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Cloud Computing: A Review

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Abstract: Cloud computing is actually a model for enabling convenient, limitless, on demand network access to a shared pool of computing resource. This paper describes introductory part explain the concept of cloud computing, different components of cloud, types of cloud service development. At last paper elaborates the classification of cloud computing which will clear the ovelall idea of cloud computing to the learners who are new to this field.
Keywords: cloud computing, SaaS, PaaS, IaaS

I. INTRODUCTION

Cloud computing is on-demand access, via the net, to computing resources—applications, servers (physical servers and virtual servers), knowledge storage, development tools, networking capabilities, and more—hosted at a foreign knowledge center managed by a cloud services provider (or CSP). The CSP makes these resources accessible for a monthly subscription fee or bills them consistent with usage.

The cloud provides you easy accessibility to a broad vary of technologies so we will be able to initiate quicker and build nearly something that you just can imagine. you'll be able to quickly spin up resources as you would like them–from infrastructure services, like cypher, storage, and databases, to web of Things, machine learning, information lakes and analytics, and far additional .You can deploy technology services during a matter of minutes, and obtain from plan to implementation many orders of magnitude quicker than before this offers you the liberty to experiment, take a look at new ideas to differentiate client experiences, and rework your business.

II. CLOUD COMPUTING

Cloud computing basically includes SaaS(Software/Application as a Services) and Utility computing. Cloud Computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide those services.The services themselves have long been referred to as Software as a Service (SaaS). When a Cloud is made available in a pay-as-you-go manner to the general public, we call it a Public Cloud; the service being sold is Utility Computing.[1]

