

An Overview on Cloud Computing and challenges

Miss Sharma R. I¹, Miss Thorat S. B.²

^{1,2} Students, Sangamner college

Abstract: *Cloud computing is nothing but delivery of computing services like servers, storage, databases, networking, software, analytics and more through the Internet. With cloud computing, there is no need to invest large amount in hardware and spend a lot of time on the heavy lifting of managing that hardware. You have to only provide the right type and size of computing resources you need to provide your ideas or operate your IT department. You can able to use number of resources as per your requirement, at any time, and pay for what you use. It is provided by service provider using network. In this paper we will discuss on what are the uses of cloud computing, how it works, its service model. Cloud networking or Cloud based networking describes the access of networking resources from a centralized third-party provider using Wide Area Networking or Internet-based access technologies.*

Cloud networking is related the concept of cloud computing, in which centralized computing resources are shared for customers or clients. In cloud networking, the network can be shared as well as the computing resources. It has spurred a trend of pushing more network management functions into the cloud, so that fewer customer devices are needed to manage the network[1]

Keywords: *cloud computing, service providers, service model*

Introduction:

Cloud computing consist of three different types of computing services delivered remotely to client through the internet. Clients pays monthly or annual service fee to providers to gain access to systems that deliver software as a service, platforms as a service and infrastructure as a service to subscribe. Client who subscribe to cloud computing services can get a variety of benefits, depending on their particular business needs at a given point in time. The ability to access powerful IT resources on an incremental basis is leveling the playing field for small and medium sized organization, providing them with the necessary tools and technology to compete in the global marketplace without the previously requisite investment in on premise IT resources. Clients who subscribe to computing services delivered through the 'Cloud' are able to reduce the IT service expenditures for their organization and gain access to more agile and flexible

enterprise level computing services in the process[2]. Cloud computing eliminates the capital expense of buying hardware and software and setting up and running on-site datacenters—the racks of servers, the round-the-clock electricity for power and cooling, the IT experts for managing the infrastructure. It adds up fast., speed because vast amounts of computing resources can be provisioned in minutes , global scale which provides more or less computing power, storage, bandwidth right when it is needed and from the right geographic location., productivity, performance, reliability in which cloud computing makes data backup, disaster recovery and business continuity easier and less expensive etc[3].

Types of Cloud:

Cloud computing is usually described in one of two ways. Either based on the cloud location, or on the service that the cloud is offering

Based on a cloud location they are classified as follow:

- 1) Public Cloud
- 2) Private Cloud
- 3) Hybrid Cloud
- 4) Community Cloud
- 5) Federated Clouds
- 6) Multi-clouds and Inter-clouds

1) Public Cloud:

Public cloud mean that the whole computing infrastructure is located on the premises of a cloud computing company that offers the cloud service. The location remains, thus, separate from the customer and he has no physical control over the infrastructure.

As public clouds use shared resources, they do excel mostly in performance, but are also most vulnerable to various attacks.

2) Private Cloud:

Private cloud means using a cloud infrastructure (network) solely by one customer/organization. It is not shared with others, yet it is remotely located. If the cloud is externally hosted. The companies have an option of

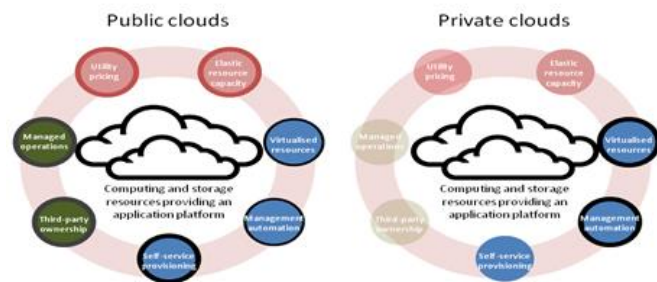
choosing an on-premise private cloud as well, which is more expensive, but they do have a physical control over the infrastructure.

The security and control level is highest while using a private network. Yet, the cost reduction can be minimal, if the company needs to invest in an on-premise cloud infrastructure.

3) Hybrid Cloud:

Of course, means, using both private and public clouds, depending on their purpose.

For example, public cloud can be used to interact with customers, while keeping their data secured through a private cloud.



4) Community Cloud:

Community Cloud implies an infrastructure that is shared between organizations, usually with the shared data and data management concerns. For example, a community cloud can belong to a government of a single country. Community clouds can be located both on and off the premises.

5) Federated Clouds • Multi-clouds and Inter-clouds

There are some interesting emerging models. Cloud Researchers have suggested that, like the Internet, a mechanism should exist for users to be able to utilize multiple clouds from multiple providers or companies, and not have the details visible. In the Internet, the user sees a uniform and global topology. The user is unaware of which Internet Service Provider is hosting the web site which is he viewing, and that user is also very unaware how packets have traveled in between their browser and that web site. We will now look at the models of Cloud federation, which allows inter-cloud resources sharing and combined provisioning. There are two types of cloud federation; a Provider side federation for resources

sharing and provisioning, and a User/customer side federation that allows creation of multi-provider heterogeneous cloud infrastructures. The provider side federation is called "Intercloud". The Intercloud deployment model provides a general framework for multi-provider heterogeneous cloud based services and infrastructures building and operation.

