

A Systematic Review of Cloud Infrastructure Providing High Level of Services

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ABSTRACT

With the passage of time, service quality is the most evolving topic of cloud infrastructure where resources are scattered over different places. Nowadays in cloud environment, it has become more essential that response time should be fast as well as consumption of bandwidth should be less and all the resources should be work properly. Thus, quality of service has achieved high priority. The purpose of this study is to review different cloud service techniques and their impact on cloud technology. This paper discusses the main factors that affect service quality and various existing methods to achieve high quality services in cloud technology.

Keywords: Cloud; Cloud Computing; Cloud Services; High level of Services; Services; Quality of Services

INTRODUCTION

Cloud computing is known as on demand service. Infrastructure of cloud technology is relying on various types of services and cloud network. There are three types of cloud network; one is public cloud which is property of service provider, second one is private cloud which is property of any company and third one is hybrid cloud which is combination of public and private cloud. There are various drawbacks that affect performance of cloud technology such as resource tracking and management. Resource monitoring is major issue because till now there is no feasible technique for complete resource tracking in cloud. Another issue is no standardization in cloud technology. There is no standard rule and regulation for deploy devices in cloud environment. Main infrastructure of cloud technology is shown in (fig1).

[1] Cloud computing is getting more attention since past few years. It is basically an innovative model and is known as software sold as service. [2] In this fast growing cloud network, increase in dangerous security attacks may affect quality service of cloud technology. [3] Now a day as cloud technology is evolving, risks involving service models have been considered as barrier for adoption. In order to increase cloud usage, we need to overcome these cloud services risks.

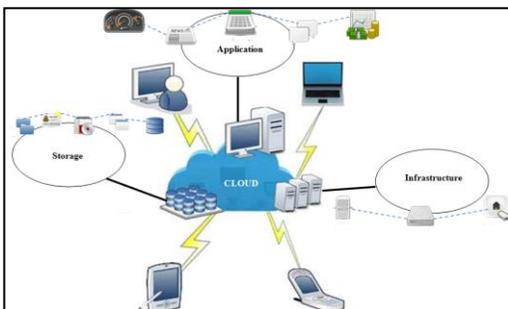


Fig.1. Cloud Computing

CLOUD SERVICES

Cloud computing provides facility of on demand delivery and payment usage service over internet. Services of cloud computing are ranges from full applications to servers, infrastructure and storage. Cloud services are distributed in three types: One is known as software as service in which software run and organized by software provider, second one is defined as infrastructure as service in which storage and networking are provided by infrastructure service provider and third one is known as Platform service provider which provides all software and hardware to build cloud plat form as show in (fig 2).

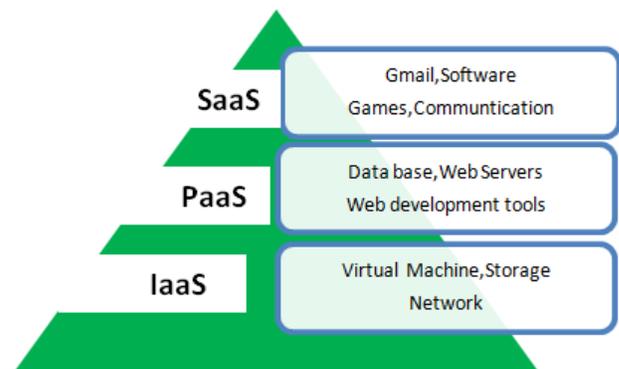


Fig.2. Cloud Services

In [4], it is discussed that cloud environment is very difficult to understand due to type of architecture, design and availability of resources. To overcome these types of characteristic writer proposed a new technique which is known as DDOPS (Dual Direction Operation). This technique provides parallel processes to make better use of the available resources more conveniently, while it does not require any particular control. From this we can say that balancing of load is automatically handled when parallel

processing takes place. So the work load from the different side handled until the work is done by both ends. This type of technique is very much feasible for the different type of environment where resources are different from one another. This technique is good for load balancing and makes the operation fast. This technique is good balancing. In this technique the acknowledgement is reduced to very much for the coordination of the servers .the servers are grouped and given a particular task which they fulfilled parallel technique. In this each server will do its own work and to ask the client that what to do and when to do. They process and completed their task. They don't have to wait for the instruction from the user. When the servers work in a group they automatically adjust themselves and they automatically minimized the load and the task has been completed very fast. This technique is feasible for the LAN WAN and cloud environment.

