CLOUD COMPUTING

Lecture One

By-

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Agenda

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Introduction

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.**
- Cloud provide “On-Demand” services over the Internet.

Cloud Computing

What is Cloud Computing?

- Cloud Computing provides us a means by which we can access the applications as utilities, over the Internet.

- It allows us to create, configure, and customize applications online.

- With Cloud Computing users can access database resources via the internet from anywhere for as long as they need without worrying about any maintenance or management of actual resources.

Cloud Computing Cont.

What is Cloud Computing?

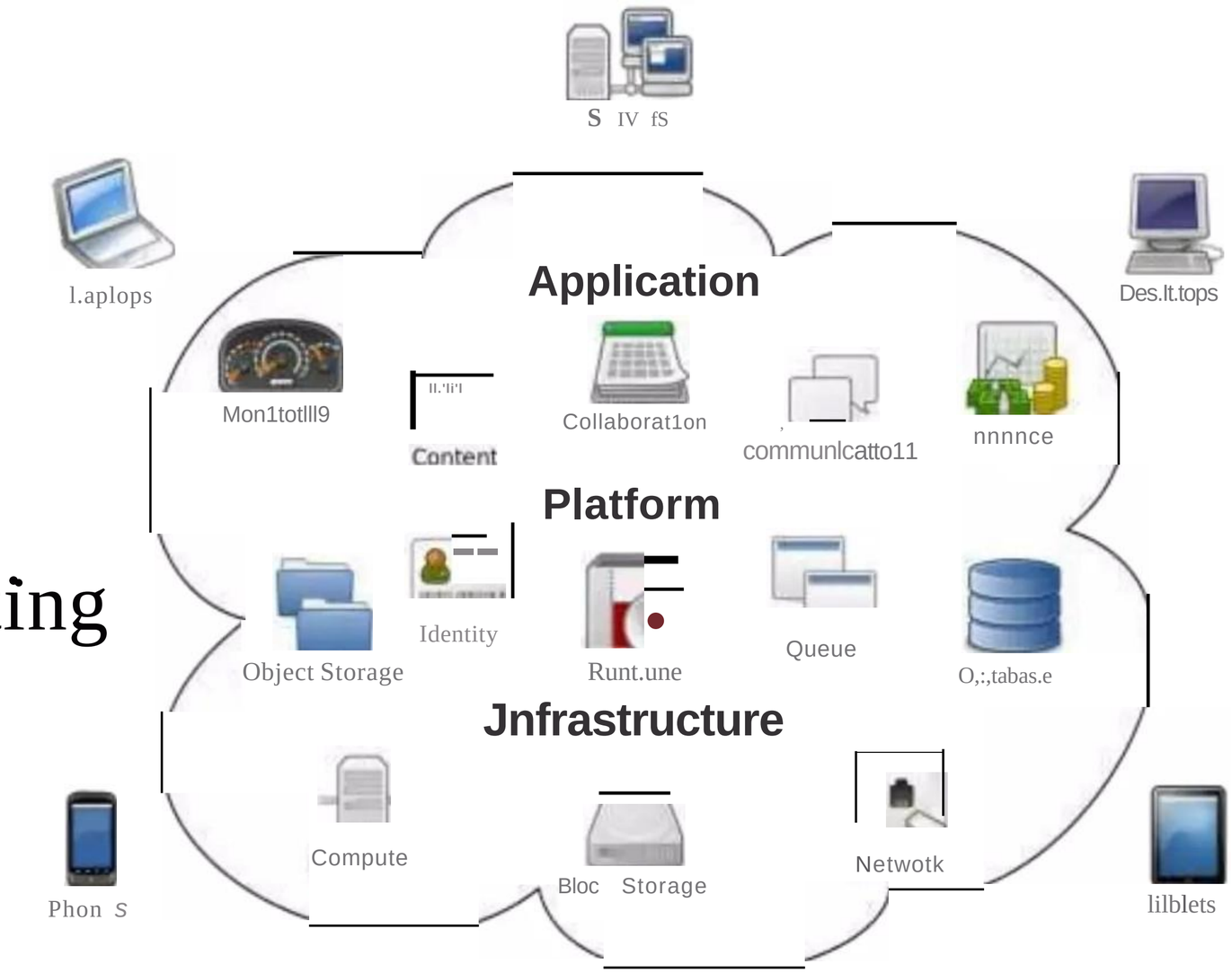
- **Cloud Computing** refers to **manipulating, configuring,** and **accessing** the applications online.