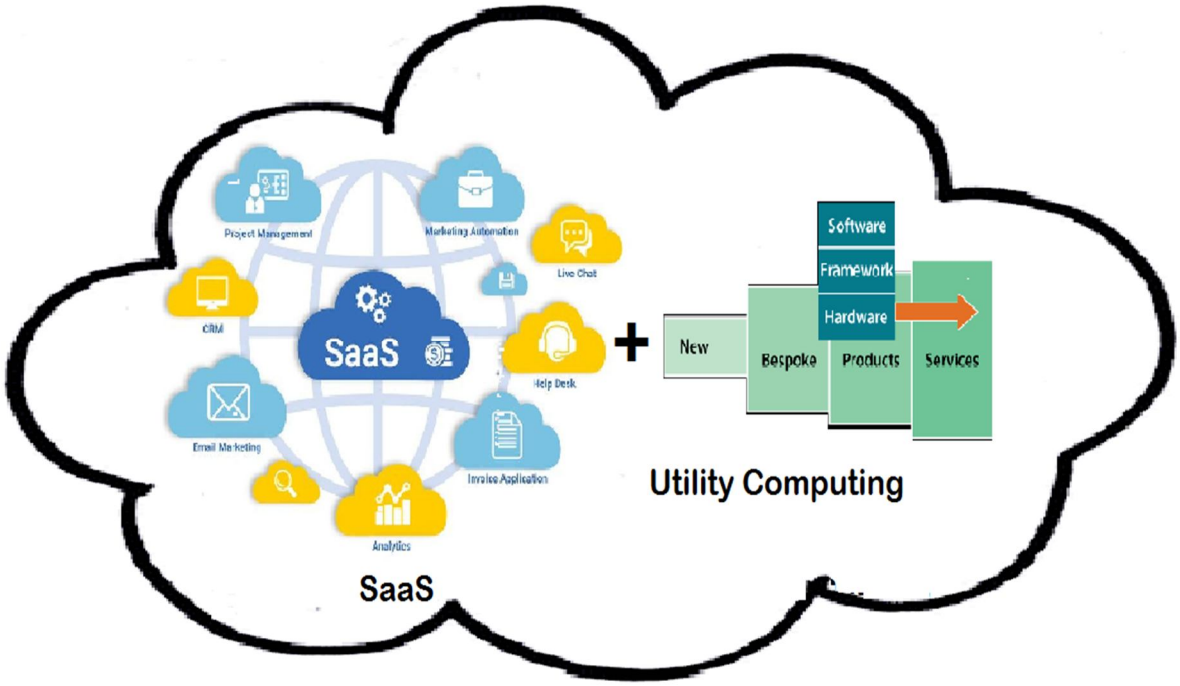


Figure1: Cloud Computing

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A. SaaS

Software as a service (or SaaS) is a way of delivering applications over the Internet—as a service. Instead of installing and maintaining software, we can simply access it via the Internet, freeing ourself from complex software and hardware management.
SaaS applications are sometimes called Web-based software, on-demand software, or hosted software. Whatever the name, SaaS applications run on a SaaS provider's servers. The provider manages access to the application, including security, availability, and performance.
Lets understand SaaS characteristics by taking an example of bank.A bank protects the privacy of each customer while providing service that is reliable and secure. A bank's customers all use the same financial systems and technology without worrying about anyone accessing their personal information without authorization.
A "bank" meets the key characteristics of the SaaS model such as:

1) Multitenant Architecture
2) Easy Customisation
3) Better Access
4) SaaS Harnesses the Consumer Web
5) SaaS Trends

B. Utility Computing

Utility computing is the most trending IT service model. It provides on-demand computing resources (computation, storage, and programming services via API) and infrastructure based on the pay per use method. It minimizes the associated costs and maximizes the efficient use of resources. The advantage of utility computing is that it reduced the IT cost, provides greater flexibility, and easier to manage. Large organizations such as Google and Amazon established their own utility services for computing storage and application.
Utility computing helps eliminate data redundancy, as huge volumes of data are distributed across multiple servers or backend systems. The client however, can access the data anytime and from anywhere.

III.COMPONENTS OF CLOUD COMPUTING

The main physical components of cloud infrastructure are **networking equipment, servers and data storage**. Cloud infrastructure also includes a hardware abstraction layer that enables the virtualization of resources and helps to drive down costs through economies of scale.

A. Client Infrastructure

The client infrastructure component is the part of the frontend which provides a graphic user interface for the user to interact with the cloud.

B. Application

An application is any platform like an app or software offered by a company by which the clients access the cloud.

C. Service

A *cloud service* manages the kind of service that a client needs to use according to his requirement. There are three types of services in cloud computing as SaaS, PaaS and IaaS.

D. Storage

The storage component of cloud computing provides the storage capacity in the cloud for storing and managing data. In cloud storage, the data can be accessible to multiple clients simultaneously. Cloud storage is generally in the form of three basic configurations: public cloud, private cloud, and hybrid cloud.

E. Infrastructure

The infrastructure provides services on the host level, application level, and network level. It includes the software and hardware components such as the storage network devices server and any other storage resource required to support the cloud computing model.

F. Platform

A cloud platform refers to the operating system and hardware of a server in an Internet-based data center. It allows software and hardware products to co-exist remotely and at scale. A cloud platform allows organizations to create cloud-native applications, test and build applications, and store, back up, and recover data. It also allows organizations to analyze data. Organizations can also stream video and audio, embed intelligence into their operations, and deliver software on-demand on a global scale.

G. Processing Power

A small one person operation can have access to large scale data processing power—all by tapping into the cloud. Cloud computing can even offer parallel processing wherein multiple microprocessors simultaneously break up and run program tasks or other operations to perform complex computations quickly and efficiently. For most companies, these operations would be too cost prohibitive to be effective. However, cloud processing power offers a viable option that allows for complex processing at a much lower cost.

IV. TYPES OF CLOUD SERVICE DEVELOPMENT

A. Software as a Service(SaaS)

Software as a service is where computer applications are accessed over the Internet rather than being installed on a local computing device or in a local data centre. SaaS can provide its users with many benefits. These include the general cloud computing advantages of dynamic scalability and any device independence, as well as the benefit of being able to use an application without incurring fixed costs. Many SaaS applications are also collaborative. This allows multiple users to share documents and even to work on them at the same time. For example, in the Google Sheets spreadsheet different users can work on different cells simultaneously. The cells different users are working on are locked-off and highlighted in different colours. A real-time chat window can also be opened up alongside the spreadsheet to further enhance collaboration.

