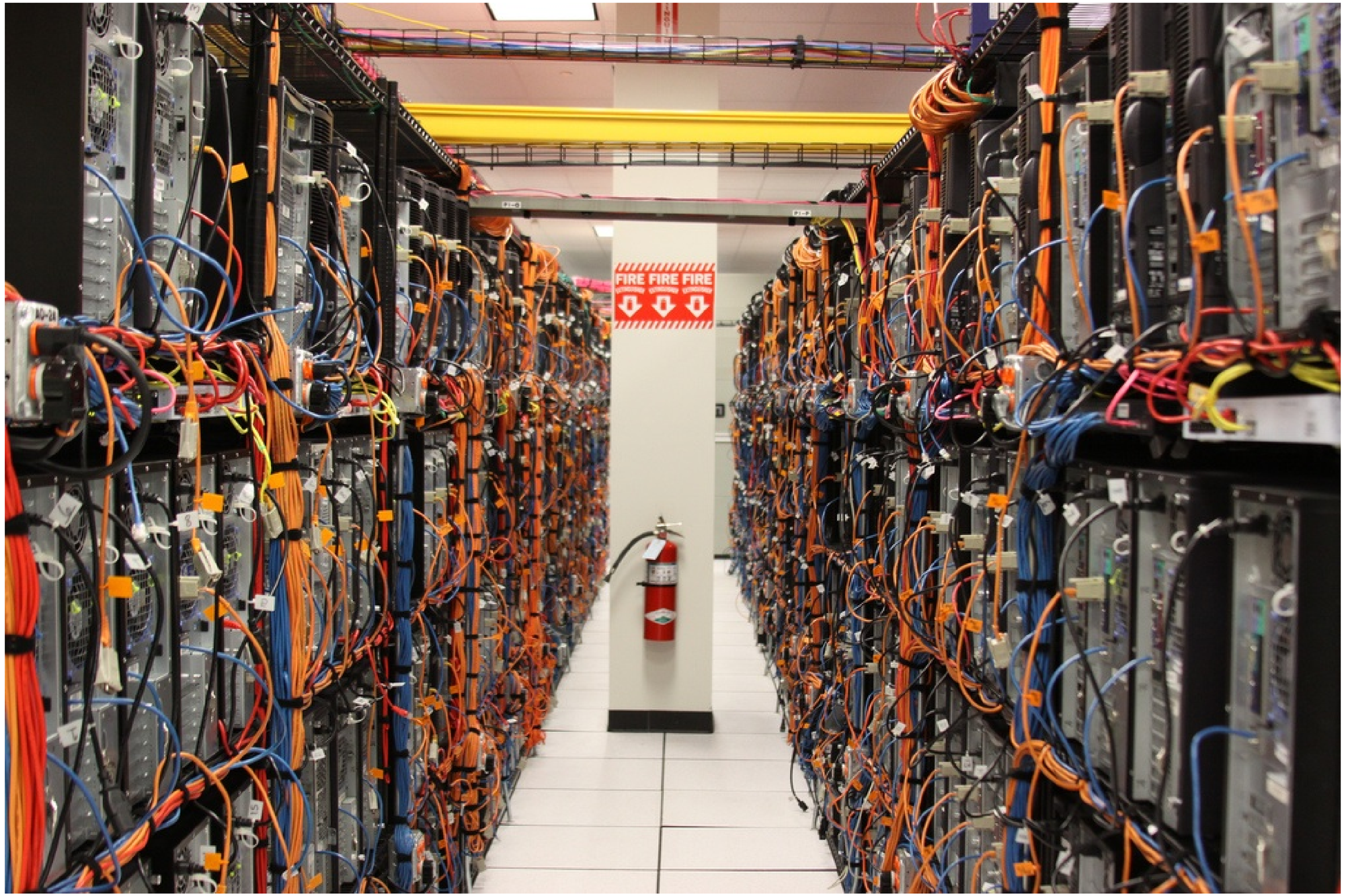
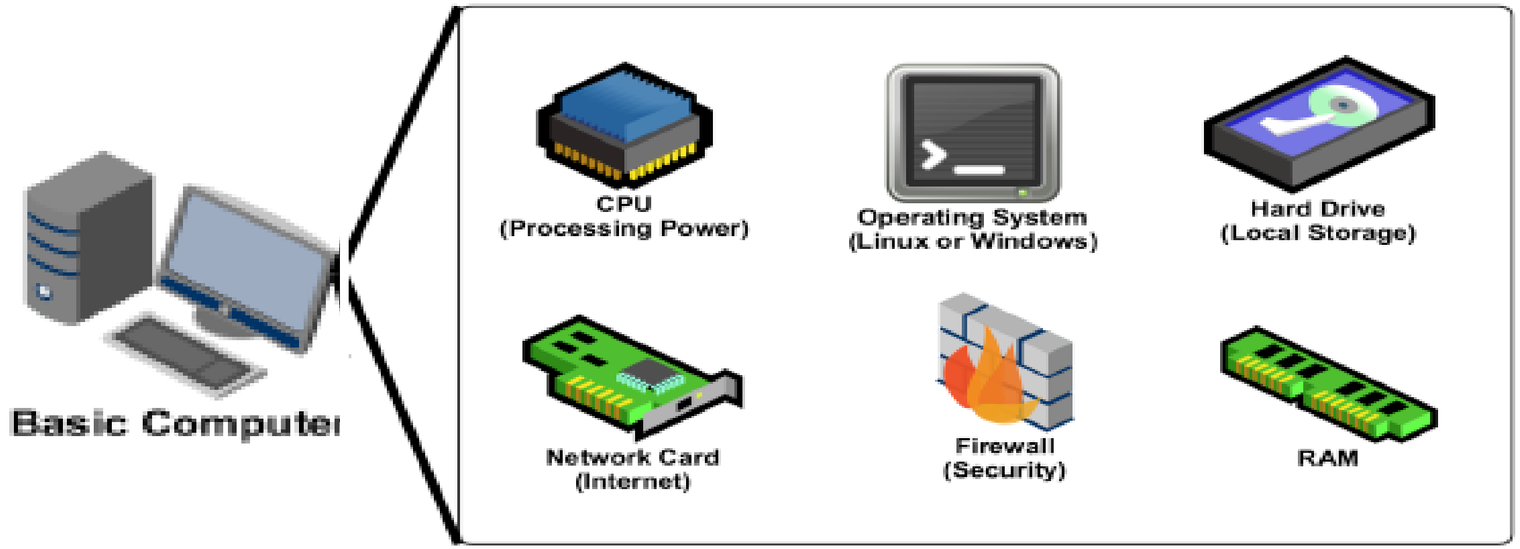

Cloud
Computing

Common Use Cases for Infrastructure

- Web site / Application hosting
- Mobile and Social Applications
- Internal IT application hosting
- Content delivery and media distribution
- High performance computing, batch data processing, and large scale analytics
- Storage, backup, and disaster recovery
- Development and test environments


FIRE FIRE FIRE

- Basic Computer
- Networking
- Security
- Storage
- Data Base




CLOUD

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.

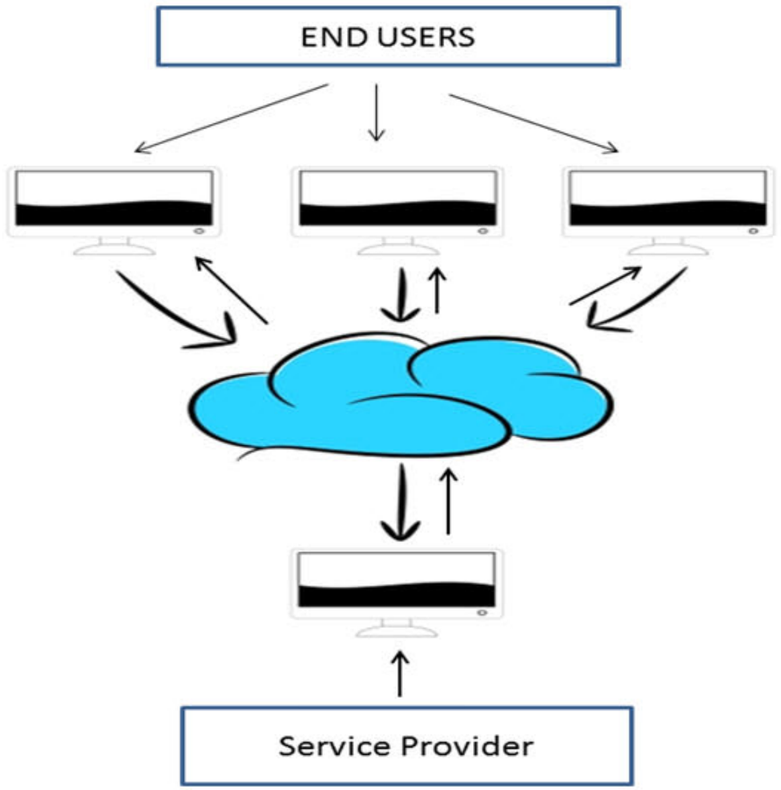
Cloud can provide services over public and private networks

Cloud computing means storing and accessing data and programs over the Internet instead of your computer's hard drive.

