CACS402: Cloud computing
BCA 7th Semester

Mechi Multiple Campus

Bhadrapur

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Unit 1: : Introduction to Cloud Computing

- 1.1 Overview of Cloud Computing
- 1.2 Evolution of Cloud Computing
- 1.3 Characteristics of Cloud Computing
- 1.4 Types of cloud and its Cloud services
- 1.5 Benefits and challenges of cloud computing
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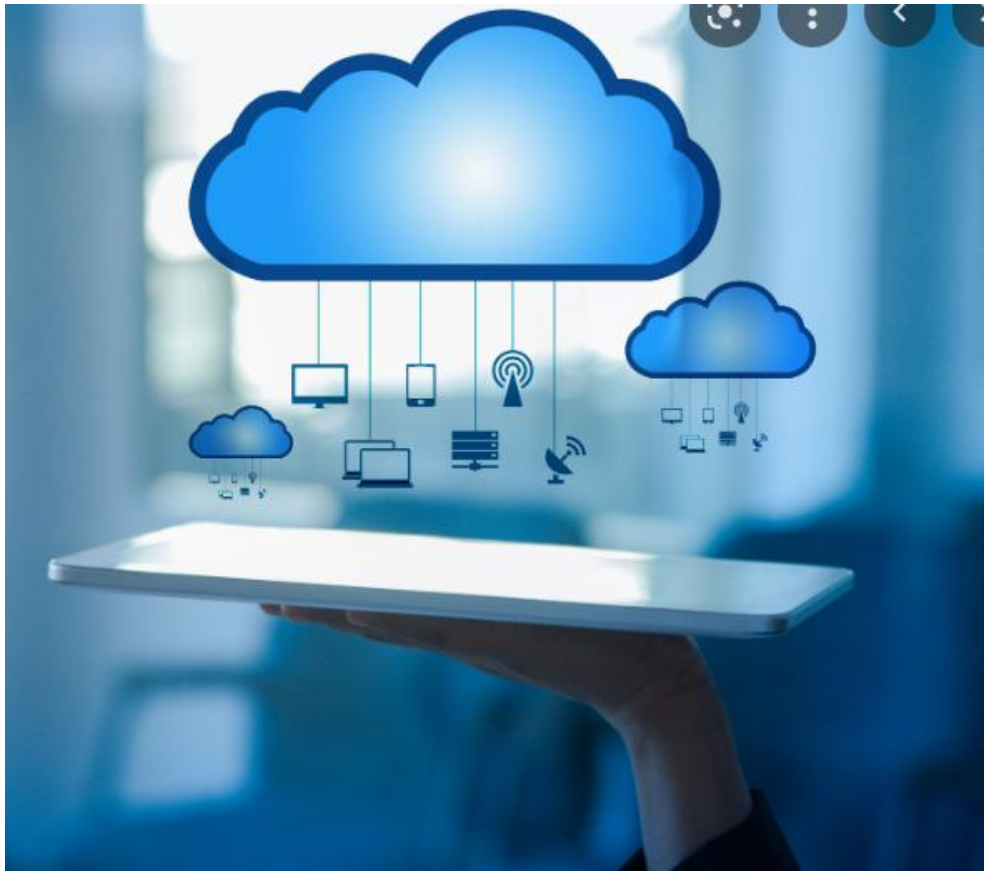
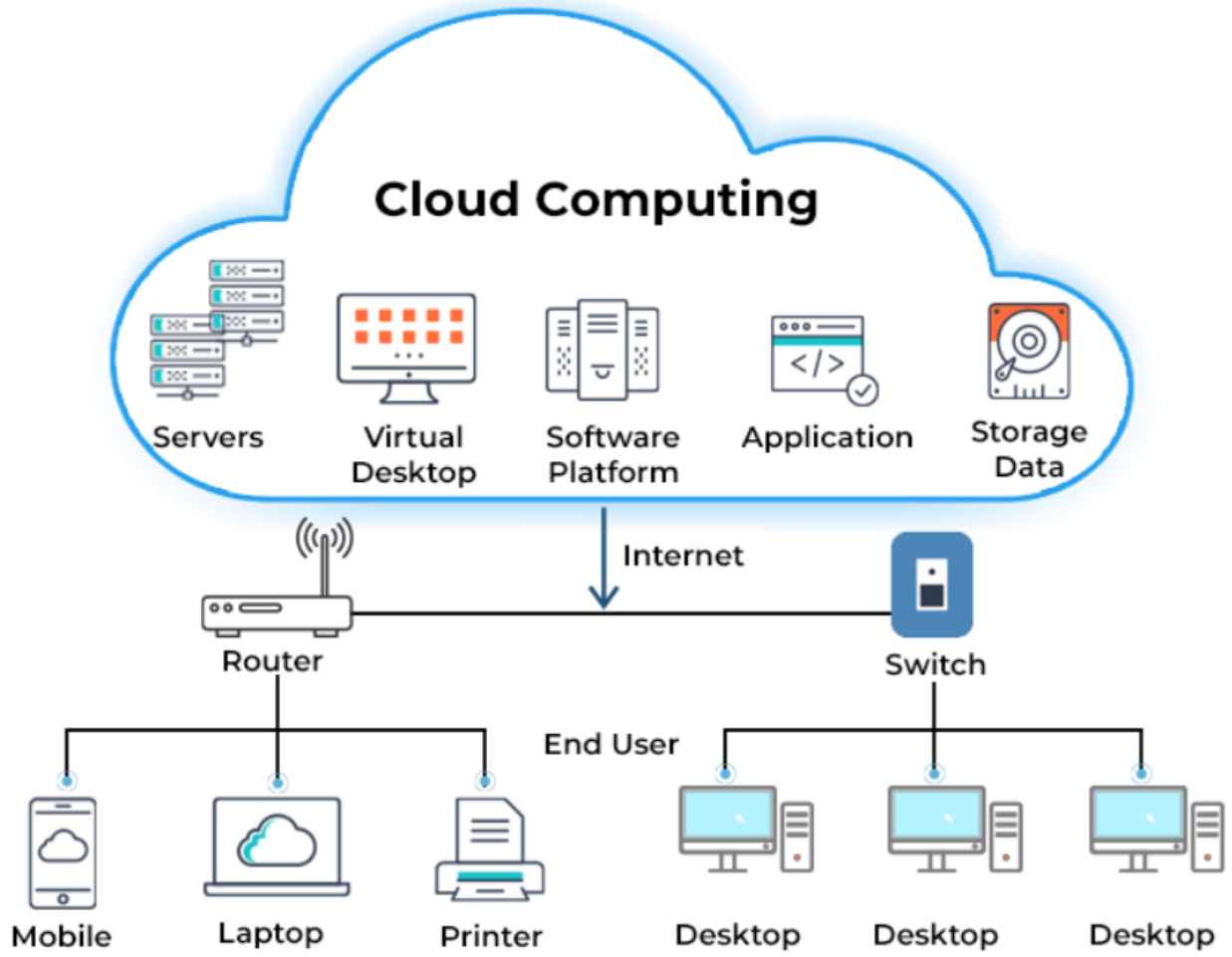
Cloud and Cloud Computing





Cloud and Cloud Computing

- 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?
- Cloud computing is the delivery of different services through the Internet. These resources include tools and applications like data storage, servers, databases, networking, and software.
- Rather than keeping files on a proprietary hard drive or local storage device, cloud-based storage makes it possible to save them to a remote database. As long as an electronic device has access to the web, it has access to the data and the software programs to run it.
- Cloud computing is a popular option for people and businesses for a number of reasons including cost savings, increased productivity, speed and efficiency, performance, and security.
- Manipulating, configuring, and accessing the applications online. It offers online data storage, infrastructure and application.
- We need not to install a piece of software on our local PC and this is how the cloud computing overcomes platform dependency issues. Hence, the Cloud Computing is making our business application mobile and collaborative.

