

Cloud Computing: A Survey on Service Providers

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Abstract

This paper describes cloud computing which is a computing environment for the next generation of the Internet. The paper discusses clouds, cloud storage and service providers on the basis of different parameters such as pricing, maximum storage limit, security of data etc. This paper also discusses the advantages and disadvantages of cloud computing.

Keywords: Cloud Computing, Dropbox, icloud, Azure

I. INTRODUCTION

Cloud computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand, like the electricity grid. In other words, Cloud computing refers to anything that involves delivering hosted services over the internet and encompasses any subscription-based or pay-by-use service that, in real time, extends IT's existing capabilities. VMware, the global leader in virtualization and cloud infrastructure definition "Cloud computing is a new approach that reduces IT complexity by leveraging the efficient pooling of on-demand, self-managed virtual infrastructure, consumed as a service". According to Wikipedia: "Cloud computing is Internet-based computing, whereby shared resource, software, and information are provided to computers and other devices on demand, like the electricity grid". It is distributed computing on internet or delivery of computing service over the internet. E.g.: Yahoo!, Gmail, Hotmail Instead of running an e-mail program on your computer, you log in to a Web e-mail account remotely. The software and storage for your account doesn't exist on your computer -- it's on the service's computer cloud. With traditional desktop computing, we run copies of software programs on our own computer. The documents we create are stored on our own pc. Although documents can be accessed from other computers on the network, they can't be accessed by computers outside the network. This is PC-centric. With cloud computing, the software programs one use aren't run from one's personal computer, but are rather stored on servers accessed via the Internet. If a computer crashes, the software is still available for others to use. Same goes for the documents one create; they're stored on a collection of servers accessed via the Internet. Anyone with permission can not only access the documents, but can also edit and collaborate on those documents in real time. Unlike traditional computing, this cloud computing model isn't PC-centric, it's document-centric. Cloud computing is a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications. In cloud computing, the word cloud (also phrased as "the cloud") is used as a metaphor for "the Internet," so the phrase cloud computing means "a type of Internet-based computing," where different services such as servers, storage and applications are delivered to an organization's computers and devices through the Internet. Cloud computing is comparable to grid computing, a type of computing where unused processing cycles of all computers in a network are harnessed to solve problems too intensive for any stand-alone machine. 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) [1]. The datacenter hardware and software is what we will call a Cloud [4]. It helps to use applications without installations. User can access the personal files, data from any computer with internet access. This technology allows much efficient computation by centralizing storage, memory and processing.

A. Cloud Characteristics:

- 1) Cloud On Demand Self Service:
- 2) Ubiquitous network Access: Anywhere, Anytime, Any Device
- 3) Location independent Resource Pooling
- 4) Rapid Elasticity
- 5) Pay as you go

B. Supporting Factors for Cloud Computing:

Combined effect of following factors have made Cloud Computing a compelling Paradigm

- 1) Advancement in processors
- 2) Virtualization technology
- 3) Distributed Storage Automated Management
- 4) Broadband internet Access

5) Fast and Inexpensive Servers

II. CLOUD SERVICES

Cloud computing is a general term for anything that involves delivering hosted services over the Internet. These services are broadly divided into three categories as shown in figure 1:

- 1) Infrastructure-as-a-Service (IaaS)
- 2) Platform-as-a-Service (PaaS) and
- 3) Software-as-a-Service (SaaS).



Fig. 1: Cloud services

A. Infrastructure-As-A-Service:

In the most basic cloud-service model, providers of IaaS offer computers physical or (more often) virtual machines and other resources. IaaS clouds often offer additional resources such as a virtual-machine disk image library, raw (block) and file-based storage, firewalls, load balancers, IP addresses, virtual local area networks (VLANs), and software bundles.[49] IaaS-cloud providers supply these resources on-demand from their large pools installed in data centers. Examples of IaaS providers include: Amazon EC2, Azure Services Platform, DynDNS, Google Compute Engine, HP Cloud, iland, Joyent, LeaseWeb, Linode, NaviSite, and Oracle Infrastructure as a Service, Rackspace Cloud, Ready Space Cloud Services, ReliaCloud, SAVVIS, Single Hop, and Terremark.

B. Platform-As-A-Service:

In the PaaS model, cloud providers deliver a computing platform typically including operating system, programming language execution environment, database, and web server. Application developers can develop and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers. Examples of PaaS include: AWS Elastic Beanstalk, Cloud Foundry, Heroku, Force.com, Engine Yard, Mendix, Open Shift, Google App Engine, Windows Azure Cloud Services and Oranges cape.

C. Software-As-A-Service

It is defined as service-on-demand, where a provider will license software tailored. In the SaaS model, cloud providers install and operate application software in the cloud and cloud users access the software from cloud clients. Cloud users do not manage the cloud infrastructure and platform where the application runs. This eliminates the need to install and run the application on the cloud user's own computers, which simplifies maintenance and support. Examples of SaaS include: Google Apps, Microsoft Office 365, Onlive.