Like this?

Why the Name “Cloud”?

- The term “Cloud” came from a network design that was used by network engineers to represent the location of various network devices and there inter-connection. The shape of this network design was like a cloud.



What is cloud computing?

- Cloud Computing can be defined as delivering computing power(CPU, RAM, Network Speeds, Storage OS software) a service over the internet rather than physically having the computing resources at the customer location.

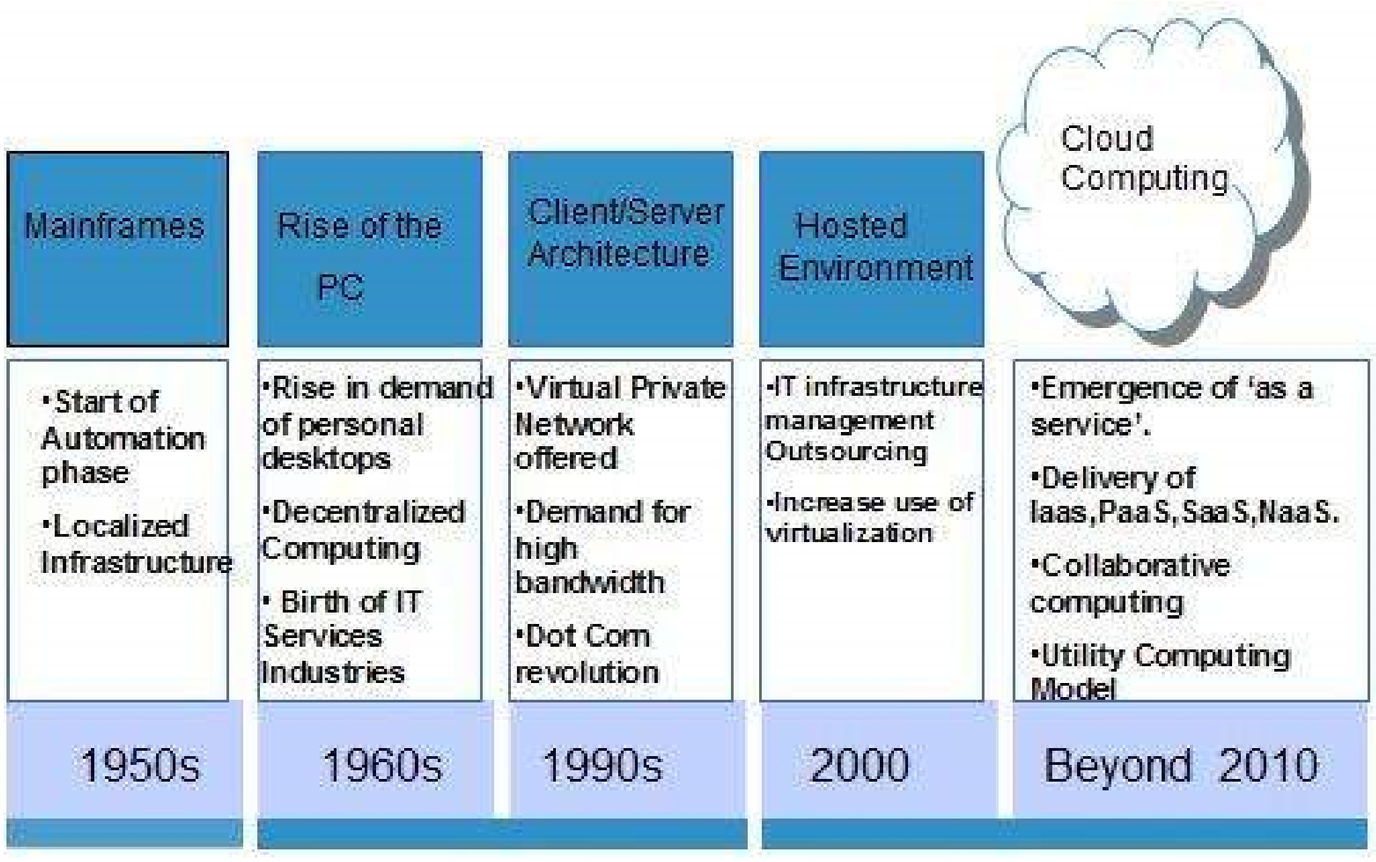
Or

- Cloud Computing refers to ***manipulating, configuring, and accessing the hardware and software resources remotely***. It offers online data storage, infrastructure, and application.

