

A Survey on the Role of Cloud Computing in Social Networking Sites

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Abstract— Millions of the people are connected with the help of Internet and many of them are also connected on social networking sites.

Social networks are more than just a place for social interactions and personal relationship. Cloud computing enables the social networking companies to consume compute resources as a utility rather than building and maintaining computing infrastructures. These days, the “cloud” and “social” work together to generate a sustainable resource sharing environment to the social network users. This papers introduces internet-based cloud computing and exploring the Characteristics, service models which are used these days as well as the benefits and the challenges of using cloud computing in the social networks.

Keywords— Cloud computing, Social Network

I. INTRODUCTION

Cloud computing is the delivery of the applications and the computing services over the Internet. The cloud services allow the enterprises and the individuals to use the software and the hardware that are managed by third parties at remote locations. [1]

The following definition of cloud computing has been developed by the U.S. National Institute of Standards and Technology (NIST):

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models.[2]

II. CHARACTERISTICS OF CLOUD COMPUTING

The “five essential characteristics” cloud computing defined by The National Institute of Standards and Technology(NIST) are :

A. On demand self services: Cloud service providers providing on demand computer services such as email, applications, network or server service can be utilized without any human interaction with each service provider. The companies which provide these services are Amazon Web Services (AWS), Microsoft, Google, IBM and Salesforce.com.

B. Broad network access: Cloud Capabilities are available over the network and can be accessed by client platforms such as mobile phones, laptops and PDAs.

C. Resource pooling: The provider’s computing resources are pooled together to serve multiple consumers using multiple-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. The resources include among others storage, processing, memory, network bandwidth, virtual machines and email services. The pooling together of the resource builds economies of scale (Gartner).

D. Rapid elasticity: Cloud services can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

E. Measured service: Cloud computing resource usage can be measured, controlled, and reported providing transparency for both the provider and consumer of the utilized service. Cloud computing services use a metering capability which enables to control and optimize resource use. This implies that just like electricity , IT services are charged per usage metrics – “pay per use”. The more you utilize the higher the bill

III. DEPLOYMENT SERVICES

The four primary types of cloud models are given below. Each has its advantages and disadvantages with significant implications for any organization researching or actively considering a cloud deployment.

A. Public Cloud : A public cloud is a cloud computing model in which services, such as applications and storage, are available for general use over the Internet. Public cloud services may be offered on a pay-per-usage mode or other purchasing models. An example of a public cloud is IBM’s Blue Cloud.

B. Private Cloud: A private cloud is a virtualized data center that operates within a firewall. Private clouds are highly virtualized, joined together by mass quantities of IT infrastructure into resource pools, and privately owned and managed.

C. Hybrid Cloud: A hybrid cloud is a mix of public and private clouds.

D. Community Cloud:A community cloud is an infrastructure shared by several organizations which supports a specific community.

IV. SERVICE MODELS

Once a cloud is established, how its cloud computing services are deployed in terms of business models can differ depending on requirements. The primary service models being deployed (see Figure 1) are commonly known as:

A. *Software as a Service (SaaS)* — Consumers purchase the ability to access and use an application or service that is hosted in the cloud. A benchmark example of this is Salesforce.com, as discussed previously, where necessary information for the interaction between the consumer and the service is hosted as part of the service in the cloud. Also, Microsoft is expanding its involvement in this area, and as part of the cloud computing option for Microsoft® Office 2010, its Office Web Apps are available to Office volume licensing customers and Office Web App subscriptions through its cloud-based Online Services.

B. *Platform as a Service (PaaS)* — Consumers purchase access to the platforms, enabling them to deploy their own software and applications in the cloud. The operating systems and network access are not managed by the consumer, and there might be constraints as to which applications can be deployed.

C. *Infrastructure as a Service (IaaS)* — Consumers control and manage the systems in terms of the operating systems, applications, storage, and network connectivity, but do not themselves control the cloud infrastructure.

