Cloud Computing

Some Background

- In the early days (1950s)

  Research organisations & Universities had their campuses linked together through basic communication networks to share information.

Large Businesses used mainframe computers which occupied whole rooms and users ran their chosen computer programs ? from 'dumb (ie simple) terminals'.

Home Computers first became available around 1980s and entered the personal and small business domain around 2008.

The Cloud Foundation Era 1960

- Engineers had begun thinking how computers could be linked together by networks and came up with three fundamental concepts :
- The first **is delivering a service, such as computing or storage as a utility;**

- The second **is multiple people sharing the same computer resource;**

- **T**he third **is accessing the services via networking from anywhere in the world.**

# So what is - THE CLOUD & CLOUD COMPUTING ?

You may have heard people using terms like the cloud, cloud computing, or cloud storage. But what exactly is the cloud ?

CLOUD/CLOUD COMPUTING

- To begin with, the CLOUD is **not a mysterious fog or mist floating above our heads or in the sky— it's a physical infrastructure, of many computers housed in massive warehouses (Data Centres) located at various places around the world.**

- Simply put, the cloud is more specifically all of the things you can **access remotely** over the Internet. When data is **in the cloud**, it means it's stored on **Internet servers** instead of your computer's hard drive.

- The word "Cloud" started off as a tech industry buzzword. In the early development days of the Internet, technical diagrams which represented the servers and networking infrastructure which make up the Internet were represented as a Cloud.

- **Cloud computing,** basically refers to a *process of sharing resources to optimize computer performance.*

Basis of CLOUD/CLOUD COMPUTING
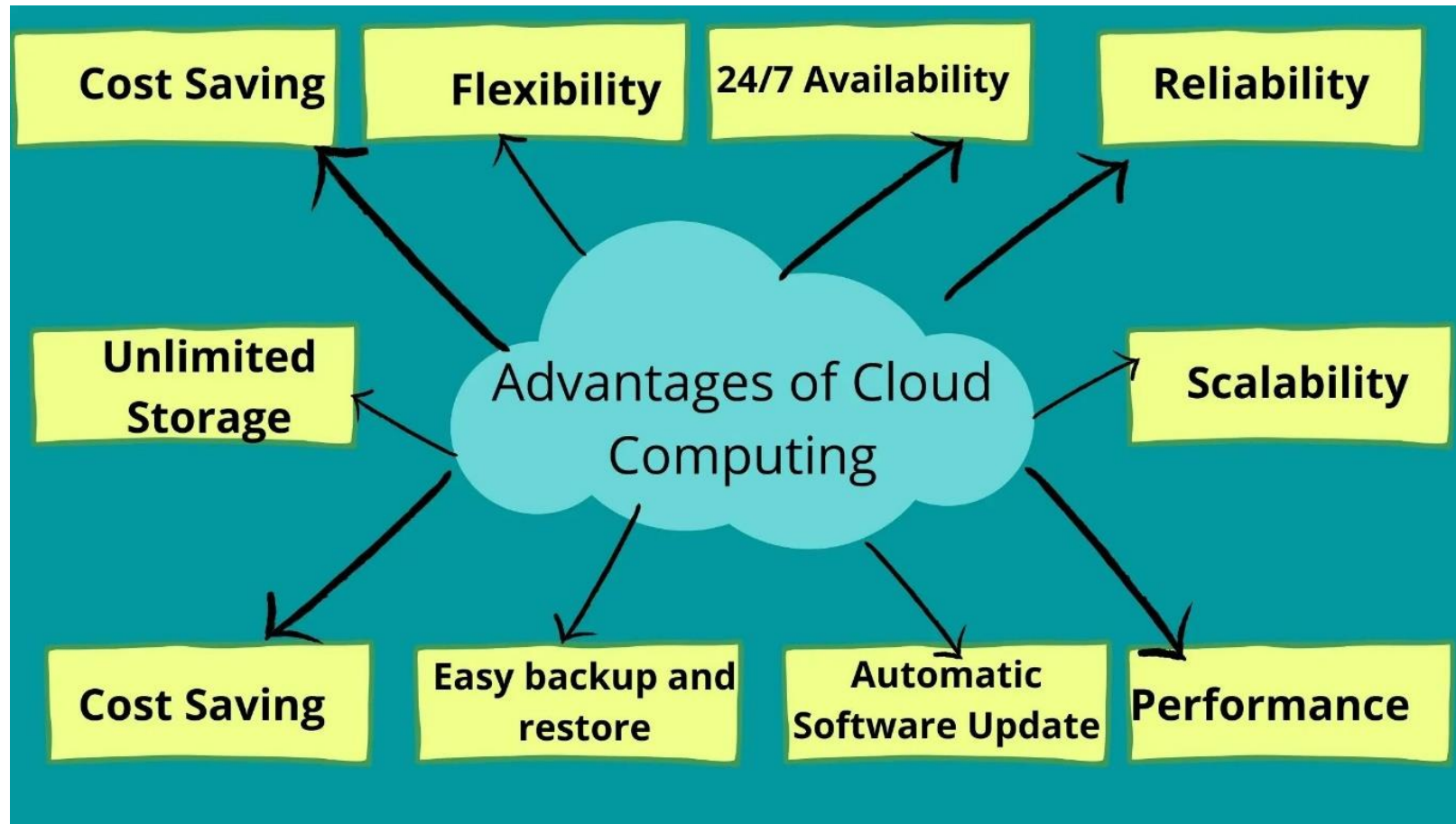
According to Cisco researchers era 2018 they predicted around 95% of workloads and computer instances will most likely be processed through cloud data centers by 2021, compared to only 6% by traditional data centers,

