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Cloud Computing Tutorial

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Cloud Computing Tutorial

Delivering IT resources using a pay-as-you-go paradigm is known as cloud computing. Just the usage is charged for. Let's learn more about them in this cloud computing tutorial.

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Introduction to Cloud Computing

With the use of an internet connection, we can design, set up, and personalize apps thanks to cloud computing technologies. It consists of a database, software, hard disk, and development platform. In this cloud computing tutorial, we cover the following concepts:

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- Overview of Cloud Computing
- Cloud Deployment Models
- Cloud Services Models
- Cloud Virtualization
- Cloud Service Providers

Overview of Cloud Computing

We have access to applications as utilities through the internet due to cloud computing. Our business apps may be created, set up, and customized online because of it. Cloud computing relieves the storage issues for many organizations globally.

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Features of Cloud Computing

Cloud computing has many features, these are just a few of them:

- Wide-ranging network access and quick elasticity
- On-demand self-services and resource pooling
- Measured services and multi-tenancy
- Virtualization and flexible pricing models
- Resilient computing with high-level security
- Automation and sustainability

Advantages of Cloud Computing

With the innovative technology known as cloud computing, people and organizations may now access and store data and apps online rather than on local servers or desktop PCs. Here are some advantages to using cloud computing:

Cost-efficient: These businesses scaled fast as their user base increased while managing their operations cost-effectively because of the utilization of cloud services.

Effective collaboration: Cloud-based platforms provide real-time collaboration among employees,

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irrespective of their geographical location.

Scalability: Because cloud computing is scalable, its systems can accommodate growing demand without experiencing a breakdown.

Disaster recovery: In the case of a natural disaster or data center failure, they can swiftly recover vital information and carry on with business.

Improved customer service: The ability to obtain current information from any location, enhancing customer service and response times.

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Cloud Computing Interview Questions and Answers

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Cloud Computing Architecture

Every firm is taking on a new structure due to cloud computing, which offers virtualized services and resources on demand. Cloud computing architecture is an amalgam of Event Driven Architecture (EDA) and Service Oriented Architecture (SOA).

The components of cloud computing architecture include client infrastructure, applications, services, runtime clouds, storage, infrastructure, management, and security.

Front End: The client side of the cloud computing system is referred to as the frontend of the cloud architecture.

This means that it includes all of the client-side applications and user interfaces needed to access cloud computing resources and services.

Using a web browser to access the cloud platform is one example.

Back End: The term "backend" describes the cloud that the service provider uses.

In addition to managing the resources and offering security measures, it also holds the resources.

Massive storage, virtual computers, virtual apps, traffic management systems, deployment methodologies, etc. are also included.

Components of Cloud Computing Architecture

The components of the cloud computing architecture are as follows:

- **Client Infrastructure:** It includes the user interfaces and applications needed to use the cloud platform.
- **Internet:** An internet connection creates interaction and communication between the front end and the back end by serving as a medium or bridge.
  - **Application:** An application is a piece of software or platform that a client accesses and is part of the backend component.
  - **Service:** Backend refers to the three main categories of cloud-based services: SaaS, PaaS, and IaaS. It controls the kind of service the user accesses as well.
  - **Cloud Runtime:** The runtime cloud in the backend provides the runtime environment and execution platform for the virtual machine.
  - **Storage:** Backend storage offers scalable, adaptable storage services and data management for stored information.
  - **Infrastructure:** Cloud infrastructure refers to the servers, storage, network devices, virtualization software, and other hardware and software that comprise the cloud.
- **Management:** Backend components such as applications, services, runtime clouds, storage, infrastructure, and additional security measures are called backend components.

- **Security:** Using various security measures in the backend to protect end users' access to cloud resources, systems, files, and infrastructure is known as "security in the backend."
- **Database:** The term "backend database" refers to a database, such as a SQL or NOSQL database, that is used to store structured data. A few instances of database services are Google Cloud SQL, Microsoft Azure SQL database, and Amazon RDS.
- **Networking:** Backend networking services, such as load balancing, DNS, and virtual private networks, offer networking infrastructure for cloud applications.
- **Analytics:** Backend services that offer analytics features including business intelligence, machine learning, and warehousing for cloud data.

Cloud Engineer Salary

Cloud Deploment Models

The cloud deployment model is a virtual computing environment that may be deployed in many ways based on the volume of data to be stored and the users' access rights to the infrastructure.

You can use any one of the following five cloud types, contingent on the needs of the organization:

Public Cloud

Anyone can use public cloud storage to store and retrieve data over the Internet on a pay-per-use basis.

Example: Google App Engine, Amazon elastic compute cloud (EC2), Microsoft, Windows Azure Services Platform, and IBM SmartCloud Enterprise.

Features of Public Cloud

Key features of the public cloud:

- Easily available
- Shared infrastructure
- Quick scalable
- Pay-per-usage
- Cloud server maintenance
- Reliable and redundant use
- High security

Private Cloud

Organizations use it to construct and oversee internal or external data center management. Opensource tools like Eucalyptus and Openstack can be used to deploy it.

