Cloud Computing: Effective Concepts

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Abstract

Cloud computing solved so many market problems through its efficient services provided on Internet. It is meant for people and companies irrespective of their function, size and infrastructure, as a new technology or even architecture for the consumption of services over the internet. But its significance is much broader, and is not restricted to the use of technology, software, hardware or platform. In fact it is a new form of delivery of information technology to reduce costs, better utilization of resources through rational use and demand. It also technically increased the usage of servers by linking them together as a virtual system, where the stand alone server was utilized only for its fractional capacity.

Keywords: *Cloud Computing, Software, Hardware, Platform, Servers*

I. INTRODUCTION

For more than a half century, all interested, either an individual or a company, had to bring the computer and its accessories for their use as a highly paid device. The large sized machines were shrunk to PCs to hand held tiny devices as mobiles and so on. As the Internet grown using set of protocols and other techniques, the population of usage of Internet increased tremendously.

I arranged this paper as 1. Distinguishing the Internet and Cloud, 2. Cloud service models, 3. Leading vendors providing cloud computing services, 4.Types of cloud, 5. Pros and cons, 6. Conclusion

II. DISTINGUISHING THE INTERNET AND CLOUD

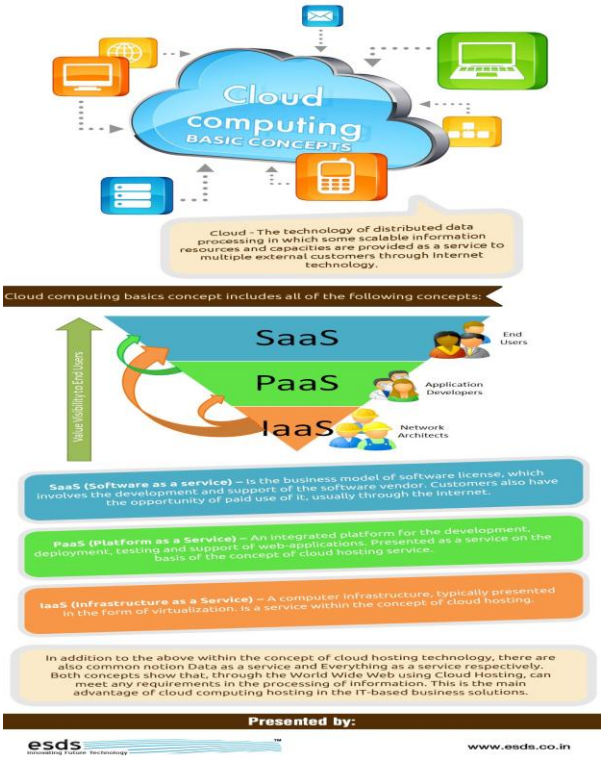
A cloud refers to a distinct IT environment or an efficient method of managing lots of servers, networking and the storage, that is designed for the purpose of remotely provisioning scalable and measured IT resources. Cloud is used as a metaphor for the Internet which is, in essence, a network of networks providing remote access to a set of decentralized IT resources. Earlier, the symbol of a cloud was commonly used to represent the Internet in a variety of specifications and mainstream documentation of Web-based architectures. This same symbol is now used to specifically represent the boundary of a cloud environment, as shown in Figure 1.

Figure 1 - The Symbol Used to Denote The Boundary of A Cloud Environment.

Basically a cloud has a finite boundary. There are many individual clouds that are accessible via the Internet. A cloud is typically privately owned and offers access to IT resources that is metered. Much of the Internet is dedicated to the access of content-based IT resources published via the World Wide Web. IT resources provided by cloud environments, on the other hand, are dedicated to supplying back-end processing capabilities and user-based access to these capabilities. Another key distinction is that it is not necessary for clouds to be Web-based even if they are commonly based on Internet protocols and technologies. Protocols refer to standards and methods that allow computers to communicate with each other in a pre-defined and structured manner. A cloud can be based on the use of any protocols that allow for the remote access to its IT resources. The technology of distributed data processing in which some scalable information resources and capacities are provided as a service to multiple external customers through Internet technology.

III. CLOUD SERVICE MODELS

Objectives of any business can be achieved through excellent customer service and different types of services are provided by following Cloud Service Models:



A. Software as a Service (SaaS):

A software release model, SAAS is hosted centrally in the cloud along with its allied data and can be accessible through users by means of web a browser. SaaS is also referred as "on-demand software". For many business applications such as, accounting, collaboration, customer relationship management, business enterprise resource planning, human resource management, content management and service desk management etc, SaaS becomes a general delivery model.

