



A Comprehensive Proliferation on Cloud Computing with Models

Miss. Akshata Sanjay Bhoir¹, Prof. Sachin M. Vaidya²

¹Final year Student of A.C.Patil College of Engineering, Master of Computer Application Department, Kharghar-410210, Navi Mumbai, Maharashtra

Email: asbhoir@acpce.ac.in

²Professor & Head of Master of Computer Application Department, A.C.Patil College of Engineering, Kharghar-410210, Navi Mumbai, Maharashtra

Email: smvaidya@acpce.ac.in

ABSTRACT

Cloud computing is becoming an increasingly popular enterprise model in which computing resources are made available on-demand to the user as needed. Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. The term is generally used to describe data centers available to many users over the Internet. Large clouds, predominant today, often have functions distributed over multiple locations from central servers. If the connection to the user is relatively close, it may be designated an edge server. The unique value proposition of cloud computing creates new opportunities to align IT and business goals. 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. It also explore certain benefits of cloud computing over traditional IT service environment-including scalability, flexibility, reduced capital and higher resource utilization are considered as adoption reasons for cloud computing environment. I also include security, privacy, and internet dependency and availability as avoidance issues. The later includes vertical scalability as technical challenge in cloud environment.

I.INTRODUCTION

Traditional application integration technologies are performed in a rigid and slow process that usually takes a long time to build and deploy, requiring professional developers and domain experts. They are server-centric and thus do not fully utilize the computing power and storage capability of client systems. Since the face of the Internet is continually changing, as new services and novel applications appear and become globally noteworthy at an increasing pace. Nowadays the locus of computation is changing, with functions migrating to remote data centers via Internet based communication. Computing and communication are being blended into new ways of using networked computing systems. Next generation networks and service infrastructures should overcome the scalability, flexibility, resilience and security bottlenecks of current network and service architectures, in order to provide a large variety of services and opportunities, adoptable by business models capable of dynamic and seamless utilization of IT resources based on user- demand across a multiplicity of devices, networks, providers, service domains and social and business processes.

Today is the era of Cloud Computing Technology in IT Industries. Cloud computing which is based on Internet has the most powerful architecture of computation. It reckons in of a compilation of integrated and networked hardware, software and internet infrastructure. It has various avails atop grid computing and other computing. In this paper, I have given a brief of evaluation of cloud computing by reviewing more than 30 articles on cloud computing. The outcome of this review signalizes the face of the IT industry's before and after the cloud computing

II.ANATOMY OF CLOUD COMPUTING

Definition of Cloud computing Cloud computing is becoming one of the next IT industry Buzz words: users move out their data and applications to the remote "Cloud" and then access them in a simple And pervasive way. This is again a central processing use case. Similar scenario occurred around 50 years ago: a Time-sharing computing server served multiple users. Until 20 years ago when personal computers came to us, data and programs were mostly located in local resources. Certainly currently the Cloud computing paradigms not a recurrence of the history. 50 years ago we had to adopt the timesharing servers due to limited computing resources. Nowadays the Cloud computing comes into fashion due to the need to build complex IT infrastructures. Users have to manage various software installations, configuration and updates. Computing resources and other hardware are prone to

be outdated very soon. Therefore outsourcing computing platforms is a smart solution for users to handle complex IT infrastructures. At the current stage, the Cloud computing is still evolving and there exists no widely accepted definition. Based on our experience, we propose an early definition of Cloud computing as follows: A computing Cloud is a set of network enabled services, providing scalable, QoS guaranteed, normally personalized, inexpensive computing platforms on demand, which could be accessed in a simple and pervasive way.

Cloud Architecture All Cloud computing is a set of IT services that are provided to a customer over a network on a leased basis and with the ability to scale up or down their service requirements. Usually cloud computing services are delivered by a third party provider who owns the infrastructure. It advantages to mention but a few include scalability, resilience, flexibility, efficiency and out sourcing non-core activities. Cloud computing offers an innovative business model for organizations to adopt IT services without upfront investment. There are two basic cloud models are discussed, first the Cloud service model and the second Cloud Deployment model.

