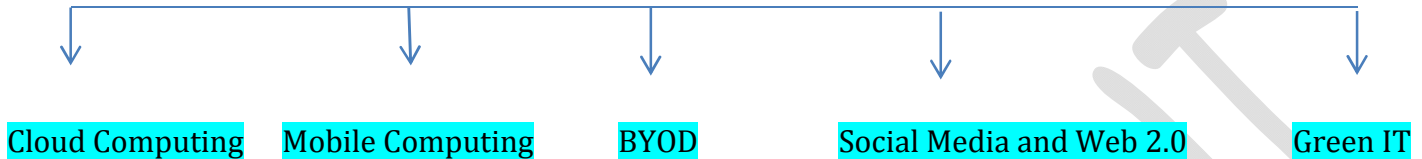


CHAPTER-8 EMERGING TECHNOLOGIES

TOPICS TO BE DISCUSSED



A. CLOUD COMPUTING

- WHAT IS CLOUD COMPUTING
- CLOUD VS GRID COMPUTING
- PERTAINING ISSUE
- GOALS OF CLOUD COMPUTING
- CLOUD COMPUTING ARCHITECTURE
- TYPES OF CLOUD
- CLOUD COMPUTING MODELS
- CHARACTERISTICS OF CLOUD COMPUTING
- ADVANTAGES OF CLOUD COMPUTING
- CHALLENGES RELATING TO CLOUD COMPUTING

B. MOBILE COMPUTING

- WHAT IS MOBILE COMPUTING
- MOBILE COMPUTING BENEFITS

C. BYOD (BRING YOUR OWN DEVICE)

- WHAT IS BYOD
- THREATS OF BYOD
- MOBILE COMPUTING VS BYOD

D. SOCIAL MEDIA & WEB 2.0

- WHAT IS SOCIAL MEDIA
- WHAT IS WEB 2.0
- COMPONENTS OF WEB 2.0 FOR SOCIAL MEDIA
- BENEFITS FOR SOCIAL NETWORK USING WEB 2.0
- CHALLENGES OF SOCIAL NETWORK USING WEB 2.0

E. GREEN IT

- WHAT IS GREEN IT
- STEPS FOR ENVIRONMENT FRIENDLY GREEN IT
- GREEN IT BEST PRACTICES
- GREEN IT CHALLENGES

A. CLOUD COMPUTING

• WHAT IS CLOUD COMPUTING

- ✓ Use of computing resources through network / Internet
- ✓ Combination of software, hardware and network
- ✓ Anywhere Anytime access
- ✓ Location of physical resources may not be known to user
- ✓ Simple front-end interface like Web browser
- ✓ Pay as you use
- ✓ Highly scalable
- ✓ Cost effective
- ✓ Eco friendly
- ✓ E.g. *Big Rock, amazon , Google Apps etc.*

• CLOUD COMPUTING VS GRID COMPUTING

	Grid Computing	Cloud Computing
Meaning	No. of system linked through network Problem are divided into many small parts which are processed on multiple machines	Computing through Internet It evolved from Grid Computing
Difference	For large data storage	For both small and large data Storage
	For large and complicated computation only	For both large and small Computation
	If one component of grid fails them the whole system may fail	Less chances of failure

Similarity	Scalable services by using load balancing (<i>distributing work load on different machines as per the available capacity</i>)
	Many customers can perform different tasks at the same time
	Provides Service Level Agreement (SLA) for guaranteed uptime availability

- ***PERTINENT ISSUE***

- ✓ **THRESHOLD POLICY**
Policy for allocation of resources to clients as per their work load
- ✓ **INTEROPEABILITY**
Cloud server may not support client application
- ✓ **HIDDEN COST**
Cloud vendors may charge several hidden costs later
- ✓ **UNEXPECTED BEHAVIOUR**
Client application may not work properly in cloud server
- ✓ **SECURITY ISSUE**
Whether client data is safe in cloud server has to be ensured

- ***GOALS OF CLOUD COMPUTING***

- ✓ To create a highly efficient IT Eco system
- ✓ To consolidate IT infrastructure into a more integrated and manageable environment
- ✓ To improve the anytime anywhere access
- ✓ To reduce the cost related to IT power consumption

- ***CLOUD COMPUTING ARCHITECTURE***

- ✓ **FRONT END ARCHITECTURE**

User device (computer) and some applications are required to access the data from cloud.
All front end user interfaces will not look same.
There is need of web browser like Google Chrome, IE etc. to access the data on cloud.

