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Cloud computing and its research challenges

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ABSTRACT

Cloud computing is the on-demand accessibility of computer system resources, especially data storage and calculating power, without primary active operation by the user. Large clouds frequently have functions distributed over multitudinous locales, each location being a data center. Although cloud computing is easing the Information Technology industry, the research and development in this arena is yet to be palatable. My contribution in this paper is an advanced survey centering on cloud computing conceptions and most developed research outgrowths. This paper provides a better understanding of cloud computing and identifies significant research outcomes in this accelerating field of computer science.

Keywords: *Cloud Computing, Security Issue Virtualization, Data Center, Server Consolidation, Cloud Security.*

1. INTRODUCTION

Cloud Computing is the delivering computing services such as servers, storage, databases, networking, software, analytics etc over the Cloud. The word 'Cloud' refers to the Internet or network. Cloud provides a substitute for an on-premises data center. With an on-premises data center, we have to manage everything, such as purchasing and installing hardware, virtualization, installing an operating system, and other required applications, setting up the network, configuring the firewall, and setting up storage for data and we become responsible for maintaining it through entire its lifecycle. Whereas Cloud Computing, a cloud vendor is responsible for the hardware purchase and maintenance through its entire lifecycle. They also provide a numerous variety of software, infrastructure

and platform as a service. We can rent any required services and those services will be charged based on our usage. Any IT company follows the traditional procedure to provide an IT infrastructure i.e. Server Room. In that server room, there should be a database server, mail server, networking, firewalls, routers, QPS (Query Per Second), configurable system, high net speed, and the maintenance team of engineers. To establish such infrastructure, we need to spend a lot of funds. To prevail over such problems and to reduce infrastructure expenditure, Cloud Computing came into picture. The Cloud Computing environment requires the traditional service providers to have two different ways i.e. Infrastructure and Service provider. Infrastructure providers manage cloud platforms and lease available resources as per use. Whereas service providers rent resources from infrastructure providers and serve the end user. Cloud Computing has attracted many MNC's like Google, Microsoft, Amazon and is considered as a great influence in today's IT industry. Business owners are attracted to the cloud computing concept because of several features. My aim is to provide better understanding about Cloud Computing and focus on the research which is ongoing tremendously in the IT sector.

1.1 Characteristics of cloud computing:

- Agility
- High Availability and Reliability
- High Scalability
- Multi-User Sharing
- Location and Device Independence
- Low Maintenance Cost
- On-demand Self Services
- Services in the 'pay-per-use' mode
- Measured Service

2. SECURITY RISKS OF CLOUD COMPUTING

Cloud computing provides various advantages, such as accessibility, Mobility, Storage capacity, etc. But there are also security risks in cloud computing.
Here are some Security Risks of Cloud Computing are given below:

- Data Loss
- Hacked Interfeces and Insecure APIs
- Data Breach
- Vendor Lock-In
- Increased Complexity Strains IT Staff
- Spectre and Meltdown
- Denial of Service (DoS) Attacks
- Account Hijacking

3. RESEARCH CHALLENGES IN CLOUD COMPUTING

Cloud Computing research gives the challenges of meeting the necessities of coming generation cloud computing architectures. The research on cloud computing is at an primitive stage. Some of the considerable challenging research issues in cloud computing are as follows:

- Data Encryption
- Cloud Data Management and Security
- Energy Management
- Denial of Services
- Development New Architecture
- Metering
- Limited Scalabilty
- Governance

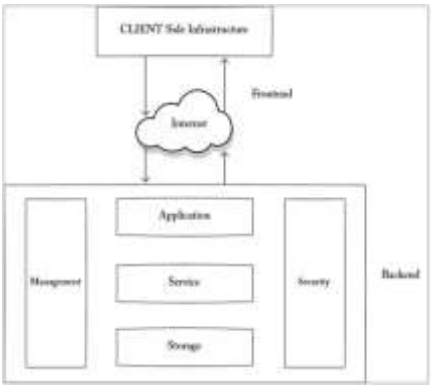

Figure-1 Cloud Computing Infrastructure

4. CONCLUSION

Cloud Computing has the potential to have a great impact on the Information Technology industry. It has numerous benefits that it provides to users and businesses. It is also cost effective as it is based on the 'pay-per-use' concept with no hardware and maintenance cost from the user or vendor side. But there are few research challenges that cloud computing must resolve. One of the major security issues in the cloud computing model is sharing of resources. However, cloud computing has innumerable benefits, but also many challenges in it, such as energy management, platform management, data encryption are the only attracting research sections. There are still a number of research challenges to be solved. Opportunities are enough in this domain of Information Technology industry. In this paper, I presented Introduction to Cloud Computing, its Characteristics and Research Opportunities in this area. As cloud computing is at its initial stage of research and development, I hope that this paper will provide a better understanding of cloud computing and various research issues.

5. REFERENCES

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