the basic need of IT companies.

- In that server room, there should be a database server, mail server, networking, firewalls, routers, modem, switches, QPS (Query Per Second means how much queries or load will be handled by the server), configurable system, high net speed, and the maintenance engineers.

- To establish such IT infrastructure, we need to spend lots of money.

- To overcome all these problems and to reduce the IT infrastructure cost, Cloud Computing comes into existence.

Why Cloud Computing

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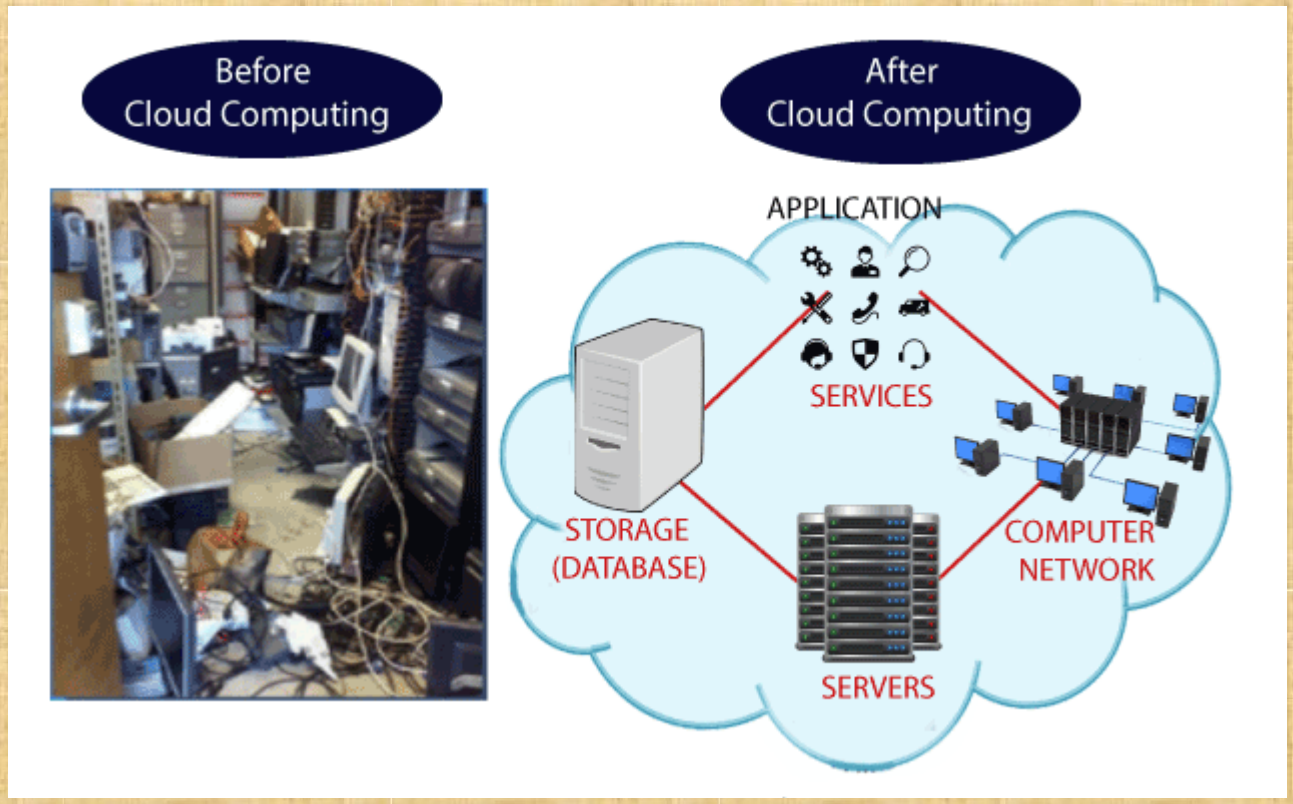

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Characteristics of Cloud Computing

The characteristics of cloud computing are given below:

1) Agility

The cloud works in a distributed computing environment. It shares resources among users and works very fast.