In [5], the writer explains the improvement of network distribution of resources marked as a main problem which has taken into account for further research. The writer has described the distribution of resources for cloud computing which is basically based on tailored active measurement. The main theme of this technique can be considered by the following factors that include the network design, the specific routes of the traffic for incoming and outgoing, and the changing in the resources or needs of the user gradually time by time, plays a vital role for the future work. Tailored Measurement relies on the computing resources and storage resources. Due to the variable nature of networks the allocation of the resources at a particular time on the basis of tailored active method will not remain optimal. Due to variable nature of cloud it is possible that the resources any increases or decreases for this we have to optimize the changing in the user requirement either offline or online, resource connectivity, the change in the routes of

traffic the design of the network. By the study of this paper the existing ways for resource allocation in cloud computing we cannot say that this model is optimal for allocation, many more techniques will be required to fully fill the need properly, The major problem in that is that one cannot say how much traffic user will be increased in the future no one knows exactly the numbers it is changing with the passage of time, For this we have to make the performance model more active more predictive to find the solution of the optimal resource allocation.

Yağız Onat et al in [6] proposed a new technique to avoid the wasting of the resources in cloud computing. The model, he proposed for this is called two fold models. Firstly in this we have to adopt the distributed architecture where resource management is separated into independent tasks, each of the task is controlled by the independent terminal agents that are connected together in such a way that they share some or all of the system's memory and input output resources and connected with the data centers. The independent terminals also known as node agents will performed the configuration in parallel by the help of multiple criteria decision which takes place with the help of PROMETHEE technique. The primary goal of this technique is to avoid wasting the resources. The process should avoid high response time and over utilization. The second technique will select suitable configuration technique with respect to the criteria. The criteria will define the quality solutions. The

method adopted in this technique should be much flexible. By this technique the complexity is decrease and the scalability is increased. This approach is very much feasible than any other technique.

Zhiyun et al in [7] highlighted the facts about adopting cloud services and numerous amounts of risks that are taking place. The main problem is the availability of the resources and the loss of the data integrity. Enterprises required high availability of the resources. The writer has addressed the model for the secure cloud services for the enterprises. The model name is called Governance model. The governance model basically rely on the policy model, which includes the policies of cloud services, it includes data policies which controls the data structures, logical model, physical model data definition where the data is now when this all operation runs in the end we have all the results about the data. A services policy includes service directories which includes the information of the services running. Business policies management tells how web services and cloud based services work. Then governance model contain operational model which include authentication, authorization, and audit. It includes monitoring of the transactions generation of graphs and reports. Adaption and metadata repository also plays a vital role in the operational model. The management model contains policy management which holds generic policy ontology which defines the main concepts that are used in policy specification. Application specification ontology which defines the ideas that used in cloud environment. Policy repository contains policies and policy specification services. Security management model privacy, access. Service management model contains service directory, delivery, errors and exceptions management, risk management control. The governance model is become a industrial standard, because it provides feasibility, optimality. Basically now a day the cloud governance model become the standard and fulfills the needs of enterprise.

Luigi Romano and Danilo De in [8] proposed a quality enhancing technique by monitoring it at SAAS level which will be available to all the user of the cloud virtually in the same manner. The writer named the technique of monitoring as a service.

The main key points are given below:

- ❖ • The major theme is to provide reliability to the business processes
- ❖ • It will gather all the data sequence form to which it helps in continuous monitoring. This technique is available for all the users running simultaneously.
- ❖ • The necessary information will be given to the MONAAS with the help of CBR and CEP
- ❖ • The reliable processing techniques or stream monitoring will be taken by CEP
- ❖ • The confidentiality of message content will be given by the SRT 15
- ❖ • Each routing technique are efficient and on time

It has two major operations

- ❖ Service provider operation which will be responsible for registration and SLA updates
- ❖ Service user operations which only can do registration

Main components of operations

- ❖ SLA analyzer
- ❖ Domain Information
- ❖ KPI Meter
- ❖ CA

In [9] the writer discusses the service system delays. The author experimented delays between the systems that are located the different part of the world. It will define the particular work done by the particular machine in a particular time and the number of delays which will be occurred; those all will be latterly calculated and mutually shows the results. It is helpful to guarantee the better quality in service level agreement. The results of both are not same.

To achieve the same results two techniques are proposed which will measures the high level of services.

Active Monitoring

- ❖ It will rely on the traffic, packets which will be included in the system.

Passive monitoring

- ❖ It is the observation of existing traffic included jumpy movements.

It is not easy to find the mutual relation between two methods. The delays vary with the passage of time sometime delay increase and decrease so hard to understand. It is not possible to find out complete relation among the particular criteria, Sometimes throughput increases and delay decreases.

In [10], Salvatore at al proposed a technique to overcome issues related to reliability in cloud resource sharing.

[11] Describes the sketch and the evaluation of third party design service level agreement, configuration, managing and the designing the best of the resources and the services. The design is too much dynamically efficient that fulfills the high level of services in cloud customer application and hosted on cloud. The basics are packed in service level agreement which is hosted on some platform. In this we will use load balancer which will divided load into different resources and will check the service quality either it is delivering or not. If the all agreement which is packed in the service level agreement not works properly then it will be reconfigured. The SLA will perform the following activities.

❖ Negotiation

The home user contracts the service quality which will be provided to it and the end of the services in regulated manner.

❖ Observation

It will do all the activity like providing reliability, portability any failure occurs during the provider of services.

