Chapter 1.

1. What is cloud Computing?
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3. What are different uses of Cloud Computing?
4. Explain different types of Cloud Computing Services such as Iaas, Paas, SaaS and Serverless computing.
5. What are different types of Cloud Computing?

What is Cloud Computing?

Well, to say in different words, cloud computing is the service provided to you on a pay-as-you-go basis wherein you can find various services such as servers, storage, databases, networking, software, analytics and intelligence-over the Internet i.e. ("the cloud"). This will lead one self to faster innovation, flexible resources and economies of scale. For example running millions of videos or viewing different sizes of photos shared from various platforms such as laptops, computers, mobiles etc. One can also get power to manage various critical operations from business needs and thus, gain profit. With all sorts of explanations, I would say that the cloud provides the flexibility for various infrastructure, low cost large upfront investments in hardware. Also, this will reduce the lot of time managing the hardware resources. The cloud will fulfil all your business needs to excel by accessing as many resources you need and only pay for what you use.

What are the top benefits of Cloud Computing?

Cloud computing has diverged the entire traditional way of business thinking to cloud service managing the small scale, large scale hardwares on just click of a button. The seven common reasons why organizations are turning to cloud computing services are:

1. **Cost:**
The capital expense for buying various hardware, software, setting up various settings on the servers or resources, running on-site data centers i.e. the racks of servers, all time availability of electricity for running hardware resources and cooling, internet connection, etc will be reduced to much extent.

2. **Global Scale:**
Cloud service provides the ability to scale elastically. In other words, one can use the right amount of resources - for example, more or less computing power, storage bandwidth etc. from the moment it is needed and from the geographic location they want to purchase.

3. **Performance:**
The cloud service eventually runs on a world wide network of secure data centers. These services are upgraded to the latest generation of fast and efficient computing hardware. Thus, benefiting the low network latency for applications and greater economies of scale.

4. **Security:**

The cloud services indeed provide better security posture overall, which helps protect data, apps and infrastructure from potential threats. Indeed, many cloud services provide a broader set of policies, technologies and control.

5. **Speed:**
Cloud services are provided on demand with self service, so even vast amounts of computing resources can be provisioned with just a few mouse clicks, giving businesses a lot of flexibility and taking the pressure off capacity planning.

6. **Productivity:**
Managing a private or personally owned data center requires a lot of racking and stacking of hardware setup, software patching, and other time-consuming IT management chores. But, using cloud computing it removes all of these managing tasks, and IT teams can spend time on achieving more important business goals.

7. **Reliability:**
Using data mirroring at multiple redundancy sites on the cloud provider's network will be useful for data backup, disaster recovery and thus, make business continuity easier and less expensive.

Explain different types of cloud services such as IaaS, PaaS, serverless and SaaS.

Most cloud computing services fall into four broad categories: infrastructure as a service (IaaS), platform as a service (PaaS), serverless and software as a service (SaaS). These are sometimes called the cloud computing stack because they build on top of one another. Knowing what they are and how they are different makes it easier to accomplish your business goals.

Cloud computing is divided into four different categories such as.
  a. *Infrastructure as service (IaaS)*
  b. *Platform as service (PaaS),*
  c. *Serverless.*
  d. *Software as a service (SaaS).*

IaaS: The most basic category of cloud computing services. With IaaS, you rent IT infrastructure—servers and virtual machines (VMs), storage, networks, operating systems—from a cloud provider on a pay-as-you-go basis.

PaaS: Platform as a service refers to cloud

computing services that supply an on-demand environment for developing, testing, delivering and managing software applications. PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network and databases needed for development.

Serverless computing: Overlapping with PaaS, serverless computing focuses on building app functionality without spending time continually managing the servers and infrastructure required to do so. The cloud provider handles the setup, capacity planning and server management for you. Serverless architectures are highly scalable and event-driven, only using resources when a specific function or trigger occurs.

SaaS: Software as a service is a method for delivering software applications over the Internet, on demand and typically on a subscription basis. With SaaS, cloud providers host and manage the software application and underlying infrastructure and handle any maintenance, like software upgrades and security patching. Users connect to the application over the Internet, usually with a web browser on their phone, tablet or PC.

What are different uses of Cloud Computing?

To introduce you from various perspectives, knowingly or unknowingly you are using cloud computing the moment you consume your internet connection for sending emails to watching videos from OTT platforms or youtube, listening to music or playing games online, store pictures or other files to sharing photos on social media, all sorts of information are nowadays shared using cloud computing. These information are shared or processed or analysed by many tiny startups to global corporations, governments agencies to nonprofits- are embracing the technology for all sorts of reasons.

a. Create cloud-native applications
Cloud computing is helping companies to quickly build, deploy and scale various applications - web, mobile and API. One may take advantage of cloud computing by building cloud-native technologies and approaches, such as containers, Kubernetes, micro services architecture, API-driven communication and DevOps.

b. Test and build applications
Nowadays scaling up or scaling down the infrastructure on cloud has become more popular and user friendly. These will lead to application development cost and time to reduce to much extent.

c. Store, backup and recover data.
Data protection is more efficiently done at massive scale - by transferring your data over the internet to an offsite cloud store system that is accessible from any location and/or device.

d. Analyse data
You can analyse the data using cloud services - machine learning and artificial intelligence, to give fruitful and better results with more informative decisions analysed from the data. The data can be unified using various sources of the internet whether it be real time data or from the data warehouse storing PetaBytes of data.

e. Stream audio and video.
Connecting globally with the audience from anywhere, anytime on any device with high definition video and audio.

f. Embed intelligence
Design meaningful models to help customers engagements which will provide valuable insights from the data captured.

g. Deliver software on demand
Delivering software on demand to Software as a Service (SaaS), this facility lets you offer the latest software versions and updates to customers - anytime they need anywhere they are.

What are different types of Cloud Computing?

There are several Cloud Computing services available on the internet, even though not all the clouds are the same, so one must pick the right computing solution which fulfills your demands and produces the computing service output desired by you.

Thus, firstly determine the cloud deployment or cloud computing architecture required by you, then select the cloud services which will be implemented on. There are three different ways to deploy the cloud services:

a. Public Cloud:
To be precise, the public clouds are owned and operated by a third-party cloud service providers, these services deliver their

computing resources like servers, storage over the internet and other facilities

b. Private Cloud:

A single business or organisation may host a private cloud referring to cloud computing. This private cloud can be physically located on the company's on-site datacenter. There are server companies too which pay to third-party service providers to host their private cloud. In other words, a private cloud is one in which the service and infrastructure are maintained on a private network.

c. Hybrid Cloud:

There are several situations in which the private clouds and public clouds are bound together by technology that allows data and applications to be shared between them. They also allow data and applications to move between different networks from private to public clouds. A Hybrid cloud gives business greater flexibility, more deployment options and helps optimise existing infrastructure, security and compliance.

Bibliography

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