- ✓ **BACK END ARCHITECTURE**

It includes Computers, Machines, Data storage devices and servers.
It is useful for administration of whole system.
It monitors the client demand.
There are some set of rules and protocols in Back End Architecture.

- ***TYPES OF CLOUD***

- ✓ **PUBLIC CLOUD**

The public cloud is used by the general public.
The public cloud offer service as pay per use basis.
The public cloud is less expensive; we need to pay only rental charges.
The public clouds are highly scalable and reliable.
The public clouds are less secured than private clouds.
Ex. Go-Daddy, Big-Rock etc.

✓ **PRIVATE CLOUD**

The private clouds are used by the organizations for their own purposes and benefits.
The private clouds are more expensive.
The private clouds are highly secured.
Administration and maintenance cost of private clouds are very high.
Ex. Facebook, Google etc.

✓ **HYBRID CLOUDS**

Hybrid clouds are the combinations of public cloud and private cloud.
Hybrid clouds are used by public as well as private purposes.
Ex. Amazon

• ***CLOUD COMPUTING MODEL***

✓ **IaaS – Infrastructure as a service**

IaaS providers offer computers, more often virtual devices, machines and other resources as a service.

IaaS providers offer infrastructure/ storage required to host services.

✓ **PaaS – Platform as a service**

PaaS providers provide IaaS including operating system, programming language, database and web browser.

Application developer can develop and run their application / software solution on a cloud platform without the cost and complexity of acquiring hardware and software layers.

✓ **SaaS – Software as a Service**

SaaS providers provide a large variety of software's applications over internet that are hosted on service provider infrastructure.

Ex. Office 365 – under this application users are not required to install MS Office, users can online access MS Office.

✓ **NaaS – Network as a Service**

It is a category of cloud service where NaaS providers provide service to user is to use network/ transport connecting service.

Ex. Virtual Private Network (VPN)

✓ **CaaS – Communication as a Service**

CaaS providers provide service in the same line as SaaS.

The CaaS vendor is responsible for all hardware and software management and guaranteed quality of service.

Ex. IM, Skype etc.

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- **CHARACTERISTICS OF CLOUD COMPUTING (ASAP VIRTUAL MMS)**

- ✓ **AVAILABILITY** Whenever user wants he get the service.
- ✓ **SCALABLE** Size of the server can be increased or decreased as per the requirement of the user.
- ✓ **AGILITY** The cloud is fast and responsive.
- ✓ **VIRTUAL** Same server can be used by different people at different at time.
- ✓ **MAINTENANCE** In case developers wants to introduce new features, only server cloud is required to be update.
- ✓ **MULTI SHARING:** One application can be used by different peoples.
- ✓ **Performance** It is the responsibility of the CCS mgt. to monitor the CCS service.
- ✓ **Service as per pay per use** i.e. user required to pay only for the space used by him.

- **ADVANTAGE OF CLOUD COMPUTING (AB QU CA)**

- ✓ **ACCESS TO INFORMATION** – User can access information anytime anywhere.
- ✓ **BACKUP AND RECOVERY** – All the data is stored at one place i.e. on cloud and it became easy to take backup from one place rather than different places.
- ✓ **QUICK DEPLOYMENT** – Distribution of application and information became so easy because we need to update information / application at only place i.e. on cloud.
- ✓ **UNLIMITED STORAGE** – User can store unlimited as per the requirement of the user.
- ✓ **COST EFFICIENCY** – User is not require to purchase or maintain separate devices, he can pay rental charges and use the CCS services.
- ✓ **AUTOMATIC SOFTWARE INTEGRATION** - In the cloud software integration is something that occurs automatically. It means user should not think about compatibility.

- **CHALLENGES RELATING TO CLOUD COMPUTING (CIA AND GPL KE BICH DTAA H)**

- ✓ **Confidentiality** Data is not disclosed to unauthorized person using encryption.
- ✓ **Integrity** Integrity means correctness of data.
- ✓ **Availability** Availability means that data is available on time whenever required.
- ✓ **Governance** Lack of overall control over IT by client organization.
- ✓ **Privacy** Privacy risk over client data.
- ✓ **Legal Compliance** IT related laws are different in different countries.
- ✓ **Data Stealing** There is an inherent risk of data stealing.
- ✓ **Trust** It is very difficult for the cloud service provide to build trust with the client.
- ✓ **Application Security** Infected applications should be monitored and recovered

B.MOBILE COMPUTING

• WHAT IS MOBILE COMPUTING

It means using mobile network to transfer computer data. Earlier mobile network was only used to transfer voice signals but now it can be used to send and receive data also.