- It offers online data storage, infrastructure and application.

- Cloud Computing is both a combination of software and hardware-based computing resources delivered as a network service.

Cloud Computing

- Sharing of resources **over a network**
- Virtually infinite computing **resources**
- **Scalable on-demand**
- Pay as you go



Definition of Cloud Computing

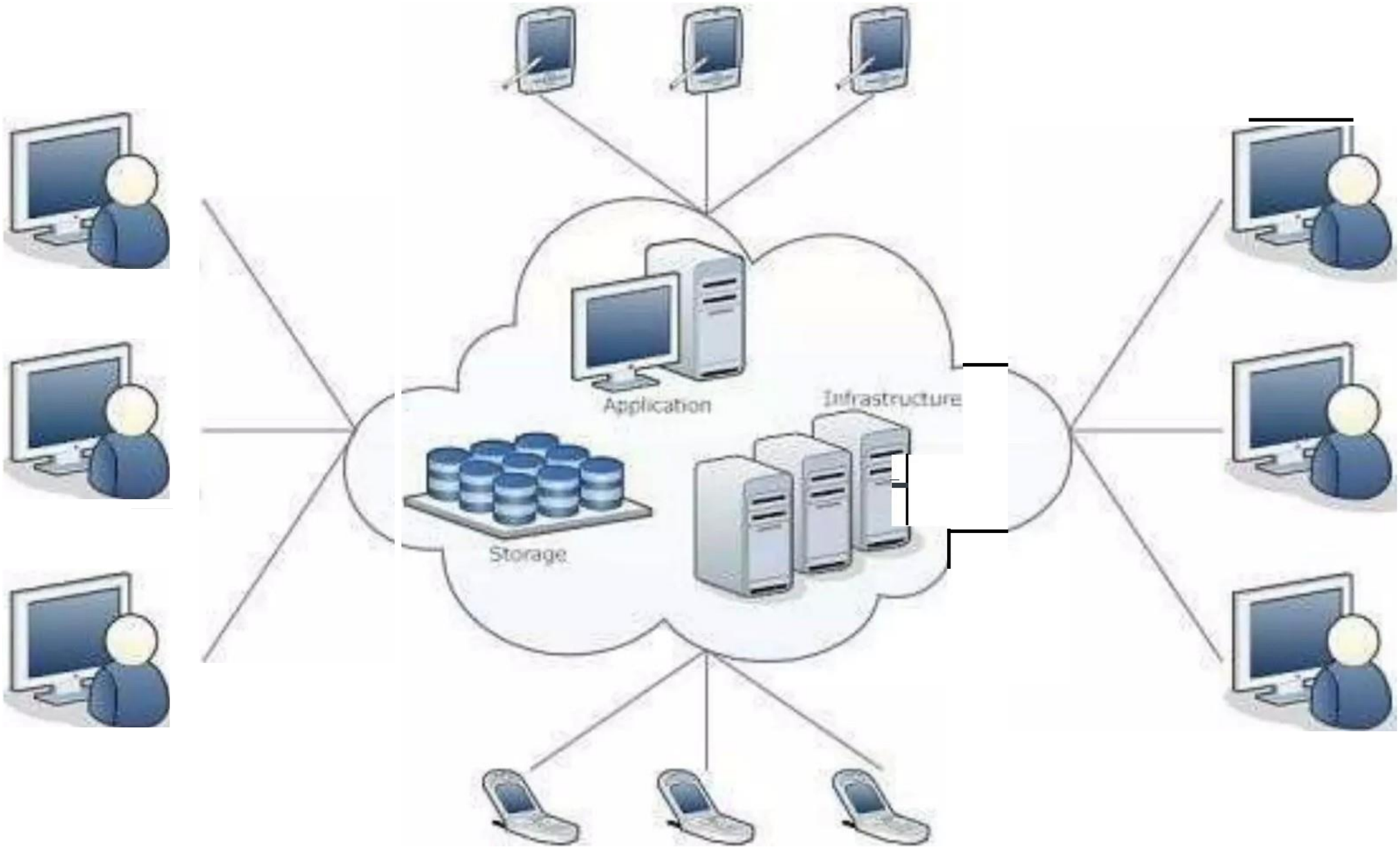
- "Clouds are vast resource pools with on-demand resource allocation".
  - *Jan Pritzker*

- "Cloud computing is the latest effort in delivering computing resources as a service. It represents a shift away from computing as a product that is purchased, to computing as a service that is delivered to consumers over the internet from large-scale data centers - or clouds"
  -- (Ilango and ….ajeh-Hosseini, 2010).