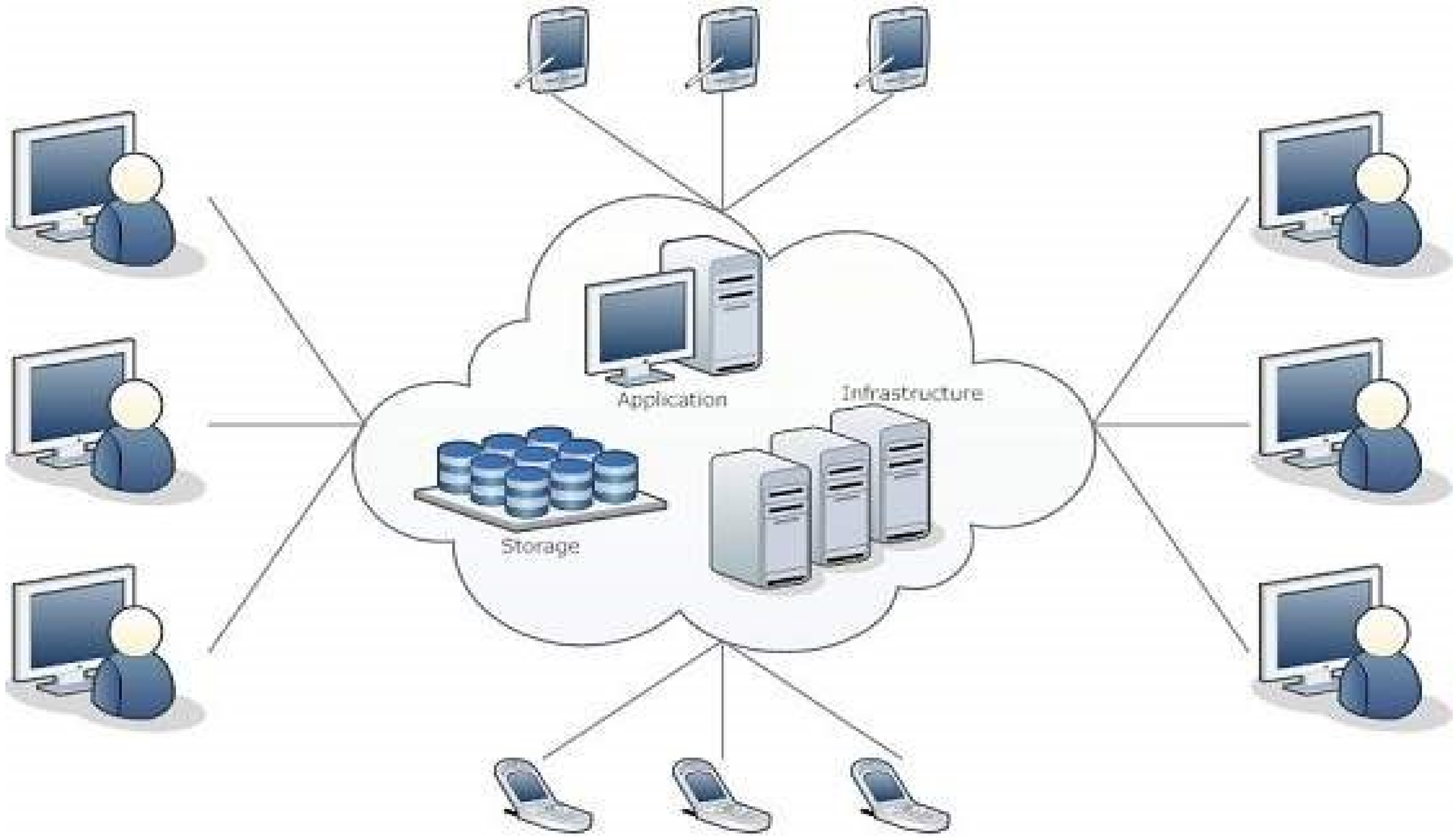
Example: AWS, Azure, Google Cloud

History of Cloud Computing

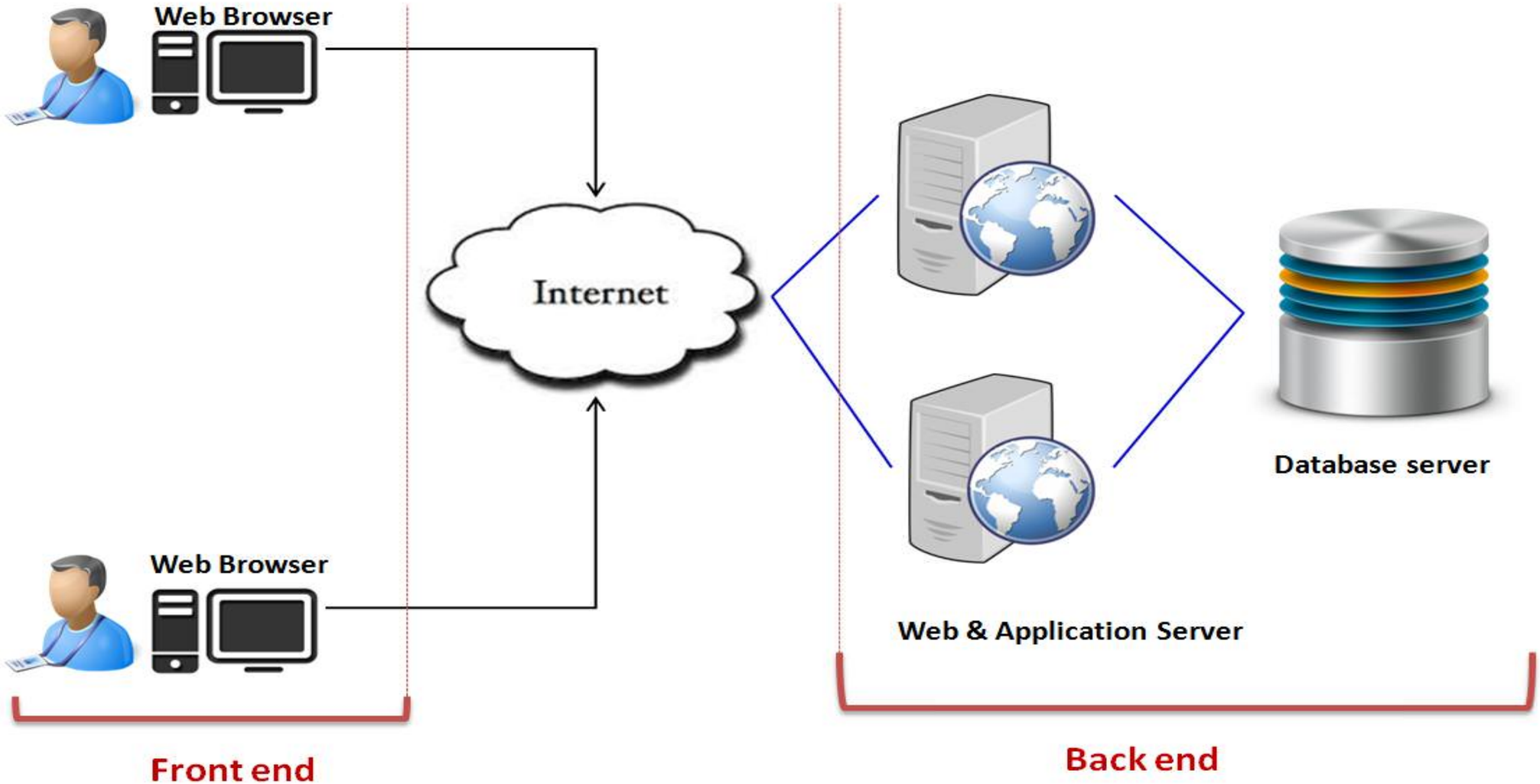
- The concept of **Cloud Computing** came into existence in the year 1950 with implementation of mainframe computers, accessible via **thin clients.** Since then, cloud computing has been evolved from thin clients to dynamic ones and from software to services. The following diagram explains the evolution of cloud computing:



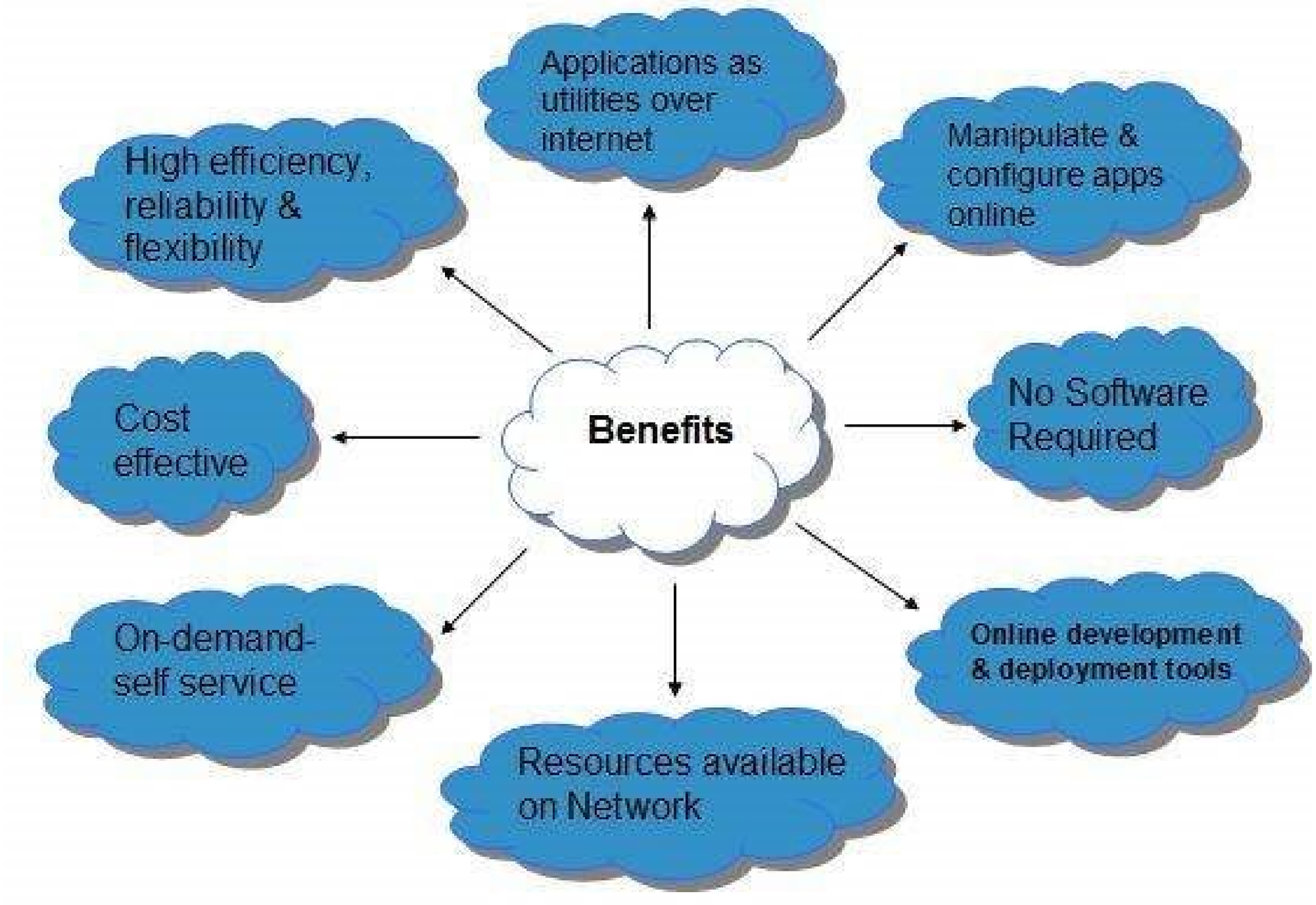
Conceptual view of cloud computing



What is Cloud Computing Architecture?



Benefits


Applications as utilities over internet
High efficiency, reliability & flexibility
Manipulate & configure apps online
Benefits
Cost effective
No Software Required
On-demand-self service
Online development & deployment tools
Resources available on Network

Benefits of Cloud Computing

- Lower IT infrastructure and computer costs for users
- Improved performance
- Fewer Maintenance issues
- Instant software updates
- Improved compatibility between Operating systems
- Backup and recovery
- Performance and Scalability
- Increased storage capacity
- Increase data safety

Risks related to Cloud Computing

- **Security and 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 cloud service providers.

