Cloud Computing

Lecture-9

Introduction

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.

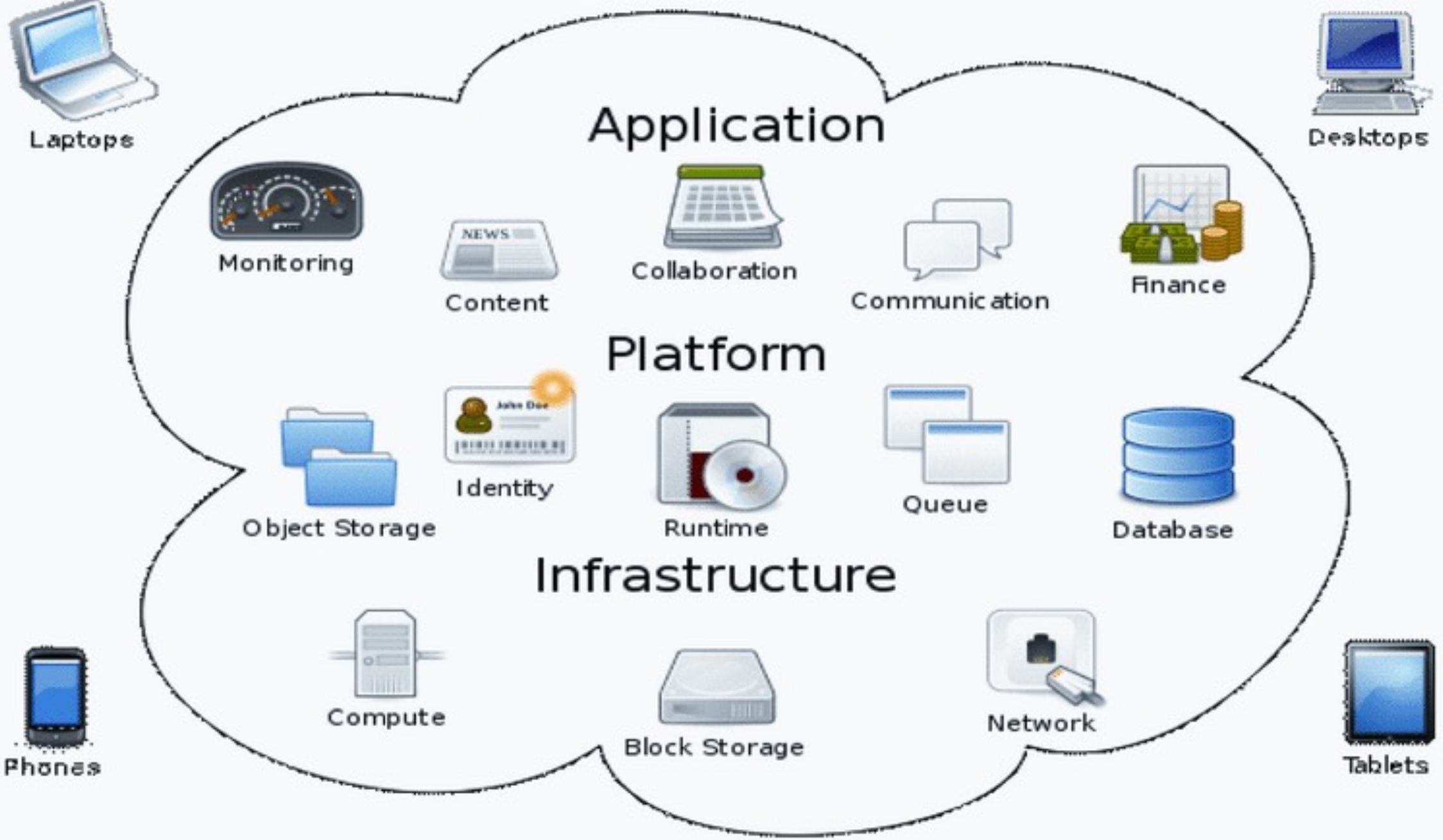
With Cloud Computing users can access database resources via the internet from anywhere for as long as they need without worrying about any maintenance or management of actual resources.

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.

- Applications such as e-mail, web conferencing, customer relationship management (CRM), all run in cloud.



Cloud Computing

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
- Service Models

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
- Community
- Hybrid

Deployment Models

- **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.

Service Models

Service Models are the reference models on which the Cloud Computing is based.

These can be categorized into three basic service models as listed below:

- Infrastructure as a Service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)

Infrastructure as a Service (IaaS)

Infrastructure as a service (IaaS):is a cloud computing offering in which a vendor provides users access to computing resources such as servers, storage, and networking. Organizations use their own platforms and applications within a service provider's infrastructure.

Key features

- Instead of purchasing hardware outright, users pay for IaaS on demand.
- Infrastructure is scalable depending on processing and storage needs.
- Saves enterprises the costs of buying and maintaining their own hardware.
- Because data is on the cloud, there is no single point of failure.

IaaS Examples

Platform as a Service (PaaS)

Platform as a service (PaaS): is a cloud computing offering that provides users a cloud environment in which they can develop, manage, and deliver applications. In addition to storage and other computing resources, users are able to use a suite of prebuilt tools to develop, customize and test their own applications.

Key features

- PaaS provides a platform with tools to test, develop, and host applications in the same environment.
- Enables organizations to focus on development without having to worry about underlying infrastructure.
- Providers manage security, operating systems, server software, and backups.
- Facilitates collaborative work even if teams work remotely.