CLOUD - INFRASTRUCTURE

- "The CLOUD" refers to **Servers that are accessed over the Internet, and the Software and Databases that run on those servers.** Cloud servers are located in **data centers** all over the world. By using cloud computing, users and companies do not have to manage physical servers themselves or run software applications on their own machines.

- The cloud enables users to **access the same files and applications** from almost **any device**, because the computing and storage takes place on servers in a *data center*, instead of locally on the user device. This is why a user can for example log in to their Instagram account on a new phone after their old phone breaks and still find their old account in place, with all their photos, videos, and conversation history. It works the same way with cloud email providers like Gmail or Microsoft Office 365, and with cloud storage providers like Dropbox or Google Drive. (More on this later)

- Users access cloud services either through a browser or through an app, connecting to the cloud over the Internet — regardless of what device they are using.

Types of CLOUD Implementations

- **Software-as-a-Service (SaaS)**: Instead of users installing an application on their device, SaaS applications are hosted on cloud servers, and users access them over the Internet.

- SaaS is like renting a house: the landlord maintains the house, but the tenant mostly gets to use it as if they owned it.

- Examples of SaaS applications include Salesforce and MailChimp.

- **Platform-as-a-Service (PaaS)**: In this model, companies don't pay for hosted applications; instead they pay for the things they need to build their own applications. PaaS vendors offer everything necessary for building an application, including development tools, infrastructure, and operating systems, over the Internet.

- PaaS can be compared to renting all the tools and equipment necessary for building a house, instead of renting the house itself. PaaS examples include Microsoft Azure.

Types of the CLOUD - contd

- **Infrastructure-as-a-Service (IaaS)**: In this model, a company rents the servers and storage they need from a cloud provider. They then use that cloud infrastructure to build their applications.

  IaaS is like a company leasing a plot of land on which they can build whatever they want — but they need to provide their own building equipment and materials.

  IaaS providers include DigitalOcean, Google Compute Engine, and OpenStack.

  Formerly, **SaaS, PaaS, and IaaS** were the three main models of cloud computing, and essentially all cloud services fit into one of these categories. However, in recent years a fourth model has emerged:

- **Function-as-a-Service (FaaS)**: FaaS, also known as serverless computing, breaks cloud applications down into even smaller components that only run when they are needed.

  Imagine if it were possible to rent a house one little bit at a time: for instance, the **tenant only pays for the dining room at dinner time, the bedroom while they are sleeping, the living room while they are watching TV, and when they are not using those rooms, they don't have to pay rent on them.**

Basic definition of the CLOUD

- **Cloud computing technology allows people to use digital resources stored in the "virtual" space by way of networks**

  It allows people to share information and   applications without being restricted by their physical location.

