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An Analysis of Applications and Challenges of Cloud Computing

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ABSTRACT: This paper analyze the challenges which are present in cloud computing and best practices by service providers. Cloud computing is a model for providing computing service such as storage, servers, services and applications, without physically acquiring them via the internet. Security is one of the major issues which hamper the growth of cloud. This research paper focus on security issues in services provided by web applications. This research paper also analyzes the many applications area where Cloud computing works.

Keywords: CCC, ACC and SICC.

I. INTRODUCTION

Cloud computing has cropped up as a breakthrough in the IT industry. With its emergence it has truly revolutionized the IT sector. It has played a major role in catering to the escalating demands for storage and infrastructure. The special capability of cloud is its ability to provide hardware and software resources over a network. Broadly we can divide the cloud as:

Private cloud: Herein the cloud works within a defined network. For example cloud for a specific organization.

Public cloud: This involves the use of cloud to provide services outside the defined framework.

Community cloud: In a community cloud the services are provided to organizations with similar interests.

Hybrid cloud: As the name suggests it comprises of two or more clouds. Though the clouds are combined, still each retains its individual identity thus aiding multiple deployments.

II. APPLICATIONS OF CLOUD COMPUTING

Application in various fields With its advent, cloud computing has occupied a very significant position in the IT industry. Distinct practical applications are making use of the services provided by it. Arenas like medical research to agriculture; educational institutions to industries are availing its services.

a. Educational institutions: Cloud computing has truly revolutionized the erudition sector. The conventional face to face classroom techniques are increasingly being replaced with other cloud mediated exercises like smart classes using pictorial and auditory illustrations. The cloud based model gives an edge to the redundant study routine people has in their daily lives. It has also enabled remote access of erudition material and has done a great deal in assisting the progress of rustic India whilst making learning easy for them.

b. Industries: Cloud computing has empowered the industries to prevent varied technical and business problems that can occur while executing their own data centres and save money by incorporating a pay-per-use facility. Additional costs for running their own data centers are reduced thus saving overheads and simultaneously availing cloud services. It also allows them to increase their resources. It has management of data and the records very easy for the companies like never before. They now have access to a plethora of software and hardware services without having the need to buy them all thus improving the quality of services.

c. Medical fields: In hospitals a cloud assists in procuring patient's information by the medical

professionals which enables them to access the data remotely instead of having to go through a hospital's computers. This aids in updating professionals about their patient's condition even if they are not present in the hospitals. Cloud computing is still emerging in this field. There is a lot more to come.

d. Banking Industry: All the banking companies across the world have become automated and are now increasingly availing cloud services. Though adoption of cloud in this sector is relatively low on account of the security issues that prevail. With new measures being taken this industry is now increasingly employing cloud services so as to reduce their cost of ownership. Core banking, communication services, on demand BI is some ways in which banks make use of cloud computing.

III. CHALLENGES OF CLOUD COMPUTING

A. Data Security concern

When we talk about the security concern of the cloud technology, then a lot of questions remain unanswered. Multiple serious threats like virus attack and hacking of the client's site are the biggest cloud computing data security issues. Entrepreneurs have to think on these issues before adopting cloud computing technology for their business. Since you are transferring your company's important details to a third party so it is important to ensure yourself about the manageability and security system of the cloud.

B. Selecting the perfect cloud set-up

Choosing the appropriate cloud mechanism as per the needs of your business is very necessary. There are three types of clouds configuration such as public, private, and hybrid. The main secret behind successful implementation of the cloud is picking up the right cloud. If you are not selecting the right cloud then maybe you have to face some serious hazards. Some companies having vast data so they prefer private clouds while small organisations usually use public clouds. A few companies like to go for a balanced approach with hybrid clouds. Choose a cloud computing consulting service which is aware and clearly disclose the terms and conditions regarding cloud implementation and data security.