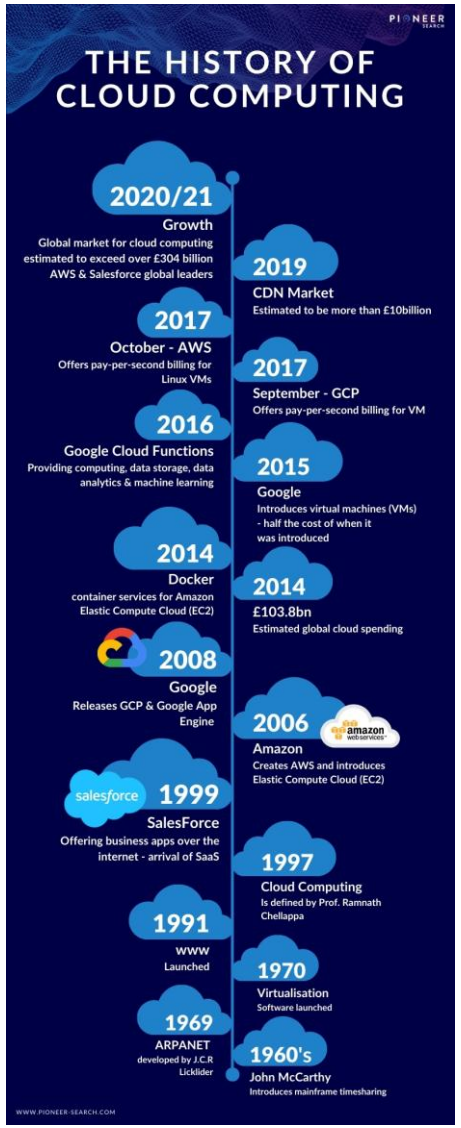
Cloud Computing

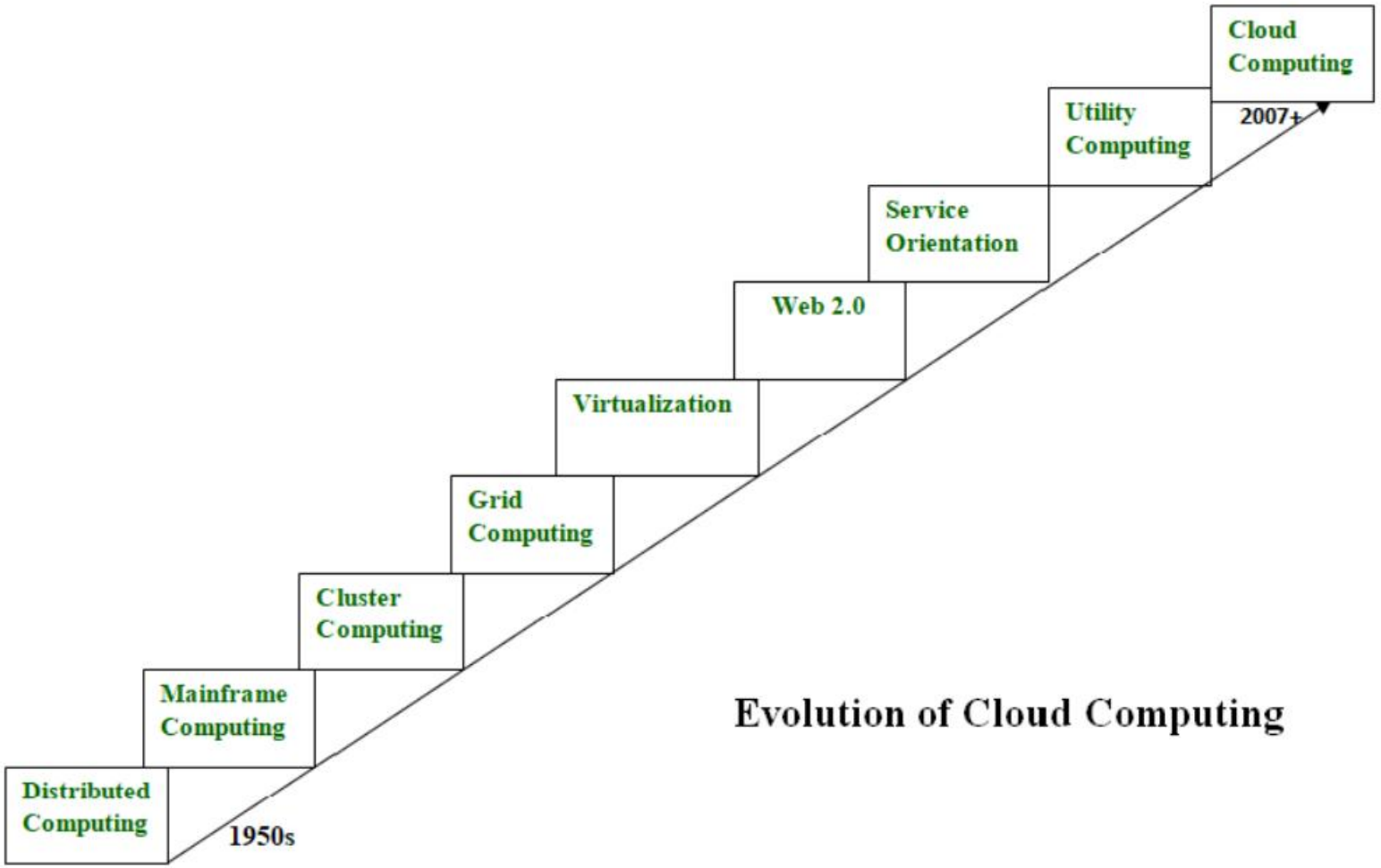
- Cloud computing is an abstraction based on the notion of pooling physical resources and presenting them as a virtual resource. It is a new model for provisioning resources, for staging applications, and for platform-independent user access to services. Clouds can come in many different types, and the services and applications that run on clouds may or may not be delivered by a cloud service provider. These different types and levels of cloud services mean that it is important to define what type of cloud computing system you are working with.
- To help clarify how cloud computing has changed the nature of commercial system deployment, consider these three examples:
- **Google**: In the last decade, Google has built a worldwide network of datacenters to service its search engine. In doing so Google has captured a substantial portion of the world's advertising revenue. That revenue has enabled Google to offer free software to users based on that infrastructure and has changed the market for user-facing software. This is the classic **Software as a Service**.
- **Azure Platform**: By contrast, Microsoft is creating the Azure Platform. It enables .NET Framework applications to run over the **Internet as an alternate platform** for Microsoft developer software running on desktops.
- **Amazon Web Services**: One of the most successful **cloud-based businesses is Amazon Web Services**, which is an **Infrastructure as a Service** offering that lets you rent virtual computers on Amazon's own infrastructure.

Key points

- Cloud computing is the delivery of different services through the Internet, including data storage, servers, databases, networking, and software.
- Cloud storage has grown increasingly popular among individuals who need larger storage space and for businesses seeking an efficient off-site data back-up solution.
- Cloud-based storage makes it possible to save files to a remote database and retrieve them on demand.
- Services can be both public and private—public services are provided online for a fee while private services are hosted on a network to specific clients.
- Cloud security has become an increasingly important field in IT.

Evolution of Cloud computing





Essential characteristics of Cloud Computing

On-demand self-services:

» The Cloud computing services does not require any human administrators, user themselves are able to provision, monitor and manage computing resources as needed.

Broad network access:

» The Computing services are generally provided over standard networks and heterogeneous devices.

Rapid elasticity:

» The Computing services should have IT resources that are able to scale out and in quickly and on as needed basis. Whenever the user require services it is provided to him and it is scale out as soon as its requirement gets over.

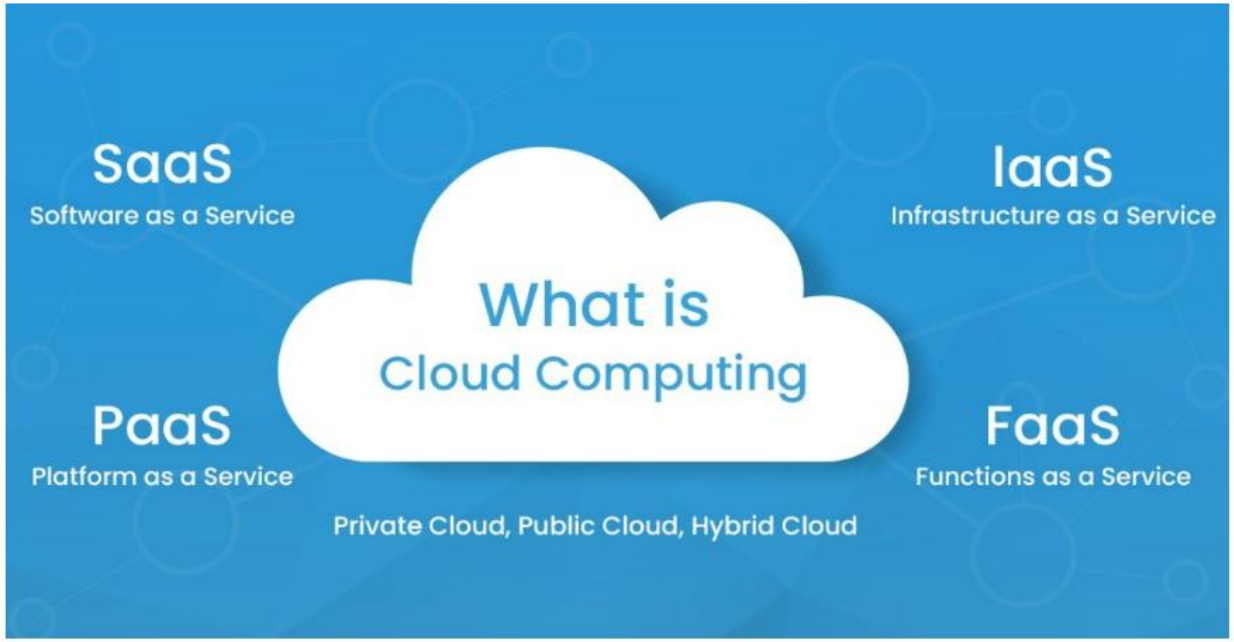
Resource pooling:

» The IT resource (e.g., networks, servers, storage, applications, and services) present are shared across multiple applications and occupant in an uncommitted manner. Multiple clients are provided service from a same physical resource.