Cloud Service Providers

- Amazon Web Service
- Alibaba Cloud
- IBM Cloud
- Google Cloud

Cloud Computing Architecture

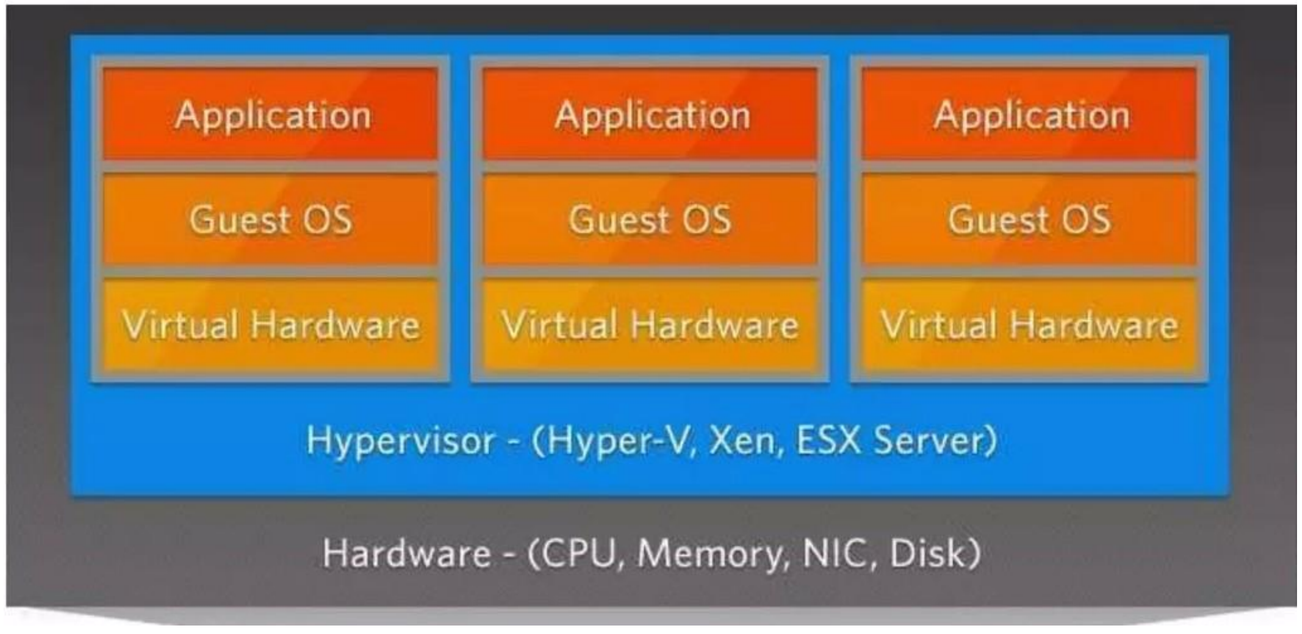


Base Of Cloud Computing

- The main enabling technology for cloud computing is virtualization. Virtualization generalizes the physical infrastructure and provides it as a soft component that is easy to be used and managed.

- Virtualization: VMWare - A pioneer in virtualization and cloud software and services

- "Virtualization software makes it possible to run multiple operating systems and multiple applications on the server at the same time.



Characteristics of Cloud Computing

1. The Key Essential Characteristics / Attributes of Cloud Computing Are:
2. **On-demand self-service:** resources can be acquired and used at any time. Computing resources include processing power, storage, virtual machines etc.

3. **Broad network access:** Recourses are acquired over the network and accessed through standard devices such as laptops, tablets and mobile devices.

4. **Device and location independence:** Enable users to access systems using a web browser regardless of their location or what device they are using, e.g., PC, mobile.

5. **Rapid elasticity:** A user can quickly acquire more resources from the cloud by scaling out. They can scale back in by releasing those resources once they are no longer required.

6. **Measured service:** resource usage is metered using appropriate metrics such monitoring storage usage, CPU hours, bandwidth usage etc. The service is Pay as You Go. Cost is greatly reduced, and capital expenditure is converted to operational expenditure . Also, you can convert fixed cost to variable.

7. **Reliability:** improves through the use of multiple redundant sites, which makes it suitable for business continuity and disaster recovery.

8. **Scalability:** via dynamic ("on-demand") provisioning of resources on a fine-grained, self-service basis near real-time, without users having to engineer for peak loads.