PaaS Example

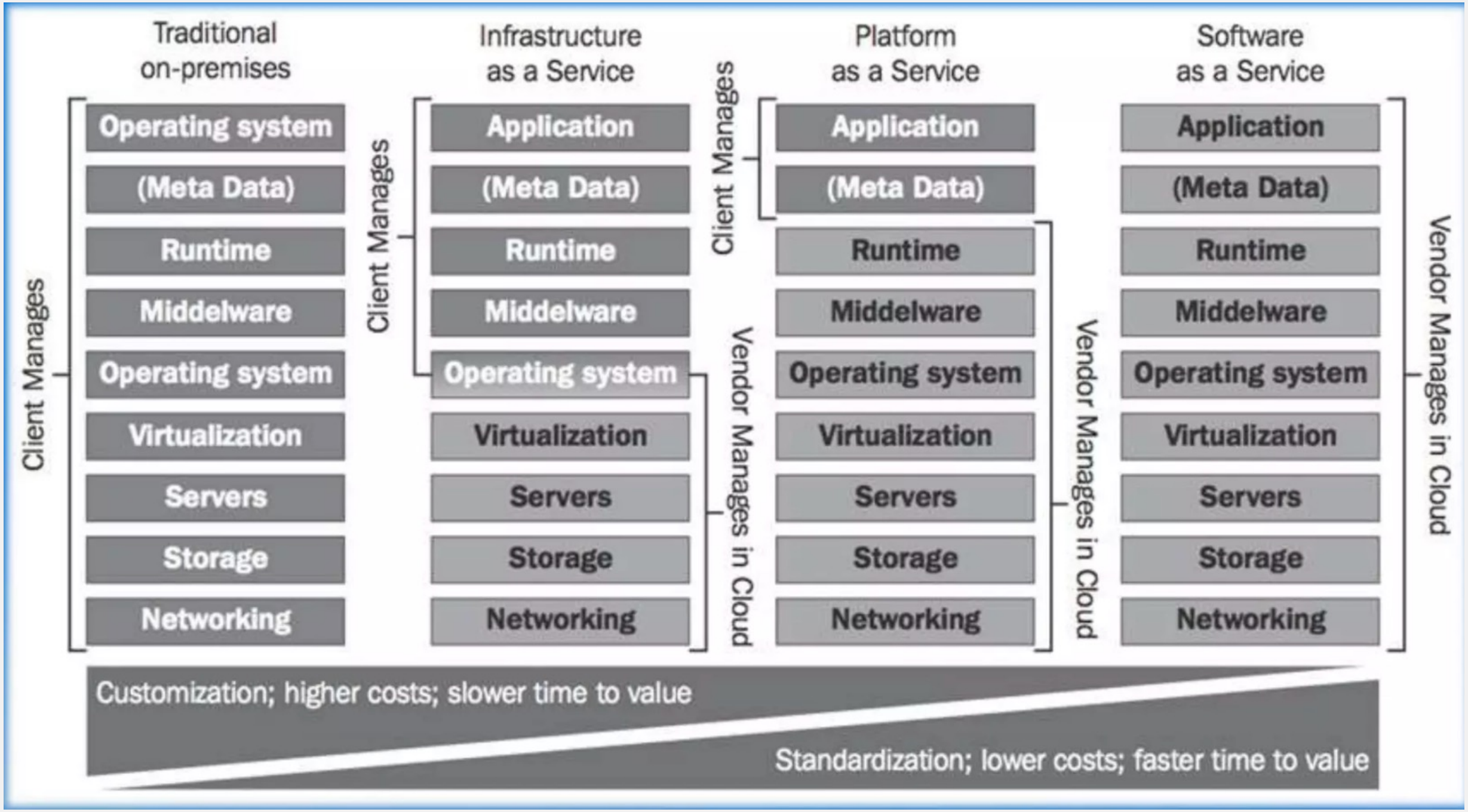
Software as a Service (SaaS)

Software as a service (SaaS): is a cloud computing offering that provides users with access to a vendor's cloud-based software. Users do not install applications on their local devices. Instead, the applications reside on a remote cloud network accessed through the web or an API. Through the application, users can store and analyze data and collaborate on projects.

Key features

- SaaS vendors provide users with software and applications on a subscription model.
- Users do not have to manage, install, or upgrade software; SaaS providers manage this.
- Data is secure in the cloud; equipment failure does not result in loss of data.
- Use of resources can be scaled depending on service needs.

SaaS Examples


Traditional on-premises
Infrastructure as a Service
Platform as a Service
Software as a Service
Client Manages
Vendor Manages in Cloud
Vendor Manages in Cloud
Vendor Manages in Cloud
Application
(Meta Data)
Runtime
Middelware
Operating system
Virtualization
Servers
Storage
Networking
Customization; higher costs; slower time to value
Standardization; lower costs; faster time to value

Advantages

- Lower computer costs Improved performance
- Reduced software costs
- Instant software updates
- Improved document format compatibility
- Unlimited storage capacity
- Increased data reliability
- Universal document access
- Latest version availability
- Easier group collaboration
- Device independence

Disadvantages

- Requires a constant Internet connection
- Does not work well with low-speed connections
- Features might be limited
- Can be slow
- No control over storage data