# Challenges Of Cloud Computing

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***Abstract-*** *Cloud computing is the development of parallel computing, distributed computing, grid computing and virtualization technologies which define the shape of a new era. Cloud computing is an emerging model of business computing. In this paper, we explore the concept of cloud architecture and compares cloud computing with grid computing. Cloud computing use the internet technologies for delivery of IT-Enabled capabilities 'as a service' to any needed users i.e. through cloud computing we can access anything that we want from anywhere to any computer without worrying about anything like about their storage, cost, management and so on. In this paper I provide a comprehensive study on the motivation factors of adopting cloud computing, review the several cloud deployment and service models.*

***Keywords****-* Cloud Computing, Cloud Services, Scalability, Vertical Scaling, Virtualization

## I. INTRODUCTION

the development of parallel computing, distributed computing grid computing, and the combination and evolution of Virtualization, Utility computing, Software-as-a-Service(SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). The IT resources are include network, server, storage, application, service and so on and they can be deployed with much quick and easy manner and least management and also interactions with service providers. The Cloud computing have been much improve the availability of IT resources and owns many advantages over other computing techniques.

The Cloud Computing provides are a surroundings for resource sharing in terms of ascendance frameworks, middleware's and application development platforms, and business applications. The operation models of cloud computing grasp free infrastructure services with value another platform services, subscription-based infrastructure services with supplemental application services, and free services for sellers but sharing of revenues generated from shoppers.

A Cloud Computing is emerging trend to deploy and maintain software and is being adopted by the industry such as Google, IBM, Microsoft, and Amazon. Several prototype applications and platforms, such as the IBM —Blue Cloud infrastructure, the Google App Engine, the Amazon Cloud, and the Elastic Computing Platform. Cloud Computing is perceived as the next progression that will impact organizational businesses and how they are manage their IT infrastructures. The technology and architecture that cloud service and deployment models offer are a key area of research.

## II. ARCHITECTURE

### Cloud Computing Architecture: How Does the Cloud Work?

The architecture that makes up today's current cloud computing services environment can be summarized as a front end platform (some kind of computing device the user interacts with), a back end system (servers and storage), and a connection to the Internet.

### Front-End Platform

A visible interface that can be accessed on mobile or desktop devices, the front-end platform is the component that can be seen by users and clients. This front-end platform interacts with cloud data storage networks and servers through an application, commonly Middleware, a web browser (Chrome, Firefox, etc.) or a virtual session.

Each cloud computing system or architecture may have a different interface to meet specific user or client demands. Sometimes the platform is a desktop computer or a mobile Smartphone, other times it is a thin client or virtual terminal.

### Back-End Platform

The back-end platform component of cloud architecture is comprised of millions of servers and data storage systems and software that is accessed securely over the public network, or via private connections. The size and usage growth of the largest platforms in place today is staggering.

To put the magnitude of the back-end platform into perspective, Amazon AWS and Microsoft together have more than 4 million servers in hundreds of cloud data centers

around the world, and Google's cloud offering likely has at least 2 million servers. A single AWS data cenhttp://Link to http://www.cloudcruiser.com/aws-azure-google-cloudter will conservatively contain 50,000 – 80,000 servers and cover an area the size of 10 football fields.

### Internet / Network

Without the network, there would be no cloud. The Internet and other private or public networks connect user to data, and data platforms to each other. This cloud network layer should provide users with uninterrupted access to data and applications, agile movement between servers and other clouds and effective security protocols.
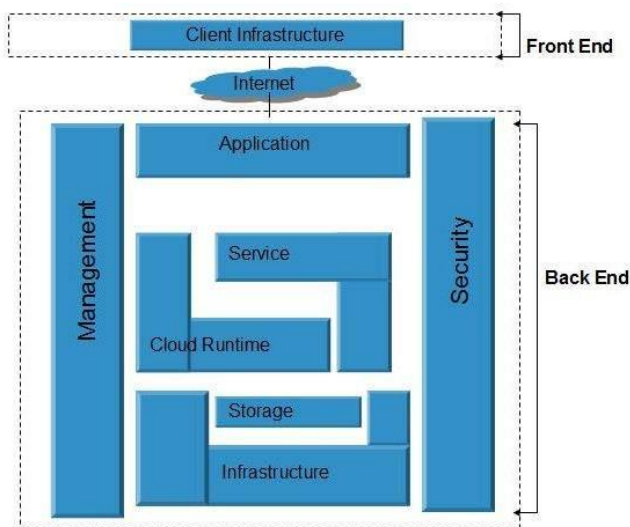


### III. CLOUD BASED DELIVERY

The delivery of cloud computing services can be broken down into four models: Software as a Service (SaaS), Development as a Service (DaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).