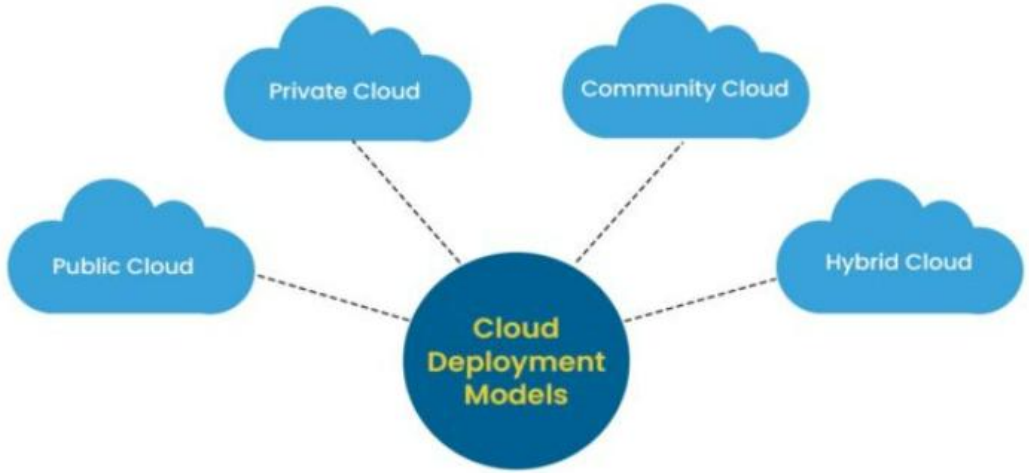
Measured service:

» The resource utilization is tracked for each application and occupant, it will provide both the user and the resource provider with an account of what has been used. This is done for various reasons like monitoring billing and effective use of resource.

Types of Cloud Services and deployment model

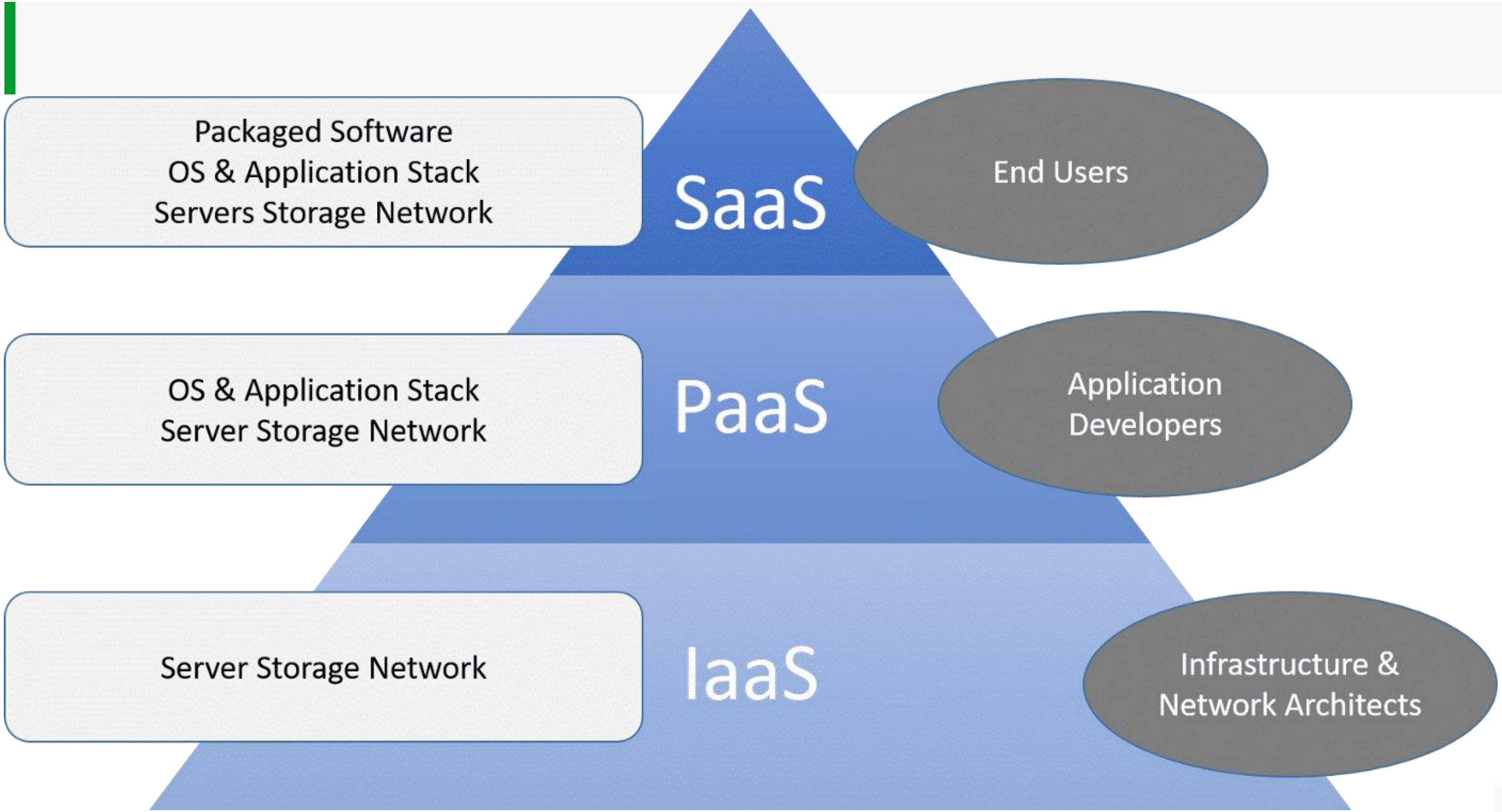


Types of Cloud services: IaaS, PaaS, SaaS and FaaS

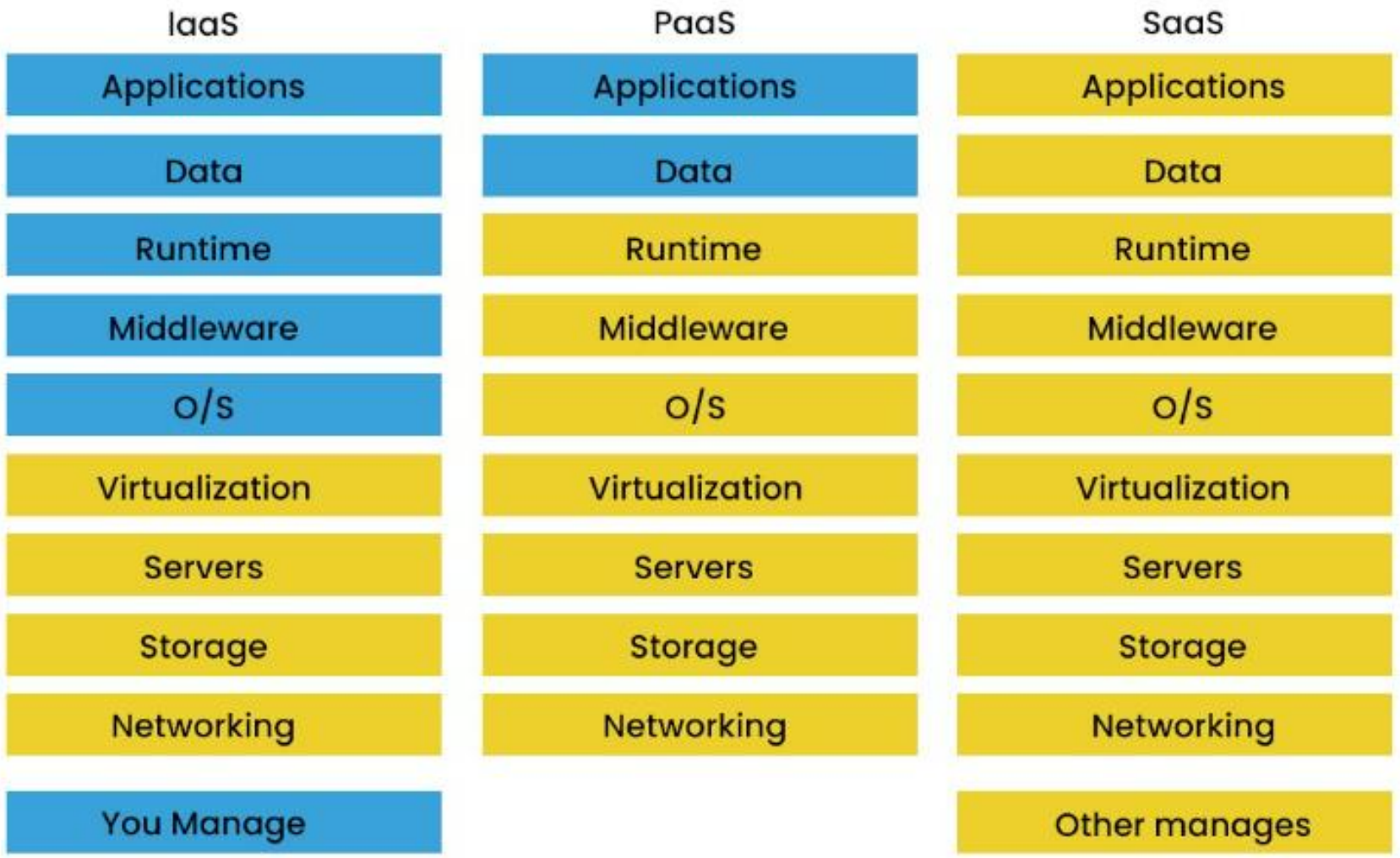


There are 4 types of Cloud deployment models:

Cloud Service Models



Types of Cloud Services and deployment model



Cloud Services Model

Infrastructure as a service (iaas)

» IaaS provides access to fundamental resources such as physical machines, virtual machines, virtual storage, etc.

