

Cloud Computing-Architecture, Models, Issues and Challenges

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Abstract— Cloud computing is the evolution of shared computing, lateral computing, the network computing and virtualization technologies which define the scenario of a new generation. Cloud computing serves resources as a commodity that can be acquired by the client and pay peruse. Although cloud computing is achieving viable demand in the Information Technology industry, academia appeared to be underdeveloped behind the rapid developments in this field. The theory of architecture and intent to hand over an overview of the promptly developing approach in the technical support of cloud computing.

Keywords: Cloud Computing, Cloud Services, PaaS, SaaS, IaaS

I. INTRODUCTION

Cloud computing means delivering all information technology from computing power to computing infrastructure, applications, business, process, storage and personal collaboration to an end-user as a service. Cloud computing is the procedure of storing documents, data processing, or automation resources on remote servers connected to the internet. The reason behind we are using cloud computing is because it is available 24*7, pay per use, lower TCO, device & location independent, easy & agile development, utility-based, highly automated, free up internal resources, lower capital expenditure, secure storage management, reliability, scalability & sustainability.

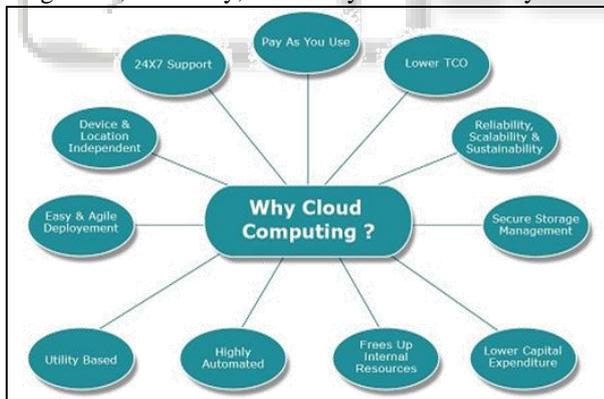


Fig. 1: Cloud Computing

II. CLOUD DEPLOYMENT MODELS

A. Private Cloud

A private cloud is typically defined as everything behind a company's wall. These kinds of the system operate in a company local data centers, although some companies prefer to use collocated data center facilities.

B. Public Cloud

The public cloud charges a low amount for their services, it uses client's data for analysis and research purposes. Due to publically available public cloud is sometimes not secured.

C. Community Cloud

Community cloud services are provided by two or more organization which belongs to the same community.

D. Hybrid Cloud

Cloud computing domain that utilizes an associate of properties, private cloud, and mediator, public cloud services with composition between the two platforms.

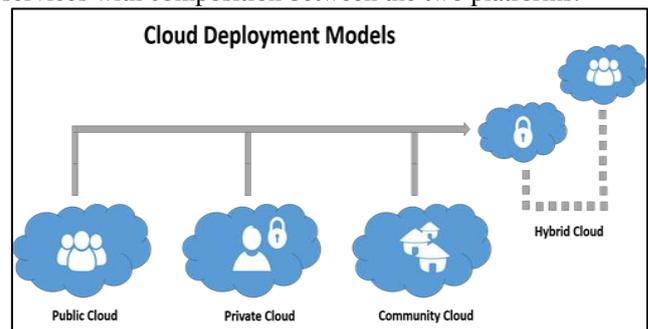


Fig. 2: Deployment Models

III. ARCHITECTURAL COMPONENTS

A. Software as a Service (SaaS)

The cloud automation in which resources are leveraged by the cloud user in the form of software. It is used by the industries, MNC's cooperates and management firms that seek software as a solution for their requirements. Examples: Big Commerce, Salesforce, Slack, Google app, etc.

B. Platform as a Service (PaaS)

In the cloud computing model in which agents distribute hardware and software tools usually to the application development. Examples: Amazon web services, Microsoft Azure, Google Application Engine, etc.

C. Infrastructure as a Service (IaaS)

IaaS is the cloud technology in which a dealer/salesman provides user access to computing assets such as a server, storage, and networking. The company uses its scheme and operation within a service provider's framework. Examples: Google Compute Engine, Amazon Web Service, DigitalOcean, Rackspace, etc.

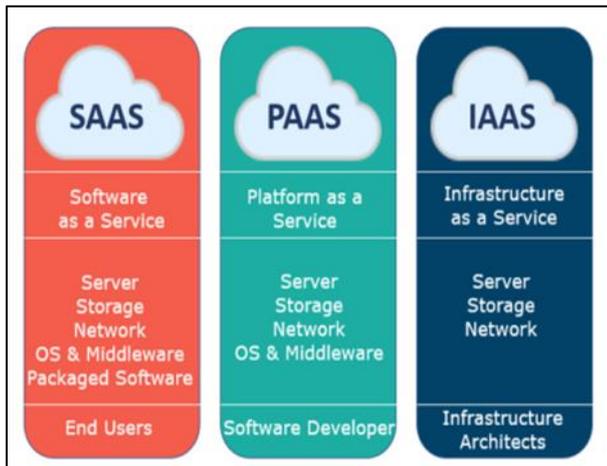


Fig. 3: Architectural Components

IV. ISSUES IN CLOUD COMPUTING

A. Privacy

Cloud computing makes use of virtual computing technology, user's confidential data may be dispersed in various virtual data center's rather than put off in the same physical location.

B. Security

Data must be secured by taking support before transfer. Applications retrieving the data must be authorized and follow the benchmark.

C. Backups

Data backups must be executed frequently and automatically in short intervals. High standard data backup plans guarantee the security and reliability of data.

D. Compliance

Many regulations exist for the storage and use of data require regular broadcasting and audit trails. Management in which the client is subject, the data centers preserve by cloud providers may also be subject to compliance requirements.

E. Sustainability

This issue refers to reduce the consequences of cloud computing on the environment.

V. CHARACTERISTICS

A. Resources Pooling

It means that the Cloud provider draws the computing resources to allocate services to multiple clients with the help of a multi-occupant model.

B. On-Demand Self-Service

In Cloud Computing the client can continuously track the server uptime, potentiality, and assign network storage.

C. Easy Maintenance

The servers are smoothly maintained and the downtime is very low and even in some cases, there is no downtime.

D. Availability

The potential of the Cloud can be altered as per the client usage and can be widened a lot. It examines the storage usage and authorizes the user to buy extra Cloud storage if needed for a very small amount.

E. Measured Service

Cloud computing resource used to monitor & resource implementation is examined by assisting charge-per-use capabilities.

VI. CHALLENGES

A. Cost

Cloud computing itself is economical, but adapting the platform according to the organization's needs can be costly.

B. Vendor lock-in

Entering a cloud computing contract is easier than leaving it. "Vendor lock-in" happens when modifying providers is either excessively high priced or just not possible.

C. Portability

The applications functioning on one cloud platform can be moved to a new cloud platform and it should be managed correctly without making any changes in design, coding.

D. Downtime

Downtime is the common challenge of cloud computing as no cloud provider guarantees a platform that is free from downtime.

E. Hacking

The hackers who have the potential too breakthrough the firewalls to steal the information from an organization. Implement proper measures for protecting the data from unwanted hackers.

VII. CONCLUSION

To conclude, the paper focuses attention on the key features of cloud computing, cloud models, deployment models, issues, applications, and challenges encountered with the use of cloud computing. For example, some of the benefits that it provides to businesses are that it reduces operating costs by spending less on maintenance and software upgrades and focus more on the businesses itself. Cloud computing is the latest technology that guarantees vast benefits, but there is a lot of research that is still needed in this area.

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