• MOBILE COMPUTING BENEFIT

- ✓ Mobile workforce (i.e. field executives) can access information anywhere
- ✓ They can update information in real-time
- ✓ Access to corporate services and information anytime anywhere
- ✓ Remote access to corporate knowledgebase
- ✓ Improves management effectiveness and control over mobile workforce

C. BYOD

• WHAT IS BYOD

- ✓ BYOD means Bring Your Own Device
- ✓ Employees can use their own laptop, smartphone, tablets etc. to connect to corporate network and access applications.
- ✓ This gives employees freedom to work anytime and from anywhere.
- ✓ 90% of organization will shift to BYOD very soon.
- ✓ BYOD has been made possible due to technology convergence through which many features have been integrated in mobile devices.

• THREATS OF BYOD

- ✓ Network Risk (*Lack of Device Visibility*)
- ✓ Device Risk (*Loss of Devices*)
- ✓ Application Risk (*Application Viruses and Malware*)
- ✓ Implementation Risk (*Weak BYOD Policy*)

• MOBILE COMPUTING AND BYOD

- ✓ Mobile computing and BYOD is the most radical shift in business since the PC revolution of the 1980's.
- ✓ Use of mobile computing and BYOD have made a huge impact on how people work and how companies operate
- ✓ These devices act as end points to all types of data networks
- ✓ These devices are light, easy to handle and long battery life

D.SOCIAL MEDIA AND WEB 2.0

- **WHAT IS SOCIAL MEDIA**

- ✓ Social media is a social network
- ✓ Social network is a complicated logical network
- ✓ Social networks are comprised of the most intelligent components i.e. human beings
- ✓ Managing such a network requires lot of collective efforts and collaboration
- ✓ It links the people with common interests and objectives
- ✓ Success depends on contribution, interest and motivation of its members and good technology support
- ✓ Web 2.0 has contributed significantly in the advancement of social networks

- **WHAT IS WEB 2.0**

- ✓ Web 2.0 is the term given to describe a second generation of World Wide Web
- ✓ Initially Web consisted of static HTML Web pages
- ✓ Now it is a more dynamic web and consists of Web Applications
- ✓ It helps people to collaborate and share information online
- ✓ Increased social collaboration
- ✓ Blogs, Wikis, social networking and Web services are components of Web 2.0

- **COMPONENTS OF WEB 2.0 FOR SOCIAL NETWORK**

- ✓ Communities: Group of people to share their views and ideas
- ✓ Blogging: Blogs helps an individual to express his thoughts
- ✓ Wiki: Wiki is a set of co-related pages on a particular subject
- ✓ Folksonomy: This facility allows users to tag their contents
- ✓ File Sharing / Podcasting: This facility allows users to share their media files
- ✓ Mashups: This facility allows merging two or more different services

E. GREEN IT

- **WHAT IS GREEN IT**

- ✓ Green IT refers to the study and practice of using IT resources in a more efficient and environment friendly way
- ✓ Computers consume lot of natural resources, raw material to make them, power to run them and then problem in disposing them
- ✓ Green computing is the environment friendly use of computers and other IT resources Environment Protection Agency (EPA) introduced the concept of 'Energy Star' for labelling energy efficient products

- **STEPS FOR ENVIRONMENT FRIENDLY GREEN IT**

- ✓ Power down the CPU and other devices when they are inactive
- ✓ Try to do computer related tasks in continuity and power off the device at other times
- ✓ Power-up and power-down energy-intensive devices like laser printers
- ✓ Use LCD monitors instead of CRT
- ✓ Use notebook computers rather than desktop
- ✓ Use power management features to turn off hard drive when system is inactive
- ✓ Minimize the use of paper
- ✓ Recycle waste paper
- ✓ Dispose of e-waste according to the law
- ✓ Use alternative energy sources

- **GREEN IT BEST PRACTICES**

- ✓ Involving Stakeholders: Participation of all user community
- ✓ Partnering: Partnering takes full advantage of the existing resources
- ✓ Guidelines: Guidelines for green IT should be available to user community
- ✓ On-going communication: On-going communication amongst users about green IT

- **GREEN IT CHALLENGES**

- ✓ The basic aim of 'Green IT security service' is to reduce the energy consumption of customer and move towards sustainable computing technology
- ✓ Green IT services gives benefit to the client as well as the service provider
- ✓ If administered properly green security can be cost-effective
- ✓ How to evaluate a client's infrastructure is a real vital issue
- ✓ Green IT also focuses on reducing the environmental impact of the organization