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A Review Paper on Cloud Computing

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Abstract: On demand or on pay per use of resource such as: network, storage and server these all facilities are provided by cloud computing through internet is called cloud computing. Although, cloud computing is facilitating the Information Technology industry, the research and development in this arena is yet to be satisfactory. Our contribution in this paper is an advanced survey focusing on cloud computing concept and most advanced research issues. This paper provides a better understanding of the cloud computing and identifies important research issues in this burgeoning area of computer science. Section 1 contains the introduction, in the section 2, we provide an overview of cloud computing, section 3 contains the security architecture and section 4 will focus on the research issues and security issue. We conclude the paper on section 5 along with references.
Keywords: Cloud Computing; Security issue Virtualization; Data Center; Server Consolidation; cloud security.

I. INTRODUCTION

Cloud Computing is a distributed architecture that centralizes server resources on a scalable platform so as to provide on demand computing resources and services Due to the unprecedented success of internet in last few years, computing resources is now more ubiquitously available. And it enabled the realization of a new computing concept called Cloud Computing. Cloud Computing environment requires the traditional service providers to have two different ways. These are infrastructure and service providers. Infrastructure providers manage cloud platforms and lease resources according to usage. Service providers rent resources from infrastructure providers to serve the end users. Cloud Computing has attracted the giant companies like Google, Microsoft, and Amazon and considered as a great influence in today's Information Technology industry. Business owners are attracted to cloud computing concept because of several features .

These are as follows:

 Lower initial investment Easier to manage Scalability
 Deploy faster Location independent Device independent
 Reliability Security

Although cloud computing has shown considerable opportunities to the IT industry of today's world, but still there are number of challenges that requires to be carefully addressed. In our paper, we present a survey of cloud computing and state-of-the-art research challenges. Our aim is to provide a better understanding of cloud computing and focus on the research ongoing in this tremendously flourishing arena of computer science.

II. CLOUD COMPUTING OVERVIEW

- What is Cloud Computing?

Cloud computing is a way of leveraging the Internet to consume software or other IT services on demand. Users share processing power, storage space, bandwidth, memory, and software. With cloud computing, the resources are shared and so are the costs. Users can pay as they go and only use what they need at any given time, keeping cost to the user down. Cloud computing is very much a business model as well. Providers of cloud computing solutions, whether they are software, hardware, platform, or storage providers, deliver their offerings over the Internet. There are no shrink wrapped boxes containing discs or hardware for you to buy and set up yourself. Cloud providers typically charge monthly recurring fees based on your usage.

- Understanding Cloud Computing Applications

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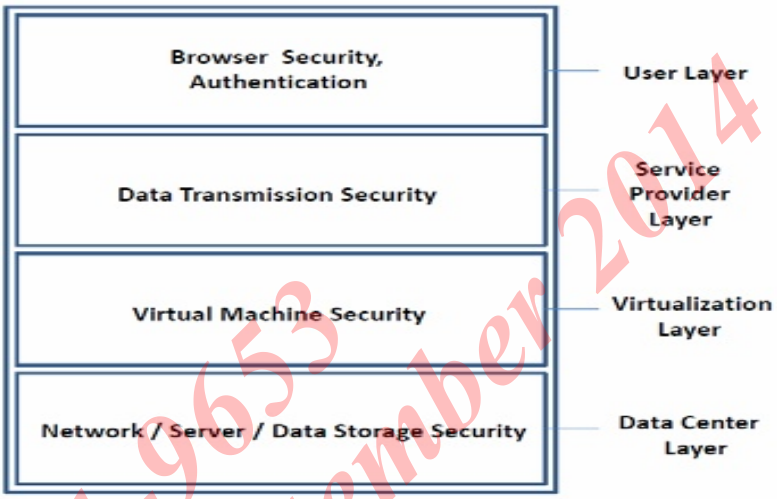
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Cloud computing, at its simplest, is a collection of computing software and services available from a decentralized network of servers. The term "cloud" has long been used as a metaphor for the Internet, and there are many popular services and Web sites which you may already be enjoying, without being aware that they are cloud-based. Social networking sites, Web-based email clients like Yahoo! and Gmail, Wikipedia and YouTube, and even peer-to-peer networks like Skype or Bit Torrent are all applications that run in the cloud. In other words, there is no one centralized location or organization that controls them, and nothing is required to utilize them besides a Web browser and an Internet connection.

Enterprise cloud computing is cloud computing for the business world. Instead of purchasing and installing the physical infrastructure necessary to run software programs, a business instead consumes resources on a software-as-a-service basis. Running individual applications such as Microsoft, SAP, or Oracle will require hardware and an extensive infrastructure to support it: office space, power, networks, servers, storage, cooling, and bandwidth, not to mention the experts needed to install and run them. Cloud computing offers a streamlined, simplified solution to this complexity and the capital expenditure it necessitates.

A simple example of cloud computing is Yahoo email, Gmail, or Hotmail etc. You don't need software or a server to use them. All a consumer would need is just an internet connection and you can start sending emails. The server and email management software is all on the cloud (internet) and is totally managed by the cloud service provider Yeah, Google etc. The consumer gets to use the software alone and enjoy the benefits. The analogy is, 'If you need milk, would you buy a cow?' All the users or consumers need is to get the benefits of using the software or hardware of the computer like sending emails etc. Just to get this benefit (milk) why should a consumer buy a (cow) software /hardware?

III. CLOUD COMPUTING SECURITY ARCHITECTURE:



IV KEY SECURITY ISSUES IN CLOUD COMPUTING

Cloud computing consists of applications, platforms and infrastructure segments. The given below are the various security concerns in a cloud computing environment.