Platform as a service (paas)

» PaaS provides the runtime environment for applications, development & deployment tools, etc.

Software as a service (saas)

» SaaS model allows to use software applications as a service to end users.

» SaaS examples: BigCommerce, Google Apps, Salesforce, Dropbox, MailChimp, ZenDesk, DocuSign, Slack, Hubspot.

» PaaS examples: AWS Elastic Beanstalk, Heroku, Windows Azure (mostly used as PaaS),Force.com, OpenShift, Apache Stratos, Magento Commerce Cloud.

» IaaS examples: AWS EC2, Rackspace, Google Compute Engine (GCE), Digital Ocean, Magento 1 Enterprise Edition.

» **Function-as-a-Service (FaaS)** is a serverless way to execute modular pieces of code on the edge. FaaS lets developers write and update a piece of code on the fly, which can then be executed in response to an event, such as a user clicking on an element in a web application. This makes it easy to scale code and is a cost-efficient way to implement microservices.

Types of Cloud on the basis of deployment model

Public cloud

» The Public Cloud allows systems and services to be easily accessible to the general public. Public cloud may be less secure because of its openness, e.g., e-mail.

Private cloud

» The Private Cloud allows systems and services to be accessible within an organization. It offers increased security because of its private nature.

Community cloud

» The Community Cloud allows systems and services to be accessible by group of organizations.

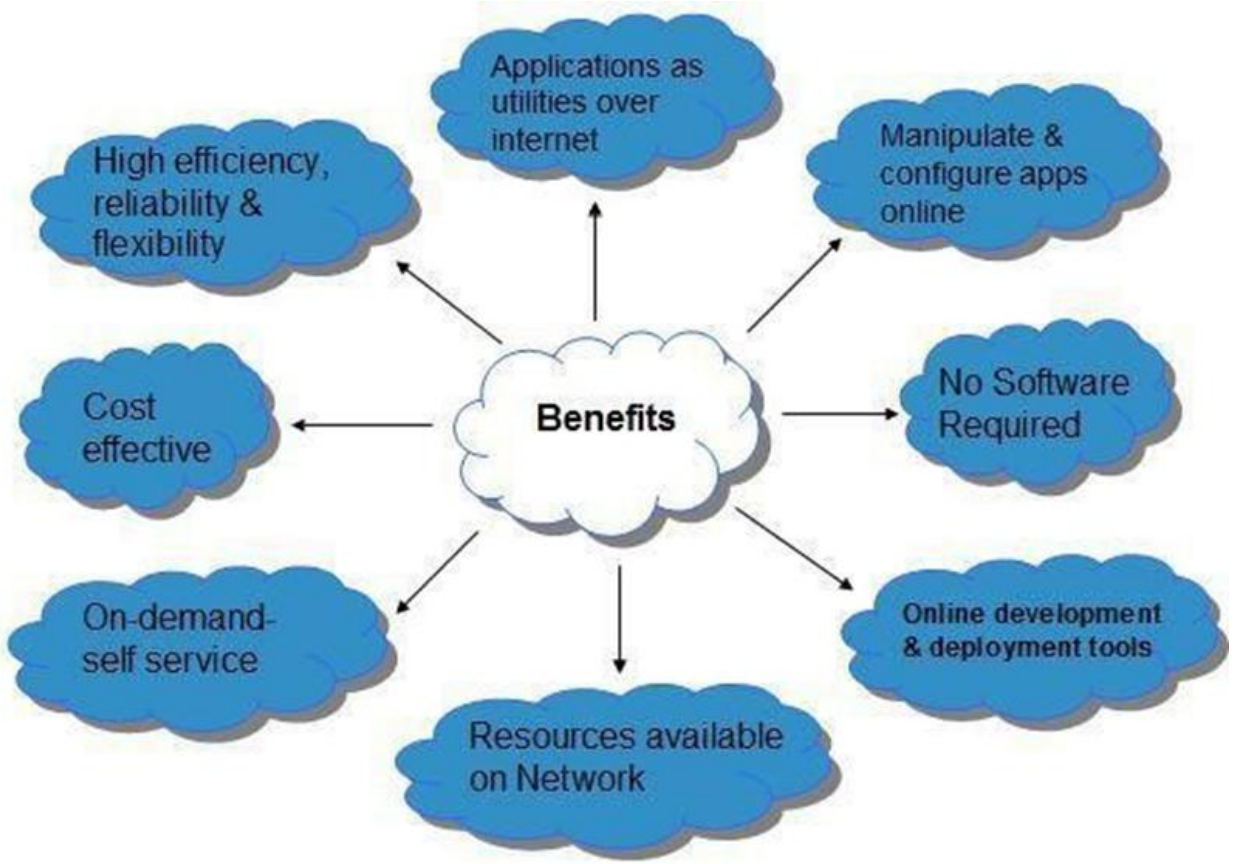
Hybrid cloud

» The Hybrid Cloud is mixture of public and private cloud. However, the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

Comparative chart of all model

Cloud Model	Public Cloud	Private Cloud	Community Cloud	Hybrid Cloud
Ease of setup	Very easy to setup	Very hard to setup as your team creates the system	Easy to setup because of community practices	Complex to setup due to interconnected systems
Ease of use	Very easy to use	Complex and requires on in-house team	Relatively easy to use as members help solve problems and protocols	Difficult to use if the system was not setup properly
Data control	Low-provider has complete control	Very high- ownership is with your system	High - if members collaborate	Very high- with right setup
Reliability	Prone to outrages and failures	High with right team	Depends on the community policy	High- with the setup
Scalability	Low, most providers offer limited resources and predefined setups	Very high- there are no other tenants	Fixed capacity tends to limit scalability	High - with right setup
Cost	Inexpensive	Very expensive	Members share cost	Cost-effective
Demand for in-house hardware	No	In-house hardware is preferable	No	In-house hardware is not a must

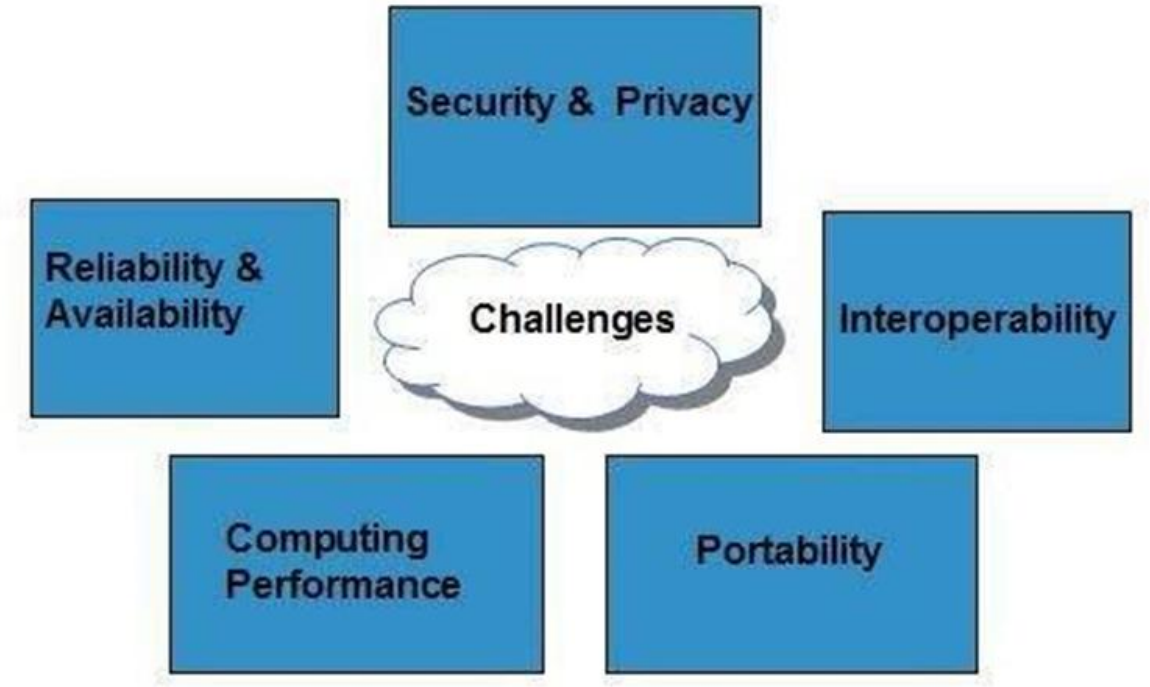
Benefits of cloud computing



Benefits of cloud computing

- One can access applications as utilities, over the Internet.
- Manipulate and configure the application online at any time.
- It does not require to install a specific piece of software to access or manipulate cloud application.
- Cloud Computing offers online development and deployment tools, programming runtime environment through **Platform as a Service model**.
- Cloud resources are available over the network in a manner that provides platform independent access to any type of clients.
- Cloud Computing offers **on-demand self-service**. The resources can be used without interaction with cloud service provider.
- Cloud Computing is highly cost effective because it operates at higher efficiencies with greater utilization. It just requires an Internet connection.
- Cloud Computing offers load balancing that makes it more reliable.

