# CLOUD COMPUTING IS HEADING INTO STRATOSPHERE
## (A BEGINNING OF NEW ERA…)

Rajinder Kaur*

Payal Garg*

## ABSTRACT

*This paper describes cloud computing, a computing platform. Cloud computing minimizes or eliminates the ongoing cost of traditional on – premises applications such as software maintenance and upgrades. This paper defines, business benefits , cloud computing risk assessment and critical cloud services. We will go over a wide range of security parameters like reach ability, throughput, QOS or e2e availability. Cloud computing is internet based development and use of computer technology. There are some security issues which are managed through SLA such that the service contracts can be set up and monitored in such a way that the information security is optimized. A survey is conducted on how security parameter are used currently in SLA. It describes an abstract view of services that simplifies and ignores much of the details and inner working a provider's offering of abstracted internet services is often called "THE CLOUD". Cloud computing incorporates infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS).*

***Keywords:** QOS, e2e, critical cloud, security risk, SLA*

*Department of Computer Science and Applications, Mukand Lal National College, YamunaNagar.

## INTRODUCTION

Cloud computing is an emerging technology that may help enterprises meet the increased requirements of lower total cost of ownership, higher return on investment, increased efficiency, dynamic provisioning and utility like key-as-you-go services. It is the use of a $3^{rd}$ party  services (Web Services) to perform computing needs.  With cloud computing company can scale up to massive capacities in an instant without having to invest in new infrastructure. 'It offers the end user resources without the requirements of having knowledge of the system that deliver it.'

The cloud can provide the user with a far greater range of applications and services.

It is computation, software, data access and storage services that do not require end user knowledge of physical location and configuration of the system that delivers the services. This concept can be drawn with the electricity grid where end-users consume power resources without any necessary understanding of component device.

Cloud computing is a model for enabling convenient, on-demand network access to shared pool of configurable computing resources (Networks, Servers, Storage, Application and Services)

Typical cloud computing providers deliver common business applications online that are accessed from another Web service or software like a Web browser, while the software and data are stored on servers. Most cloud computing infrastructure consist of services delivered through common centers and built-on servers. Cloud  often appear as single points of access computing needs. Commercial offerings are generally expected to meet Quality of service(QoS) requirements of customers and typically include Service Level Agreements(SLAs)

## HOW TO WORK

cloud computing provides computer application developers and users an abstract view of services that simplifies and ignores much of the details and inner working. When a user access the cloud for a popular website, many things can happen. The user's IP address, for example can be used to establish where the user is located geolocation. DNS services can then direct the user to a cluster of services that are close to the user so the site can be accessed rapidly user do not log in to a server, but they log in to the service they are using y obtaining a session id or a cookie, which is stored in their browser.

## REAL-TIME CLOUD ENVIRONMENT

Gartner saw an opportunity for cloud computing "to shape the relationship among consumers of IT service, those who use it service and those who sell them" and observed that "[o]rganisations are switching from company-owned hardware and software assets to per-use service-based models" so that the projected shift to cloud computing will result in dramatic growth in IT products in some area and significant reductions in other areas.

## LAYERS

Once an internet protocol connection is established among several computers, it is possible to share services within any one of the following layers.
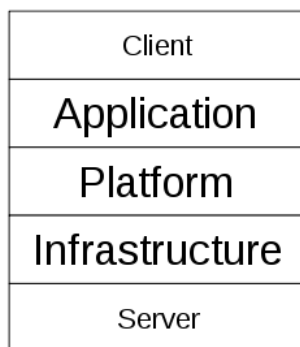


## CLIENT

A cloud client consists of computer hardware and/or computer software that relies on cloud computing for application delivery and that is in essence useless without it. Examples include some computers (example: Chromebooks), phones (example: Google Nexus series) and other devices.

## APPLICATION

Cloud application services or "**Software as a Service (SaaS**)" deliver software as a service over the Internet, eliminating the need to install and run the application on the customer's own computers and simplifying maintenance and support.