III. SERVICE PROVIDERS AND SUMMARY

There are a various service provider for cloud computing such as Amazon's web services [2], Google's application engine [3], Window's azure [4], Proof point, Right Scale, Rackspace, Salesforce.com, Sun Open Cloud Platform etc.

A. Amazon's web services:

Cloud Services provided by this provider are Paas, Iaas. Platforms Supported are Windows Server 2003/2008,Oracle Enterprise Linux, Microsoft SQL Server Standard 2005Fedora Gentoo Linux, Red Hat Enterprise Linux.

The various services and tools provided are Amazon Elastic(EC2), AWS GovCloud (US), Amazon Relational Database Service (RDS).Amazon S3 store object up to 5 GB, Amazon EC2 [Elastic Block storage] has volume sizes ranging from 1GB to1TB. Amazon's web services network provides significant protection and also enables customer to implement further protection .It uses SSL (encryption) to maintain confidentiality [2].

B. Windows Azure:

Cloud Services provided by this provider are Paas, Iaas. Platforms Supported are Operating systems Windows 7, Windows Server 2008, Windows Vista

The various services and tools provided are Windows Azure Platform Training Kit, Windows Azure

Software Development Kit , Microsoft Visual Studio 2008 Service Pack 1, Windows Azure platform AppFabric SDK V1.0, Windows 7 Training Kit for Developers .Azure has a 64MB limit on individual blobs and also allows you to split a blob into blocks of 4MB each. Amazon's web services network provides significant protection and also security services such as Filtering Routers, Firewalls, Cryptographic Protection of Messages, Software Security Patch Management, centralized monitoring, correlation, and analysis systems, Network Segmentation, Service, Administration Access. Languages supported are VB.NET, C#, PHP. Billing is based on compute, storage, storage transactions and data transfers.

C. Google App Engine

Cloud Services provided by this provider are Paas, Saas. Platforms Supported are Java Runtime Environment, Python Runtime Environment .The various services and tools provided are Google Search, Gmail Chrome browser, Google Maps. Automatic scaling is built in with App Engine, No matter how many users you have or how much data your application stores. App Engine can scale to meet your needs .For security it provides Google's 2 step verification. An efficient application on a free account can use up to 500MB of storage and up to 5 million page views a month [3].

IV. CLOUD STORAGE

Online file storage centers or cloud storage providers allow you to safely upload your files to the Internet.

There are various providers of cloud storage Apple iCloud, Dropbox, Google Drive, Amazon Cloud Drive, Microsoft Sky Drive etc.

A. Apple iCloud

It gives 5GB of free storage (if you want more, you have to pay for it yearly) Allows users to sync all your idevices to iCloud anything you have stored in the iCloud can be accessed from any idevice For example, a document typed on an iPad and saved to the iCloud can be accessed from an iPhone.

B. Dropbox

It gives 2GB of free storage. It allows users to get more free space by completing certain tasks. It is available in the App Store and Android Market For example; a file uploaded to Dropbox from a MacBook can be accessed from a Samsung phone.

C. Google Drive

It gives 15GB of free storage. User requires a G-mail account to be accessed. Individuals can buy more storage for themselves (Google Apps for Business Administrators can buy storage licenses).It allows users to type documents, make spreadsheets/presentations, etc., and then save them to your drive.

D. Amazon Cloud Drive

It gives 5GB of free storage (additional storage is available for \$10 a year). It is available for download on Kindle Fire(HD).A Save to Cloud Drive app is available in the App Store for \$1.99 and an Amazon Cloud Pictures is in the Android Market for free.

E. Microsoft SkyDrive

It gives 7GB of free storage (additional storage can be bought).It requires a Windows Live account to be accessed. It can be saved to a Windows computer as a mapped drive.

V. ADVANTAGES AND DISADVANTAGES

Following are the advantages of cloud computing [5]:

- 1) Lower computer costs
- 2) Improved performance
- 3) Reduced software costs
- 4) Instant software updates
- 5) Improved document format compatibility
- 6) Unlimited storage capacity
- 7) Increased data reliability
- 8) Universal document access
- 9) Latest version availability
- 10) Easier group collaboration
- 11) Device independence

Following are the disadvantages of cloud computing:

- 1) Requires a constant Internet connection
- 2) Does not work well with low-speed connections
- 3) Features might be limited
- 4) Can be slow
- 5) Stored data can be lost
- 6) Stored data might not be secure

VI. CONCLUSIONS

Thus cloud computing provide a super-computing power. This cloud of computers extends beyond a single company or enterprise. The applications and data served by the cloud are available to broad group of users, cross-enterprise and cross-platform. This paper discusses various cloud services, service providers and cloud storage providers available for cloud in market.

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