Cloud computing challenges



Cloud computing challenges

Security and Privacy

» Security and Privacy of information is the biggest challenge to cloud computing. Security and privacy issues can be overcome by employing encryption, security hardware and security applications.

Portability

» This is another challenge to cloud computing those applications should easily be migrated from one cloud provider to another. There must not be vendor lock-in. However, it is not yet made possible because each of the cloud provider uses different standard languages for their platforms.

Interoperability

» It means the application on one platform should be able to incorporate services from the other platforms. It is made possible via web services, but developing such web services is very complex.

Computing Performance

» Data intensive applications on cloud requires high network bandwidth, which results in high cost. Low bandwidth does not meet the desired computing performance of cloud application.

Reliability and Availability

» It is necessary for cloud systems to be reliable and robust because most of the businesses are now becoming dependent on services provided by third-party

Advantages of cloud computing

- Cloud computing is an emerging technology that almost every company switched to from onpremise technologies. Whether it is public, private or hybrid, Cloud computing has become an essential factor for the companies to rise up to the competition. Let us find out why Cloud is so much preferred over the on-premise technologies.
- **Cost efficiency –** The biggest reason behind shifting to cloud computing is that it takes considerably lesser cost than an on-premise technology. Now the companies need not store the data in disks anymore as the Cloud offers enormous storage space, saving money and resources of the companies.
- **High Speed –** Cloud computing lets you deploy the service quickly in fewer clicks. This quick deployment lets you get the resources required for your system within fewer minutes.
- **Excellent accessibility –** Storing the information in cloud allows you to access it anywhere and anytime regardless of the machine making it highly accessible and flexible technology of present times.
- **Back-up and restore data –** Once the data is stored in Cloud, it is easier to get the back-up and recovery of that, which is quite a time taking process on-premise.
- **Manageability –** Cloud computing eliminates the need for IT infrastructure updates and maintenance since the service provider ensures timely, guaranteed and seamless delivery of your services and also takes care of all the maintenance and management of your IT services according to the service level agreement (SLA).
- **Periodic Batch processing –** Cloud computing lets you add or subtract resources and services according to your needs. So, if the workload is not 24/7, you need not worry about the resources and services getting wasted and you won't end up stuck with unused services.
- **Strategic edge –** Cloud computing provides your company a competitive edge over the competitors when it comes to accessing the latest and mission critical applications whenever you need them without having to invest your time and money on installations. It lets you focus on keeping up with the business competition by offering access to most trending and in demand applications and doing all the manual work of installing and maintaining the applications for you.

Disadvantages of cloud computing

- Every technology has positive and negative aspects that are highly important to discuss before implementing it. Aforementioned points highlight the benefits of using cloud technology and following discussion will outline the potential cons of Cloud Computing.
- **Vulnerability to attacks –** Storing data in cloud may pose serious challenge of information theft since in cloud every data of your company is online. Security breach is something that even the best organizations have suffered from and it's a potential risk in cloud as well. Though advanced security measures are deployed on cloud, still storing a confidential data in cloud can be a risky affair.
- **Network connectivity dependency –** Cloud computing is entirely dependent on the internet. This direct tie up with internet means that you need a reliable and consistent internet service as well as a good connection speed and bandwidth for your business to reap the benefits of cloud computing.
- **Downtime –** Downtime is considered as one of the biggest potential downside of using Cloud computing. Your cloud providers may sometimes face technical outages which can happen due to various reasons such as loss of power, low internet connectivity, data centres going out of service for maintenance etc. This can lead to a temporary downtime in your cloud services.
- **Vendor lock in –** When in need to migrate from one cloud platform to another, your company might face some serious challenges because of the differences between vendor platforms. Hosting and running the applications of your current cloud platform on some other platform may cause support issues, configuration complexities and additional expenses. Your data might also be left vulnerable to security attacks due to compromises that might have been made during migrations.
- **Limited control –** Cloud customers may face limited control over their deployments. The cloud services run on remote servers which are completely owned and managed by the service providers, which makes it hard for the companies to have the level of control that they would want over their back-end infrastructure.

Risks related to cloud computing

» Although Cloud Computing is a great innovation in the world of computing, there also exist downsides of cloud computing. Some of them are discussed below:

Security & privacy

» It is the biggest concern about cloud computing. Since data management and infrastructure management in cloud is provided by third-party, it is always a risk to handover the sensitive information to such providers. Although the cloud computing vendors ensure more secure password protected accounts, any sign of security breach would result in loss of clients and businesses.

Lock-in

» It is very difficult for the customers to switch from one **Cloud Service Provider (CSP)** to another. It results in dependency on a particular CSP for service.

Isolation failure

» This risk involves the failure of isolation mechanism that separates storage, memory, routing between the different tenants.

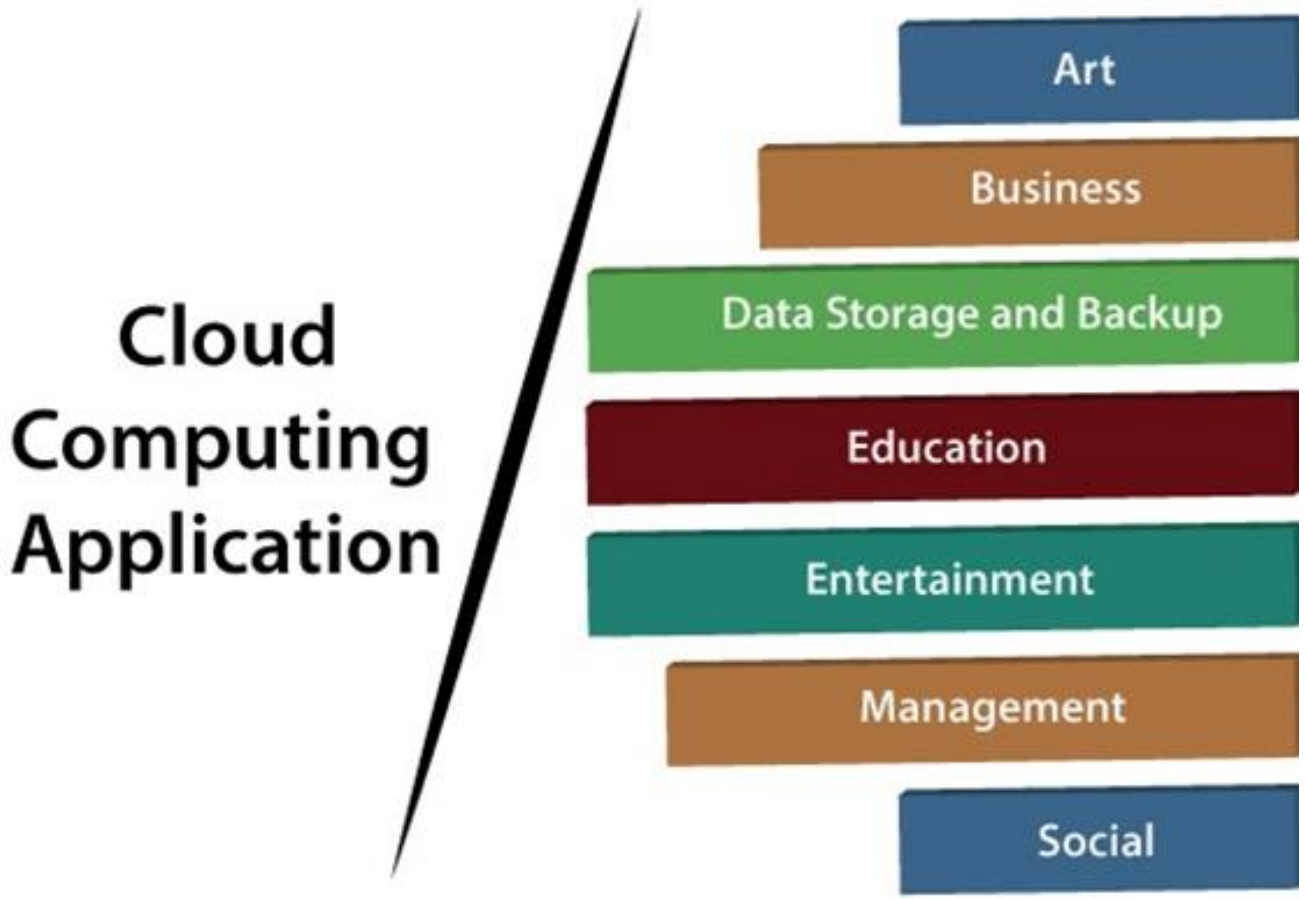
Management interface compromise

» In case of public cloud provider, the customer management interfaces are accessible through the Internet.