Cloud Service Model Cloud computing is a delivery of computing where massively scalable IT-related capabilities are provided —as a service across the internet to numerous external clients. This term effectively reflects the different facets of the Cloud Computing paradigm which can be found at different infrastructure levels. Cloud Computing is broadly classified into three services:

1) IaaS (Infrastructure as a service) model: The main concept behind this model is virtualization where user have virtual desktop and consumes the resources like network, storage, virtualized servers, routers and so on, supplied by cloud service provider. . Usage fees are calculated per CPU hour, data GB stored per hour, network bandwidth consumed, network infrastructure used per hour, value added services used, e.g., monitoring, auto-scaling etc. Examples: Storage services provided by AmazonS3, Amazon EBS. Computation services: AmazonEC2,

2) PaaS (Platform as a service) model: It refers to the environment that provides the runtime environment, software deployment framework and component on pay to enable the direct deployment of application level assets or web deployment framework and component on pay to enable the direct deployment of application level assets or web applications. PaaS is a platform where software can be developed, tested and deployed. It means the entire life cycle of software can be operated on a PaaS. This service model is dedicated to application developers, testers, deployers and administrators. Examples: Google App Engine (GAE), Microsoft Azure, IBM Smart Cloud, Amazon EC2, salesforce.com and jelastic.com and so on.

3) SaaS (Software as a service): Through this service delivery model end users consume the software application services directly over network according to on-demand basis. For example, Gmail is a SaaS where Google is the provider and we are consumers. Other well known examples of PaaS include billing services provided by Arial system, op source. Financial services: Concur, workday, Backup and recovery services and so on.

Cloud Service Models

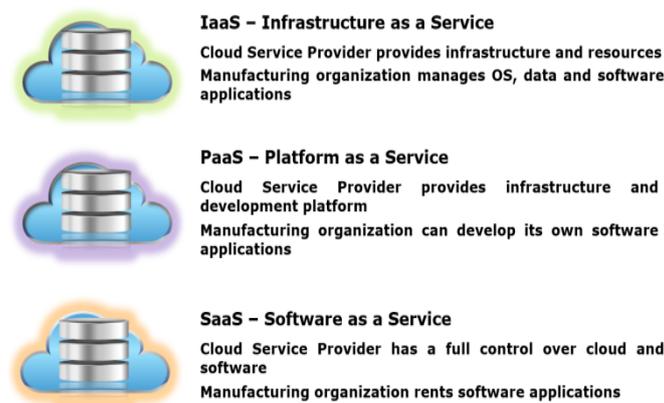


Fig Cloud Service Models

There are four primary cloud computing deployment models which are available to service consumer. Each deployment model is defined according to where infrastructure of environment located.

1) Public cloud/external cloud: This model allows cloud environment as openly or publically accessible. Public cloud is off premise in which various enterprises can be used to deliver the services to users by taking it from third party.

2) Private cloud/internal cloud: This model referred to on-premise cloud which is managed or owned by an organization to provide the high level control over cloud services and infrastructure. In other words private cloud is build specifically to provide the services within an organization for maintaining the security and privacy.

3) Hybrid cloud/virtual private cloud model: This model compromised both private and public cloud models where cloud computing environment is hosted and managed by third party (off-premise) but some dedicated resources are privately used only by an organization.

4) Community model: It allows the cloud computing environment which is shared or managed by number of related organizations. Community Model in which several individuals or groups are encouraged to join and participate in

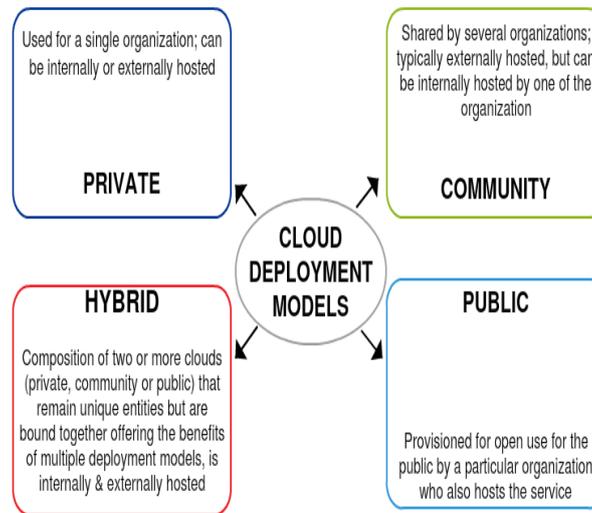


Fig. Cloud Deployment Model

IV. MOTIVATING FACTORS AND CHALLENGES

Cloud systems are not just another form of resource provisioning infrastructure and in fact, have multiple opportunities from the principles for cloud infrastructures that will enable further types of applications, reduced development and provisioning time of different services. Cloud computing has particular characteristics that distinguish it from classical resource and service provisioning environments.