A cloud application is software provided as a service. It consists of the following: a package of interrelated tasks, the definition of these tasks, and the configuration files, which contain dynamic information about tasks at run-time. Cloud tasks provide compute, storage, communication and management capabilities. Tasks can be cloned into multiple virtual machines, and are accessible through application programmable interfaces (API). Cloud applications are a kind of utility computing that can scale out and in to match the workload demand. Cloud applications have a pricing model that is based on different compute and storage usage, and tenancy metrics.

## PLATFORM

Cloud platform services, also known as **Platform as a Service (PaaS)**, deliver a computing platform and/or solution stack as a service, often consuming cloud infrastructure and sustaining cloud applications. It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers Cloud computing is becoming a major change in our industry, and one of the most important parts of this change is the shift of cloud platforms. Platforms let developers write certain applications that can run in the cloud, or even use services provided by the cloud. There are different names being used for platforms which can include the on-demand platform, or Cloud.

## INFRASTRUCTURE

Cloud infrastructure services, also known as "**Infrastructure as a Service**" (IaaS), deliver computer infrastructure – typically a platform virtualization environment – as a service, along with raw (block) storage and networking. Rather than purchasing servers, software, data-center space or network equipment, clients instead buy those resources as a fully outsourced service. Suppliers typically bill such services on a utility computing basis; the amount of resources consumed (and therefore the cost) will typically reflect the level of activity.

**THREE KINDS OF CLOUD SERVICES**
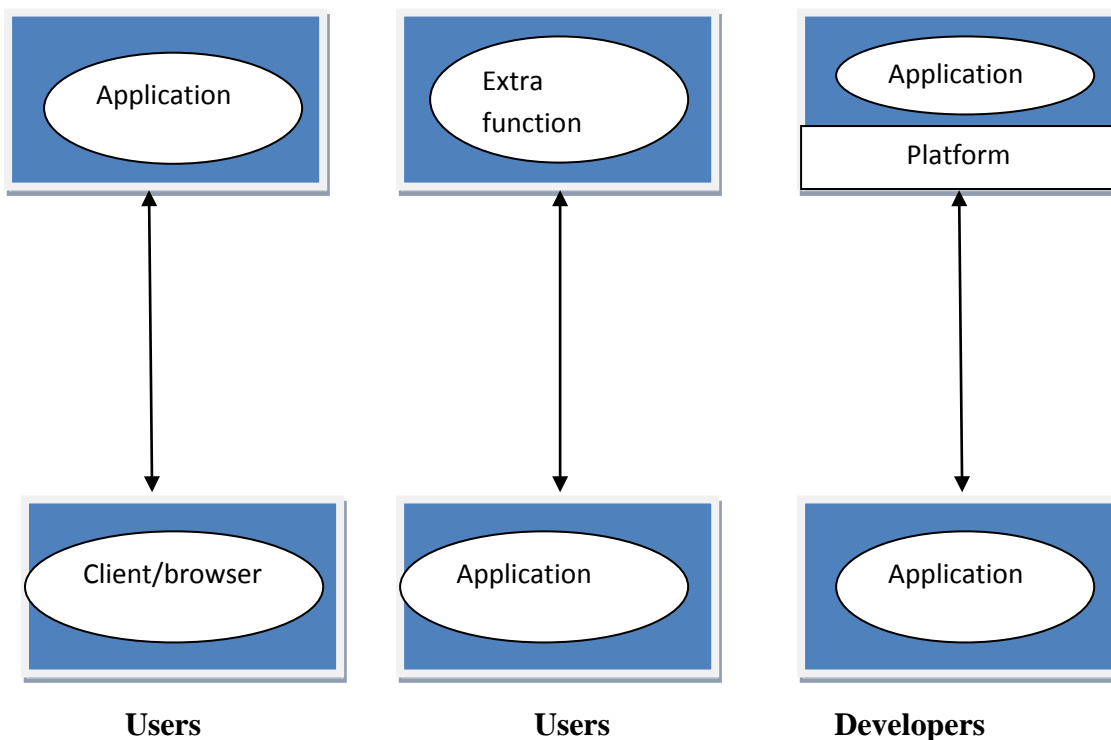
## SERVER

The servers layer consists of computer hardware and/or computer software products that are specifically designed for the delivery of cloud services, including multi-core processors, cloud-specific operating systems and combined offering.

