A New Insight of Hybrid Cloud

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Abstract - Cloud computing has become a landscape and prevalent topic which significantly changed over the last decade. Cloud computing is the development of distributed computing, grid computing, parallel computing, virtualization technologies which will define the new era of research. It is an emerging model of business computing. Many of the explanations of cloud computing are not sufficient for getting the terminologies which don't reach to great number of IT sectors and researchers. This research paper is a layout for the literature analysis and discussion regarding cloud computing and its terminology. This paper introduces the concept of cloud infrastructure, multiple providers' infrastructure and the benefit of decentralizing data centers. This paper also discuss the trends and developments of cloud computing. Another aim of this paper is to address the characteristics, challenges of hybrid computing. Finally, a layout is generated for the roadmap of challenges that will address the potential of next generation cloud systems. This paper also investigates the cloud computing system providers about their concern on security and privacy issues.

Keywords - *Cloud computing, hybrid cloud, challenges, security*

I. INTRODUCTION

In a computer industry there is a buzz word known as cloud computing. This computing is associated with everyone in any means because of its brand new concept. This concept gains a lot of traction because it is spotted on advertisements all over the internet from web space hosting providers and software visualization providers. This is more similar to high end computing. Cloud computing may be applied for the many domains of information technology to solve the problem like Scientific Research, e-Governance system, Decision support system, ERP, web application development etc.

According to the different types of services, cloud computing can be consisting of three layers: software as a service(SaaS), platform as a service(PaaS) and infrastructure as a service(IaaS).SaaS is the topmost layer which offers a service on demand, IaaS is the lowest layer which provides basic infrastructure support service. PaaS is the middle layer which provides platform oriented services, besides providing the platform for hosting user's applications.

In this paper section II describes the latest and emerging trends of next generation clouds, section III explains the types of clouds, section IV discuss the comparison of clouds. Section V identifies the challenges of cloud computing. Section VI concludes and explore the efforts for cloud computing.

II. TRENDS IN NEXT GENERATION CLOUD

Resources and services offered on the cloud will change rapidly from the last decade. These changes are work for academia and industry for a computing purpose as a utility. This part of paper aims to present the latest trends in cloud computing. New computing architectures are emerging and they can impact on societal and scientific areas. This section of paper will focus on what is the future of cloud computing by finding out the trends and directions for the next generation clouds. These trends will be majorly divided into four areas i.e. changing infrastructure, impact areas, emerging architectures, and Directions. The changing infrastructure cloud services will comprises with the dedicated compute and storage resources located at various data centers. This will be divided into multi clouds, micro clouds, adhoc clouds, heterogeneous clouds etc. Multi clouds will be further divided into hybrid clouds and federated clouds. Ad hoc clouds will also be divided into mobile cloud and social cloud. Another trend is emerging computing architectures in which the conventional cloud computing architectures requires application to simply follow two tier architecture. The cloud computing infrastructure is evolving and requires new computing models to satisfy the large scale applications. This section consider the four computing models that are volunteer computing, fog and mobile edge computing, server less computing and software defined computing. Another emerging trend is a avenues of impact which aims is becoming more ambient, ubiquitous, pervasive with distributed and heterogeneous clod computing. It has many impacts like connecting people and devices from IOT, Big data computing, service space and self learning systems. The latest trends in research directions of cloud computing are enhanced security, achieving expressivity of applications, market place, management, reliability and sustainability.

III. TYPES OF CLOUDS

There are three types of cloud on which computing is performed or one can say that there are three types of cloud computing- public clouds, private clouds and hybrid clouds.

Public Cloud: It is the standard cloud computing model in which resources are available to customers and business over the internet. The service provider will make sure that all the resources like applications, storage and infrastructure will available to the customers and other business scenarios all over the internet. Microsoft, Google have their own infrastructure at their respective data centers and the good thing is that the availability of data is only through the internet. These services of private cloud are easy to administer and they are cost

effective but they are not secure as private cloud because anyone wants to access it they can access by paying the costing of this data.