Insecure or incomplete data deletion

» It is possible that the data requested for deletion may not get deleted. It happens either because extra copies of data are stored but are not available or disk destroyed also stores data from other tenants.

Cloud Computing Application



1. Art Applications

»Cloud computing offers various art applications for quickly and easily design **attractive cards, booklets,** and **images**. Some most commonly used cloud art applications are given below:

Moo

»Moo is one of the best cloud art applications. It is used for designing and printing business cards, postcards, and mini cards.

Vistaprint

»Vistaprint allows us to easily design various printed marketing products such as business cards, Postcards, Booklets, and wedding invitations cards.

Adobe Creative Cloud

»Adobe creative cloud is made for designers, artists, filmmakers, and other creative professionals. It is a suite of apps which includes PhotoShop image editing programming, Illustrator, InDesign, TypeKit, Dreamweaver, XD, and Audition.

2. Business Applications

Business applications are based on cloud service providers. Today, every organization requires the cloud business application to grow their business. It also ensures that business applications are 24*7 available to users.

There are the following business applications of cloud computing -

- **MailChimp:** MailChimp is an **email publishing platform** which provides various options to **design, send,** and **save** templates for emails.
- **Salesforce** : Salesforce platform provides tools for sales, service, marketing, e-commerce, and more. It also provides a cloud development platform.
- **Chatter** :Chatter helps us to **share important information** about the organization in real time.
- **Bitrix24 :**Bitrix24 is a **collaboration** platform which provides communication, management, and social collaboration tools.
- **Paypal** :Paypal offers the simplest and easiest **online payment** mode using a secure internet account. Paypal accepts the payment through debit cards, credit cards, and also from Paypal account holders.
- **Slack** : Slack stands for **Searchable Log of all Conversation and Knowledge**. It provides a **user-friendly interface** that helps us to create public and private channels for communication.
- **Quickbooks**: Quickbooks works on the terminology "**Run Enterprise anytime, anywhere, on any device**." It provides online accounting solutions for the business. It allows more than 20 users to work simultaneously on the same system.

3. Data Storage and Backup Applications

- Cloud computing allows us to store information (data, files, images, audios, and videos) on the cloud and access this information using an internet connection. As the cloud provider is responsible for providing security, so they offer various backup recovery application for retrieving the lost data.
- A list of data storage and backup applications in the cloud are given below -
- **Box.com** :Box provides an online environment for **secure content management, workflow,** and **collaboration**. It allows us to store different files such **as Excel, Word, PDF, and images on the cloud**. The main advantage of using box is that it provides **drag & drop service** for files and easily integrates with Office 365, G Suite, Salesforce, and more than 1400 tools.
- **Mozy:** Mozy provides powerful **online backup solutions** for our personal and business data. It schedules automatically back up for each day at a specific time.
- **Joukuu:** Joukuu provides the simplest way to **share** and **track cloud-based backup files**. Many users use joukuu to search files, folders, and collaborate on documents.
- **Google G Suite** : Google G Suite is one of the best **cloud storage** and **backup** application. It includes **Google Calendar, Docs, Forms, Google+, Hangouts**, as well as cloud storage and tools for managing cloud apps. The most popular app in the Google G Suite is Gmail. Gmail **offers free email** services to users.

4. Education Applications

- **Education Applications:** Cloud computing in the education sector becomes very popular. It offers various **online distance learning platforms** and **student information portals** to the students. The advantage of using cloud in the field of education is that it offers strong **virtual classroom environments**, Ease of accessibility, **secure data storage, scalability, greater reach for the students,** and **minimal hardware requirements** for the applications.
- There are the following education applications offered by the cloud -
- **Google Apps for Education** : Google Apps for Education is the most widely used platform for free web-based email, calendar, documents, and collaborative study.
- **Chromebooks for Education** : Chromebook for Education is one of the most important Google's projects. It is designed for the purpose that it enhances education innovation.
- **Tablets with Google Play for Education** : It allows educators to quickly implement the latest technology solutions into the classroom and make it available to their students.
- **AWS in Education:** AWS cloud provides an education-friendly environment to universities, community colleges, and schools.

5. Entertainment Applications

- Entertainment industries use a **multi-cloud strategy** to interact with the target audience. Cloud computing offers various entertainment applications such as online games and video conferencing.
- **Online games** : Today, cloud gaming becomes one of the most important entertainment media. It offers various online games that run remotely from the cloud. The best cloud gaming services are **Shaow, GeForce Now, Vortex, Project xCloud, and PlayStation Now**.
- **Video Conferencing Apps** : Video conferencing apps provides a simple and instant connected experience. It allows us to communicate with our business partners, friends, and relatives using a cloud-based video conferencing. The benefits of using video conferencing are that it reduces cost, increases efficiency, and removes interoperability.

6. Management Applications

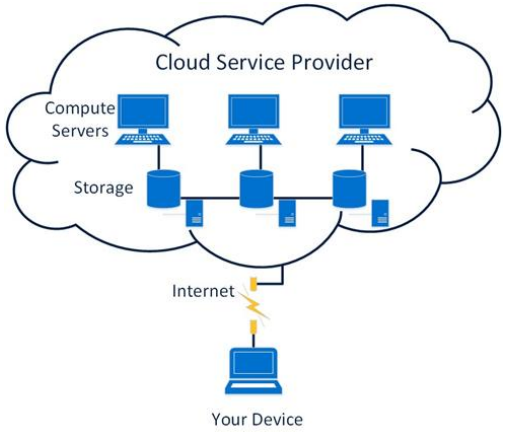
- Cloud computing offers various cloud management tools which help admins to manage all types of cloud activities, such as resource deployment, data integration, and disaster recovery. These management tools also provide administrative control over the platforms, applications, and infrastructure.
- Some important management applications are -
- **Toggl :** Toggl helps users to track allocated time period for a particular project.
- **Evernote :** Evernote allows you to sync and save your recorded notes, typed notes, and other notes in one convenient place. It is available for both free as well as a paid version. It uses platforms like Windows, macOS, Android, iOS, Browser, and Unix.
- **Outright :** Outright is used by management users for the purpose of accounts. It helps to track income, expenses, profits, and losses in real-time environment.
- **GoToMeeting :** GoToMeeting provides **Video Conferencing** and **online meeting apps**, which allows you to start a meeting with your business partners from anytime, anywhere using mobile phones or tablets. Using GoToMeeting app, you can perform the tasks related to the management such as join meetings in seconds, view presentations on the shared screen, get alerts for upcoming meetings, etc.

7. Social Applications

- Social cloud applications allow a large number of users to connect with each other using social networking applications such as **Facebook, Twitter, LinkedIn,** etc.
- There are the following cloud based social applications -
- **Facebook** :Facebook is a **social networking website** which allows active users to share files, photos, videos, status, more to their friends, relatives, and business partners using the cloud storage system. On Facebook, we will always get notifications when our friends like and comment on the posts.
- **Twitter** : Twitter is a **social networking** site. It is a **microblogging** system. It allows users to follow high profile celebrities, friends, relatives, and receive news. It sends and receives short posts called tweets.
- **Yammer** : Yammer is the **best team collaboration** tool that allows a team of employees to chat, share images, documents, and videos.
- **LinkedIn** : LinkedIn is a **social network** for students, freshers, and professionals.

Cloud storage

- Cloud storage is the process of storing digital data in an online space that spans multiple servers and locations, and it is usually maintained by a hosting company.
- Here's a diagram representing the process:



- Essentially, an individual or organization can store and access data in this online space maintained by a host service provider using the internet.
- You are likely using cloud storage already – whether it is Microsoft Office 365, Dropbox, Google Drive – or one of the other dozens of cloud storage providers.
- Even media sharing devices like Instagram and YouTube or webmail clients like Gmail and Hotmail fall into this category. Each of these services stores data – your data – on the cloud.

Benefits of cloud storage

- **Data Retrieval**: You can retrieve data from virtually anywhere. Companies can now offer workfrom-home and bring-your-own-device (BYOD) solutions. As the business changes, the agile nature of cloud storage makes it easy to adjust.
- **Collaboration**: Other people can access the same data and tools, enabling teams to work together more easily. Engaging the right provider with the right tools, even version control can become a breeze.
- **Pay-As-You-Use**: In the past, businesses had to purchase computing infrastructure – hardware, licenses, equipment – based on their expectations on business growth for the next several years. Companies tended to over-buy, fearing being underprepared, and were left with expensive equipment and storage space they didn't use. Cloud storage and virtualization allows businesses to pay for the data they actually use. This means businesses can scale and adjust up and down as their business needs and strategy change.
- **Increased Capabilities**: Small and medium-sized businesses of the past were only able to use the tools they could afford. Today, using a cloud storage provider means SMBs(**Server Message Block protocol**) can utilize the different services the cloud provider offers for all their clients.
- The Server Message Block protocol (**SMB protocol**) is a client-server communication protocol used for **sharing access to files, printers, serial ports and other resources on a network**. It can also carry transaction protocols for inter-process communication. Over the years, SMB has been used primarily to connect Windows computers, although most other systems -- such as Linux and macOS -- also include client components for connecting to SMB resources.