## BENEFITS OF CLOUD COMPUTING TO YOUR BUSINESS

Cloud computing is the use of the Internet for the use of desired software as a service. By incorporating cloud computing services, companies have access to scalable and virtualized resources that are delivered in real-time. All upgrades, applications, and data is stored using alternate servers more equipped to handle them.

1.  **Saves time**. Businesses that utilize software programs for their management needs are disadvantaged, because of the time needed to get new programs to operate at functional levels. By turning to cloud computing, you avoid these hassles. You simply need access to a computer with Internet to view the information you need.

2.  **Less glitches**. Applications serviced through cloud computing require fewer versions. Upgrades are needed less frequently and are typically managed by data centers. Often, businesses experience problems with software because they are not designed to be used with similar applications. Departments cannot share data because they use different applications. Cloud computing enables users to integrate various types of applications including management systems, word processors, and e-mail. The fewer glitches, the more productivity expected from employees.

3.  **Going green**. On average, individual personal computers are only used at approximately 10 to 20 percent of their capacity. Similarly, computers are left idle for hours at a times soaking up energy. Pooling resources into a cloud consolidates energy use. Essentially, you save on costs by paying for what you use and extending the life of your PC.

4.  **Mobilization**. From just about anywhere in the world, services that you need are available. Sales are conducted over the phone and leads are tracked by using a cell phone. Cloud computing opens users up to a whole new world of wireless devices, all of which can be used to access any applications. Companies are taking sales productivity to a whole new level, while at the same time, providing their sales representatives with high quality, professional devices to motivate them to do their jobs well.

5.  **Consumer trends**. Business practices that are most successful are the ones that reflect consumer trends. Currently, over 69 percent of Americans with internet access use a source of cloud computing. Whether it is Web e-mail, data storage, or software, this

number continues to grow. Consumers are looking to conduct business with a modern approach.

6. **Customize.** All to often, companies purchase the latest software in hopes that it will improve their sales. Sometimes, programs do not quite meet the needs of a company. Some businesses require a personalized touch, that ordinary software cannot provide. Cloud computing gives the user the opportunity to build custom applications on a user-friendly interface. In a competitive world, your business needs to stand out from the rest. Customization is the solution for this problem.

## RISKS OF CLOUD COMPUTING

Cloud Computing has many benefits, however there are also some associated risks with using cloud computing. These include:

- Users do not physically possess storage of their own data, which leaves the responsibility and control of data storage with the provider

- Users could become dependent upon the cloud computing provider

- With data held externally, business continuity and disaster recovery are in the hands of the provider

- Data migration issues when changing cloud provider

- What happens if your cloud provider goes out of business?

## CLOUD COMPUTING RISK ASSESSMENT

Organizations considering cloud-based services must understand the associated risks, defining acceptable use cases and necessary compensating controls before allowing them to be used for regulated or sensitive information. Cloud-computing environments have IT risks in common with any externally provided service. There are also some unique attributes that require risk assessment in areas such as data integrity, recovery and privacy, and an evaluation of legal issues in areas such as e-discovery, regulatory compliance and auditing.

## KEY FINDINGS

- The most practical way to evaluate the risks associated with using a service in the cloud is to get a third party to do it.

- Cloud-computing IT risks in areas such as data segregation, data privacy, privileged user access, service provider viability, availability and recovery should be assessed like any other externally provided service.

- Location independence and the possibility of service provider "subcontracting" result in IT risks, legal issues and compliance issues that are unique to cloud computing.

- If your business managers are making unauthorized use of external computing services, then they are circumventing corporate security policies

## RECOMMENDATION

Organizations that have IT risk assessment capabilities and controls for externally sourced services should apply them to the appropriate aspects of cloud computing.

• Legal, regulatory and audit issues associated with location independence and service subcontracting should be assessed before cloud-based services are used.

• Demand transparency. Don't contract for IT services with a vendor that refuses to provide detailed information on its security and continuity management programs.

