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A Case Study of PaaS and Its Application in Cloud Computing

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Abstract— In modern era Cloud Computing is major hi-tech research area in latest technology. In the present time cloud computing technology have been developed to achieve better performance, Computing architecture and nature of access changed drastically the format of service-delivery model. Cloud offers services for computing on single mouse click. Cloud Computing is a broad word that describes a broad range of services such as Accessibility, Availability, Movability, Scalability, Flexibility, Reliability and Cap-Ex Free of computing resources on service-based economic model. Since the Cloud is a broad collection of services, user/client can choose where, when, and how they use Cloud Computing. The key utility of Cloud Computing is that here the client could take services on demand and pay per use. Cloud Computing contains of Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Software as a Service (SaaS). In this paper we will explain the Cloud Computing services commonly referred to as Platform as a Service (PaaS) and give some examples and case studies to illustrate how they all work. We will also provide some guidance on situations where particular flavours of Cloud Computing are not the best option for an organization.

Keywords— Cloud Computing, PaaS, IaaS, SaaS

I. INTRODUCTION

In traditional computing system, software, applications and data are typically installed and stored in local physical computer or local computing environment. Whereas, in a cloud computing environment, individuals and businesses work with applications and data stored and/or maintained on shared machines in a web-based environment rather than physically located in the home of a user or a corporate environment [1]. More than decades of research on computational performance in traditional Information Technology (IT), the focus is now concept of PaaS in cloud environment clear to the user, so that they can analyse that cloud is a most important technology when it comes to Platform as a service and that it is capable of handling small and big Organization, Academia, Institute and Industrial project as well. So that each and every thing shifted towards the computation resource as a service on-demand, over the internet, pay-on-usage. Availability is the vital metric for these resources; near 100% availability is becoming mandatory for both intensive users and service providers [2]. Figure 1, is a block diagram of cloud computing for users/client, describes the communication between cloud user and the simple cloud platform.

Block Diagram of Cloud Computing for User/Client



Fig. 1 Block Diagram of Cloud Computing for User/Client

II. CLOUD COMPUTING

Cloud Computing has been emerged as a new service centric technology. Offers service on-demand, elastic provisioning, reliability, security and pay-per-uses economic model [2]. Cloud Computing is basically an internet architecture that provides service from anywhere and at any time. We have tried to make the concept of PaaS in cloud clear to the people, so that they can realize that cloud is a very convenient technology when it comes to Platform as a

Service, and that it is capable of handling big industrial projects as well. Cloud Computing environment provides internet based platform which are used for computer technology. Over the past few years, the concept of cloud computing and virtualization has gained much momentum and has become a more popular phrase in information technology. Many organizations have started implementing these new technologies to further reduce costs through improved machine utilization, reduced administration time and infrastructure costs. Cloud computing is the environment that enables customers to use applications on the Internet such as storing and protecting data while providing a service. It describes a variety of computing concepts [3]. Cloud becomes the new wrapped around the new technology. Cloud Computing collects all the computing resources and manages them automatically [4]. Today World relies on Cloud computing to store their public as well as personal information. Today World relies on Cloud computing to store their public as well as personal information. Cloud computing, becomes the requirement for every user and provide relevant hardware, software and service according to the need that users put forward. With the rapid development of the Internet, user's requirement is realized through the Internet, different from changing with the need. In fact cloud computing is an ex-tend of grid computing, distributed computing, and parallel computing. Its foreground is to provide secure, quick, convenient data storage and net computing service centred. Many organizations that could be consider as the giant of software industry like Microsoft are joining to develop Cloud services [5]. Cloud Computing having secure access to all the application and data from any network devices.