2) High availability and reliability

The availability of servers is high and more reliable because the chances of infrastructure failure are minimum.

3) High Scalability

Cloud offers "on-demand" provisioning of resources on a large scale, without having engineers for peak loads.

4) Multi-Sharing

With the help of cloud computing, multiple users and applications can work more efficiently with cost reductions by sharing common infrastructure.

Characteristics of Cloud Computing

5) Device and Location Independence
Cloud computing enables the users to access systems using a web browser regardless of their location

6) Maintenance
since they do not need to be installed on each user's computer and can be accessed from different places. So, it reduces the cost also.

7) Low Cost
services of cloud computing, IT company need not to set its own infrastructure and pay-as-per usage of resources.

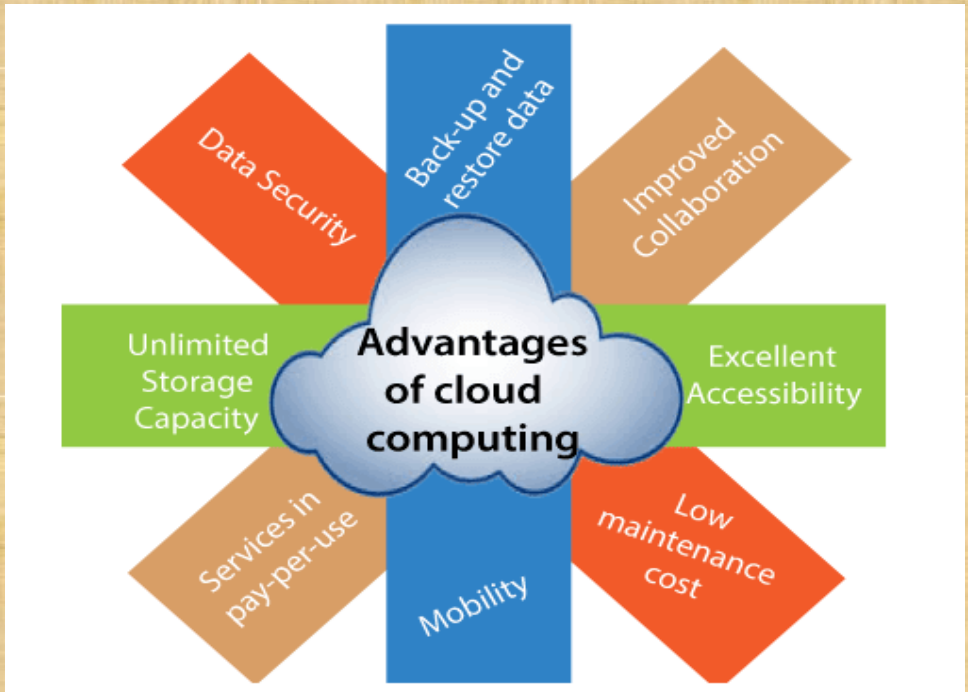
8) Services in the pay-per-use mode
Application Programming Interfaces (APIs) are provided to the users so that they can access services on the cloud by using these APIs and pay the charges as per the usage of services.

Advantages and Disadvantages of Cloud Computing

Advantages of Cloud Computing

As we all know that Cloud computing is trending technology. Almost every company switched their services on the cloud to rise the company growth.

Here, we are going to discuss some important advantages of Cloud Computing-



Advantages of Cloud Computing

1) Back-up and restore data
Once the data is stored in the cloud, it is easier to get back-up and restore that data using the cloud
.

2) Improved collaboration
Cloud applications improve collaboration by allowing groups of people to quickly and easily share information.

3) Excellent accessibility
Cloud allows us to quickly and easily access store information anywhere, anytime in the whole world, using an internet connection.

4) Low maintenance cost
Cloud computing reduces both hardware and software maintenance costs for organizations.

5) Mobility
Cloud computing allows us to easily access all cloud data via mobile..

Advantages of Cloud Computing

6) Unlimited storage capacity

Cloud offers us a huge amount of storing capacity for storing our important data such as documents, images, audio, video, etc. in one place.

