1. Abstract

Cloud computing is emerging as the latest BUZZ word in Information Technology. There is going to be a great shift from traditional network computing to cloud computing. The features of Cloud computing - Pay as you go and Virtualization has made it a long run in advance technologies. This paper is a brief survey based of readings on “cloud computing” and the role of open source in cloud computing. The paper will also review about the flexible bandwidth of the cloud applications and its tools. The point of discussion in Information Technology sector is that the mainstream adoption of cloud computing creates hindrance for many user. This paper will contradict this theory and let us know how cloud computing is going to change the scenario of network computing and the way open source shapes the cloud computing.

2. INTRODUCTION

In early sixties J.C.R. Licklider proposed a plan which is now called as Internet Computing. The plan proposed by the Licklider approximately matched with what is today known as cloud computing but due to less number of resources and manpower, all the features were not achieved. The National Institute of Standards and Technology’s (NIST) Information Technology Laboratory recognizes that cloud computing is an “evolving paradigm. [1] “Cloud Computing is a general term for anything that involves delivering hosted services over the internet. These services are broadly classified into three categories: Infrastructure as a service (IaaS), Platform as a service (PaaS) and software as a service (SaaS). The name cloud computing was inspired by the cloud symbol that is often used to represent the internet in flowcharts and diagrams”.

2.1 Infrastructure as a Service:
Infrastructure-as-a-Service like Amazon Web Services provides virtual server instance API to start, stop, access and configure their virtual servers and storage. It [2] “is a provision model in which an organization outsources the equipment used to support operations, including storage, hardware, servers and networking components. The service provider owns the equipment and is responsible for housing, running and maintaining it. The client typically pays on a per-use basis”. Examples are Amazon EC2, Flexiscale, GoGrid.

Figure 1 Cloud computing service models
**Platform as a service:** provides developers with proprietary API’s to make an application that will run in a specific environment. While a developer is free to create any application they wish, the app is locked to the platform used for its creation. It is a way to rent hardware, operating systems, storage and network capacity over the Internet. Examples are Facebook, Google App Engine, Force.com.

**Software as a service:** It is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network, typically the Internet. Examples are Google Docs, Dropbox, Box.net, Salesforce.com.

2.2 **Deployment Models:** There are four deployment models:

2.2.1 **Private cloud:** It is a proprietary network or a data center that supplies hosted services to a limited number of people. When a service provider uses public cloud resources to create their private cloud, the result is called a virtual private cloud

2.2.2 **Public Cloud:** The cloud infrastructure is available to the public by cloud service provider. These services may be free or offered on a pay-per-usage model.

2.2.3 **Hybrid Cloud:** It is the combination of atleast one private cloud and one public cloud. In this an organization provides the resources in-house and has others provided externally.

2.2.4 **Community Cloud:** In this the cloud infrastructure is shared by several organizations. It supports a specific community with shared concerns including security requirements, compliance considerations.

2.3 **VIRTUALISATION:** It is the cornerstone design technique for all cloud architectures. Virtualisation allows servers, storage devices, and other hardware to be treated as a pool of resources rather than discrete systems, so that these resources can be allocated on demand. In non-cloud computing three independent platform exist for three different applications running on its own server. In the cloud the servers can be shared or virtualized.

2.4 **PAY AS YOU GO:** In the enterprise, cloud computing allows a company to pay for only as much capacity as is needed, and bring more online as soon as required. Because this pay-for-what-you-use model resembles the way electricity, fuel and water are consumed it's sometimes referred to as utility computing.

2.5 **BENEFITS OF CLOUD COMPUTING:**
Cost savings: Since the applications run in cloud, we do not need a high powered and a high priced computer to run cloud computing web-based applications. By enabling agencies to purchase only the computing services needed, instead of investing in complex and expensive IT infrastructure, agencies drive down the costs of testing, developing and maintaining new and existing systems.

Increased Storage: Since it is online so it offers more storage.

Highly automated: When the application is web-based, updates happen automatically and we get the latest version.

Flexibility: It offers more flexibility than past computing methods.

Mobility: In cloud computing we are no longer tied to a single computer or network.

2.7 OPEN SOURCES: Open source software, as we all know, are those whose source codes are available publicly without any charge. In recent years, more and more softwares are being declared open source. Anyone can get the source, modify (such that it fits the programmer's needs), and re-compile and even re-distribute. The world of IT was greatly ruled by sort of patents, which made it a 'close' and very competitive model, in which knowledge was rarely ever shared without money involved. This has changed in recent years. Softwares that are provided with Open Source License (GNU and GPL specifically), the user is allowed to disassemble, rebuild, manipulate and personalize the software. Few examples of open source softwares are - Linux, OpenSolaris and many other Operating Systems; PHP, MySQL (for databases), Perl, C++, C# and many more programming languages; Joomla, Mambo, CMSimple, Wordpress and many other Content Management Systems (for websites) etc.

2.7.1 Monetisation of Open Source:
1) Paid Support: Not all, but some (infact, many) open source softwares offer paid support. They offer instant support (via Live chat, e-mail, mailing list etc) to those users who buy various support packages.
2) Paid CDs and/or DVDs: Open source softwares are available to be downloaded from the Internet for free but some open source softwares are available through CDs, which you'd have to buy. CDs are shipped to user's address when he orders.
3) Marketing: The coders can upload Ads (of CPA networks, PPC campaigns, Traffic Exchange etc) on their product's website(s) and the respective companies pay for that.

2.7.2 Key benefits of Open Source:
1) Cost savings: Of course, this is pretty much obvious. Proprietary softwares cost a lot, how can a common man be able to pay so much for each and every software he needs?! For example, Single pc license for Windows 7 ultimate costs around Rs. 9,700!
2) Ending Piracy: High costs of softwares leads to piracy and copyright violation. Warez and illegal communities are increasing. If proprietary softwares were open source, piracy would not be practiced.
3) Modify: If you're a programmer, and you find a bug in a program or if you just want to add some feature of your own, you can do
it easily with Open Source softwares. But with closed source ones, you cannot.

FUTURE WORK:

1) Bandwidth: In traditional network, when we access some application and due to increase in traffic, the system gets slower. But in cloud the bandwidth is flexible. The bandwidth management can be done with the scenario that is distributed hybrid cloud architecture. According to this scenario the enterprise will use the core applications on its private cloud while some other applications will be distributed on several private clouds, which are optimized for specific applications.

2) Open sources and Cloud computing: Many IT professionals believe that Cloud computing and open sources have separate corners in industry and are not interdependent on each other but in actual practices Open resources play vital role in the sustainability of Cloud Computing as it drives some of the technologies of cloud computing. The open source infrastructures and platforms like Eucalyptus and appsacle are used in cloud computing. Open source software plays a significant role in cloud computing:

a) Creation of Appliances: Appliances can be created by layering open source software into a virtual machine image. In the figure below, a database appliance is created by layering MySQL software on top of OpenSolaris operating system.

b) Foundation to Server Efficiency: The developer dream scenario can be created with open source in an optimised way. Thus open source solutions provide with a framework to maximise server efficiency.

![Database appliance creation](image)

Figure 3 Creation of a database appliance by layering MySQL software

3) Tools availability: It is also believed in the IT industry that the main stream adoption of cloud computing would create hindrance for users across the world. That is why large scale IT companies are providing very less tools for cloud computing.

REFERENCES:
