Cloud Computing – An Introduction

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Abstract
Cloud computing is making available the various resources required by different types users at one place. These resources include servers of different capacities, storage devices, databases, networking, software, analytics and security. Users can use these services as per their need and requirement without worrying about the huge money requirement, infrastructure requirement, maintenance issues, hardware and networking resources, software and tools. The user just has to pay for the services used by him.

Keywords
Cloud Computing, Service Providers, Cloud types, SaaS, PaaS, IaaS

Introduction
When did you create your email id? Or maybe Orkut login or Facebook login? That's the time you started working in cloud! Yap! You read it correct! Your 1st email id or Orkut login or Facebook id – any or all of them are based on the cloud technology.

You might have seen or must be using Google drive. It stores 15GB of data for each account but where? Of course! In the cloud!

Today every social media is operating in cloud. But do you wonder how does it work or how secure it is to share data in the cloud? Does the heavy rainfall / storm effects this cloud!! Certainly not!

Alright, so here are the answers to all your doubts about the cloud.

As per IBM, it was back in 1950s when the cloud computing was born!

Ref: https://www.ibm.com/cloud/blog/cloud-computing-history
As per Wikipedia - https://en.wikipedia.org/wiki/Cloud_computing
Cloud computing came into regular use from 2000. Later various companies introduced their cloud services and providers are increasing.

As the technology evolved around the internet, cloud computing became the most obvious choice of service and tomorrow it'll be the only way of managing your data, running your businesses or even for that matter maintaining your home appliances ☺

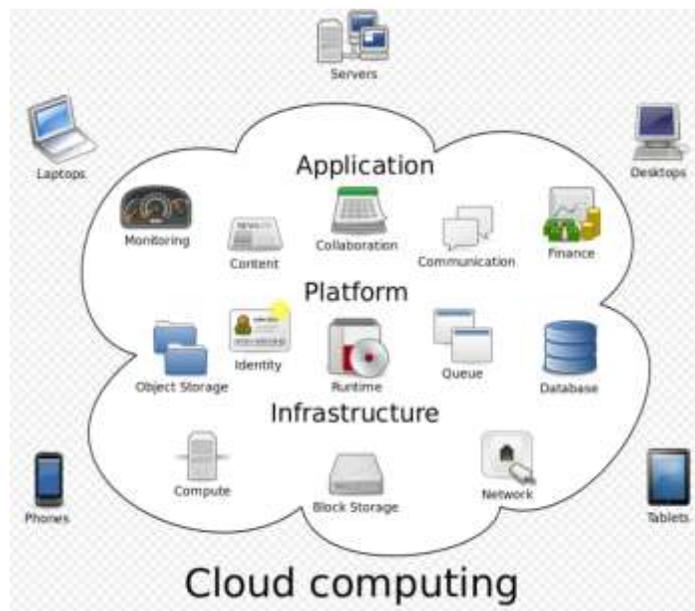So what exactly is cloud computing? Let's get started.

Image courtesy: Wikipedia

Cloud computing is availability of computer system resources (including servers, storage, databases, networking, software, analytics and intelligence) over the internet. Mainly on demand for your regular work or for running an entire IT department of any business.

As it's available over the internet, main features of cloud technology are offering speed for faster innovation, flexible resources and economies of scale. When you opt for any "cloud" based services, you only pay for the service not for any of the backend resources used to run that whole system.

Main aim of this unique technology is to allow users to use it without any expertise or depth of technical knowledge. Also, it helps you to focus on your main business instead of delving into IT related maintenance complications.

To simplify it further, I would like to give one example.

You want to start new small-scale business where initial team is of four-six people.

In today's world no business can run without its website and social media presence. Also, whatever be the business, daily some or the other form of transactions are going to get generated. These transactions need to be documented with utmost accuracy and detailing.

Now, to cater to these requirements, you would need

1) domain name i.e. ".com" or ". co.<county name abbreviation -.in/.uk >" with unique name of your business for the website, social media account on Facebook, Instagram & twitter.
2) Dedicated computer(s) with good amount of disc space to store all the daily transactions as well as other activities carried out on admin / non-admin front by the staff.
3) Internet connection with good speed
4) Computers for all the staff members with licenses for OS, Microsoft office and business transactions related ERP / Tally applications
5) Dedicated office space to keep computers/ servers

So, to start your own business, this initial investment is MUST which may costs you at least few thousands.

Now, cloud service can give you huge amount of profit in the start itself by avoiding the major investment into physical server(s), login licenses, domain space and dedicated office space.

Simply, you go to google/ Microsoft/ amazon and ask for cloud space. Any of these service providers will give you different options and packages. According to your current business need, you can purchase the subscription. This account will be accessed by all team members and business data will be stored in secured manner. This data can be accessed from any corner of the world as its available on the internet with secured credentials. Tomorrow when your business and core team expand, you just have to ask for more space in the cloud account, that's it! No more new servers are required neither the patch upgrade nor maintenance headache you have to go through which ultimately saves of investing into physical resources and time ☺

Now, as we know the definition of cloud computing, let's deep dive into mechanics of it

Virtualization is the key technology behind cloud computing. It splits actual physical device into one or more virtual devices which can be used to perform no of tasks. Mainly, operating system level virtualization is designed so that scalable system of multiple independent devices can be set up. Also, idle devices if at all are lying in your infrastructure can be used to maximum efficiency.

Virtualization can boost IT operations as well as reduces cost on infrastructure. Another advantage is, automation of manual activities resulting into speeding up of the processes and minimizing the errors.

SOA – Service Oriented Architecture is another important principle, which helps cloud computing technology to address the recurring business problems. SOA breaks these problems into services which can be integrated to provide solutions. Best practises of SOA domain allow easy and globalized access to cloud services in standard manner.

Cloud computing also influences the concepts from utility computing to provide metrics for the services used. These metrics are the major part of the pay-per-use model of the public cloud. In addition to this, the feedback loop in autonomic computing have measured services as their essential part. This allows the services to scale on demand and to perform automatic failure recovery. Cloud computing is a kind of grid computing; which has evolved by addressing the QoS (quality of service) and reliability problems. Cloud computing provides the tools and technologies to build data/compute intensive parallel applications with much more affordable prices compared to traditional parallel computing techniques.

Major 3 types of cloud services that are available today are :
1) **SaaS:** Server as a Service - offers purpose-built business applications.
2) **PaaS**: Platform as a Service – offers development environments that IT organizations can use to create cloud-ready business applications.
3) **IaaS**: Infrastructure as a Service - offers storage and compute resources that developers and IT organizations use to deliver custom business solutions.

Based on the users of the cloud, it can be further classified as Private : single user/ single business, Public : multiple users, Hybrid : partly private partly public, and Community : Particular organization hosts cloud for others

Overall, the cloud embodies the following four basic characteristics:
1) Elasticity and the ability to scale up and down
2) Self-service provisioning and automatic de-provisioning
3) Application programming interfaces (APIs)
4) Billing and metering of service usage in a pay-as-you-go model

There are various challenges faced by cloud platform such as data privacy, reliability of the service provider, secured login management, maintenance cost etc.

Service Providers : Cloud service providers are the companies that offer cloud services to the various users. These services include the network and infrastructure related services and/or various business related services in the cloud. There are various cloud service provider companies like SAP, Google, Microsoft, IBM, Amazon, Salesforce etc.

Conclusion

Cloud based applications is a revolution in computer technology which has made any non-computer user to be able to access it without any hassle. Powered small scale businesses can be made IT enabled in no time and with less cost, and are also helped to scale in an easier manner. World is marching into cloud to be more and more wireless, quicker, easier for better future.

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