Example: OpenStack, VMware vSphere, Microsoft Azure Stack, IBM Cloud Private, and Oracle Cloud at Customer.

Features of Private Cloud

- Exclusive use
- Control and security
- Flexible and customizable
- Compliance and regulatory requirements
- Scalable resource allocation
- Hybrid cloud integration
- Performance and reliability

Hybrid Cloud

Organizations can establish a computing environment that is both flexible and scalable by utilizing the advantages of both public and private clouds in a hybrid cloud arrangement.

Only users of the company can access services hosted on a private cloud, making hybrid clouds only partially secure. Services hosted on public clouds are accessible to all users.

Example: AWS, Office 365, and Google Application Suite.

Features of Hybrid Cloud

- Integration of public and private clouds

- Improved security and control
- Cost optimization
- Flexible and scalable
- Compliance and regulatory
- Data and application portability
- Disaster recovery and business continuity

Community Cloud

A community cloud enables several companies to share information amongst themselves and a particular community by making systems and services accessible.

One or more neighborhood organizations, a private business, or a combination of them own, operate, and administer it.

Example: Healthcare community cloud.

Features of Community Cloud

- Community-specific services
- Improved security
- Shared infrastructure
- Scalable and flexible
- Cost sharing and efficient

Multi-cloud

In cloud computing, multi-clouding refers to a strategy where businesses use many cloud service providers or platforms to fulfill their computing requirements.

Workloads, apps, and data are dispersed over several cloud environments, such as public, private, and hybrid clouds, in this process.

Example: AWS, Azure, and GCP (Google Cloud).

Features of Multi-Cloud

- Multiple cloud providers
- Cost optimization
- Diversification and risk deduction
- Integration and interoperability

- Vendor independence
- Data sovereignty
- High-level performance
- Improved reliability

Cloud Services Models

Using a network of distant servers hosted on the Internet for data processing, storage, and management in place of a local server or a personal computer is known as cloud computing. Five major categories comprise the majority of cloud computing services:

- Software as a service (SaaS)
- Platform as a service (PaaS)
- Infrastructure as a service (IaaS)
- Anything/Everything as a service (XaaS)
- Function as a Service (FaaS)

Software as a Service (SaaS)

One method of providing services and applications over the Internet is through software-as-a-service (SaaS). It eliminates the need for us to install and run apps on our personal computers or in data centers, which saves money on both software and hardware upkeep.

SaaS gives you the option to pay a cloud service provider on a pay-per-use basis for an entire software solution. SaaS applications are also referred to as hosted, on-demand, or web-based software at times.

Advantages of SaaS

- Cost effective and time efficient
- Accessible and scalable
- Updates automatically

Platform as a Service (PaaS)

Platform as a Service (PaaS) is a subset of cloud computing that gives programmers a framework and platform to create online apps and services. Users only need to use their web browser to access

PaaS services, which are hosted in the cloud.

Advantages of PaaS

- Easy to use and practical for users
- Economical
- Managing the lifespan effectively
- Effectiveness

Infrastructure as a Service (IaaS)

A service paradigm known as "Infrastructure as a Service" (IaaS) provides computer infrastructure to support different functions through outsourcing.

IaaS, or infrastructure as a service, refers to the provision of networking hardware, devices, databases, and web servers to businesses through outsourcing. Another name for it is HaaS, or Hardware as a Service.

Advantages of IaaS

- Cost-Effective
- High-level Security
- Less Maintenance

Anything as a Service (XaaS)

Another name for it is "everything as a service." These days, the majority of cloud service providers offer a single solution that combines all of the aforementioned features with a few extras.

Advantages of XaaS

- Flexible
- Scalable
- Cost effective

Function as a Service (FaaS)

One kind of cloud computing service is FaaS. For the purpose of developing, computing, running, and deploying code or the full program as functions, it offers its users or customers a platform. The developed code can be run in reaction to the particular occurrence. It is identical to PaaS as well.

Advantages of FaaS

- Highly scalable
- Code simplification
- Cost effective
- Simplified and efficient code maintenance
- Less authority over the structure
- You can write functions in any programming language.

Cloud Computing Project Ideas

Cloud Virtualization

Hardware virtualization, which is essential to providing infrastructure-as-a-service (IaaS) solutions for cloud computing in an efficient manner, is frequently used interchangeably with the term virtualization.

- Virtualization increases the flexibility and usage of hardware by enabling various operating systems and applications to run simultaneously on the same machine and its hardware.
- Furthermore, virtualization technologies offer a virtual environment for networking, storage, and memory in addition to application execution.

Host Machine: The host machine is the computer that will serve as the foundation for the virtual machine.

Guest Machine: The name "Guest Machine" refers to the virtual machine.

How Virtualization Works

Virtualization has a big impact on cloud computing.

- In cloud computing, users store data in the cloud, but they also profit from sharing the infrastructure thanks to virtualization.