- Software as a Service (SaaS)

Provides on-demand access and use of cloud-based software without the need for physical, on-site equipment, platforms or installed software applications. More and more traditional desktop software, such as Microsoft Office, is moving to the SaaS model.

- Development as a Service (DaaS)

Allows developers shared access to development tools for software and applications, whether those applications run on the cloud or not.

- Platform as a Service (PaaS)

This cloud computer service provides application platforms and databases for programmers use as they develop applications.

- Infrastructure as a Service (IaaS)

Gives customers the ability to use a provider's physical hardware remotely. For a fee, clients may utilize a provider's virtual servers, storage databases and networks.

### IV. APPLICATIONS

There are a few applications of cloud computing [4] as follows:

1)      Cloud computing provides dependable and secure data storage center.
2)      Cloud computing can realize data sharing between different equipments.
3)    The cloud provides nearly infinite possibility for users to use the internet.

### IV. ADVANTAGES OF CLOUD COMPUTING

*Cost Savings*

Perhaps, the most significant cloud computing benefit is in terms of IT cost savings. Businesses, no matter what their type or size, exist to earn money while keeping capital and operational expenses to a minimum. With cloud computing, you can save substantial capital costs with zero in-house server storage and application requirements. The lack of on-premises infrastructure also removes their associated operational costs in the form of power, air conditioning and administration costs. You pay for what is used and disengage whenever you like - there is no invested IT capital to worry about. It's a common misconception that only large businesses can afford to use the cloud, when in fact, cloud services are extremely affordable for smaller businesses.

*Reliability*

With a managed service platform, cloud computing is much more reliable and consistent than in-house IT infrastructure. Most providers offer a Service Level Agreement which guarantees 24/7/365 and 99.99% availability. Your organization can benefit from a massive pool of redundant IT resources, as well as quick failover

mechanism - if a server fails, hosted applications and services can easily be transited to any of the available servers.

### Manageability

Cloud computing provides enhanced and simplified IT management and maintenance capabilities through central administration of resources, vendor managed infrastructure and SLA backed agreements. IT infrastructure updates and maintenance are eliminated, as all resources are maintained by the service provider. You enjoy a simple web-based user interface for accessing software, applications and services – without the need for installation - and an SLA ensures the timely and guaranteed delivery, management and maintenance of your IT services.

### Strategic Edge

Ever-increasing computing resources give you a competitive edge over competitors, as the time you require for IT procurement is virtually nil. Your company can deploy mission critical applications that deliver significant business benefits, without any upfront costs and minimal provisioning time. Cloud computing allows you to forget about technology and focus on your key business activities and objectives. It can also help you to reduce the time needed to market newer applications and services.

## V. DISADVANTAGES OF CLOUD COMPUTING

### Downtime

As cloud service providers take care of a number of clients each day, they can become overwhelmed and may even come up against technical outages. This can lead to your business processes being temporarily suspended. Additionally, if your internet connection is offline, you will not be able to access any of your applications, server or data from the cloud.

### Security

Although cloud service providers implement the best security standards and industry certifications, storing data and important files on external service providers always opens up risks. Using cloud-powered technologies means you need to provide your service provider with access to important business data. Meanwhile, being a public service opens up cloud service providers to security challenges on a routine basis. The ease in procuring and accessing cloud services can also give nefarious users the ability to scan, identify and exploit loopholes and vulnerabilities within a system. For instance, in a multi-tenant cloud architecture where multiple users are hosted on the same server, a hacker might try to break into the data of other users hosted and stored on the same server. However, such exploits and loopholes are not likely to surface, and the likelihood of a compromise is not great.

### Vendor Lock-In

Although cloud service providers promise that the cloud will be flexible to use and integrate, switching cloud services is something that hasn't yet completely evolved. Organizations may find it difficult to migrate their services from one vendor to another. Hosting and integrating current cloud applications on another platform may throw up interoperability and support issues. For instance, applications developed on Microsoft Development Framework (.Net) might not work properly on the Linux platform.

### Limited Control

Since the cloud infrastructure is entirely owned, managed and monitored by the service provider, it transfers minimal control over to the customer. The customer can only control and manage the applications, data and services operated on top of that, not the backend infrastructure itself. Key administrative tasks such as server shell access, updating and firmware management may not be passed to the customer or end user.

## VI. CONCLUSION

This paper discussed the architecture and popular platforms of cloud computing. It also addressed challenges and issues of cloud computing in detail. In spite of the several limitations and the need for better methodologies processes, cloud computing is becoming a hugely attractive paradigm, especially for large enterprises.

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