Based on a service that the cloud is offering are as follow

1) IaaS (Infrastructure-as-a-Service)

Infrastructure as a Service, is considered as IaaS, contains the basic building blocks for cloud IT and provide access to networking features, computers either virtual or on dedicated hardware, and data storage space. Infrastructure as a Service provides you the highest level of flexibility and management control over your IT resources and it is similar to existing IT resources that many IT departments and developers are familiar today.

2) PaaS (Platform-as-a-Service)

Platforms as a service remove the need for organizations to manage the underlying infrastructure, infrastructures are usually hardware and operating systems and allow you to focus on the deployment and management of your applications. This helps you be more efficient as you don't need to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other undifferentiated heavy lifting involved in running your application.

3) SaaS (Software-as-a-Service)

Software as a Service provides you a completed product that is run and managed by the service provider. In most cases, people referring to Software as a Service are referring to end-user applications. With a SaaS offering you do not have to think about how the service is maintained or how the underlying infrastructure is managed; you only need to think about how you will use that particular software. A common example of a SaaS application is web-based email where you can send and receive email without having to manage feature additions to the email product or maintaining the servers and operating systems that the email program is running on.

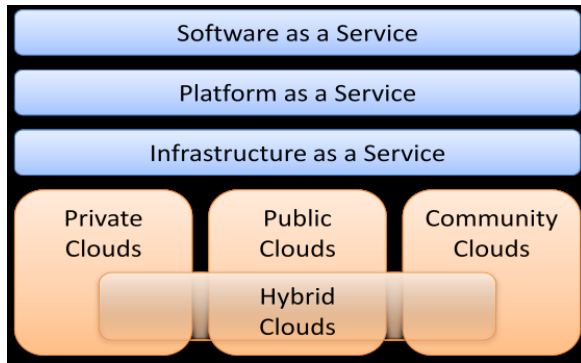


Fig: Cloud computing deployment and service models

Challenges to cloud adoption come in all shapes, sizes and severities, depending on the organization. None should be considered show-stoppers, but that doesn't make them real or significant. There is not definitive list of challenges; if there was it would be outdated as soon as it was put to paper. In discussion with prospective customers, attending tradeshow and working with clients on their future cloud roadmaps, there are recurring themes. The following are the concerns and challenges we hear most often.[3]

Making the correct choice: it is observe that SaaS, IaaS, PaaS and a plethora of options and variations are today available as a service. Making correct choice between it is difficult. It is easier to find when you need to meet the business requirements. Every cloud strategy begins with the business strategy and a determination of the risk of various choices. Business case must be at first, cloud implementation at last.

Lack of Executive Support: It is a difficult challenge with many people. In many ways, a lack of support mostly generate fear, uncertainty and doubt. It is necessary to speak business languages, understanding business issues, business goals and generating a sound business for your proposals. Align proposal with corporate campaigns.

Loss of Control: It is too much difficult challenge to let it go. It not only belongs to security, but also Entrusting a third party to be a responsible, honest and reliable business partner, they are responsible for some. There are some of the other revenue-generating projects and business contributions IT can accomplish when some of operational responsibility is taken away from you.

Vendor Lock-in: Even though if you are using the cloud you would like to have control over your data and wanted to able to switch service providers without any costing. Ensuring that data portability is essential and understanding the data ownership and retrieval policies of the provider.

Security and Compliance: At last it is possible that there is some data or applications with which your organization will not be comfortable and may want to letting out of sight. But this is also focused by some service providers because the large number of demand and it's a major point of competitive differentiation. Security and compliance is not a cloud computing issue instead it is a cloud service provider issue.

Availability and Reliability: Security, availability and reliability are a service provider issue. It is necessary that delivering on a stringent SLA requires a commitment of best practices, thoroughly redundant architecture, 24/7/365 staffing by trained and experience technicians, and top-flight hardware, software and network products.

Lack of Skills, Knowledge and Expertise: This challenge is quite different in the cloud, IT organizations and it may not have the necessary tools or resources to implement, monitor and manage cloud solutions. It is not about what they are doing. It is necessary to Educating staff about new processes and tool sets, or hiring staff with new skills so that your operations and applications move to the cloud within time. Selecting the right service provider will definitely help to make easy the transition and fill gaps.

Performance and Bandwidth Cost: Businesses can save money on system acquisitions, management and maintenance, but they may have to spend more for the bandwidth. For smaller applications this is not usually an issue, but cost can be high for the data-intensive applications. Delivering and receiving intensive and complex data over the network requires sufficient bandwidth to stave off latency and application time outs[3].

Vendor Transparency: It is not about what you want from your service provider. If you are getting it then get respond from it. It is necessary that service provider should open about the processes and methods for delivering on its SLAs. It is true with to security and compliance.

Conclusion:

This paper we discussed on the cloud computing i. e. how cloud computing is used by people cloud computing. Also we took look on types cloud based on the cloud location, or on the service that the cloud is offering. It also addressed challenges 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. Cloud Computing initiatives could affect the

enterprises within two to three years as it has the potential to significantly change IT[8].

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