7) Data security

Data security is one of the biggest advantages of cloud computing.

Cloud offers many advanced features related to security and ensures that data is securely stored and handled.

Disadvantages of Cloud Computing

A list of the disadvantage of cloud computing is given below –

1)Internet Connectivity

- we access these data through the cloud by using the internet connection.
- If you do not have good internet connectivity, you cannot access these data.
- However, we have no any other way to access data from the cloud.

2**) Vendor lock-in**

- Vendor lock-in is the biggest disadvantage of cloud computing.
- Organizations may face problems when transferring their services from one vendor to another.
- As different vendors provide different platforms, that can cause difficulty moving from one cloud to another.

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Disadvantages of Cloud Computing

3) Limited Control

➢As we know, cloud infrastructure is completely owned, managed, and monitored by the service provider.

➢so the cloud users have less control over the function and execution of services within a cloud infrastructure.

4) Security

➢you should be aware that you will be sending all your organization's sensitive information to a third party, i.e., a cloud computing service provider.

➢While sending the data on the cloud, there may be a chance that your organization's information is hacked by Hackers.

History of Cloud Computing

- Before emerging the cloud computing, there was Client/Server computing which is basically a centralized storage in which all the software applications, all the data and all the controls are resided on the server side.
- If a single user wants to access specific data or run a program, he/she need to connect to the server and then gain appropriate access, and then he/she can do his/her business.
- Then after, distributed computing came into picture, where all the computers are networked together and share their resources when needed.

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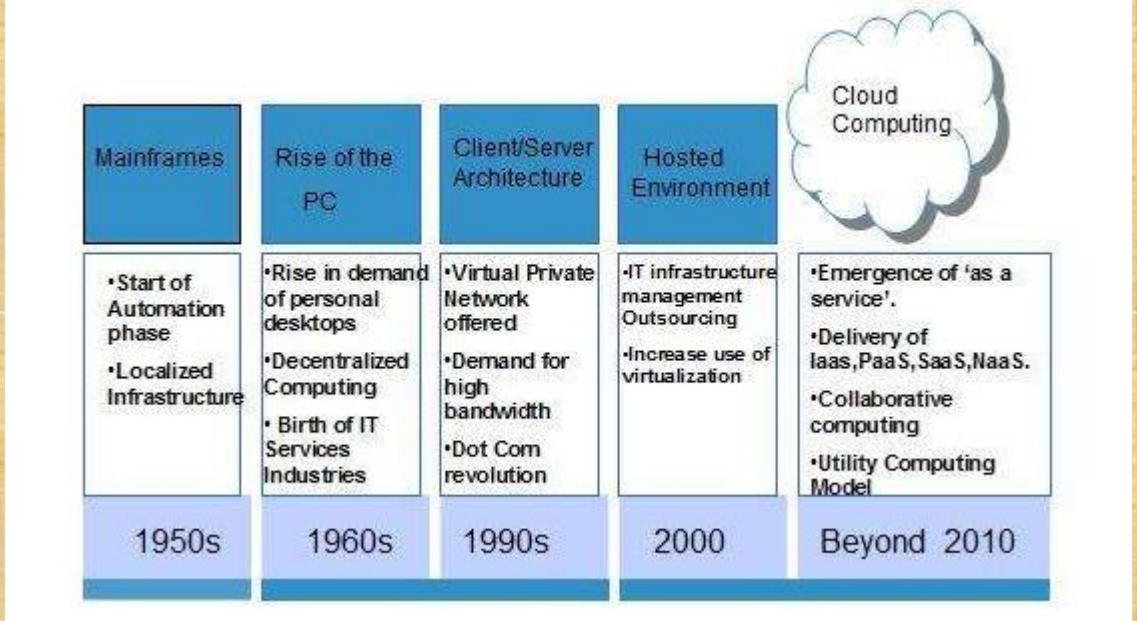
History of Cloud Computing

- The concept of **Cloud Computing** came into existence in the year 1950 with implementation of mainframe computers, accessible via **thin/static clients.**

- Since then, cloud computing has been evolved from static clients to dynamic ones and from software to services.

- The following diagram explains the evolution of cloud computing:



History of Cloud Computing

In 1999, **Salesforce.com** *started delivering of applications to users using a simple website*. The applications were delivered to enterprises over the Internet, and this way the dream of computing sold as utility were true.

In 2002, **Amazon** *started Amazon Web Services*, providing services like storage, computation and even human intelligence. However, only starting with the launch of the Elastic Compute Cloud in 2006 a truly commercial service open to everybody existed.

In 2009, **Google Apps** *also started to provide cloud computing enterprise applications.*

Of course, all the big players are present in the cloud computing evolution, some were earlier, some were later.

In 2009, **Microsoft** *launched Windows Azure*, and companies like Oracle and HP have all joined the game.

This proves that today, cloud computing has become mainstream.

Cloud Computing Architecture

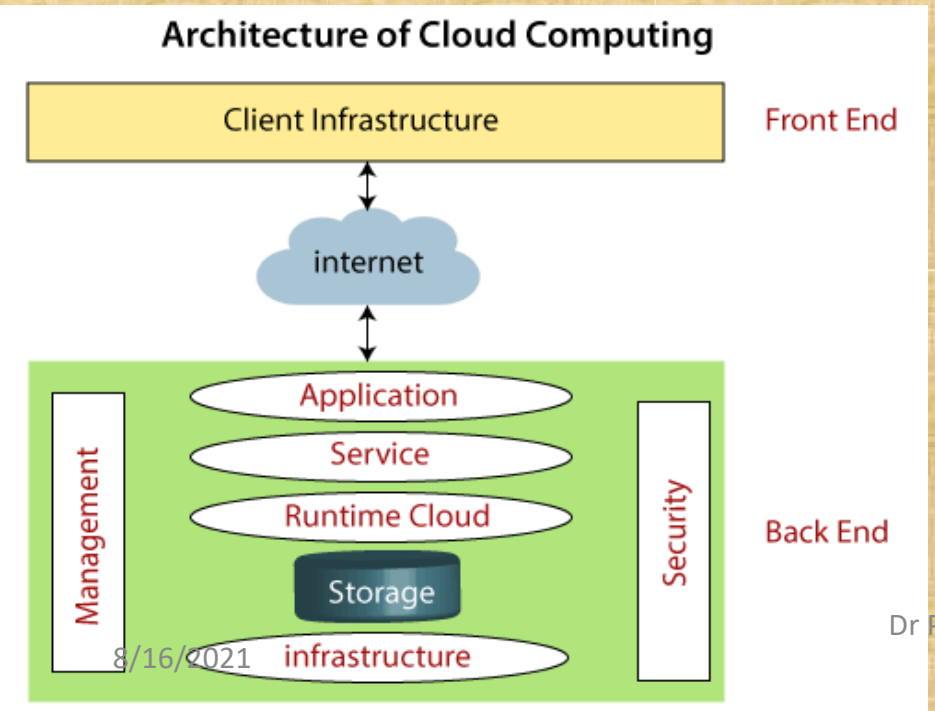
Cloud computing architecture is a combination of