- Cloud vendors manage the required physical resources, yet these providers impose excessive costs on their services, which impact each user and each enterprise.
- Through the use of external parties, virtualization enables users or organizations to maintain the services that the business needs, thereby cutting expenses.

In cloud computing, virtualization operates in this manner.

Advantages of Virtualization

- More adaptable and effective resource distribution.
- Increase the productivity of development.
- It lowers the cost of IT infrastructure.
- Swift scalability and remote accessibility.
- Resilience in the event of a calamity and high availability.
- Pay for on-demand access to the IT infrastructure.
- Allows for the use of several operating systems.

Types of Virtualization

The following are the various types of virtualization:

- Application Virtualization
- Network Virtualization
- Desktop Virtualization
- Storage Virtualization
- Server Virtualization
- Data virtualization

Application Virtualization

Application virtualization makes it feasible to view an application remotely from a server. The application can still be used locally on a workstation connected to the internet, but the server retains all user data and other features.

Example: A user who needs to run two separate versions of the same software. Packaged and

hosted apps are examples of technologies that make use of application virtualization.

Network Virtualization

The capacity to operate several virtual networks, each with its own data plan and control.

On top of a single physical network, it coexists. Individual parties that might be secretive to one another could manage it.

Within days or even weeks, network virtualization enables the creation and provisioning of virtual networks, logical switches, routers, firewalls, load balancers, virtual private networks (VPN), and workload security.

Desktop Virtualization

With desktop virtualization, an OS can be remotely stored on a data center server. It enables the user to virtually access their desktop from any location using a separate device.

- Users will require a virtual desktop if they desire to use an operating system other than Windows Server.
- Desktop virtualization's primary advantages include user mobility, portability, and simple software installation, patching, and update management.

Storage Virtualization

An array of servers under the control of a virtual storage system is known as storage virtualization.

Despite modifications, malfunctions, and variations in the underlying hardware, storage virtualization software keeps everything running smoothly, delivers steady performance, and offers an ongoing array of sophisticated features.

Server Virtualization

This is a type of virtualization where server

resources are hidden. Every system can run its operating system independently.

By deploying main server resources into a sub-server resource, it improves performance and lowers operational costs. It helps with energy conservation, virtual migration, infrastructure cost reduction, and other areas.

Data Virtualization

This type of virtualization involves gathering data from multiple sources and managing it in one location without having to know more about technical details like how data is gathered, stored, and formatted.

- The data is then logically arranged so that interested parties, stakeholders, and users can access its virtual view remotely through various cloud services.
- Numerous massive corporations, including Oracle, IBM, At Scale, Cdata, etc.

Cloud Computing Training

Cloud Services Providers

Cloud service providers (CSPs) provide a range of services, including network services, business applications, mobile applications, infrastructure in the cloud, software as a service, platform as a service, and infrastructure as a service.

The following companies are cloud service providers:

AWS: Amazon Web Services

Amazon offers a safe cloud service platform called AWS (Amazon Web Services).

To support the expansion of the company, it provides a range of services, including relational databases, database storage, processing power,

content distribution, simple email, simple queue, and other features.

Key Features of AWS

- Highly scalable
- Cost effective
- More security services
- Flexible storage options

Microsoft Azure

Windows Azure is another name for Microsoft Azure.

IT professionals can create, implement, and oversee applications over a global network with ease due to its support for a multitude of operating systems, databases, programming languages, and frameworks. Users can also establish distinct groups for associated utilities.

Key Features of Azure

- Scalable, flexible, and cost-effective.
- Faster application management
- Various platforms are available to launch applications.
- Effective content delivery system.

GCP: Google Cloud Platform

Google produces the Google Cloud Platform. It is made up of several hardware components, including hard drives, virtual machines, and PCs.

Key Features of GCP

- Big data services
- Networking-related services
- High performance and highly scalable
- Serverless architecture
- Shell environment with Boost mode.

IBM Cloud Services

Faster, more dependable, and open-source is IBM Cloud. It is constructed using a variety of cutting-edge AI and data techniques.

- It provides a range of services, including platform as a service, software as a service, and infrastructure as a service.
- With an internet connection, you can use its services, which include compute power, cloud data & analytics, cloud use cases, and storage networking.

Key Features of IBM Cloud

- Improved operational efficiency
- Enhanced speed and agility
- IaaS, PaaS, and SaaS
- Effective cloud communication services.

VMWare Cloud

A single platform for Software-Defined Data Centers (SSDCs) in the hybrid cloud is VMware Cloud. It enables cloud service providers to create strong, flexible, agile, and efficient cloud services.

Key Features of VMWare

- Pay per usage and monthly subscription.
- Customer data protection.
- SDDC (Software-Defined Data Center)
- Flexible storage options.
- Supports multicast networking
- Cost and time efficient.

Conclusion

This cloud computing tutorial covers the fundamental concepts for your basic understanding. Join our **cloud computing training in Chennai** for comprehensive hands-on practices.

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