TABLE I
SERVICE MODELS

Service Models	Who uses it?	Examples
Software as a Service (SaaS)	Business Users	E-mail, Virtual desktop, communication games
Platform as a Service (PaaS)	Developers and Deployers	Executable runtime, databases, web servers
Infrastructure as a service (IaaS)	System Managers	Virtual machines, servers, storage, load balancers, networks

V. EXISTING APPLICATIONS

A. CLOUD COMPUTING IN SOCIAL NETWORKING SITES

1) *Facebook*: It is a social networking website with 1.39 billion active user (December 2014). Its features are: The users the personal space to share updates, photos and videos, get notifications when friends like and comment on the users posts, play games and use the apps, other features like friend lists and groups. [4]

Facebook has introduced integration with the personal file storage company Dropbox where people can share files to Facebook Groups using Dropbox's cloud-based storage system. [5]

Facebook has also collaborated with Heroku cloud service providers which was integrated into Dev App. With Heroku, users can now start building from a sample app in their own choice of languages including PHP, Ruby, Python at free of cost [6]

Facebook also partnered with Salesforce.com in ad technology, audience onboarding, content marketing and community management.[7]

2) *Twitter*: Twitter is the Social Networking site which lets the people connect with their friends, express themselves. Twitter has 284 million active user (December 2014). Its features are: Get breaking news, Go behind the scenes at exclusive events like Oscars and World Cup, Express with text, photos, videos etc., Use hashtags (like #NFL) to find more Tweets about topics one love, share the Tweets with apps like Facebook, Whatsapp and LINE etc., Tweet links from sites like YouTube, Instagram etc.[8]

Salesforce Marketing Cloud Social Ads Platform for Twitter, brands and agencies will be able to: Build and execute real time Twitter advertising campaigns; allow advertisers to more efficiently scale their campaigns on Twitter through innovative workflows; and improve ROI through creative, bid and targeting optimization. [9]

B. CLOUD STORAGE TYPES OF PHOTOGRAPHERS [10]

There are multiple types of cloud storage available today for photographers:

1) *Public/community web-based cloud storage* : you upload your files to the cloud via your browser or other external software and your files become instantly accessible through a web-based interface. This method is used by popular photo-sharing websites like [Flickr](#) and [Smugmug](#).

2) *Local/hybrid folder synchronization*: a client is installed that monitors a specific folder on your computer for changes. As soon as a new file is created within that folder, it is automatically uploaded to the cloud through your Internet connection. You might have heard of services like Dropbox, Livedrive and Live Mesh that can do this.

3) *Dedicated/private cloud storage* : you buy as much space as you need in a cloud and use it however you need. You can manually upload your files or you can install client software that automatically synchronizes specific folders on your computer. It is up to you whether you want to keep a local copy of your backup or not. The space you buy is yours only and is not shared with others like in Flickr. There are many different companies such as Amazon that provide cloud storage services. Lots of different ways to store and retrieve your data, but might require some technical skills to use it efficiently. Depending on the amount of storage you need, this type of cloud storage can get very expensive. There are some photographer-friendly sites like Mosaic Archive that allow uploading images through Lightroom directly. There is also another breed of cloud storage that is specifically targeted at photographers. [Photoshelter](#), for example, is a community web-based cloud storage that has a web-based interface for uploading and downloading files. You can access your account via FTP and you can use plugins for Aperture and Lightroom to export pictures directly into your account. RAW image upload is also supported. These services are gaining popularity very fast and they are a great alternative to mainstream sites like Flickr. If you have upload bandwidth issues, you can even send in your hard drive.

VI. BENEFITS OF CLOUD COMPUTING [11]

A. Flexibility: A cloud-based service can instantly meet the demand because of the vast capacity of the service's remote servers. In fact, this flexibility is so crucial that 65% of respondents to an InformationWeek survey said "the ability to quickly meet business demands" was an important reason to move to cloud computing.

