

CLOUD COMPUTING : VARIOUS ISSUES AND CHALLENGES

¹Anjana Singh

¹.Department of Computer Science, A.I.J.H.M.College,
Rohtak (India), E-Mail :anjanatalan81@gmail.com

Abstract:

In an age of information and globalization, massive computing power is desired to generate business insights and competitive advantage. Since the phenomenon of cloud computing was proposed, there is an unceasing interest for research across the globe. Cloud computing has been seen as unitary of the technology that poses the next-generation computing revolution and rapidly becomes the hottest topic in the field of IT. This fast move towards Cloud computing has fuelled concerns on a fundamental point for the success of information systems, communication, virtualization, data availability and integrity, public auditing, scientific application, and information security. Therefore, cloud computing research has attracted tremendous interest in recent years. In this paper, we aim to precise the current open challenges and issues of Cloud computing. We have discussed the paper in three-fold: first we discuss the cloud computing architecture and the numerous services it offered. Secondly we highlight several security issues in cloud computing based on its service layer. Then we identify several open challenges from the Cloud computing adoption perspective and its future implications. Finally, we highlight the available platforms in the current era for cloud research and development.

ISSN : 2348-5612 © URR



9 770234 856124

1. Introduction :

Cloud computing is a complete new technology. It is the development of parallel computing, distributed computing grid computing, and is the combination and evolution of Virtualization, Utility computing, Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). Cloud is a metaphor to describe web as a space where computing has been pre installed and exist as a service; data, operating systems, applications, storage and processing power exist on the web ready to be shared. To users, cloud computing is a Pay-per-Use-On-Demand mode that can conveniently access shared IT resources through the Internet. Where the IT resources 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. Cloud computing can much improve the availability of IT resources and owns many advantages over other computing techniques. Users can use the IT infrastructure with Pay-per-Use-On-Demand mode; this would benefit and save the cost to buy the physical resources that may be vacant.

2. Different Issues in Cloud Computing:

More and more information on individuals and companies is placed in the cloud; concerns are beginning to grow about just how safe an environment it is? The issues can be organized into several different categories varying from security, protection, identity management, resource management, power and energy management, data isolation, availability of resources, heterogeneity of resources. Although, there are several issues that demand attention but the following could be treated as of prime concern:

2.1. Privacy :

Cloud computing utilizes the virtual computing technology, users' personal data may be scattered in various virtual data centers rather than stay in the same physical location, users may leak hidden information when they are accessed cloud computing services. Attackers can analyze the critical task depend on the computing task submitted by the users. According to the survey of International Data Corporation (IDC), Security, Performance and Availability are the three biggest issues in cloud adoption. The critical challenge is how it addresses security and privacy issues which occur due to movement of data and application on networks, loss of control on data, heterogeneous nature of resources and various security policies. Data stored, processing and movement of data outside the controls of an organization poses an inherent risk and making it vulnerable to various attacks.

2.2. Reliability :

The cloud servers also experience downtimes and slowdowns as our local server.

2.3. Execution :



According to IDC's survey, performance is the second biggest issue in cloud adoption. The cloud must provide improved performance when a user moves to cloud computing infrastructure. Performance is generally measured by capabilities of applications running on the cloud system. Poor performance can be caused by lack of proper resources viz. disk space, limited bandwidth, lower CPU speed, memory, network connections etc. Many times users prefer to use services from more than one cloud where some applications are located on private clouds while some other data or applications being on public and/or community cloud. The data intensive applications are more challenging to provide proper resources. Poor performance can results in end of service delivery, loss of customers, reduce bottom line revenues etc.

2.4. Legal Issues :

Worries stick with safety measures and confidentiality of individual all the way through legislative levels.

2.5. Availability :

Any technology's strength is measured by its degree of reliability and availability. Reliability denotes how often resources are available without disruption (loss of data, code reset during execution) and how often they fail. One of the important aspect that creates serious problems for the reliability of cloud computing is down time. One way to achieve reliability is redundant resource utilization. Availability can be understood as the possibility of obtaining the resources whenever they are needed with the consideration to the time it takes for these resources to be provisioned. Regardless of employing architectures having attributes for high reliability and availability, the services in cloud computing can experience denial of service attacks, performance slowdowns, equipment outages and natural disasters.

2.6. Compliance :

Numerous regulations pertain to the storage and use of data requires regular reporting and audit trails. In addition to the requirements to which customers are subject, the data centers maintained by cloud providers may also be subject to compliance requirements.