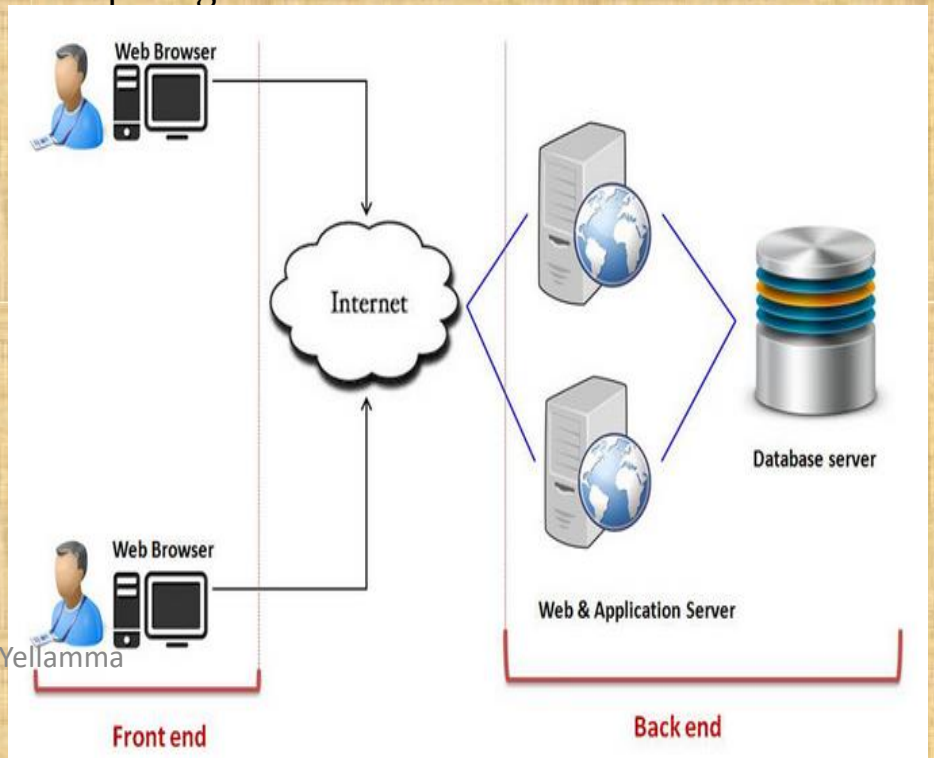
- service-oriented architecture
- and event-driven architecture.

Cloud computing architecture is divided into the following two parts -

- Front End
- Back End

The below diagram shows the architecture of cloud computing -





Cloud Computing Architecture

Front End:

➢The front end is used by the client.

➢ It contains client-side interfaces and applications that are required to access the cloud computing platforms.

➢The front end includes web servers (including Chrome, Firefox, internet explorer, etc.), thin & fat clients, tablets, and mobile devices.

Back End:

➢The back end is used by the service provider.

➢ It manages all the resources that are required to provide cloud computing services

➢ It includes a huge amount of data storage, security mechanism, virtual machines, deploying models, servers, traffic control mechanisms, etc.

Components of Cloud Computing Architecture

There are the following components of cloud computing architecture –

1. Client Infrastructure
Client Infrastructure is a Front end component. It provides GUI (Graphical User Interface) to interact with the cloud.

2. Application
The application may be any software or platform that a client wants to access.

3. Service
A Cloud Services manages that which type of service you access according to the client's requirement.
Cloud computing offers following three core types of services:

i. Software as a Service (SaaS)
ii. Platform as a Service (PaaS)
iii. Infrastructure as a Service (IaaS)

Components of Cloud Computing Architecture

4. Runtime Cloud
Runtime Cloud provides the **execution and runtime environment** to the virtual machines.

5. Storage
Storage is one of the most important components of cloud computing. It provides a huge amount of storage capacity in the cloud to store and manage data.

6. Infrastructure
It provides services on the host level, application level, and network level.

7. Management
Management is used to manage components such as application, service, runtime cloud, storage, infrastructure, and other security

8. Security
Security is an in-built back end component of cloud computing. It implements a security mechanism in the back end.

9. Internet
The Internet is medium through which front end and back end can interact and communicate with each other.

How does cloud computing work

- Assume that you are an executive at a very big corporation.

- Your particular responsibilities include to make sure that all of your employees have the right hardware and software they need to do their jobs.

- To buy computers for everyone is not enough. You also have to purchase software as well as software licenses and then provide these softwares to your employees as they require.

- Whenever you hire a new employee, you need to buy more software or make sure your current software license allows another user.