❖ Rehabilitation

When the something goes wrong or any error occurs then this phase brings back the services in to track as were going.

❖ Ending

It will simply end the services and the resources are free.

In [12], author highlighted issues to facilitate private cloud. Author proposes the high level of services mechanism at

virtually foundation. The paper also facilitates with low cost virtually video streaming. Virtual environment depends on the following factors such as storage, memory, processing, and less wastage of resources. To fulfill the multimedia facilities in any particular organization many features are considered, security, integrity and managing the resources should be considered in the design. The architecture of Media Cloud computing will rely on the storage, the software's that are using the networking devices they are uses and virtually machines and the management of resources. The client accesses the services from different types of devices that are using different type of networks. The main theme is to attain the optimization of bandwidth and the end to end wait should be less.

In [13], writer explains that cloud is new computing environment which provides same access to wide area distributed resources. The writer proposed a new technique for the cloud which achieve the best same level of cost and performance. The writer gave the name to this theory is game theory. The game model is the blend of the physical locations and the channels that are available for the resources. It shows main properties of the physically present and the channels accessible between the task and resources, and gives stress and make scheduling relationship between resources standing nearby. The logic of the game model has been driven from the scheduling algorithm, which gives the best solution for the available resources that are scattered in physically nearby. The game model contains two types of agents, which are known as the resource services agent, and the task agents.

The service model will define the economic factors that are lying resources of cloud computing. Task agents will show the entire cloud request that is requested by the user to fulfill the need. The game theory model gives the best level for completing task, make acceleration of resources.

CRITICAL REVIEW

In literature review [4-13], we discussed critical factors in cloud computing. In [4, 5, 6, and 7], it is discussed that resource management is important for balancing LAN and WAN as well as dual operations. Resource monitoring and utilization also plays vital role for indicating problem in large scale network .But these techniques are not feasible for homogeneous networks. In [8, 11, 12 and 13], authors also evaluated that effective services provide equal opportunities to user. The System generates high level of resources availability and fault tolerance but single user can take benefit of system. So this factor reduces service quality of system. In [9], writer proposed a method of monitoring latency. Usage of this method is easier but not authentic way of monitoring. It is very expensive and time taking method. In [10], author discussed a method of enhance quality of service by accelerating the speed. This method reduces the time of task completion but this method is much complicated and time taking. A summary on analysis of critical aspects in cloud computing is shown in table 1. In review table, Every focused area is precisely discussed with limitations and merits as well as technique used to overcome problems discussed in focused area of cloud computing.

Table 1: Critical Review of Service Quality Techniques

Ref #	Focused Area	Technique Used	Merits	Limitations
[4]	Resource management	Dual Direction Operation	This method is useful for dual direction operation and is also suitable for balance in WAN & LAN.	Not feasible for homogeneous systems and static delay method.
[5]	Resource monitoring and Tracking	Tailored active Measurement	It helps in future predictions and also indicates problems in large scale networks.	Due to increase in traffic, prediction through this tool is not easy.
[6]	Resource Organization	PROMETHEE Technique	This technique provides scalability and more useful in large data Centers. For Much convenient adding and removing process, this method is more effective in distributed environment.	Useful in centralized environment but not applicable in static allocation. Handling of this technique is worst.
[7]	Resource management and utilization	Policy model	A pre-requirement technique that provides consistency, predictability and performance. Main theme of this technique focuses to provide best service quality.	Model has become commercial standard.
[8]	Quality of Service	Service monitoring	Effective service provides equal facilities to all users. For advance level monitoring, this scheme is employed.	Much complex and costly scheme.
[9]	Monitoring latency	Active and Passive monitoring	Usage of this scheme is much easier but not authentic way for monitoring.	Time taking And expensive way.
[10]	Process speed Acceleration	Partitioning around medoids (PAM)	Scheme provides a feasible solution for accelerating the process speed and also reduces the time of task completion.	Much complicated and time taking way.
[11]	Service Quality	Third Party Design	The system generates high level of resource availability and also provides fault tolerance facility.	System provides specific scenario. Single user takes benefits by using this technique.
[12]	Streaming Service Quality	Virtual Streaming	This method provides useful streaming techniques.	It is complicated
[13]	Service Quality Analysis	Quantitative Analysis	Technique is very fast. Cost and time is rated high.	Complex Calculations are involved.

CONCLUSION

In cloud, resource savings is very important. Taking this advantage, it can possible to reduce cost and earn more profit. As switching to cloud is easy and low cost, the number of user linked to cloud servers is increasing very fast. On other hand, resources and bandwidth are limited compared to their access. There are many feasible and optimal ways to achieve high level of services but still cannot get ideal value of solution. However, a lot of work has been required to be done to achieve high level of services in cloud computing. This research paper highlighted areas need to be

focus in cloud computing to ensure high level of services. It also produces a comparative and precise study on work done in cloud computing to achieve high level of services.

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