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Introduction to Cloud Computing

1. What is cloud computing?
    a. An computing resource distribution method over the internet that was created in response to users' needs.
2. 5 essential characteristic
    a. On-demand Self-service
    b. Broad Network Access
    c. Resource Pooling
    d. Rapid Elasticity
    e. Measured Service
3. 3 deployment model
    a. Public
    b. Hybrid
    c. Private
4. 3 service model
    a. Software as a Service
    b. Platform as a Service model
    c. Infrastructure as a Service

## Lesson Summary

- Cloud computing is the delivery of on-demand computing resources over the internet on a pay-as-you-go basis; resources are dynamically assigned and reassigned among multiple users and scale up and down in response to users' needs.

- The origins of cloud computing can be traced back to the mainframes of the 1950s, with virtualization technologies and hypervisors serving as catalysts for the emergence of modern-day cloud computing.

- Organizations must consider their business needs, investment viability, and risk capacity in order to create a cloud adoption strategy that delivers desired benefits without causing business disruptions and security, compliance, or performance issues.

- Cloud adoption is growing faster than predicted. Driving this technological wave are cloud service providers with a host of services ranging from Infrastructure, Platform, and Software services. Some major Cloud providers of our times include AWS, Alibaba Cloud, Google, IBM, and Microsoft Azure.

# Overview of Cloud Service Models

1. IaaS cloud provider manages
    a. Data centers
    b. Cooling
    c. Power
    d. Networking & security
    e. Servers & Storage

    Pro : 1. Test and Development
    2. Business Continuity and Disaster Recovery
    3. Faster Deployment and Scaling
    4. High Performance Computing
    5. Big Data Analysis

    Con : 1. Lack of Transparency
    2. Dependency on a third party

2. PaaS Cloud provider manages the Platform infrastructure
    a. Operating System
    b. Development tools
    c. Databases
    d. Business analytics

    Pro : 1. Test and Development
    2. Business Continuity and Disaster Recovery
    3. Faster Deployment and Scaling
    4. High Performance Computing
    5. Big Data Analysis

    Con : 1. Lack of Transparency
    2. Dependency on a third party

3. SaaS Cloud provider hosts & manages
    a. Application
    b. Data

Pro : 1. Greatly reduce the time from decision to value
2. Increase workforce productivity and efficiency
3. Users can access core business apps from anywhere
4. Buy and deploy apps in minutes
5. Spread out software costs over time

Con : 1. Data ownership and data safety
2. Third-party maintains business- critical data
3. Needs good internet connection

**Summary**

- Cloud computing allows us to utilize technology as a service, leveraging remote resources on-demand, on a pay-as-you-model. There are three main service models available on the cloud—Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS).

- IaaS provides the fundamental compute, network, and storage resources for customers on-demand.

- PaaS provides customers the hardware, software, and infrastructure to develop, deploy, manage, and run applications created by them or acquired from a third-party.

- SaaS provides access to users to a service provider's cloud-based software. Users simply access the applications on Cloud while the Cloud provider maintains the infrastructure, platform, data, application code, security, availability, and performance of the application.

# Introduction to Deployment models

1. Deployment models indicate
    a. Where the infrastructure resides
    b. Who pens and manages it
    c. How cloud resources and services are made available to users

2. Public Cloud model : The cloud provider owns, manages, provisions, and maintains the infrastructure

    a. Characteristics : Virtualized multi-tenant architecture enabling tenants or users to share computing resource

    b. Pro :
        1. On-demand resources
        2. Economies of scale
        3. Highly reliable

    c. Con:
        1. Security
        2. Data sovereignty compliance

3. Private Cloud model : cloud infrastructure provisioned for exclusive use by a single organization comprising multiple consumers.

    a. Pro :
        1. Controlled by internal IT
        2. Reduced Costs
        3. Better scalability
        4. Controlled access & security
        5. Greater agility

4. Hybrid Cloud model : connects an organizations' on-premise private cloud and third-party public cloud

    a. Pro :
        1. Interoperable
        2. Scalable
        3. Portable

    b. Type : :
        1. Hybrid monocloud - one cloud provider
        2. Hybrid multi cloud - can be deployed on any public cloud infrastructure
        3. Cinoisute multi cloud - greater flexibility

## Summary

- Deployment models indicate where the infrastructure resides, who owns and manages it, and how cloud resources and services are made available to users. There are three main deployment models available on the cloud—Public, Private, and Hybrid.

- In the Public cloud model, the service provider owns, manages, provisions, and maintains the physical infrastructure such as data centers, servers, networking equipment, and storage, with users accessing virtualized compute, networking and storage resources as services.

- In the Private cloud model, the provider provisions the cloud infrastructure for exclusive use by a single organization. The private cloud infrastructure can be internal to the organization and run or on-premises. Or, it can be on a public cloud, as in case of Virtual Private Clouds (VPC) and be owned, managed, and operated by the cloud provider.

- In the Hybrid cloud model, an organization's on-premise private cloud and third-party, public cloud is connected as a single, flexible infrastructure leveraging the features and benefits of both Public and Private clouds.