9. **Virtualized:** applications are decoupled from the underlying hardware. Multiple applications can run on one computer (virtualization a la VMWare) or multiple computers can be used to run one application.

Models of Cloud Computing

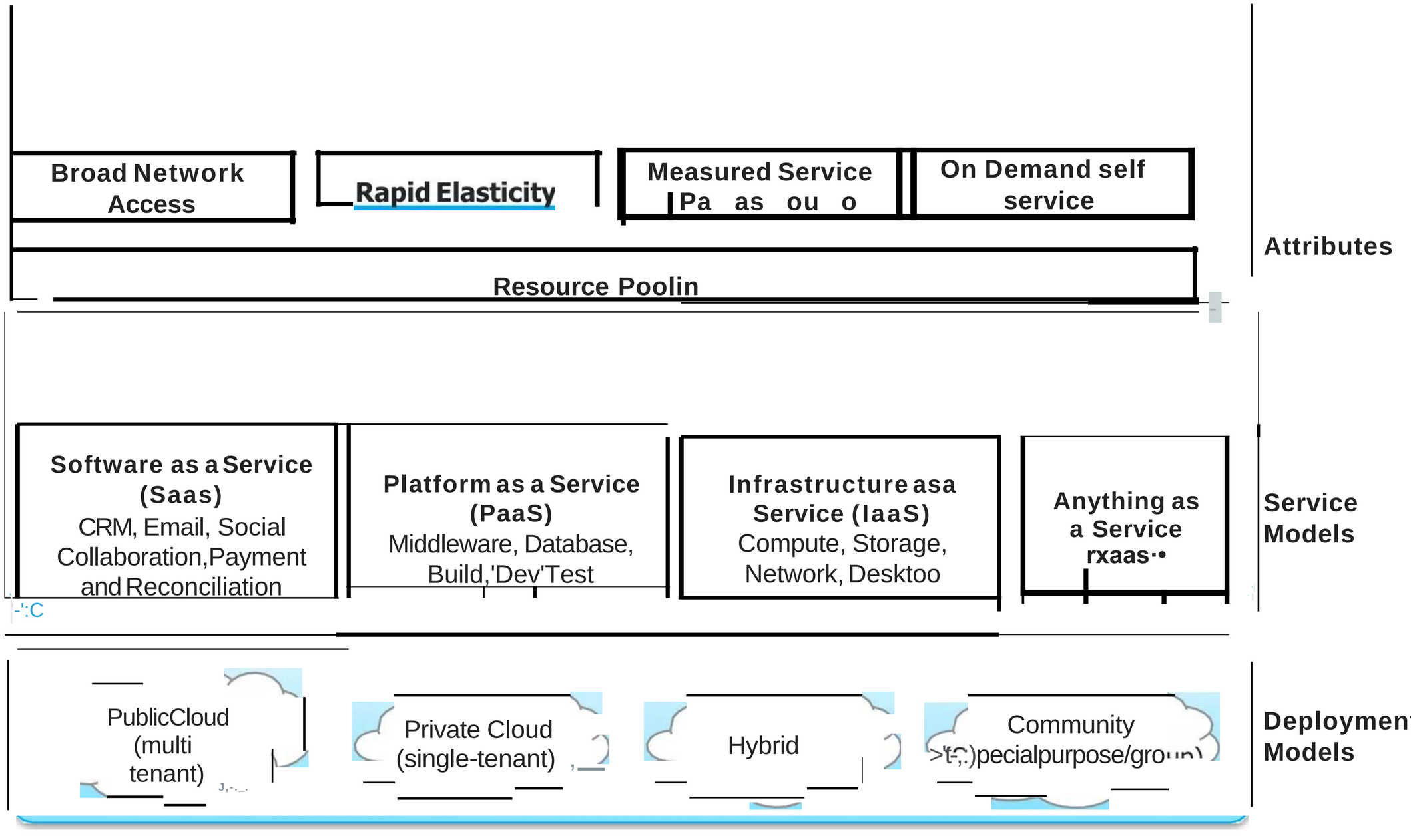
There are certain services and models working behind the scene making the cloud computing feasible and accessible to end users.

Following are the working models for cloud computing:

1. Deployment Models

2. Service or delivery Models

Cloud Structure



Deployment Models

- Deployment models define the type of access to the cloud, i.e., how the cloud is located?

