

# Cloud Computing and its Services – A Review

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**Abstract - Cloud computing has recently emerged as a new paradigm for hosting and delivering services over the Internet. Cloud computing is attractive to business owners as it eliminates the requirement for users to plan ahead for provisioning, and allows enterprises to start from the small and increase resources only when there is a rise in service demand.**

**Keywords: Cloud Computing, Security, website, business, services.**

## I. INTRODUCTION

Cloud computing, or the cloud, is a colloquial expression used to describe a variety of different types of computing concepts that involve a large number of computers connected through a real-time communication network such as the Internet. Cloud computing is a term without a commonly accepted unequivocal scientific or technical definition. In science, cloud computing is a synonym for distributed computing over a network and means the ability to run a program on many connected computers at the same time. The phrase is also, more commonly used to refer to network-based services which appear to be provided by real server hardware, which in fact are served up by virtual hardware, simulated by software running on one or more real machines. Such virtual servers do not physically exist and can therefore be moved around and scaled up (or down) on the fly without affecting the end user - arguably, rather like a cloud.

The popularity of the term can be attributed to its use in marketing to sell hosted services in the sense of application service provisioning that run client server software on a remote location.

In marketing, cloud computing is mostly used to sell hosted services in the sense of application service provisioning that run client server software at a remote location. Such services are given popular acronyms like 'SaaS', 'PaaS', etc.

Cloud computing is a kind of grid computing; it has evolved by addressing the [QoS](#) (quality of service) and reliability problems. Cloud computing provides the tools and technologies to build data / compute intensive parallel applications with much more affordable prices compared to traditional parallel computing techniques.

## II. BUSINESS AREAS BEST SUITED FOR CLOUD COMPUTING

Businesses are shifting from the client-server model to the cloud computing model. There are still some concerns about the security of cloud based servers. Many IT analysts firmly believe that the benefits of using the cloud for certain applications will far outweigh its risks. The needs to store most of the relevant data and access it efficiently is the main driving force behind many companies moving to the cloud.

### 1. Cloud Backup:

Some companies like Mozy are working to move businesses backup and disaster recovery data to cloud servers. Because of the presence of security concerns with cloud servers, businesses want to keep a back-up of their important data to avoid any unexpected turn of unforeseen events.

## 2. Collaboration Applications:

Business firms have already been managing their email and PIM by managed service providers for some years now. Some of the most important areas of collaboration applications will be for: *Email, File Sharing, Online Video and Voice Conferencing*. The low costs of cloud computing will make easier for decision makers to consider implementing it.

## 3. Web Serving:

The web servers, management tools, analytical and business software are moving to cloud computing. Cloud based web infrastructure and software will save you a lot of money. Enterprises corporations are already benefiting by the low price.

## 4. Employee Productivity Applications:

Applications used for improving employees performance and better reporting within the office is another type of cloud application being widely used at present. This will be looked into by many new and old businesses wanting increased accountability and efficiency within the workplace.

## 5. Business Applications:

Cloud based business applications provide tremendous opportunities to business firms to pay for what they have used. The Pay As You Go plan. Since companies don't have to actually purchase the software, they have access to the latest solutions. The availability of solutions such as CRM, ERP, HR, and Finance and Accounting on cloud based servers means a decrease in up-front investment and other issues of in-house deployment.

### III. SIGNIFICANCE OF CLOUD IN BUSINESS ORGANIZATION

The Cloud refers to a centralized location on the Internet that stores data, making it accessible anytime,

anywhere, from any device. Small businesses have embraced the Cloud because it has a number of benefits, including:

- Reduced Cost - Using the Cloud over physical file storage can save a significant amount of money.
- Ease of Use - Saving and accessing files on the Cloud is easy, making it an attractive option, even for non-technical small business owners.
- Flexibility - The Cloud, and the way you use it, can grow and change as your business needs grow and change.
- Automation - Instead of having to invest in IT support to keep your file storage system updated and maintained, most applications that use the Cloud automatically update themselves.

Of course, there are also negatives to using the Cloud. Security of data stored in the Cloud and loss of complete control over that data are serious concerns, for example. However, there are ways to protect your data to ensure it remains accessible and secure at all times. In most cases, the benefits far outweigh the risks for small business owners.

### IV. BENEFITS OF THE CLOUD IN BUSINESS

#### Data Backup

As a small business owner, you are probably already aware of the importance of backing up your data so you don't lose everything in the case of a systems failure or other disaster. The Cloud not only simplifies the process by allowing your data to automatically update as you work, but it also creates copies of your data off-site where it will be safe from any local natural disaster, theft or malfunction.

#### Mobile Working

One of the great benefits of technology is the ability for small business owners to create fully functional mobile offices. The Cloud fits in perfectly with this because it allows you to access and sync your

data from wherever you are, essentially allowing you to take your office with you on the road.

### **Information Sharing**

Whether you have in-house staff or a team spread across a distance, the Cloud makes sharing data effortless. Once you have your data backed up, sharing files can be as easy as sending a link, eliminating the cumbersome process of emailing large files or saving copies on drives that are then mailed.

### **File Storage**

Many small businesses are using images, audio and video to enhance their marketing activities. These files often take up a significant part of your hard drive space, which can be costly. The Cloud allows you to shift the storage of large files off of your local system, saving local storage for the files you need to access every day.

### **Growth Planning**

The Cloud is scalable, so it allows small businesses to create a plan for growth that utilizes the benefits of the Cloud without a significant up-front investment. You can start small, and gradually increase your usage over time, while only paying incrementally for the services and access you need. The Cloud is also self-managed by the apps that provide the services, so you can eliminate or at least reduce the need for an in-house IT staff to manage your technology.