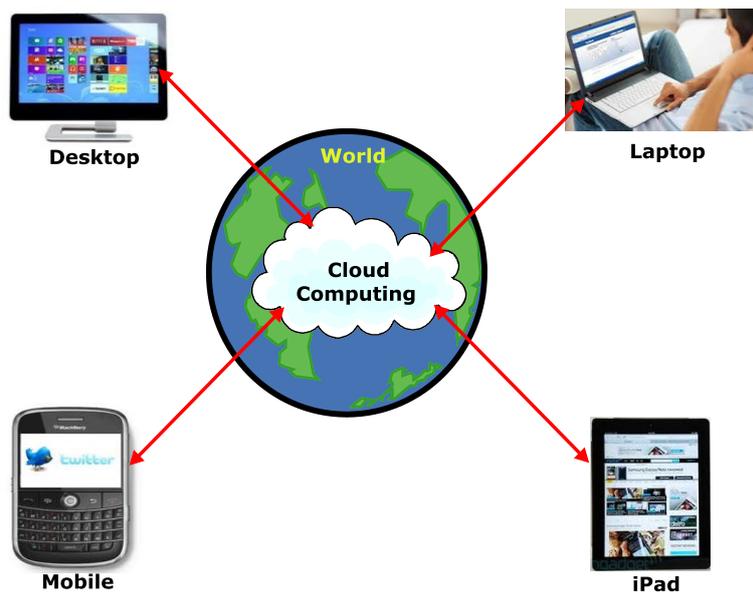


Fig. 2 Cloud Computing

III. PLATE FORM AS SERVICES (PAAS)

Platform as a service is a virtualized platform that comprises one or more servers (virtualized over the set of physical servers), operating systems, and specific applications (such as Apache and MySQL for Web-based applications). It comprises a layer of software and provides it as a service that can be used to build higher-level services. Platform as a Service, often simply referred to as PaaS, is a type of cloud computing that provides an environment and platform to permit developers to figure applications and services over the internet. PaaS services are hosted in the cloud and accessed by users simply via their web browser. PaaS services are normally paid for on a payment basis with clients finally paying just for what they use. Previously without cloud, Developer where used individually platform and different software for different platform. This used a huge amount of memory, time and money wastage. There were some terms and condition that were to be followed by a hardware component which was in-need to follow the software installation requirements Also if configuration if in case not satisfied by hardware according to software it may not get installed on it. And many more issues where there that must to be solved. So that PaaS solved the problem by using cloud as its working condition. Platform is considered as one of the basic need for any developer. It allows the developer to use a platform on demand and on pay-per-use basis. This eliminates the need to purchase platform for our own particular PC or system.

A. Basic Feature

The elementary feature of cloud computing is that it increases the facilities, functionalities, and add abilities, without any need of spending in novel design, training new classifieds or licensing new software. It is totally based on pay-per-use concept. In software as service(using cloud computing), the clients are benefited as many clients can access the same application, through the browser it also means that there is no investment in the server or in the software licensing, also here the costs are small. End User can easily scale up or down the services, limiting them according to their requirements. There are many data centres that are located at multiple locations for the storage of data from near locations.

The user has no need to organize or own the resources. Service providers can select the location for infrastructure freely, according to their requirements, minimizing their overhead expenses. Cloud computing services can be used and accessed from any device such as computer, mobile phone, or iPhone [6].

B. Physiognomies of Cloud Computing

1) Common Characteristics



2) Essential Characteristics



- *On-demand self-service*: -Get computing capabilities as needed automatically
- *Broad network access*: -Services available over the net using desktop, laptop, PDA, mobile phone
- *Resource pooling*: - Location independence, Provider resources pooled to server multiple clients
- *Rapid elasticity*: - Ability to quickly scale in/out service
- *Measured service*: -control, optimize services based on metering

IV. COMPARISON: TRADITIONAL SYSTEM V/S CLOUD COMPUTING SYSTEM

In today's globalization world, integration of ICT with cloud have been evolved and emerged with service-centric technology. To achieve resource pooling, elasticity, minimization of operational cost, outsourcing of critical operations, simplified application deployment, On-demand Services and make computing power universally available. Computing architecture and nature of access changed drastically the format of service-delivery model. Presently cloud has been implementing for business models and occupied global world. It describes a broad movement toward the access of heterogeneous networks, such as the Internet, Wi-Fi, 2G, and 3G etc. Service provider are expending their traditional IT stack and provide optimize facility in the context of cloud traditional computing model has been change from a single-server computing architecture to a distributed, that helps move data and computation to the cloud. It is reshaping the economies and social life of many countries globally at large.

"In the wake of a global recession, companies are looking for innovative ways to cut costs and differentiate themselves from the competition. However, with the multitude of new technology and service offers on the market, investment decisions are becoming increasingly difficult [7]." "The latest technological shift is toward cloud computing, which offers clients the ability to transform their IT infrastructures, breaking down barriers to innovation [8]."

A. Traditional System

In traditional software system, we had to install all software on our individual system. Due to this, the software was inaccessible to the end user when moved from one system to another. Also the results stored on one system cannot be retrieved from another system.

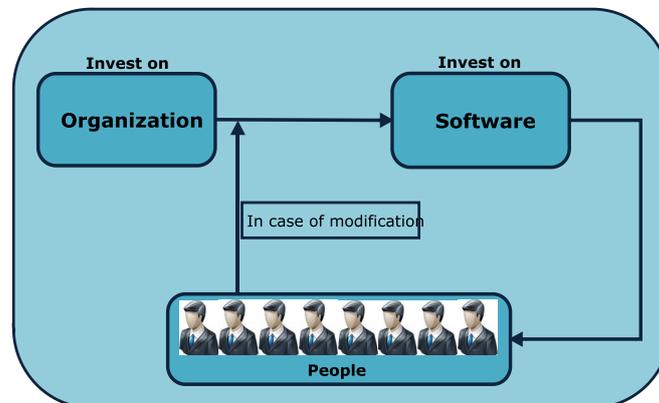


Fig. 3 Traditional System

B. Plat Serve (Platform of PaaS)

In "Plat Serve" which is basically a platform, there is no need to install particular operating system on every machine. All the required operating system is installed on a centralized server and is accessed on-demand and pay per use. Almost all the problems of traditional software system are solved by this platform. Instead of updating the operating system on individual system, the operating is only updated on the server and the new services can be used by all end users. If the user moves from one place to other or one PC to other where the required operating system is not installed, user can just login onto the server and use the required platform. Hence the service accessibility is not limited to a particular machine rather can be accessed from anywhere. As operating system is mostly stored on server and not on client side, operating system recovery is easy. It is based on Platform as a service (PaaS) model of cloud computing.