- Cloud can have any of the four types of access:

Public

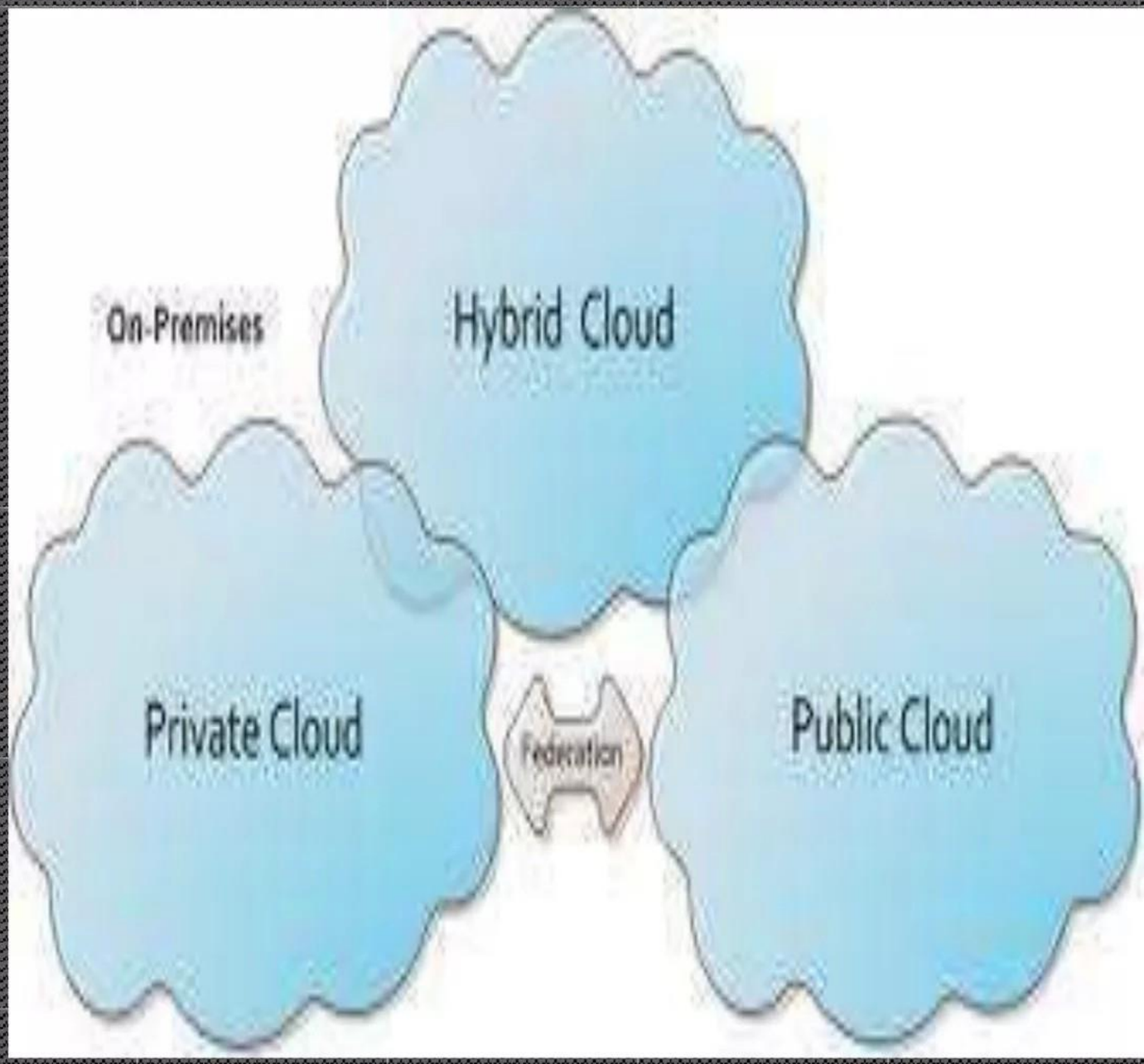
Private

Hybrid and

Community.

Types of cloud

- Public cloud
- Private cloud
- Community cloud
- Hybrid cloud



Deployment Models Of Cloud Computing

1. **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.

2. **PRIVATE CLOUD:** The Private Cloud allows systems and services to be accessible within an organization. It offers increased security because of its private nature.

3. **COMMUNITY CLOUD:** The Community Cloud allows systems and services to be accessible by group of organizations.

4. **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.

Advantages

- Reduce capital cost: Reduce spending on technology, for example lower computer costs
- Improved performance
- Reduced software costs: No cost for software updates
- Improve accessibility
- Improve flexibility
- Unlimited storage capacity
- On demand Service

Advantages

- Achieve economic of scale
- Less personal training is need
- Monitor project more effectively
- Unlimited storage capacity
- Increased data reliability
- Universal document access
- Latest version availability

Advantages Cont.