How does cloud computing work

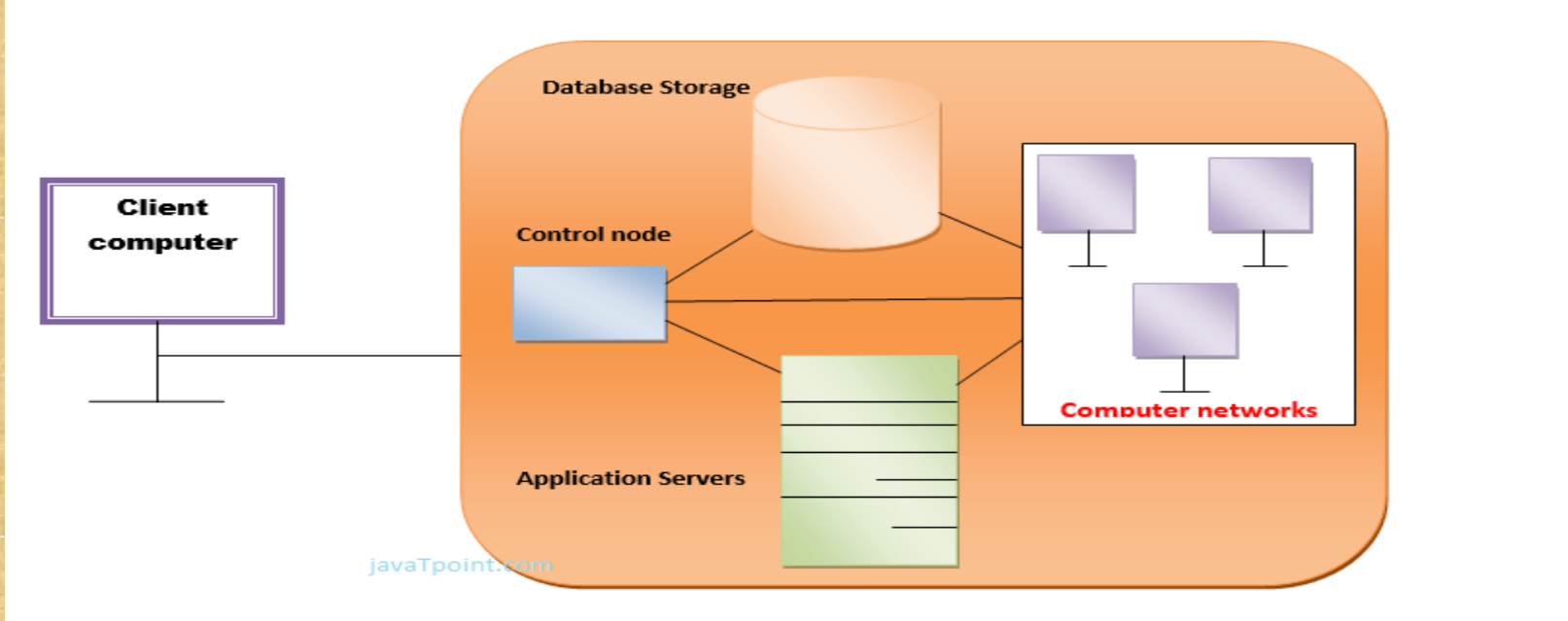
- So, instead of installing a suite of software for each computer, you just need to load one application.

- That application will allow the employees to log-in into a Web-based service which hosts all the programs for the user that is required for his/her job.

- Remote servers owned by another company and that will run everything from e-mail to word processing to complex data analysis programs.

- It is called cloud computing, and it could change the entire computer industry.

How does cloud computing work



How does cloud computing work

- In a cloud computing system, there is a significant workload shift.
- Local computers have no longer to do all the heavy lifting when it comes to run applications.
- But cloud computing can handle that much heavy load easily and automatically. Hardware and software demands on the user's side decrease.
- Generally the user's computer requires to be able to run is the cloud computing interface software of the system.
- which can be as simple as a Web browser and the cloud's network takes care of the rest.

Cloud Computing Applications

- Cloud service providers provide various applications in the field of art, business, data storage and backup services, education, entertainment, management, social networking, etc.

- The most widely used cloud computing applications are given below -