C. Real time monitoring requirements

In some agencies, it is required to monitor their system in real time. It is compulsory term for their business that they continuously monitor and maintain their inventory system. Banks and some government agencies need to update their system in real time but cloud service providers are unable to match this requirement. This is really a big challenge for cloud services providers.

D. Resolving the stress

Every organisation wants to have a proper control and access over the data. It is not easy to handover your precious data to a third party. The main tension between enterprise and executives is they desire to control over the new modes of operations while using technology. These tensions are not unsolvable, but they do suggest that providers and clients alike must deliberately address a suite of cloud challenges in the planning, contracting and managing the services.

E. Reliability on new technology

It is a fact of human nature that we trust on the things present in front of our eyes. Normally entrepreneurs feel hesitation in letting out the organisational information to any unknown service provider. They think that information stored in their office premises is more secure and easily accessible. By using cloud computing they have fear of losing control over the data. They think that data is taken from them and handover to an unknown third party. Security threads are increase as they do not know and where is the information stored and processed. These frights of the unknown service providers must very amicably be dealt with and eliminated form their minds.

F. Dependency on service providers

For uninterrupted services and proper working it is necessary that you acquire a vendor services with proper infrastructural and technical expertise. An authorized vendor who can meet the security standards set by your company's internal policies and government agencies. While selecting the service provider you must carefully read the service level agreement and understand their policies and terms and provision of compensation in case of any outage or lock in clauses.

G. Consumption basis services charges

Cloud computing services are on-demand services so it is difficult to define specific cost for a particular

quantity of services. These types of fluctuations and price differences make the implementation of cloud computing very difficult and complicated. It is not easy for a normal business owner to study consistent demand and fluctuations with the seasons and various events.
Basic Main Challenges of Cloud Computing

H. Security and Privacy

The main challenge to cloud computing is how it addresses the security and privacy concerns of businesses thinking of adopting it. The fact that the valuable enterprise data will reside outside the corporate firewall raises serious concerns. Hacking and various attacks to cloud infrastructure would affect multiple clients even if only one site is attacked. These risks can be mitigated by using security applications, encrypted file systems, data loss software, and buying security hardware to track unusual behavior across servers.

It is difficult to assess the costs involved due to the on-demand nature of the services. Budgeting and assessment of the cost will be very difficult unless the provider has some good and comparable benchmarks to offer. The service-level agreements (SLAs) of the provider are not adequate to guarantee the availability and scalability. Businesses will be reluctant to switch to cloud without a strong service quality guarantee.

I. Interoperability and Portability

Businesses should have the leverage of migrating in and out of the cloud and switching providers whenever they want, and there should be no lock-in period. Cloud computing services should have the capability to integrate smoothly with the on-premise IT.

J. Reliability and Availability

Cloud providers still lack round-the-clock service; this results in frequent outages. It is important to monitor the service being provided using internal or third-party tools. It is vital to have plans to supervise usage, SLAs, performance, robustness, and business dependency of these services.

K. Performance and Bandwidth Cost

Businesses can save money on hardware but they have to spend more for the bandwidth. This can be a low cost for smaller applications but can be significantly high for the data-intensive applications. Delivering intensive and complex data over the network requires sufficient bandwidth. Because of this, many businesses are waiting for a reduced cost before switching to the cloud.

All these challenges should not be considered as road blocks in the pursuit of cloud computing. It is rather important to give serious consideration to these issues and the possible ways out before adopting the technology

III. CONCLUSION

As the field of Cloud computing is rapidly progressing, there exist many opportunities for researchers and industrial developers to explore further. Basic key issues that need further work include: (a) Security, Privacy and Trust (b) Cloud "Lock In" worries and Interoperability (c) Application Scalability across Multiple Clouds. Cloud computing provides huge opportunities in the IT market. The security issues it puts forward are continuously being worked upon to make the cloud services safe and secure. Researchers are being carried out in the field of distributed computing which an extended part of cloud computing. Very soon cloud computing is going to replace the conventional methods of computing.

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