Challenges of cloud storage

- **Attack Surface Area**: This is a mathematical understanding of risk. The data stored on a local network is in one place and one place only. By distributing data to more locations, the risk of that data being subject to unauthorized access increases. More people = more risk of compromise. The cloud also uses the internet to transfer data. So, instead of data being transferred via a local area network (LAN), it uses a wide area network (WAN), which increases the risk.
- **Supplier Sustainability**: What happens if your cloud storage provider goes bankrupt, suffers a disaster, or changes their business strategy? Teaming up with another party means aligning business goals. That isn't always easy.
- **Security**: Many businesses store sensitive data, such as healthcare or financial records. These industries are subject to strict regulations. Putting this data in the hands of someone else can be a difficult decision to make. Understanding the safeguards cloud storage providers take and how your team will need to leverage those tools for added security is an important step in migrating your data to the cloud.

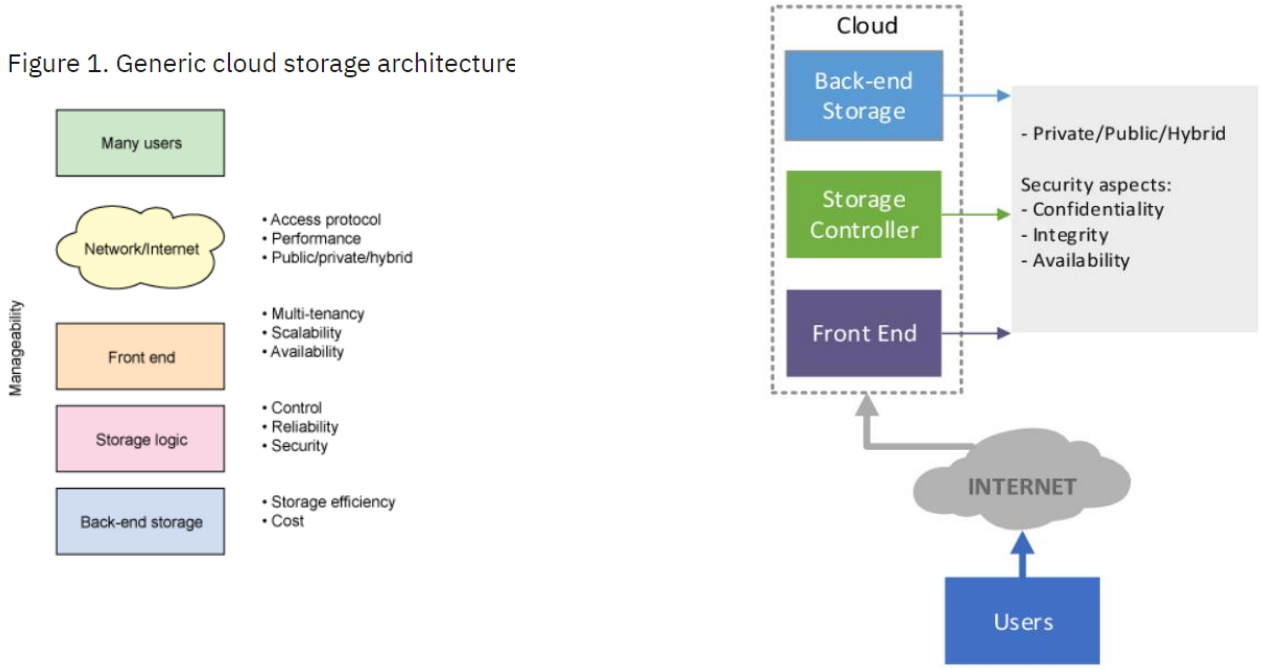
Types of cloud storage

- **Public cloud** storage is basically compatible with unstructured data. It provides a multi-tenant storage environment. Here, the data store in multiple data centres and can access across multiple regions for continents. The cloud storage providers completely manage the public cloud storage.
- **Private cloud** is mostly compatible with the customers you need to customize their control over their data. Here, the enterprise and the cloud storage providers combine the data centre to serve the customer better
- **Hybrid cloud** is a combination of private and personal cloud which can modify as per the demand. It provides more flexibility to the customer and has more data deployment options.
- Hybrid cloud is suitable for both small and large sector organizations. It is accessible from anywhere and can provide numerous amount of benefits to the customer

Cloud storage infrastructure

- Cloud storage has an infrastructure which bases on the principle of **virtualization in Cloud Computing**. Virtualization eliminates the hardware by utilizing the single hardware and making many virtual separations of it.
- Its infrastructure is elastic, scalable, and multi-tenant. With the help of proper tools, the whole infrastructure can manage and information can store and retrieve easily.
- With the help of ID and password, the whole content can retrieve from anywhere and at any time. In addition, there are proper security measures which authenticate the whole process of uploading and downloading.

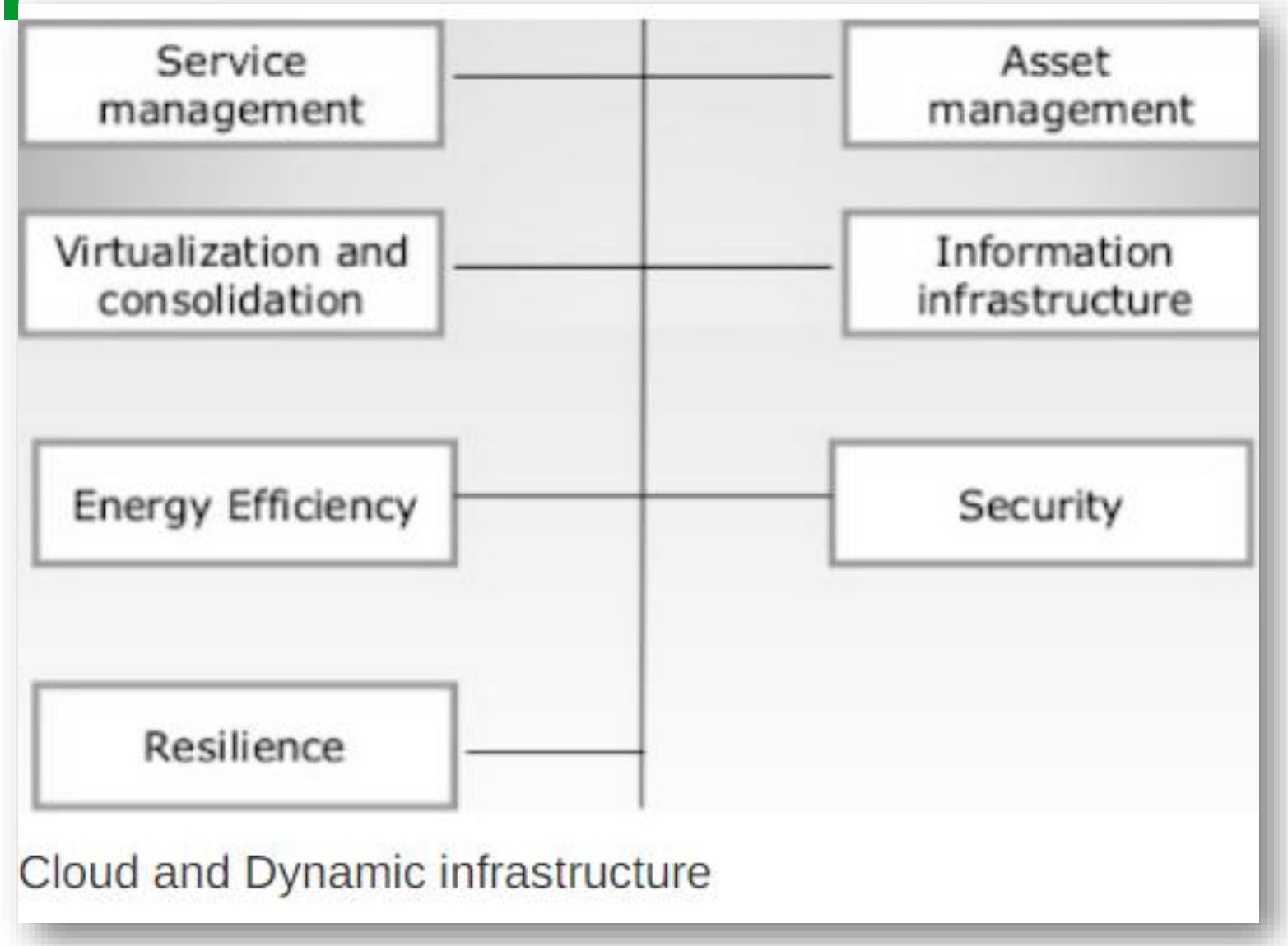
Figure 1. Generic cloud storage architecture