B. Disaster recovery: When companies start relying on cloud-based services, they no longer need complex disaster recovery plans. Cloud computing providers take care of most issues, and they do it faster. Aberdeen Group found that businesses which used the cloud were able to resolve issues in an average of 2.1 hours, nearly four times faster than businesses that didn't use the cloud (8 hours). The same study found that mid-sized businesses had the best recovery times of all, taking almost half the time of larger companies to recover.

C. Automatic software updates: In 2010, UK companies spent 18 working days per month managing on-site security alone. But cloud computing suppliers do the server maintenance – including security updates – themselves, freeing up their customers' time and resources for other tasks.

D. Cap-Ex Free: Cloud computing services are typically pay as you go, so there's no need for capital expenditure at all. And because cloud computing is much faster to deploy, businesses have minimal project start-up costs and predictable ongoing operating expenses.

E. Increased collaboration: Cloud computing increases collaboration by allowing all employees – wherever they are – to sync up and work on documents and shared apps simultaneously, and follow colleagues and records to receive critical updates in real time. A survey by Frost & Sullivan found that companies which invested in collaboration technology had a 400% return on investment.

F. Work from anywhere : As long as employees have internet access, they can work from anywhere. This flexibility positively affects knowledge workers' work-life balance and productivity. One study found that 42% of working adults would give up some of their salary if they could telecommute, and on average they would take a 6% pay cut.

G. Document control: According to one study, "73% of knowledge workers collaborate with people in different time zones and regions at least monthly".

If a company doesn't use the cloud, workers have to send files back and forth over email, meaning only one person can work on a file at a time and the same document has tones of names and formats.

Cloud computing keeps all the files in one central location, and everyone works off of one central copy. Employees can even chat to each other whilst making changes together.

This whole process makes collaboration stronger, which increases efficiency and improves a company's bottom line.

H. Security: Some 800,000 laptops are lost each year in airports alone. This can have some serious monetary implications, but when everything is stored in the cloud, data can still be accessed no matter what happens to a machine.

I. Competitiveness: The cloud grants SMEs access to enterprise-class technology. It also allows smaller businesses to act faster than big, established competitors. A study on disaster recovery eventually concluded that companies that didn't use the cloud had to rely on tape backup methods and complicated procedures to recover – slow, laborious things which cloud users simply don't use, allowing David to once again out-manuever Goliath.

J. Environmentally friendly: Businesses using cloud computing only use the server space they need, which decreases their carbon footprint. Using the cloud results in at least 30% less energy consumption and carbon emissions than using on-site servers. And again, SMEs get the most benefit: for small companies, the cut in energy use and carbon emissions is likely to be 90%.

VII. THREATS OF USING CLOUD COMPUTING

The Cloud Security Alliance (CSA) is a not-for-profit organization with a mission to promote the use of best practices for providing security assurance within Cloud Computing, and to provide education on the uses of Cloud Computing to help secure all other forms of computing. The Cloud Security Alliance is led by a broad coalition of industry practitioners, corporations, associations and other key stakeholders.

CSA conducted a survey of industry experts, to compile professional opinion on the greatest issues within cloud computing. The Top Threats Working Group used these survey results alongside their expertise to craft the final *The Notorious Nine: Cloud Computing Top Threats in 2013*. The survey methodology validated that the threat listing reflects the most current concerns of the industry. In this most recent edition of this report, experts identified the following nine critical threats to cloud security:[12]

- A. Data Breaches
- B. Data Loss
- C. Account Hijacking
- D. Insecure APIs
- E. Denial of Service
- F. Malicious Insiders
- G. Abuse and Nefarious Use
- H. Insufficient Due Diligence
- I. Shared Technology Issues

VIII. CONCLUSION

In this paper I have discussed the all the characteristics, different models and advantages and threats of cloud computing in the social networking era. As there are millions of users of the social networking sites using the cloud computing is vital as it will help in the growing need for increasing amount of computational resources.

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