- Access to Servers & Applications
- Virtual Machine Security
- Network Security
- Data Security
- Data Privacy
- Data Integrity
- Data Location
- Data Availability
- Data Segregation
- Security Policy and Compliance
- Patch management

V. RESEARCH CHALLENGES IN CLOUD COMPUTING

Cloud Computing research addresses the challenges of meeting the requirements of next generation private, public and hybrid cloud computing architectures, also the challenges of allowing applications and development platforms to take advantage of the benefits of cloud computing. The research on cloud computing is still at an early stage. Many existing issues have not been fully addressed, while new challenges keep emerging from industry applications. Some of the challenging research issues in cloud computing are given below.

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- Service Level Agreements (SLA's)
- Cloud Data Management & Security
- Data Encryption
- Migration of virtual Machines
- Interoperability
- Access Controls
- Energy Management
- Multitendancy
- Server Consolidation
- Reliability & Availability of Service
- Common Cloud Standards
- Platform Management

VI. CONCLUSION

One of the biggest security worries with the cloud computing model is the sharing of resources. The advancement of cloud computing is dramatically changing the horizon of information technology and ultimately turns the utility computing into a reality.

However, it provides a large array of benefits, but many challenges in this domain, including automatic resource positioning, energy management, information security are only attracted the research community. There are still so many issues to be explored. Opportunities are enough in this arena for some groundbreaking contribution and bring significant development in the industry.

In our paper, we have presented an overview of cloud computing and focused on the state-of-the-art research and future issues to be handled by the research community.

Cloud computing is at an early stage of research and development, we believe our paper will provide a better understanding of the cloud computing and different research issues, thereby bolstering further research in this arena.

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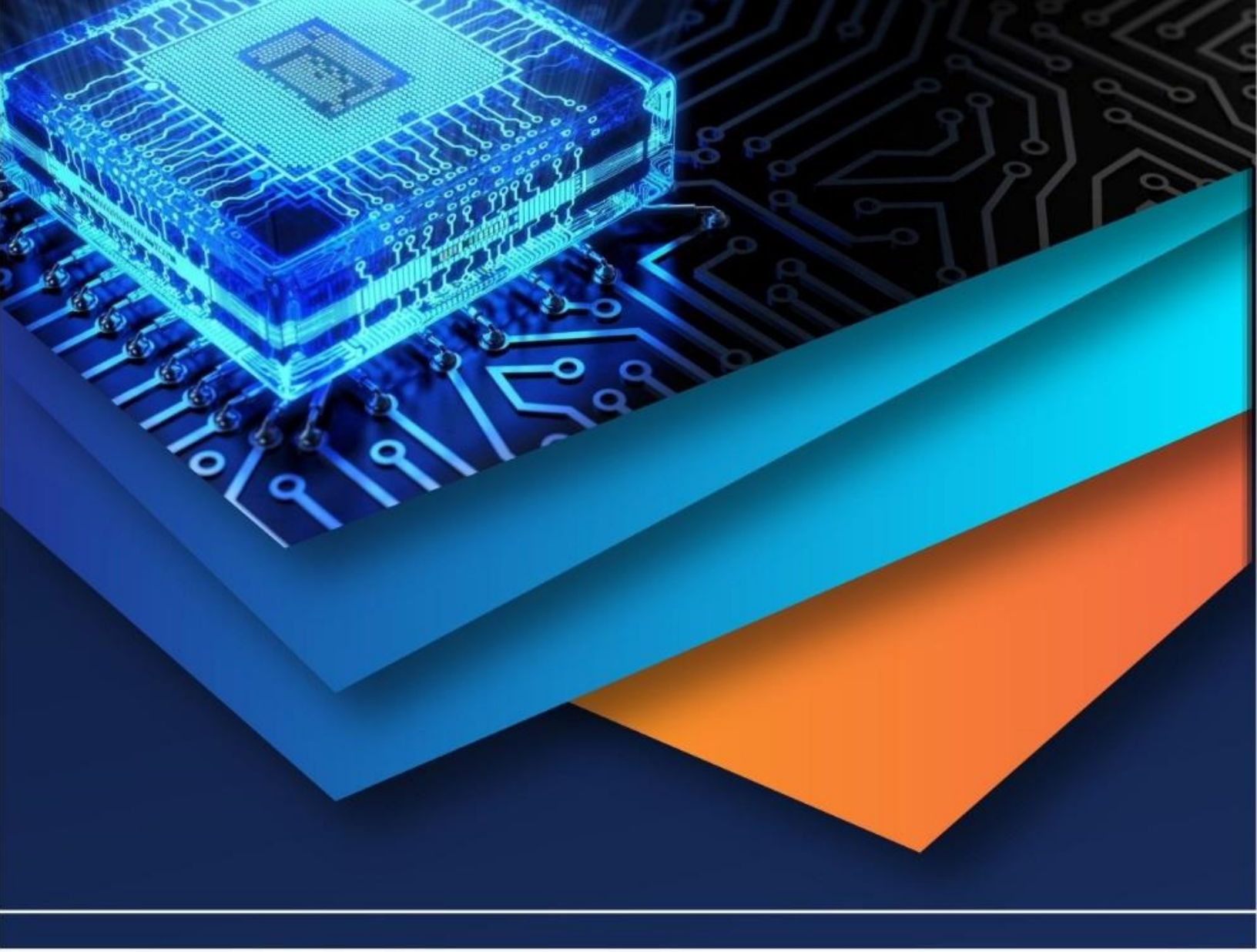
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