• Develop a strategy for the controlled and secure use of alternative delivery mechanisms, so that business managers know when they are appropriate to use and have a recognized approval process to follow.

## ANALYSIS

Cloud computing as a style of computing where massively scalable IT-enabled capabilities are delivered 'as a service' to external customers using Internet technologies. From a security and risk perspective, it is the least transparent externally sourced service delivery method, storing and processing your data externally in multiple unspecified locations, often sourced from other, unnamed providers, and containing data from multiple customers. This model provides cost savings through economies of scale, but it not only introduces the same risks as any externally provided service, it also includes some unique risk challenges. The word "cloud" suggests something big and accessible, but externally opaque. You can't see into the cloud — you just assume that it works.

If a company is considering the use of an external service of any sort, then it needs to:

• Assess the security, privacy and regulatory compliance risks

• Identify use cases that are inappropriate for this service delivery method, based on risk level and current controls

• Identify use cases that pose an acceptable level of risk for the service delivery method

• Choose and implement compensating controls before going fully operational

## HOW TO ASSESS

• How qualified are the architects, coders and operators to understand and reduce the risks of their offering?

• What risk control processes and technical mechanisms are used?

• What level of testing has been done to verify that the service and control processes are

functioning as designed and to identify unanticipated vulnerabilities?

**In practice, there are only three ways to answer these questions and provide a risk assessment of a service:**

1. Accept whatever assurances the service provider offers.

2. Evaluate the service provider in person.

3. Use a neutral third party to perform a security assessment.

# SECURITY

As cloud computing is achieving increased popularity, concerns are being voiced about the security issues introduced through adoption of this new model. The effectiveness and efficiency of traditional protection mechanisms are being reconsidered as the characteristics of this innovative deployment model differ widely from those of traditional architectures.

The relative security of cloud computing services is a contentious issue that may be delaying its adoption. Issues barring the adoption of cloud computing are due in large part to the private and public sectors' unease surrounding the external management of security-based services. It is the very nature of cloud computing-based services, private or public, that promote external management of provided services. This delivers great incentive to cloud computing service providers to prioritize building and maintaining strong management of secure services. Security issues have been categorised into sensitive data access, data segregation, privacy, bug exploitation, recovery, accountability, malicious insiders, management console security, account control, and multi-tenancy issues. Solutions to various cloud security issues vary, from cryptography, particularly public key infrastructure (PKI), to use of multiple cloud providers, standardisation of APIs, and improving virtual machine support and legal support.

# MANAGING SECURITY THROUGH SLA

It is a contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish. Many internet service providers provide their customers with an SLA.

Some metrics that SLAs may specify include:

• What percentage of the time service will be available

• The number of users that can be served simultaneously

• The schedule for notification in advance of network changes that may affect users

• help desk response time for various classes of problems

SLA are an effective means to quantify the services to be delivered to users to continuously improve those services. SLA are critical with outsourcing engagements because they form a vital part of the contract.

Managing Service level agreement

Service level reports are the primary tools to manage SLA. The SLR should be produced regularly. The report should state expectation for the reporting period and how the organization meets these expectation. The SLR contains all SLA metrics, which are applicable for the reporting period, any events related to meet or exceed SLA requirements.

The SLR is reviewed by the team leaders for completeness and accuracy. The review process answers questions such as

1.  Is the SLA complete. Have all services/processes been properly described and measured?
2.  Are the used metrics appropriate?
3.  Meet SLA requirement
4.  Improve the process
5.  Help to manage the project

## CONCLUSION

A new kind of application platform doesn't come along very often. But when a successful platform innovation does appear, it has an enormous impact. Cloud platform don't yet offer the full spectrum of an on-premises environment. For example, business intelligence as part of the platform isn't common, nor is support for business process management technologies such as full-featured workflow and rules engines. With on-premises applications, employees usually can access some key information even when online access isn't available. It means cloud applications may address the issue quite well or not at all.

The attractions of cloud-based computing, including scalability and lower costs, are very real. If you work in an application development, whether for a software vendor or an end user, expect the cloud to play an increasing role in your future. The next generation of application platform is here.