Benefits of the CLOUD
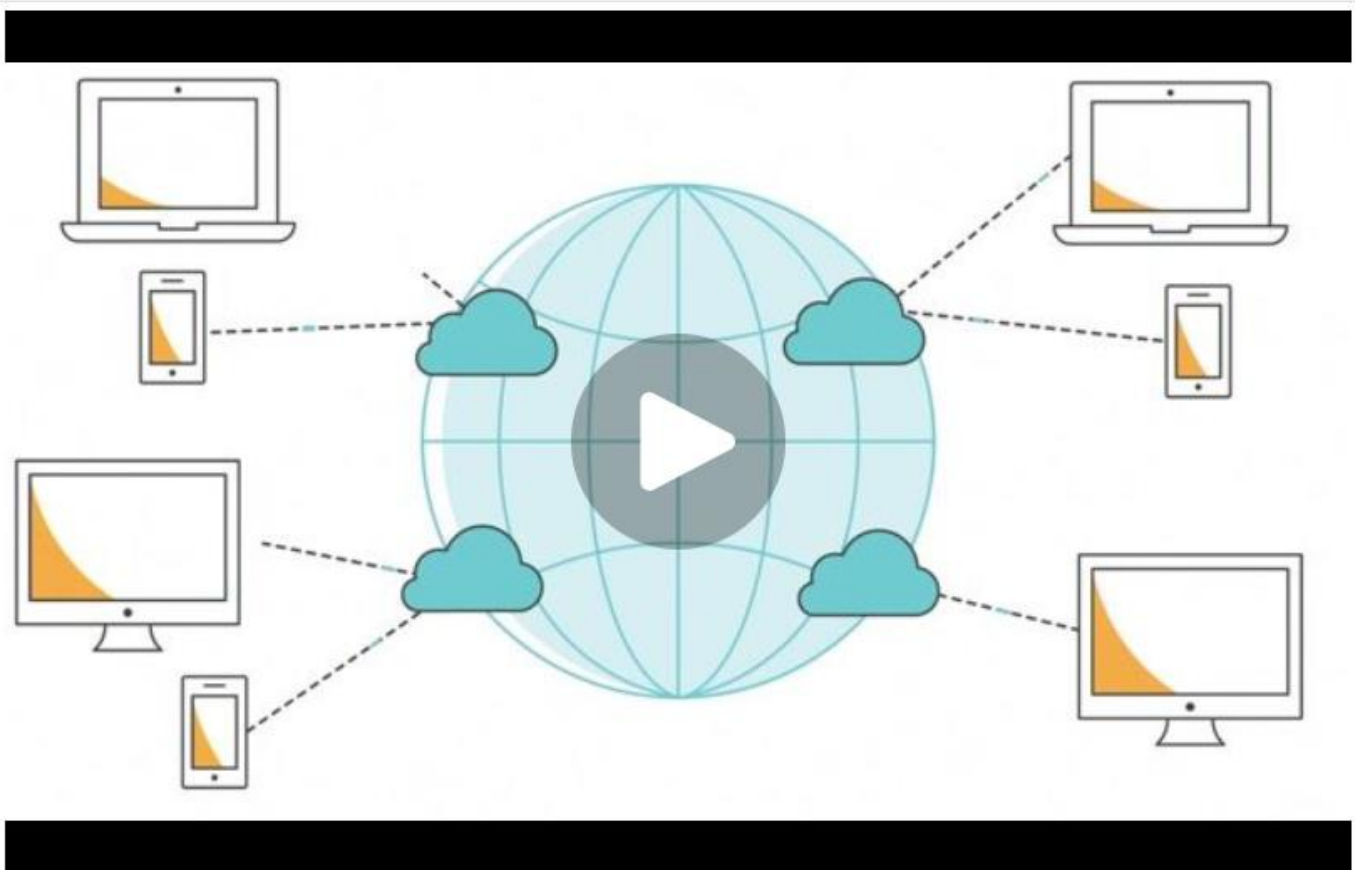
Benefits of the CLOUD

- **BETTER STORAGE**

- Cloud storage is not limited by the capacity of any physical device, This means better and higher storage without worrying about upgrading the memory of a device.