Small business owners who want to reduce costs without sacrificing their ability to do business and compete with larger companies are using the Cloud. If you are ready to put the Cloud to work for your business, you can start small so you can see the benefits without making major changes to your operations. Over time, you will discover new ways to use and benefit from the Cloud.

### **Cloud based Service model**

Cloud computing providers offer their services according to several fundamental models: infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) where IaaS is the most basic and each higher model abstracts from the details of the lower models. Other key components in anything as a service (XaaS) are described in a

comprehensive taxonomy model published in 2009, such as Strategy-as-a-Service, Collaboration-as-a-Service, Business Process-as-a-Service, Database-as-a-Service, etc. In 2012, network as a service (NaaS) and communication as a service (CaaS) were officially included by ITU (International Telecommunication Union) as part of the basic cloud computing models, recognized service categories of a telecommunication-centric cloud ecosystem.

### **Infrastructure as a service (IaaS)**

In the most basic cloud-service model, providers of IaaS offer computers - physical or (more often) virtual machines - and other resources. (A hypervisor, such as Xen or KVM, runs the virtual machines as guests. Pools of hypervisors within the cloud operational support-system can support large numbers of virtual machines and the ability to scale services up and down according to customers' varying requirements.) 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. IaaS-cloud providers supply these resources on-demand from their large pools installed in data centers. For wide-area connectivity, customers can use either the Internet or carrier clouds (dedicated virtual private networks).

To deploy their applications, cloud users install operating-system images and their application software on the cloud infrastructure. In this model, the cloud user patches and maintains the operating systems and the application software. Cloud providers typically bill IaaS services on a utility computing basis: cost reflects the amount of resources allocated and consumed.

Cloud communications and cloud telephony, rather than replacing local computing infrastructure, replace local telecommunications infrastructure with Voice over IP and other off-site Internet services.

### Platform as a service (PaaS)

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. With some PaaS offers, the underlying computer and storage resources scale automatically to match application demand so that the cloud user does not have to allocate resources manually. The latter has also been proposed by an architecture aiming to facilitate real-time in cloud environments.

### Software as a service (SaaS)

In the business model using software as a service (SaaS), users are provided access to application software and databases. Cloud providers manage the infrastructure and platforms that run the applications. SaaS is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis. SaaS providers generally price applications using a subscription fee.

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. Cloud applications are different from other applications in their scalability—which can be achieved by cloning tasks onto multiple virtual machines at run-time to meet changing work demand. Load balancers distribute the work over the set of virtual machines. This process is transparent to the cloud user, who

sees only a single access point. To accommodate a

large number of cloud users, cloud applications can be *multitenant*, that is, any machine serves more than one cloud user organization. It is common to refer to special types of cloud based application software with a similar naming convention: desktop as a service, business process as a service, test environment as a service, communication as a service.

The pricing model for SaaS applications is typically a monthly or yearly flat fee per user, so price is scalable and adjustable if users are added or removed at any point.

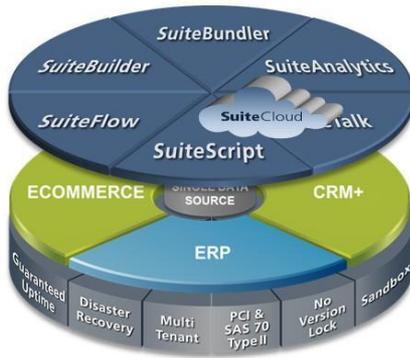
Proponents claim SaaS allows a business the potential to reduce IT operational costs by outsourcing hardware and software maintenance and support to the cloud provider. This enables the business to reallocate IT operations costs away from hardware/software spending and personnel expenses, towards meeting other goals. In addition, with applications hosted centrally, updates can be released without the need for users to install new software. One drawback of SaaS is that the users' data are stored on the cloud provider's server. As a result, there could be unauthorized access to the data.

### Network as a service (NaaS)

A category of cloud services where the capability provided to the cloud service user is to use network/transport connectivity services and/or inter-cloud network connectivity services. NaaS involves the optimization of resource allocations by considering network and computing resources as a unified whole.

Traditional NaaS services include flexible and extended VPN, and bandwidth on demand. NaaS concept materialization also includes the provision of a virtual network service by the owners of the network infrastructure to a third party (VNP – VNO).

## Cloud Architecture in Business Organisation



hardware - be it computing, storage or even networking. This introduces an additional layer - virtualization - that itself must be properly configured, managed and secured. Specific concerns include the potential to compromise the virtualization software, or "hypervisor". While these concerns are largely theoretical, they do exist. For example, a breach in the administrator workstation with the management software of the virtualization software can cause the whole datacenter to go down or be reconfigured to an attacker's liking.

### 1. Conclusion:

Users face difficult business problems every day. Cloud computing adopts concepts from Service-oriented Architecture (SOA) that can help the user break these problems into [services](#) that can be integrated to provide a solution. Cloud computing provides all of its resources as services, and makes use of the well-established standards and best practices gained in the domain of SOA to allow global and easy access to cloud services in a standardized way.

### Security issues associated with the cloud

Organizations use the Cloud in a variety of different service models ([SaaS](#), [PaaS](#), [IaaS](#)) and deployment models (Private, Public, Hybrid). There are a number of security issues/concerns associated with cloud computing but these issues fall into two broad categories: Security issues faced by cloud providers (organizations providing software-, platform-, or infrastructure-as-a-service via the cloud) and security issues faced by their customers. In most cases, the provider must ensure that their infrastructure is secure and that their clients' data and applications are protected while the customer must ensure that the provider has taken the proper security measures to protect their information.

The extensive use of virtualization in implementing cloud infrastructure brings unique security concerns for customers or tenants of a public cloud service. Virtualization alters the relationship between the OS and underlying

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