- **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**
- **Management Interface Compromise**

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

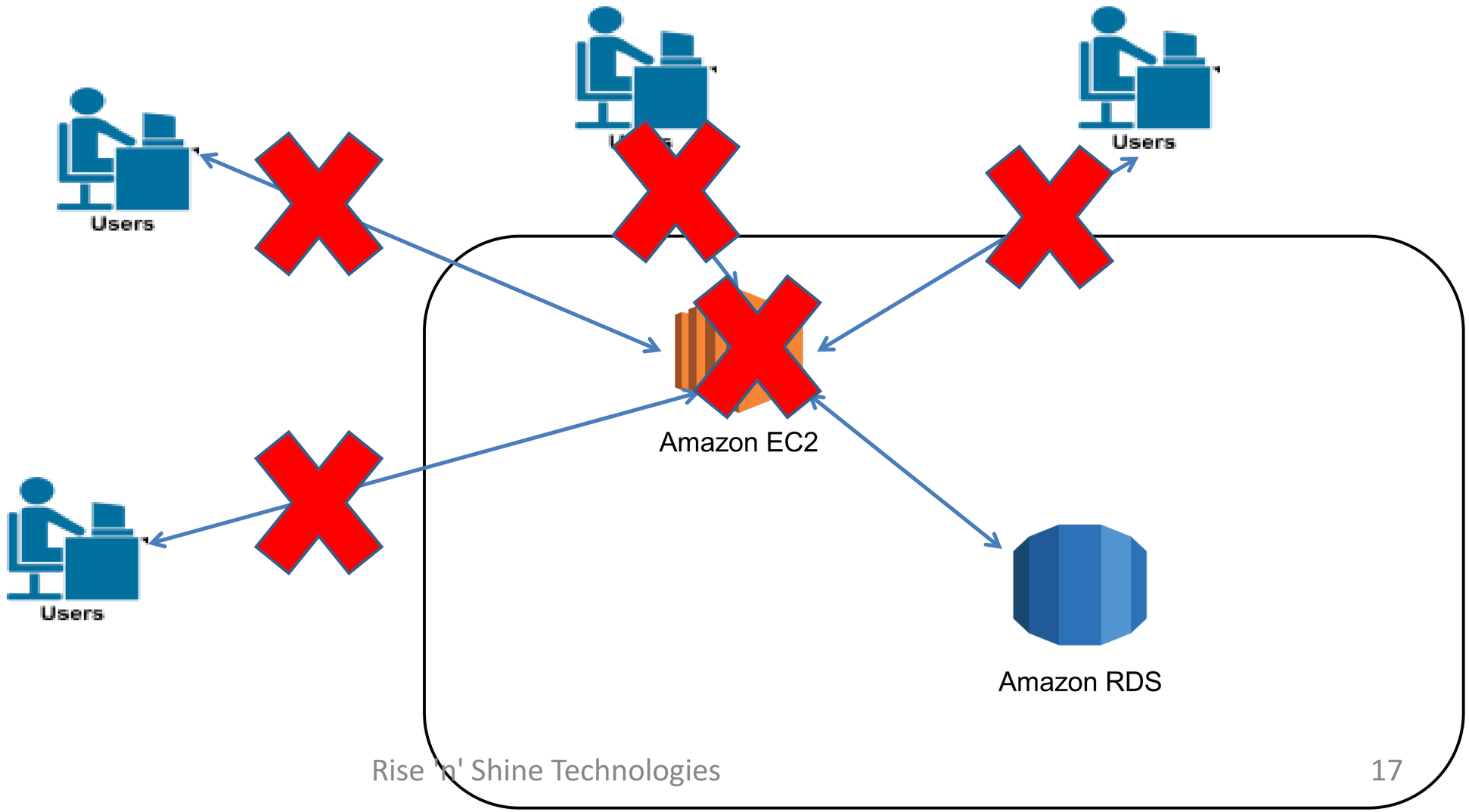
- **Insecure or Incomplete Data Deletion**
  - Extra copies of data are stored but are not available at the time of deletion
  - Disk that stores data of multiple tenants is destroyed.

Cloud Terminology:

- **High Availability** In computing, the term availability is used to describe the period of time when a service is available
- **Fault Tolerant:** is the property that enables a system to continue operating properly in the event of the failure of some (one or more **faults** within) of its components.
- **Scalability:** "Increasing" the capacity to meet the "increasing" workload.
- **Elasticity:** "Increasing or reducing" the capacity to meet the "increasing or reducing" workload.

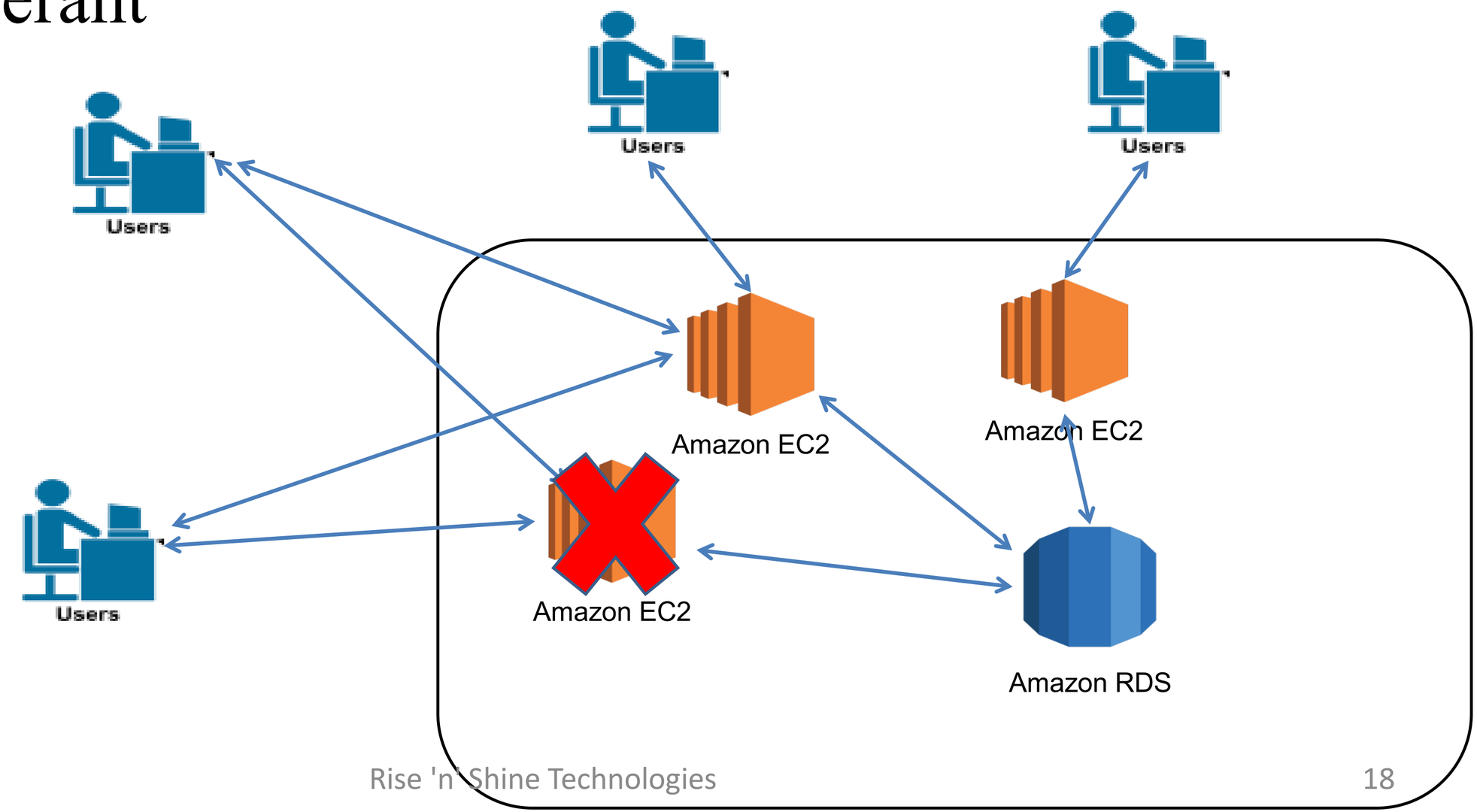
Cloud Terminology:

- High Availability



Cloud Terminology:

- High Availability
- Fault Tolerant

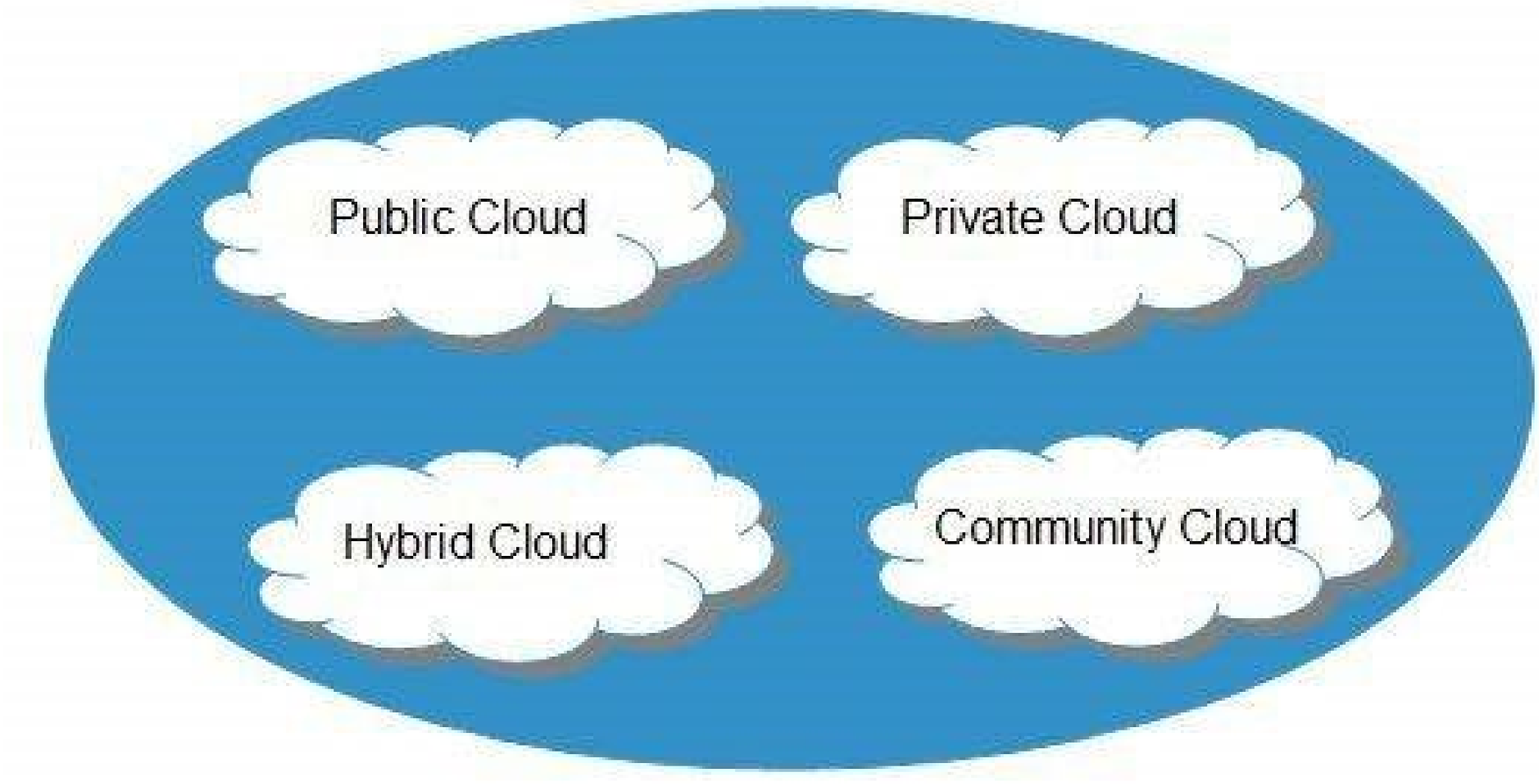


Basic Concepts

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:

- **Deployment Models**
  - Public Cloud
  - Private Cloud
  - Hybrid Cloud
  - Community Cloud
- **Service Models**
  - IAAS
  - PAAS
  - SAAS
  - Anything-as-a-Service (XaaS) is yet another service model, which includes Network-as-a-Service, Business-as-a-Service, Identity-as-a-Service, Database-as-a-Service or Strategy-as-a-Service.

Types of Clouds



Types of Cloud Explained

- **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.

- **PRIVATE CLOUD**

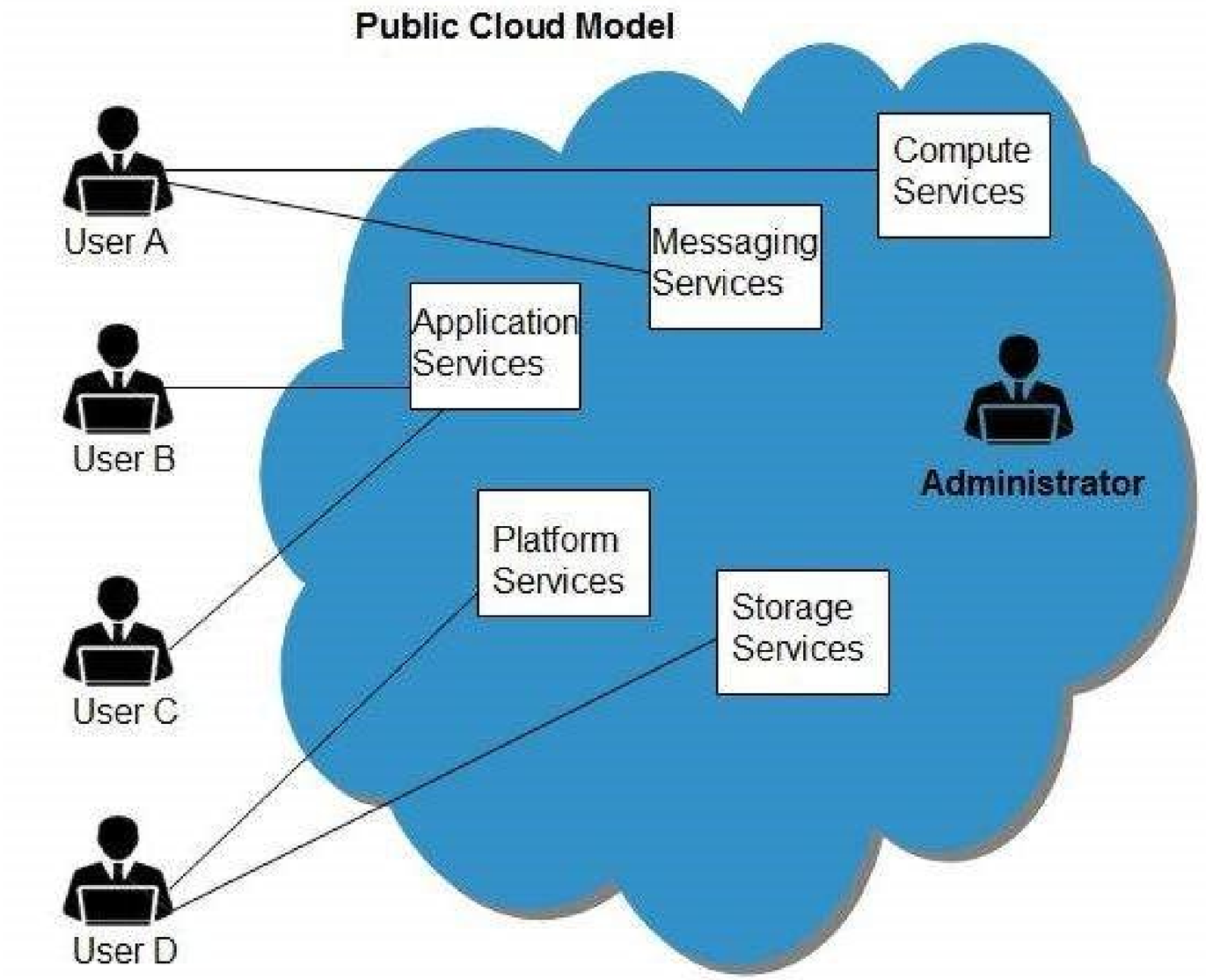
The **private cloud** allows systems and services to be accessible within an organization. It is more secured because of its private nature.

- **COMMUNITY CLOUD**

The **community cloud** allows systems and services to be accessible by a group of organizations.

- **HYBRID CLOUD**

The **hybrid cloud** is a mixture of public and private cloud, in which the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