Cloud service requirements

- **Efficiency / cost reduction:** By using cloud infrastructure, you don't have to spend huge amounts of money on purchasing and maintaining equipment.
- **Data security**: Cloud offers many advanced security features that guarantee that data is securely stored and handled. Cloud storage providers implement baseline protections for their platforms and the data they process, such authentication, access control, and encryption.
- **Scalability:** Different companies have different IT needs -- a large enterprise of 1000+ employees won't have the same IT requirements as a start-up. Using cloud is a great solution because it enables enterprise to efficiently -- and quickly -- scale up/down according to business demands.
- **Mobility:** Cloud computing allows mobile access to corporate data via smartphones and devices, which is a great way to ensure that no one is ever left out of the loop. Staff with busy schedules, or who live a long way away from the corporate office, can use this feature to keep instantly up-to-date with clients and coworkers.
- **Disaster recovery**: Data loss is a major concern for all organizations, along with data security. Storing your data in the cloud guarantees that data is always available, even if your equipment like laptops or PCs, is damaged. Cloud-based services provide quick data recovery for all kinds of emergency scenarios.
- **Control**: Cloud enables you complete visibility and control over your data. You can easily decide which users have what level of access to what data.
- **Market reach**: Developing in the cloud enables users to get their applications to market quickly.
- **Automatic Software Updates**: Cloud-based applications automatically refresh and update themselves.

Cloud and dynamic infrastructure

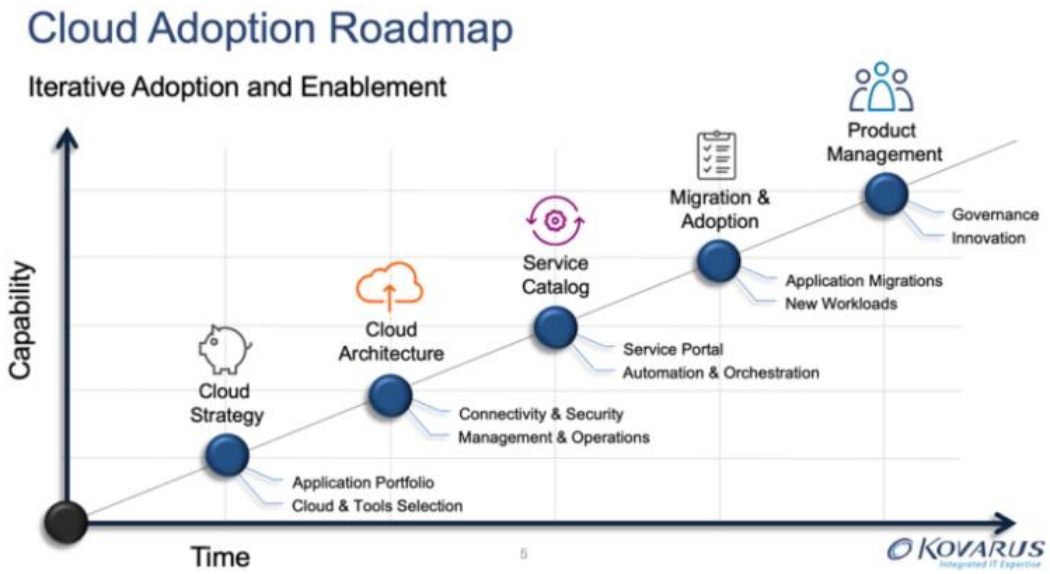


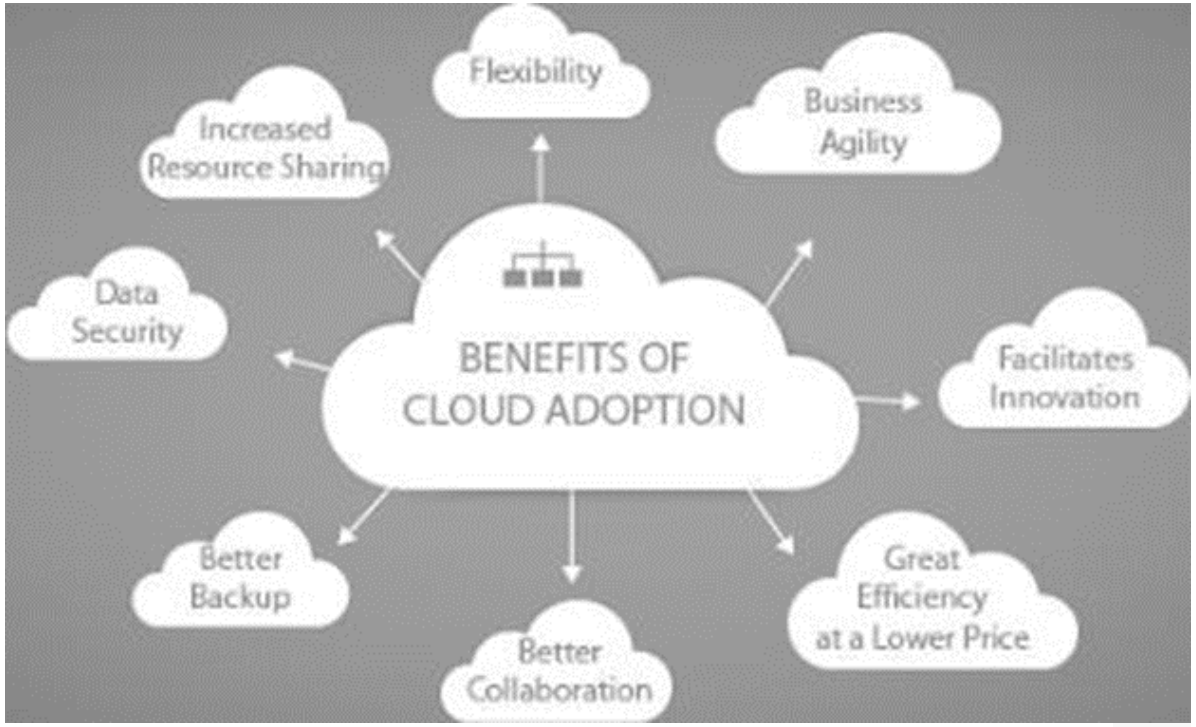
Cloud and dynamic infrastructure

- **Service management:** This type of special facility or a functionality is provided to the cloud IT services by the cloud service providers. This facility includes visibility, automation and control to delivering the first-class IT services.
- **Asset-Management:** In this the assets or the property which is involved in providing the cloud services are getting managed.
- **Virtualization and consolidation:** Consolidation is an effort to reduce the cost of a technology by improving its operating efficiency and effectiveness. It means migrating from large number of resources to fewer one, which is done by virtualization technology.
- **Information Infrastructure**: It helps the business organizations to achieve the following: Information compliance, availability of resources retention and security objectives.
- **Energy-Efficiency:** Here the IT infrastructure or organization sustainable. It means it is not likely to damage or effect any other thing.
- **Security:** This cloud infrastructure is responsible for the risk management. Risk management Refers to the risks involved in the services which are being provided by the cloud-service providers.
- **Resilience:** This infrastructure provides the feature of resilience means the services are resilient. It means the infrastructure is safe from all sides. The IT operations will not be easily get affected.

Cloud adoption

- "the cloud" is comprised of software and services residing and operating on the Internet instead of a local computer or on-premise network of servers. Cloud adoption is a strategy used by enterprises to improve the scalability of Internet-based database capabilities while reducing cost and risk.
- To achieve this, businesses engage in the practice of cloud computing or using remote servers hosted on the Internet to store, manage, and process critical data. While cloud computing has been available to the general public for several years, hybrid cloud computing is a relatively newer concept combining one or more cloud providers, such as Amazon Web Services, SAP HANA Cloud Platform, VMWare, or Salesforce, with a private IT infrastructure designed for a specific organization.





Cloud adoption

- **Cloud adoption** means adopting a service or technology from another cloud service provide, here Cloud means the environment of cloud where the cloud services are being operated.
- Adoption term states that accepting the services of new Technology.
- Adoption means following some kind of new trend or existing trend or a technology.
- This Cloud adoption is suitable for low priority business applications.
- It supports some interactive applications that combines two or more data sources.
- For example:-if a marketing company requires to grow his business in the whole country in a short span of time then it must need a quick promotion or short promotion across the country.
- Cloud Adoption is useful when the recovery management, backup recovery based implementations are required.
- By considering the above key points we conclude that it is only suitable for the applications that are modular and loosely coupled.
- It will work well with research and development projects.
- It means the testing of new services ,design models and also the applications that can be get adjusted on small servers.
- Applications which requires different level of infrastructure throughout the day or throughout the month should be deployed Through the cloud.
- The applications whose demand is unknown can also be deployed using clouds.

Assignment

- Objectives Questions: page 53-57(48)
- Subjective Questions: page 57-58(44)