Private cloud: It is also known as private or corporate cloud. It provides the services to the limited personals only which are behind the firewall. These types of clouds are secure and most preferably used and also control on their applications. This will build on your own hardware and software. They are mostly used by private or corporate sectors because the services and infrastructure which they maintained are only on private network. They are costly too because they build and manage the data and also secure the data. So, that's why this data is reliable and cost effective and also have the potential in the growing market.

Hybrid Cloud: These clouds are the hybrid and combination of development model of private and public clouds. The hybridization of public and private clouds are shown in fig 1 given below-

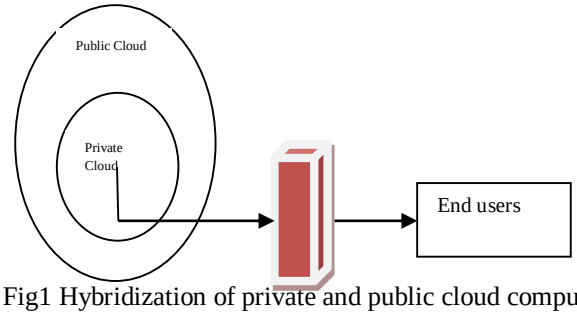

Fig1 Hybridization of private and public cloud computing

When the customer wants to maintain the different business applications at the different security levels these clouds are mostly used. The services of these clouds are the combination of private and public clouds. These clouds are good to use, cost effective but the major drawback of these clouds is to manage the various security levels and platforms together at same time.

IV. COMPARISON OF CLOUDS

The comparison of these clouds will be based on infrastructure ownership. Each model has its own pros and cons and this is the major part where security needs. There is a table shown in table 1.1 which shows that private clouds are more secure than public. If the customer will consider the security issues than private clouds are more secure. If customers will consider the cost issues than private and public clouds both are costly. If the control issues will be consider than private clouds have more control on their each and every activity compared by public and hybrid clouds. Public and hybrid clouds have their own legal issues.

Table 1. 1Comparison with security, cost, control and Legal Issues

Model	Security Issues	Cost Issues	Control Issues	Legal Issues
Public	Least Secure, Multi Tenancy, Transfers Over The Net	Setup Highest, Usage Lowest	Least Control	Jurisdiction Of Storage
Private	Most Secure	High Setup And New Operational Process Is Required	Most Control	-
Hybrid	Control Of Security Between Private And Public Clouds	-	Least Control	Jurisdiction Of Storage

The analysis of data from IT candor, November 2010 by using SPSS tool for various types of cloud computing was carried out and number of findings are presented here in table 2 like its total cost ownership(TCO), Elasticity, performance, security for public , private and hybrid cloud computing models.

Area	Private	Hybrid	Public
Total cost ownership	1.5	4.0	5.0
Security	5.0	3.5	1.5
Elasticity	1.0	4.0	5.0
Performance	4.0	5.0	2.0
Average	2.9	4.1	3.4
Standard deviation	1.93	0.63	1.89

Table 2. Comparison with TCO, security, elasticity, Performance issues

V. CHALLENGES IN CLOUD COMPUTING

The research challenges of cloud computing will meet the requirements of next generation cloud computing architectures, for allowing applications and development platforms to take the benefits of cloud computing. Some of the challenging research issues are Data encryption, Access controls and Multi tenancy, Interoperability, Migration of virtual machines, Platform management, cloud standards, cloud data management and security.

VI. CONCLUSIONS

In recent years' cloud computing has become a vibrant and rapidly growing area in research and development. This paper discussed the types of cloud computing and the popularity and the emerging trends of cloud computing. This paper also address the challenges and issues of cloud computing. Despite

of various limitations and the challenges cloud computing is the better methodology and it is hugely attractive program. It affects the enterprise as a potential to significantly change in IT sector. Comparative analysis is also performed in terms of Statistical packages for social science (SPSS) tool of different styles of cloud computing.

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VIII. BIBLIOGRAPHY

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