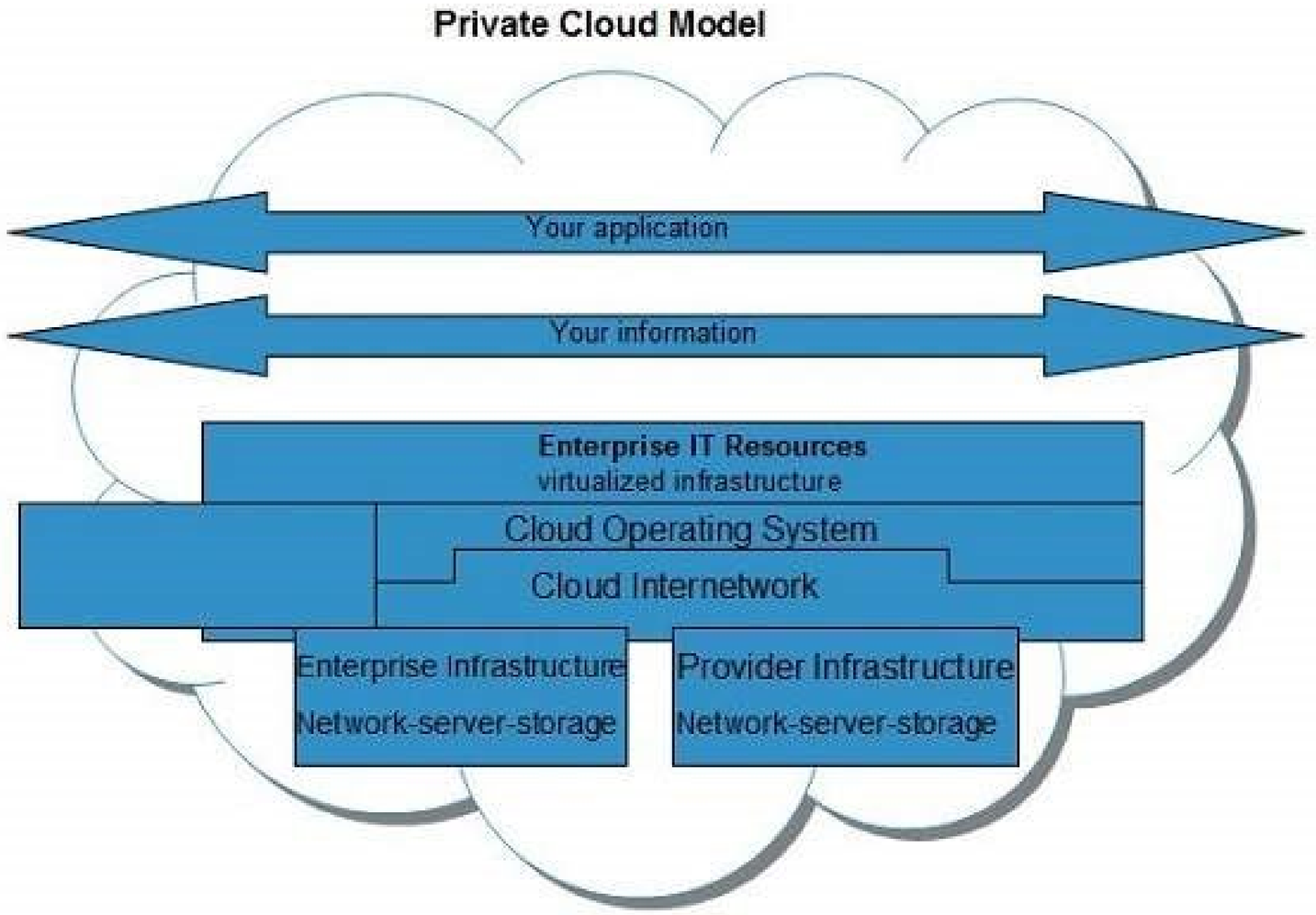


BENEFITS

- Cost Effective
- Reliability
- Flexibility
- Location Independence
- Utility Style Costing
- High Scalability

DISADVANTAGES

- Low Security
- Less customizable

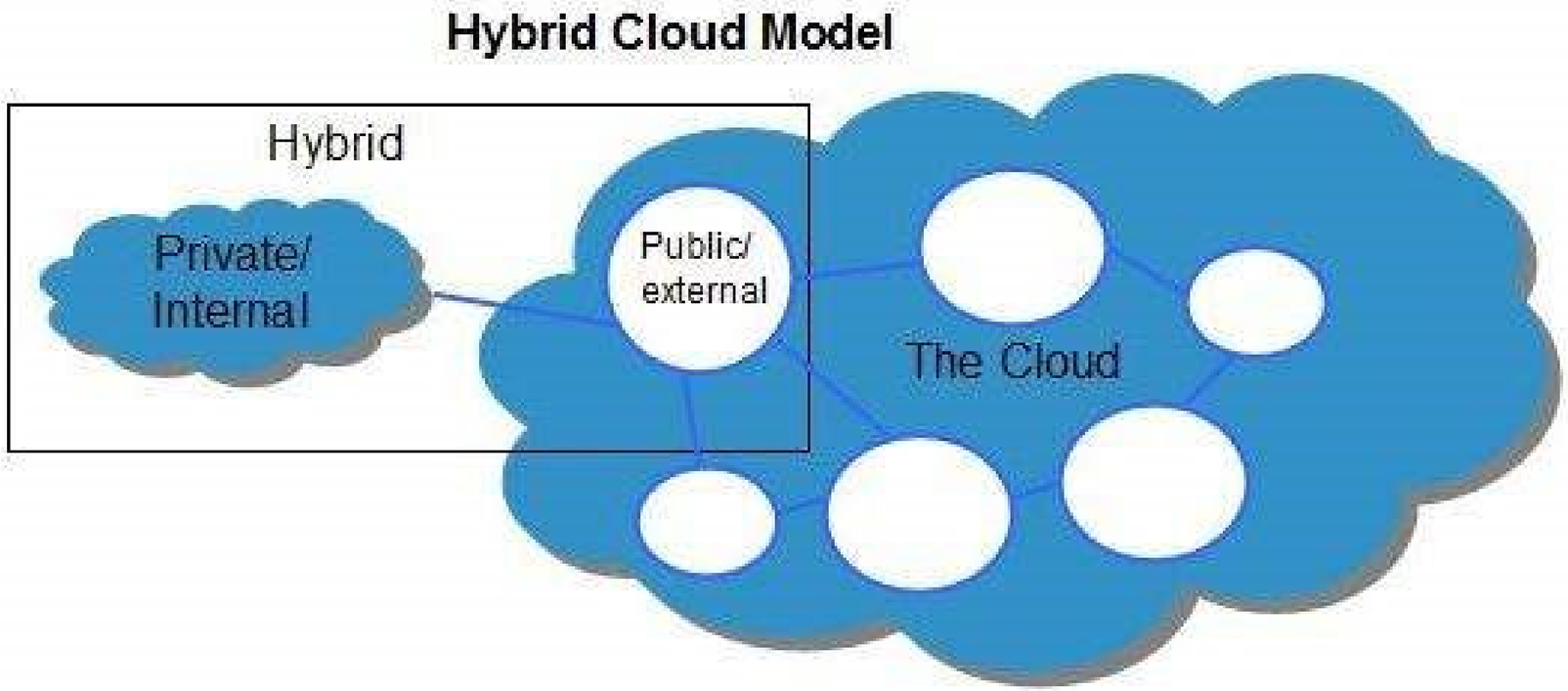


BENEFITS

- Higher Security and Privacy
- More Control
- Cost and energy efficiency

DISADVANTAGES

- Restricted Area
- Inflexible Pricing
- Limited Scalability
- Additional Skills

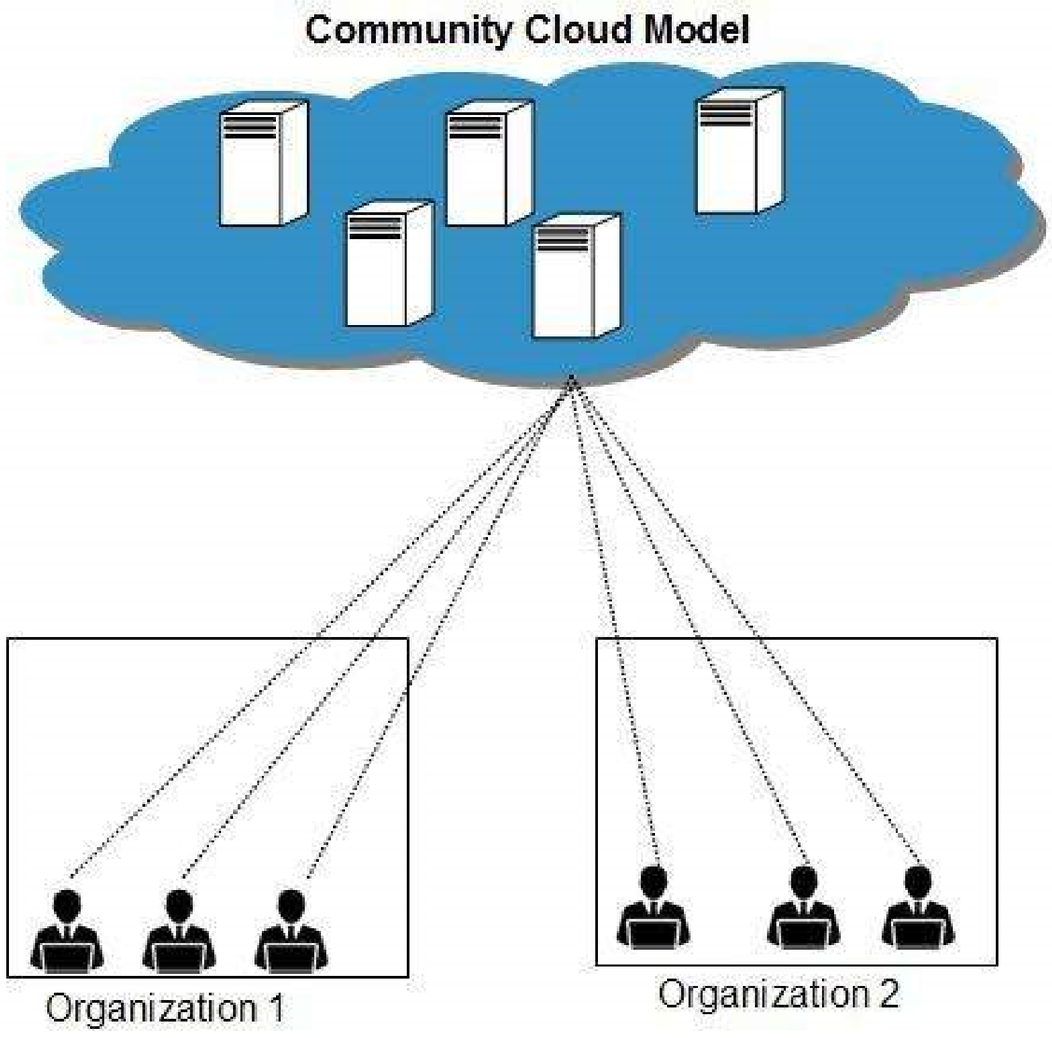


BENEFITS

- Scalability
- Flexibility
- Cost Efficiencies

DISADVANTAGES

- Networking Issues
- Security Compliance
- Infrastructural Dependency



BENEFITS

- Cost effective
- Sharing Between Organizations
- Security

ISSUES

- Since all data is housed at one location, therefore one must be careful in storing data in community cloud because it might be accessible by others.
- It is also challenging to allocate responsibilities of governance, security and cost.