B. Platform as a Service (PaaS)

A platform is a software environment used to develop and run applications. When people choose to cloud compute using platform as a service or 'PaaS', they obtain access to an online platform provided by a cloud computing vendor. They can then use this platform to develop and deliver their own online (SaaS) applications. Applications developed using PaaS may be used privately by just one or a few users within a particular company. However, they can also be offered free or for-a-fee to anybody on the web. This means that if you have a great idea for a new online application then you can use PaaS to turn it into a reality.

Several cloud suppliers now offer PaaS tools. These notably include Google App Engine, Microsoft Azure, and the Salesforce Platform. All such offerings effectively provide their customers with a box of cloud computing Lego. New applications are then constructed from the plastic bricks on offer. Some applications can even be built using a simple drag-and-drop interface. Relatively non-technical people can therefore create new online applications very quickly. Indeed, Salesforce have claimed that their "simplified programming model and cloud-based environment mean [customers] can build and run applications five times faster, at about half the cost of traditional software platforms".

C. Infrastructure as a Service (IaaS)

IaaS contains the basic building blocks for cloud IT. It typically provides access to networking features, computers (virtual or on dedicated hardware), and data storage space. IaaS gives you the highest level of flexibility and management control over your IT resources. It is most similar to the existing IT resources with which many IT departments and developers are familiar.

Infrastructure-as-a-Service, or IaaS for short, is when a cloud computing vendor hosts the infrastructure on behalf of their customers. The vendor hosts the infrastructure in "the cloud" – in other words, in various data centers. Their customers access this cloud infrastructure over the Internet. They can use it to build and host web applications, store data, run business logic, or do anything else that could be done on traditional on-premises infrastructure, but often with more flexibility.

V. CLASSIFICATION OF CLOUD

A. Public Cloud

Public cloud, in general, is SaaS services offered to users over the internet. The whole computing infrastructure is located on the premises of a cloud computing company that offers the cloud service. It is the IT infrastructure that is used by many companies and services at the same time. It is the most economical option for users in which the service provider bears the expenses of bandwidth and infrastructure. It has limited configurations, and the cost is determined by usage capacity. They offer an easy and affordable way to deploy Web sites and business systems, with high scalability, which in other solutions would be available.

B. Private Cloud

As the name implies, the private cloud is used by large enterprises to develop and manage their own data centers for particular business and IT operations. A secure IT infrastructure is controlled and operated for the benefit of a single organization. The organization can manage its own **private cloud** or outsource this task from an external contractor. Infrastructure can be placed either on the premises of the customer or in a data center. The ideal private cloud is the cloud that is deployed in the organization premises, served, and controlled by its employees.