2.7. Intermediary Layer :

A number of recent works address the interoperability issue by providing an intermediary layer between the cloud consumers and the cloud-specific resources (e.g. VM).

2.8. Open Standard :

Standardization appears to be a good solution to address the interoperability issue. However, as cloud computing just starts to take off, the interoperability problem has not appeared on the pressing agenda of major industry cloud vendors.

2.9. Interoperability and Portability :

Interoperability is the ability to use the same tools or application across various cloud service providers platforms. The interoperability can be defined at various levels viz. application, service, management and Data interoperability. Cloud users must have the flexibility of migrating in and out and switching to clouds whenever they want without no vendor lock-in period. One of the adoption barriers in cloud computing interoperability is the vendor lock-in risk. The main problems to realize it are the lack of open standards, open APIs and lack of standard interfaces for VM formats and service deployment interfaces. Cloud portability ensures that one cloud solution will be able to work with other platforms and applications as well as with other clouds.

2.10. Energy Consumption :

The cost consumption of Amazon data centers is shocking as 53% of the total cost is consumed by the servers for a 3-year amortization period while energy and cooling requirements consume 42% of the total budget including both direct power consumption (~19%) and the cooling requirements (23%) for amortization period of 15-years. In 2006, data centers of United States consumed more than 1.5% of the total energy produced in that year, and this percentage is expected to increase 18% annually. Cloud data centers house thousands of servers and set up the cooling infrastructure to remove heats generated by these servers. These servers and cooling infrastructure consume a large amount of energy and produces green house gases (GHGs).



2.11. Bandwidth Cost :

High speed communication channels work as a backbone of cloud computing. With cloud computing, business gets the ability to save money on hardware and/or software but still requires spending more on the bandwidth. It is almost impossible to fully exploit the services of cloud computing without high speed communication channels. Migration to cloud almost removes the up-front cost, while it increases the cost of data communication on network i.e. the cost involved in transfer of data to and from the private and other clouds. This problem is prominent if consumer application is data intensive and the consumer's data is distributed amongst a number of clouds (private/public/community). Cloud computing provides lesser cost for CPU intensive jobs than data intensive jobs with gray's argument "Put the computation near the data" still applicable for data intensive jobs still finding relevance. In other words, data intensive applications can perform better being employed on private cloud rather than public/hybrid cloud.

3. Conclusion:

This paper 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.

4. References:

- [1] Patidar, Shyam, Dheeraj Rane, and Pritesh Jain. "A survey paper on cloud computing." *2012 Second International Conference on Advanced Computing & Communication Technologies*. IEEE, 2012.
- [2] Wang, Lizhe, et al. "Cloud computing: a perspective study." *New Generation Computing* 28.2 (2010): 137-146.
- [3] Zhang, Shuai, et al. "Cloud computing research and development trend." *Future Networks, 2010. ICFN'10. Second International Conference on*. Ieee, 2010.
- [4] Nandgaonkar, Suruchee V., and A. B. Raut. "A comprehensive study on cloud computing." *International Journal of Computer Science and Mobile Computing* 3.4 (2014): 733-738.
- [5] Avram, Maricela-Georgiana. "Advantages and challenges of adopting cloud computing from an enterprise perspective." *Procedia Technology* 12 (2014): 529-534.
- [6] Jeferry, Keith, et al. "Challenges emerging from future cloud application scenarios." *Procedia Computer Science* 68 (2015): 227-237.
- [7] Khalid, Umer, et al. "Cloud based secure and privacy enhanced authentication & authorization protocol." *Procedia Computer Science* 22 (2013): 680-688.
- [8] Yang, Haibo, and Mary Tate. "Where are we at with cloud computing?: a descriptive literature review." *ACIS 2009 proceedings* (2009).
- [9] Rani, B. Kezia, B. Padmaja Rani, and A. Vinaya Babu. "Cloud Computing and Inter-Clouds–Types, Topologies and Research Issues." *Procedia Computer Science* 50 (2015): 24-29.
- [10] Sajid, Mohammad, and Zahid Raza. "Cloud computing: Issues & challenges." *International Conference on Cloud, Big Data and Trust*. Vol. 20. No. 13. 2013.
- [11] Santosh Kumar and R. H. Goudar. "Cloud Computing – Research Issues, Challenges, Architecture, Platforms and Applications: A Survey." *International Journal of Future Computer and Communication*, Vol. 1, No. 4, December 2012.