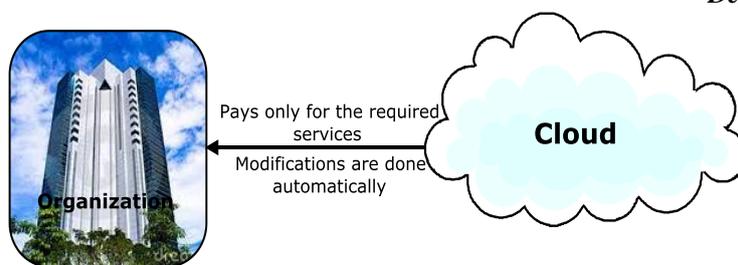


Fig. 4 Cloud System

TABLE I TRADITIONAL V/S CLOUD COMPUTING SYSTEM

Activity	Traditional System	Cloud Computing System (Plat Serve)
Software	Install each system	Install on server
Updating Software	Create Problem	No Problem
Accessibility	Application are limited for individual system	Application are not limited for individual system
Data Recovery	Data recovery is difficult	Data recovery is easy
Data loss	At time of recovery may be data loss	At time of recovery may not be data loss
Set up Price	Initial Setup cost is More	No need to setup
Memory	More Consumption	Low consumption
License Cost	Not Free	Free
Data Store	Client Side	Server Side
Pay Amount	Pay for resource Not service	Pay for Service Not Resource

V. IMPLEMENTATION OF PLAT SERVE

Here we have used Microsoft Windows for implementing the client, now in this whole project our main aim was to create an Infrastructure where one can find all platforms they need and can access it from wherever they want. For this we have used the .net framework.

A. Purpose of using the .net framework

- i. We needed a platform which is language independent, as we all were specialized in different languages.
- ii. We needed a common language where all the classes and functions are available, and also provide scope to add user defined classes.
- iii. We needed a framework where we don't need to convert our code into html, we can write it in our language and it could be converted into html on its own.
- iv. Also there are various .Net compliant languages like VB.NET, C#, J#, VC++.
- v. Here we have used C# because it is the only language that can utilize all the classes of Framework Class Library (FCL). FCL is library for .Net that contains all the key words, packages, classes, etc.

In our project there is a server where all the software is pre-installed. If a user wishes to access these software, it has to first login to the server. The server will provide them with two options:

a) *Temporary user*: such types are users are those who don't access the data regularly. Who just comes to have some services and then leaves?

b) *Permanent user*: these will be those users who always take data from this server.

This division was necessary to allocate the memory to the users in cloud and is also a convenient way of providing services. The temporary user can store their data temporarily, and when they are done the data will replenish, and for permanent users the data will be stored in the memory location, permanently.

B. Working

Just take an example of a computer lab, where the students need to work on java. Here the students don't need to install the whole java setup in their computers, rather they can just send their code to the server and the server will compile the code and then run it, and return the output. In big organizations they will not be required to every time install the software they need, they could just use the software they are interested in. this will not only provide them services but will also store their data. With cloud one can access the data from wherever they want, one just needs to send their request to the server and they get the output. Even the data storage of a cloud is very strong.

C. Security

There is also a provision of security for this project so the data will always be secured, with the login forms their will appear a code, that code will be sent to the mobile number of the user, then the page will ask for that code, in order to make sure of the user's identity and verification will be done, then the data access will be provided. Also we kept an admin login, this admin login is for the one who will handle and update the server, and any unauthorized access will be blocked.

VI. CONCLUSIONS

Now a day Cloud Computing is becomes back bone of any organization. It deals with our Daily life. It becomes most popular for every end user can enjoy highly demanded services provided such as PaaS, IaaS and SaaS by cloud. End user can share cloud services anywhere, anytime with any device. This paper outlined; PaaS, offer high flexibility with adequately low cost. It also provides the companies better efficiency with very low maintenance cost. The data in cloud is never lost, making it good for future reference. Using PaaS, IaaS and SaaS, the business could be done without any tenants or technological limitations. All platform, infrastructure and software are available on cloud therefore end user no need to install operating system and software on their personal systems. The researchers still have more work to do; we hope this paper will be considered as a starting point identifying opportunities for future research. Cloud computing is based on the demand access to virtualized IT resources that are housed outside of your range , while you can share it with different services however use it easily in addition you can subscribe for this service with an inexpensive monthly fees, and navigate the web smoothly that has many features.

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