- Helps to use application without installation.
- Access the personal files at any computer with internet.

Benefits of Cloud Computing

Benefits of Cloud Computing

"Cloud Computing", by definition, refers to the on-demand delivery of IT resources and applications via the Internet with pay-as-you-go pr1c1ng.

- **Software Updates**
  - Advantage of cloud computing is that the servers are installed off premise and out of sight. Suppliers take care of them for all regular maintenance including software and security, so you don't have to worry about wasting time maintaining the system yourself.
  - Leaving you free to focus on the things that matter, like growing your business.

- **Controlled Capital-Expenditure**
  - Cloud computing cuts out the high cost of IT infrastructure. You simply pay as you go and enjoy a subscription-based model.
  - Instead of having to invest heavily in Data- Cen_..._s and servers before you know how you'r going to use them, y can only pay when you consume computing resources, and only pay for liow much you consume.

Benefits of Cloud Computing Cont.

- **Security**
  - Data can e stored in the cloud; we can access it no matter what happens to your machine.
  - nd ou can even remotely remove data from lost laptops, so it doesn't get into t e wrong hands.

- **Stop guessing capacity**
  - You can access as much or as little as you need and scale up and down as required with only a few minutes notice.

- **Data Accessibility**
  - When business teams can access, edit and share documents anytime, from an here, they're able to do more efficiently with high performance. With cloud computing, if you've got an internet connection ou can be at work. And with most serious cloud services offering mobi e apps, you're not restricted by which device you've got to hand.

Benefits of Cloud Computing Cont.

- **Flexibility**
  - Cloud-based services are ideal for businesses with growing or fluctuating bandwidth demands.
  - If your needs increase it's easy to scale up your cloud capacity, drawing on the service's remote servers. Likewise, if you need to scale down again, the flexibility is baked into the service.

- **Competitiveness**
  - ***Cloud is available for everyone,*** it also allows smaller businesses to act faster than big, establishe competitors.
  - Pay-as-you-go service and cloud business applications mean small outfits can run with the big boys, and disrupt the market, while remaining lean and nimble.

Disadvantages of Cloud Computing

- Requires a constant Internet connection: Does not work well with low-speed connections and can be slow.
- Stored data might not be secure
- Lack and loss of control
- Accessibility and UI limitations of web apps
- Reliability, performance, security; offline access
- Policy/compliance concerns (privacy)
- Breach forensics and mitigation
- Business "surprises"
- Support; More Logins
- Consequences of "Creative Destruction"

Disadvantages of Cloud Computing

- **Security:** This is usually the top fear because most IT managers are concerned about controlling access of their sensitive data that would reside in the cloud and can't afford the data being compromised.
- **Privacy:** Another key concern of IT management is maintaining privacy of their computing data in the cloud. IT departments need to be assured that their data is not being monitored either internally within the cloud provider or by any outside hackers.
- **High Availability:** Users are looking for some form of guarantee from providers that their computing data will be up at all times and their business can't be affected with any downtime.
- **Service Delivery and Billing:** Budgeting and assessment of the cost will be very difficult unless the provider has some good and comparable benchmarks to offer.

Disadvantages of Cloud Computing

- **Poor Application Performance:** Companies can't afford to have their IT users becoming less productive while a page load times exceed several seconds, for instance when they need to use a cloud computing application.

- **Business Continuity:** Users also have concerns about recovering their data from the cloud quickly in case of a man-made or a natural disaster.

- **Performance and Bandwidth Cost:** Businesses can save money on hardware, but they have to spend more for the bandwidth. This can be a low cost for smaller applications but can be significantly high for the data intensive applications.

Conclusion

- Cloud Computing is a easy and approachable way for companies to have all the resources they need at one place.

- Cloud Computing holds some strong promises:
  - Scalable
  - Highly Available
  - Pay only for resources that you use.

- Cloud Service Providers do not provide any guarantee about your data safety.

Conclusion

- Cloud Computing is not yet well understood.
- It can be modified to be used by everyone.
- Cloud is the next generation technology.
- Leaders in the industry, such as **IBM,** Google, and Microsoft have provided their initiatives in promoting cloud.
- Big IT companies are also building their own version of cloud.
- In India because of internet bandwidth, this field is still not very popular.
- And lot more..


THANK YOU