C. Hybrid

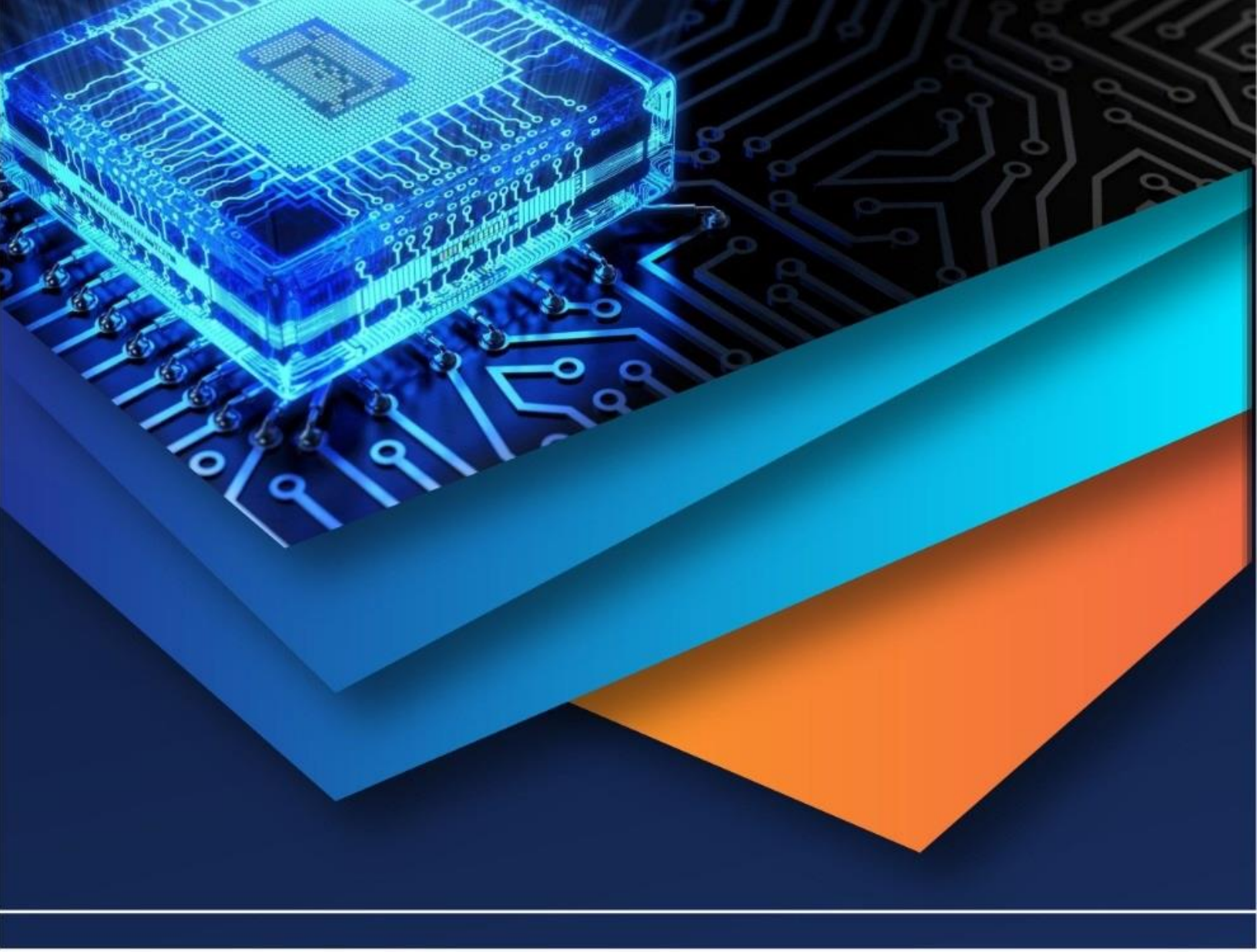
Is the IT infrastructure using the best qualities of public and private clouds, with the task? A hybrid cloud is the combination of a private and public cloud, providing for more flexibility to businesses while having control over critical operations and assets, coupled with improved flexibility and cost-efficiency. Often this type of cloud is used when an organization has seasonal periods of activity, in other words, once the internal IT infrastructure cannot cope with current challenges, some facilities are transferred to a public cloud (e.g. large amounts of statistical information, which is in its raw form or something that does not represent value for the enterprise), as well as to provide user access to enterprise resources (for private cloud) via a public cloud.

VI. CONCLUSION

Cloud computing is increasingly essential for firms that wish to remain competitive. This is simply because it costs less to access basic computing services (such as e-mail) from a cloud vendor than to run them in-house. Already many cloud computing vendors claim that their customers can reap cost savings of up to eighty per cent. Because cloud computing is dynamically-scalable, task-centric and does not require substantial fixed-cost investments, firms that cloud compute are also likely to be more competitively agile than their competitors. Cloud vendors offering SaaS, PaaS and IaaS now provide most individuals and organizations with a real alternative to running local computing resources in-house. For many years now, there have also been three key reasons to migrate to the cloud:i)To reduce costs and remain competitive ii)To lower carbon footprint iii)To access next-generation computing services.

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