- Infinitely (more or less) Scalable
- Cost saving/less capital expenditure
- Higher resource
- Utilization Business agility
- Disaster recovery and
- Back up Device and Location Independence ongoing interaction designed around a common purpose.

V. ADVANTAGES OF CLOUD COMPUTING

Cloud computing is an emerging technology that almost every company switched to from on-premise technologies. Whether it is public, private or hybrid, Cloud computing has become an essential factor for the companies to rise up to the competition. Let us find out why Cloud is so much preferred over the on-premise technologies.

1) Cost efficiency – The biggest reason behind shifting to cloud computing is that it takes considerably lesser cost than an on-premise technology. Now the companies need not store the data in disks anymore as the Cloud offers enormous storage space, saving money and resources of the companies.

2) High Speed – Cloud computing lets you deploy the service quickly in fewer clicks. This quick deployment lets you get the resources required for your system within fewer minutes.

3) Excellent accessibility – Storing the information in cloud allows you to access it anywhere and anytime regardless of the machine making it highly accessible and flexible technology of present times.

4) Back-up and restore data – Once the data is stored in Cloud, it is easier to get the back-up and recovery of that, which is quite a time taking process on-premise.

5) Manageability – Cloud computing eliminates the need for IT infrastructure updates and maintenance since the service provider ensures timely, guaranteed and seamless delivery of your services and also takes care of all the maintenance and management of your IT services according to the service level agreement (SLA).

6) Sporadic Batch processing – Cloud computing lets you add or subtract resources and services according to your needs. So, if the workload is not

24/7, you need not worry about the resources and services getting wasted and you won't end up stuck with unused services.

7)Strategic edge – Cloud computing provides your company a competitive edge over the competitors when it comes to accessing the latest and mission critical applications whenever you need them without having to invest your time and money on installations.

VLDISADVANTAGES OF CLOUD COMPUTING

Every technology has positive and negative aspects:

1)Vulnerability to attacks – Storing data in cloud may pose serious challenge of information theft since in cloud every data of your company is online. Security breach is something that even the best organizations have suffered from and it's a potential risk in cloud as well. Though advanced security measures are deployed on cloud, still storing a confidential data in cloud can be a risky affair.

2)Network connectivity dependency – Cloud computing is entirely dependent on the internet. This direct tie up with internet means that you need a reliable and consistent internet service as well as a good connection speed and bandwidth for your business to reap the benefits of cloud computing.

3)Downtime – Downtime is considered as one of the biggest potential downside of using Cloud computing. Your cloud providers may sometimes face technical outages which can happen due to various reasons such as loss of power, low internet connectivity, data centres going out of service for maintenance etc. This can lead to a temporary downtime in your cloud services.

4)Vendor lock in – When in need to migrate from one cloud platform to another, your company might face some serious challenges because of the differences between vendor platforms. Hosting and running the applications of your current cloud platform on some other platform may cause support issues, configuration complexities and additional expenses. Your data might also be left vulnerable to security attacks due to compromises that might have been made during migrations.

5)Limited control – Cloud customers may face limited control over their deployments. The cloud services run on remote servers which are completely owned and managed by the service providers, which makes it hard for the companies to have the level of control that they would want over their back-end infrastructure.

VII.CONCLUSION

Cloud computing have several benefits over traditional (non- cloud) environment and have capability to handle most sudden, temporary peaks in application demand on cloud infrastructures. Virtualization technology provides good support to achieve aim of cloud computing like higher resource utilization, elasticity, reducing IT cost or capital expenditure to handle temporary loads as well as cloud computing have various flexible service and deployment models which is also one of the main issue of adopting this computing paradigm. Virtualization concepts have open shared nature which is responsible for the violation of security polices and laws as well as degrades their computing reputation and performance. So there is need to focus on privacy and on solutions of various security problems to maintain the trust level of organization for deploying the cloud computing without any hesitation. Cloud computing is a really cheap way for companies to have all the resources they need in once place. It's a much better way to spread your resources, and it becomes easier to access things from longer distances. Cloud computing has the potential to become a frontrunner in promoting a secure, virtual and economically viable IT solution in the future. As the development of cloud computing technology is still at an early stage, this research effort will provide a better understanding of the design challenges of cloud computing, and pave the way for further research in this area.

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