Usually the term SaaS can be precisely used where most of the initial application service providers focus on managing and hosting third-party independent software vendors who are capable enough to build up and run individual software. Also by means of currently used software architecture, cloud computing service providers make a separate instance of an application mandatory for each business, so, to design an application in view of providing multiple businesses and users with corresponding partitioning of data, a multi-tenant architecture as a service solution has been utilized by existing web-based software.

B. Platform as a Service (PaaS):

Using a Cloud service model called as PaaS, applications can be used effortlessly, exclusive of any complication regarding the cost and management of the required hardware and software. As PaaS supports the complete life cycle of building and delivering web applications and services by facilitating design, development, testing, deployment and hosting itself.

Services like team collaboration, web service integration and marshalling, database integration, security, scalability, storage, persistence, state management, facilitation of developer community, application versioning and instrumentation, etc. might be provisioned as an integrated solution over the web.
All these facilities permit customization of the existing SaaS applications which is comparable to the facility of packaged software applications such as Microsoft Word. But, every time developers and users of PaaS need to subscribe SaaS applications, in view of developing a comprehensive environment, stand-alone PaaS environment has been proposed which is free from any type of technical, licensing or financial dependencies based on specific SaaS applications or web services. Still, some PaaS applications require improvement in the development, debugging and testing capabilities to provide hosting-level services such as security and on-demand scalability etc.

In PaaS, under the concept of Open platform as a service, developers can use any programming language, database, operating system and server too.

C. Infrastructure as a Service (IaaS):

To release infrastructure as a fully outsourced service, IaaS is a capital investment-sourced model. As by means of IaaS, all the resources like servers, software licenses, data center space and network equipment etc can be purchased by clients as fully outsourced service only. Hence concerning the customer's significant project, IaaS through a dedicated hosting environment is the most stout, safe and sound policy.

Advantages of IaaS:

1. Dynamic Scaling:

Capability of vertical scaling and horizontal scaling the various resource aspects in close to real time, according to varying business requirements.

2. Usage-Based Pricing:

This strategy of IAAS helps customers in purchasing the precise infrastructure which may be required at any particular time by ensuring "just pay for what you use".

3. Reduced Capital And Personnel Costs:

Reduced in-house infrastructure considerably eliminates capital expenditures and enduring cost for workforce and enables any organization to concentrate on core competencies in view of developing and filtering market product offerings more willingly than purchasing hardware accessories.

4. Access To Superior IT Resources:

Unaffordable Enterprise-grade IT infrastructure and engineering resources become accessible to IaaS users.

5. Daas (Desktop As A Service):

Another business model license the software, which is a slightly improved model of SaaS, mostly involving the use of multiple services at the same time necessary to complete the work. Was first introduced in the early 2000s.

In addition to the above within the concept of cloud hosting technology, there are also common notion Data as a service and Everything as a service respectively. Both concepts show that, through the World Wide Web using Cloud Hosting, can meet any requirements in the processing of information. This is the main advantage of cloud computing hosting in the IT-based business solutions.

IV. LEADING VENDORS PROVIDING CLOUD COMPUTING SERVICES (GLOBAL SERVICE PROVIDERS)

Many different vendors offer various types of cloud-computing services:

- Amazon EC2—virtual IT
- Google App Engine—application hosting
- Google Apps and Microsoft Office Online—SaaS
- Apple iCloud—network storage
- DigitalOcean—servers (Iaas/PaaS)

Some providers offer cloud computing services for free, while others require a paid subscription

V. TYPES OF CLOUD

Stare high to the sky and you can watch clouds drift by or, if you're more scientific and nuanced, start to tease out the differences between cumulus, cirrus, and stratus. In much the same way, computing aficionados draw a distinction between different types of cloud.

A. Public Clouds:

Provided by people such as Amazon, Google, and IBM: in theory, all users share space and time on the same cloud and access it the same way. Many companies, for example, use Gmail to power their Internet mail and share documents using Google Drive—in pretty much the same way that you or I might do so as individuals.