- **BETTER COLLABORATION WITH REMOTE USERS**

  Today's businesses requires workers to work with colleagues across multiple remote locations. Cloud computing makes it easy to share and access digital resources from any part of the globe. This allows for better collaboration between global teams

- **HIGHLY AFFORDABLE**

  Cloud computing eliminates the need for physical storage hardware, which reduces the capital expenditure of many companies. These funds can then be appropriated towards innovation or research and development.

Benefits of the CLOUD - contd

- **HIGHLY AFFORDABLE**

  For small companies that are still trying to find their footing, purchasing software can be expensive. Instead, such companies can use the software on a pay-per-use basis from the cloud. It is more similar to leasing out a service instead of purchasing it.

- **DISASTER RECOVERY**

- It is imperative for businesses of all sizes to invest in [disaster recovery](#) protocols.

  However, this requires money and expertise, which is often lacking in small companies. The cloud gives smaller corporations the ability to implement backup and recovery solutions in a cost-effective and hassle-free manner.

Overview of CLOUD benefits

- 1- Cloud data storage allows us to *have access to files at any time without being constrained* to using a single device.

    This allows us, for example, to save photos from our smartphone in the cloud and be able to access them from any other device that has Internet access.

- 2-Storing files in the cloud also means we can *share them with other people*, and this allows us, for example, to **collaborate** with others by allowing them to edit the same file.

- 3 - Cloud storage of data is not only *useful for personal use, but is equally important for a business*. Specifically, cloud storage makes it possible to share files without having to attach them via email, thereby also reducing problems due to attachment size limitations.

Overview of CLOUD benefits - contd

- 4- Cloud storage systems **keep down the costs** that would be required to purchase, maintain and manage the hardware needed to store data.

- 5-The main application of cloud storage is precisely to **back up data.** Moreover, unlike a backup to a physical medium such as a backup to a hard disk, the advantage of cloud storage is precisely that it provides greater **data security**.

- 6- Copies are stored in a different location than the original data to provide data recovery if needed.

- 7- At the same time, the greatest advantage is the availability of the data, which being in the cloud is therefore accessible at any time and from anywhere.

How to connect to CLOUD Services

- Most people are already connected to and use the CLOUD without being aware of it.

- **Email services like Gmail, Outlook.com**, Mail.com, **iCloud, Yahoo are Cloud based.**
- Mobile phones **continuously** back up data **(photos, videos etc) to the Cloud**
- Many **Videos and Music Services** are Cloud based.

- There are several **Apps for Storing and sharing files** on the Cloud.
- Four popular Apps are:
- **DropBox, Google Drive, Microsoft One Drive and Apple's Icloud**
- These Apps require an Account to be set up, and some are Free with limited storage

Popular Apps for Cloud Storage & Shareing

- *● Pros*
  - Plenty of additional features
  - Integrations with thousands of applications
  - Fast upload speeds
- *● Cons*
  - Expensive
  - A once-simple service has become too complex
  - File size is unlimited
- **Free Dropbox accounts get 2GB of storage** and access to most of the features.

Popular Apps for Cloud Storage & Shareing

Google Drive

- **Pros**
  o Generous free storage space
  o Includes desktop-to-desktop file syncing
  o Many third-party integrations
  o Cross-platform apps eg

- **Cons**
  o No password-protection for shared files
  o Mobile apps have some limitations
  o Some privacy concerns

File size limit is 5 TB (very large)

Popular Apps for Cloud Storage & Shareing

-
- *Microsoft One Drive*
- *Pros*
  - Excellent interface
  - Clients for Android, iOS, Mac, and Windows
  - Well integrated with Windows and Microsoft 365
  - Strong online photo presentation and management
  - Powerful file-sharing and collaborative editing

- · *Cons*
  - Less free storage than some competitors
  - Doesn't back up all folders on drive

Popular Apps for Cloud Storage & Shareing

-

                                                        Apple ICloud

- *Pros*
    - Tightly integrated with Apple products
    - Capable Windows client and web access
    - Fast uploads
- *Cons*
    - No Android or Linux clients
    - Can only share files with people who have an Apple ID
    - File size Limit is 15Gb
-

File Sharing

- The main file-sharing services operate by *creating a folder on your computer which is synchronised with a folder on the Cloud server*. Anything you place in that folder is copied to the Cloud (when you have an internet connection).

- To share a file, put it in the folder and get the service to create a link. you can then pass it on to the people you want to share with by email or other means.

- Depending on features of the Sharing service that is used, The File can be seen by **anyone who has the link (the public)** or **sent to specific people** by sending it to their email address.

- The receiver can also be given full access ie, to download and edit the file, or to simply view it and make a comment .

- Files stored on the cloud can be synchronised with its copy on the home computer, so that if deleted at either end, it will automatically delete the stored version of that file.

Yet another way of describing Cloud Computing

Cloud computing means that instead of all the [computer](#) hardware and software you're using sitting on your desktop, or at the workplace inside your company's [network](#), it's provided for you as a service by another company and accessed over the [Internet](#),.

Exactly where the hardware and software is located and how it all works doesn't matter to you, the user—it's just somewhere up in the nebulous "cloud" that the Internet represents.

Review

We have seen what the cloud is, where the term originated, and how it is applied to services.

Specifically, cloud services are collectively grouped under the category of cloud computing and cloud computing also includes storage, which is also referred to as cloud storage.

Along with storage and resources (such as computing power), cloud services also include applications, tools for collaborating with multiple users, and cloud gaming services.

This should clear some of the mystic about what the cloud is and how it works, What kind of cloud services do you use on a daily basis?

What is the cloud?
Simply put, the cloud is all of the things you can **access remotely** over the Internet. When something is **in the cloud**, it means it's stored on **Internet servers** instead of **your computer's hard drive.**

The web really isn't worldwide – every country has different access

What the internet looks like to users in the U.S. can be quite different from the online experience of people in other countries. Some of those variations are due to government censorship of online services, which is a significant threat to internet freedom worldwide. But private companies – many based in the U.S. – are also building obstacles to users from around the world who want to freely explore the internet.

Website operators and internet traffic managers often choose to deny access to users based on their location. Users from certain countries can't visit certain websites – not because their governments say so, or because their employers want them to focus on work, but because a corporation halfway around the world has made a decision to deny them access.

This **geoblocking**, as it's called, is not always nefarious. U.S. companies may block traffic from certain countries to comply with federal economic sanctions. Shopping websites might choose not to have visitors from countries they don't ship goods to. Media sites might not be able to comply with other nations' privacy laws. But other times it's out of convenience, or laziness: *It may be easier to stop hacking attempts from a country by blocking every user from that country, rather than increasing security of vulnerable systems.*

Whatever its justifications, this blocking is increasing on all kinds of websites and is affecting users from almost every country in the world. Geoblocking cuts people off from global markets and international communications just as effectively as government censorship. It creates a more splintered internet, where each country has its own bubble of content and services, rather than sharing a global commons of information and interconnection.

The web really isn't worldwide – every country has different access - contd

China, suspicious of **the** new Western technology from **the** get-go, only permitted very few entry **and** exit points **to** be built from **the** global **internet** into its borders, whereas **Russia** was initially quite welcoming of **the internet** boom **and is** now consequently riddled with interconnects. **China** simply has fewer digital borders **to** keep an eye on.

Additional Info on Cloud Storage Apps

DROP BOX

Available on multiple platforms including iOS, Android, Windows, and Mac.

Features:
With Dropbox Cloud Drive, **upload & transfer photos**, . **Backup and sync photos, docs, and other files to the cloud storage** drive

- **Access any file in your account—even offline—and preview over 175 different file types**

- **Easily send large files** ,

- **Photo transfer app**: save or transfer photos to the cloud
- **Scan documents, receipts, IDs, photos, and more using your mobile device** and transform them into high-quality PDFs, so you can view and send them anywhere.
- **Sync folders on your PC or Mac to Dropbox**.

New features on the Plus plan:
Dropbox Passwords: store and sync passwords across all your devices
Dropbox Vault: secure your most sensitive documents and photos

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