Service Models

- **INFRASTRUCTURE-AS-A-SERVICE (IAAS)**

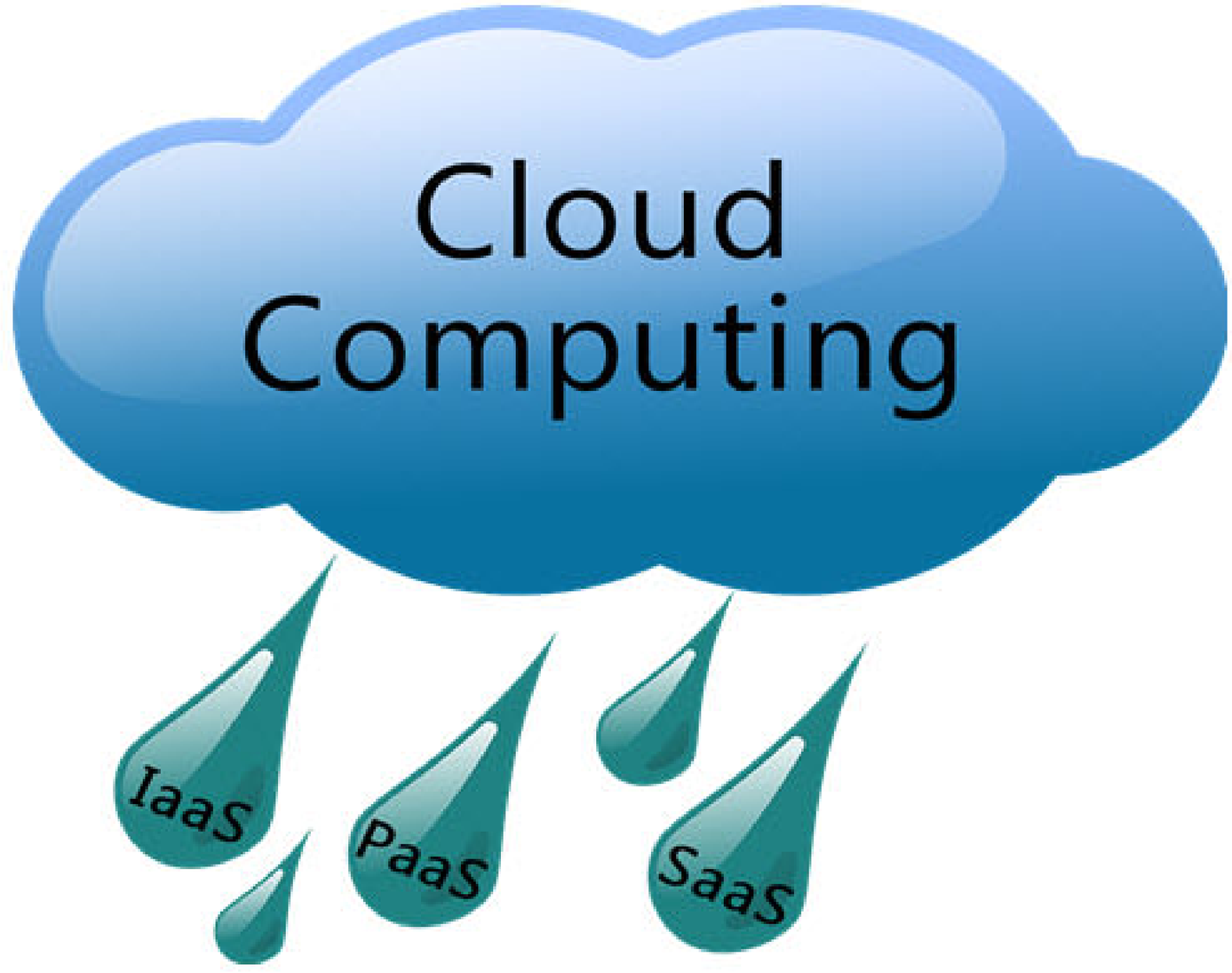
IaaS provides access to fundamental resources such as physical machines, virtual machines, virtual storage, etc.

- **PLATFORM-AS-A-SERVICE (PAAS)**

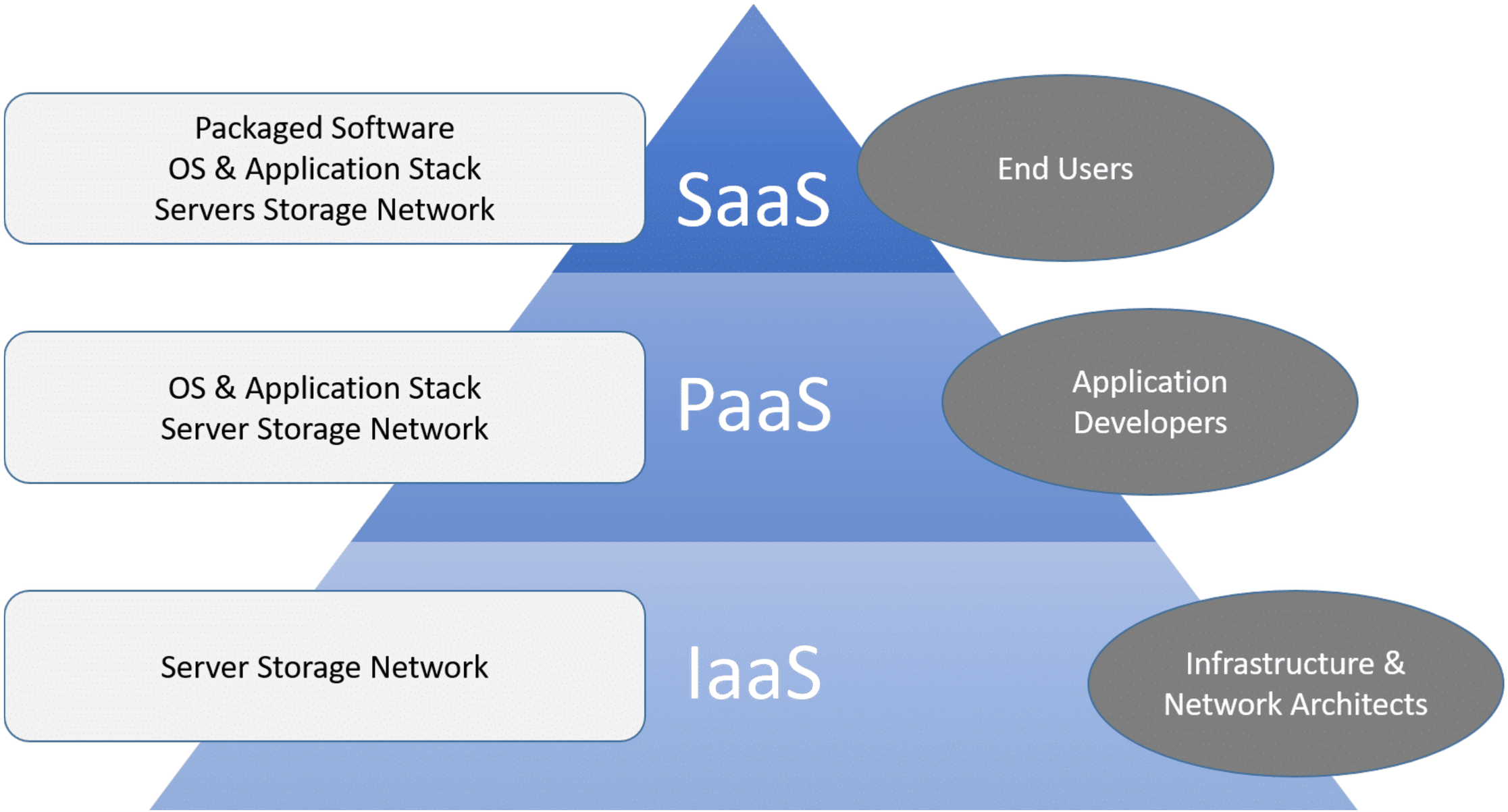
Deploy application without managing virtual servers (Google App Engine, , AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com)

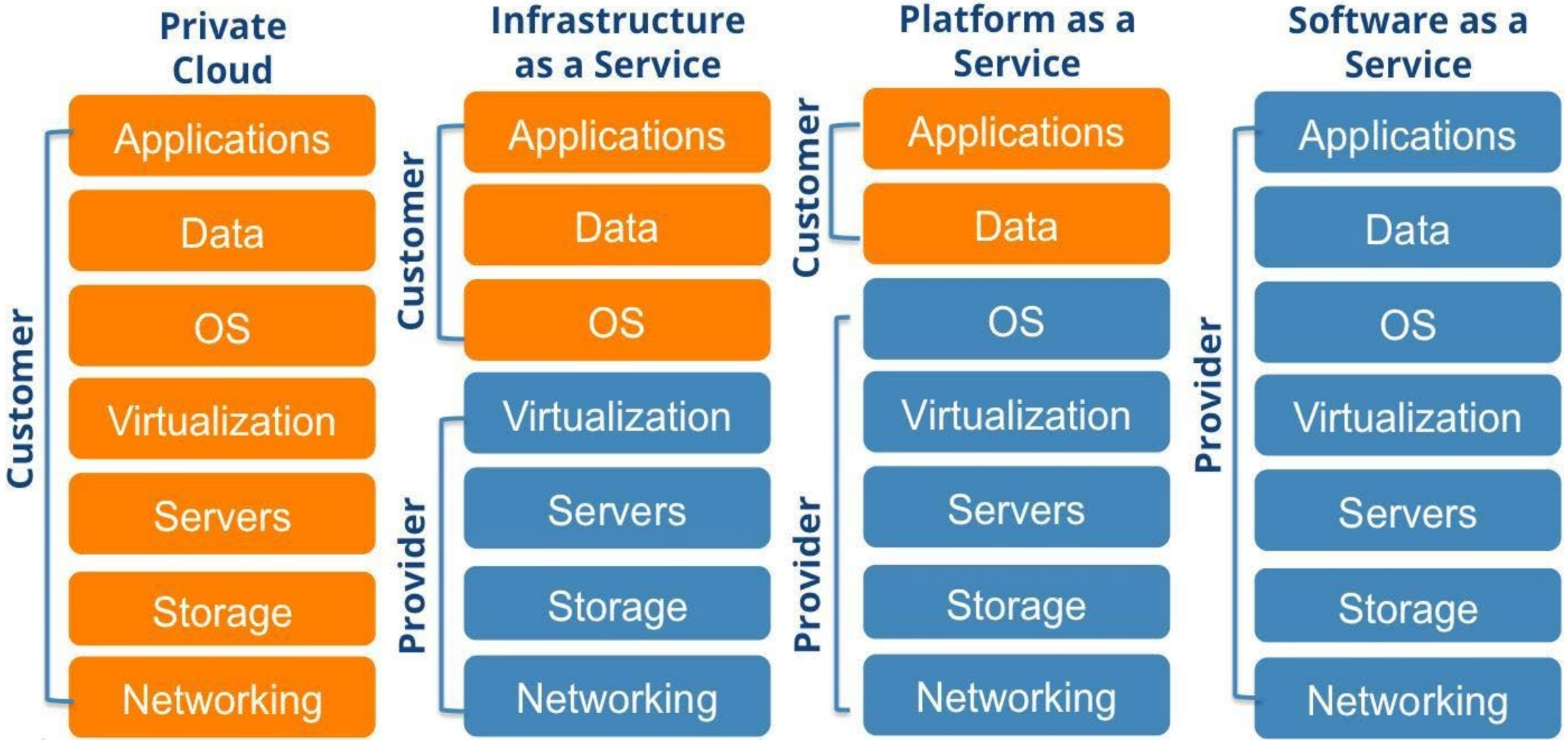
- **SOFTWARE-AS-A-SERVICE (SAAS)**

Ready to use software applications (Gmail, Office365, Google Apps, Dropbox, Salesforce, Cisco WebEx, Concur, GoToMeeting)

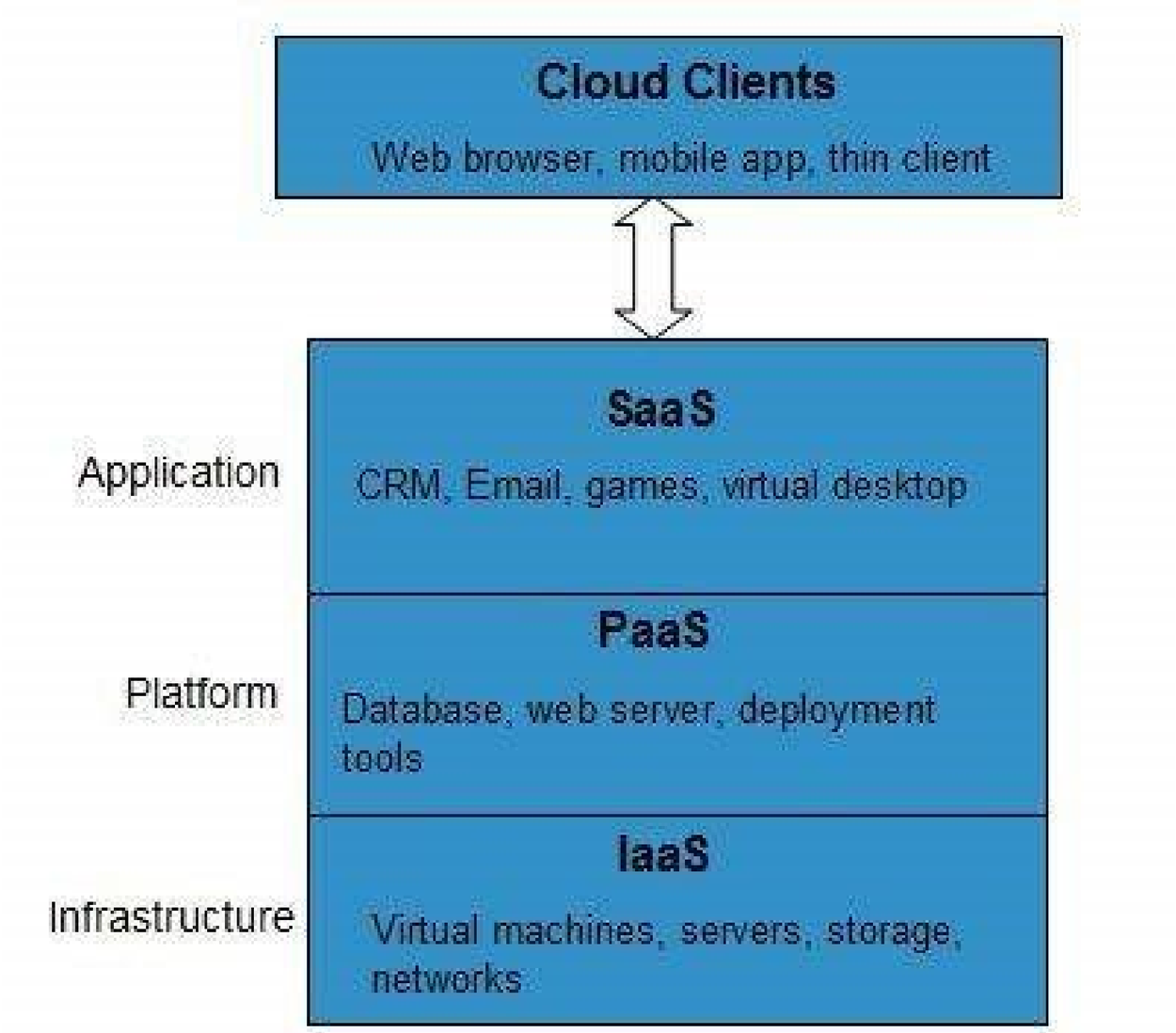

Cloud
Computing
IaaS
PaaS
SaaS

Cloud Service Models




Private Cloud
Customer
Applications
Data
OS
Virtualization
Servers
Storage
Networking
Infrastructure as a Service
Customer
Applications
Data
OS
Provider
Virtualization
Servers
Storage
Networking
Platform as a Service
Customer
Applications
Data
OS
Provider
Virtualization
Servers
Storage
Networking
Software as a Service
Provider
Applications
Data
OS
Virtualization
Servers
Storage
Networking

Service Models



The Cloud Scales: Customers in 190Countries

Summary

- **Common use cases of Infrastructure**
- **What is Cloud & Cloud Computing**
- **History of Cloud Computing**
- **Cloud Computing Architecture**
- **Deployment Models(Public, Private, Hybrid & Community Clouds)**
- **Service Models(Iaas, Paas, SaaS & Xaas)**
- **Benefits of Cloud Computing**
- **Risks of Cloud Computing**
- **High Availability, Fault Tolerance, Scalability & Elasticity**