B. Private Clouds:

Work technically the same way but service a single company and are either managed exclusively by that company or by one of the big cloud providers on their behalf. They're fully integrated with the company's existing networks, Intranet, databases, and infrastructure, and span countries or continents in much the same way.

C. Hybrid Clouds:

Increasingly, companies find neither of these bald alternatives quite fits the bill—they need elements of each—so they opt for hybrid clouds that combine the best of both worlds, hooking up their existing IT infrastructure to a public cloud system provided by someone like Amazon or Google.

D. Personal Clouds:

Other trends to watch include the development of personal clouds, where you configure your own home network to work like a mini-cloud (so, for example, all your mobile devices can store and access files seamlessly), and peer-to-peer cloud computing, in which the dynamic, scalable power of a cloud computing system is provided not by giant data centers but by many individual, geographically dispersed computers arriving on the network, temporarily contributing to it, and then leaving again, as already happens with collaborative science projects like SETI@home and ClimatePrediction.net.

VI. ADVANTAGES & DISADVANTAGES OF CLOUD COMPUTING

A. Advantages :

If used properly and to the extent necessary, working with data in the cloud can vastly benefit all

types of businesses. Mentioned below are some of the advantages of this technology.

*1) **Cost Efficient***

Cloud computing is probably the most cost-efficient method to use, maintain and upgrade. Traditional desktop software costs companies a lot in terms of finance. Adding up the licensing fees for multiple users can prove to be very expensive for the establishment concerned. The cloud, on the other hand, is available at much cheaper rates and hence, can significantly lower the company's IT expenses. Besides, there are many one-time-payment, pay-as-you-go and other scalable options available, which makes it very reasonable for the company in question.

*2) **Almost Unlimited Storage***

Storing information in the cloud gives you almost unlimited storage capacity. Hence, you no more need to worry about running out of storage space or increasing your current storage space availability.

*3) **Backup and Recovery***

Since all your data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical device. Furthermore, most cloud service providers are usually competent enough to handle recovery of information. Hence, this makes the entire process of backup and recovery much simpler than other traditional methods of data storage.

*4) **Automatic Software Integration***

In the cloud, software integration is usually something that occurs automatically. This means that you do not need to take additional efforts to customize and integrate your applications as per your preferences. This aspect usually takes care of itself. Not only that, cloud computing allows you to customize your options with great ease. Hence, you can handpick just those services and software applications that you think will best suit your particular enterprise.

*5) **Easy Access to Information***

Once you register yourself in the cloud, you can access the information from anywhere, where there is an Internet connection. This convenient feature lets you move beyond time zone and geographic location issues.

*6) **Quick Deployment***

Lastly and most importantly, cloud computing gives you the advantage of quick deployment. Once you opt for this method of functioning, your entire system can be fully functional in a matter of a few minutes. Of course, the amount of time taken here will depend on the exact kind of technology that you need for your business.

B. Disadvantages of Cloud Computing

In spite of its many benefits, as mentioned above, cloud computing also has its disadvantages. Businesses, especially smaller ones, need to be aware of these cons before going in for this technology.

*1) **Technical Issues***

Though it is true that information and data on the cloud can be accessed anytime and from anywhere at all, there are times when this system can have some serious dysfunction. You should be aware of the fact that this technology is always prone to outages and other technical issues. Even the best cloud service providers run into this kind of trouble, in spite of keeping up high standards of maintenance. Besides, you will need a very good Internet connection to be logged onto the server at all times. You will invariably be stuck in case of network and connectivity problems.

*2) **Security in the Cloud***

The other major issue while in the cloud is that of security issues. Before adopting this technology, you should know that you will be surrendering all your company's sensitive information to a third-party cloud service provider. This could potentially put your company at great risk. Hence, you need to make absolutely sure that you choose the most reliable service provider, who will keep your information totally secure.

*3) **Prone to Attack***

Storing information in the cloud could make your company vulnerable to external hack attacks and threats. As you are well aware, nothing on the Internet is completely secure and hence, there is always the lurking possibility of stealth of sensitive data.

VII. CONCLUSION

Though the technology changes everyday and people always looking for a better and ease availability of resources and make the environment friendly, like everything else, cloud computing, too, has its pros and cons as discussed above. While the technology can prove to be a great asset , it could also cause harm if not understood and used properly. Cloud computing consists of hardware and software resources made available on the internet as managed external services. These services rely on advanced software applications and high-end networks of server computers.

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