

Review on optimizing approaches of load balancing in the cloud with a web Services distributed environment

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Abstract - Cloud Computing (CC) which combines distributed application like web services in cloud computing, has become one of the industry buzz words and a major discussion thread in the IT world since 2009. As optimization on load and scheduling of task and job, which come from distributed services like web. so cloud computation should be done before its deadline in this paper inter link between cloud services and distributed web services

Keywords - cloud, distributed environment, load, scheduling

I. INTRODUCTION

The utilization of IT resources in better manner introduces the need of more dynamic IT framework which can respond on quick modification of requirement in real-time. There is a need of real time dynamism just to change the datacenter landscape and also to transform IT framework [3]. The term cloud computing deals with the services like computation, storage and data access. The term 'cloud' is originated from telecommunication world while providing VPN services to data communication. It is very popular in the world of IT; it helps in data transfer from desktop into large data centers. The term of cloud computing is given by NIST they says that it is a model which enables conveniences to demand network access to share a pool of configurable computing resources which can quickly provisioned and released with less management efforts. The objective of cloud computing is to make appropriate use of distributed resources and to add the resources to obtain huge output which will be able to solve large problems while evaluations[2]. Clouds have risen as computing framework that empowers quick conveyance of processing assets as a utility in a powerfully adaptable, virtualized way.

The main features of cloud computing as compare to traditional computing include are sharpness, lower entry cost, devise independency, geographic independency or scalability. Now there are several clouds computing initiative from IT giants such as Google, Amazon, and Microsoft etc. [1]. Cloud computing is a distributed design that brings together server resources on the acceptable stage in order to provides on request figuring resources and administration. Cloud specialist organizations (CSP's) offer cloud stages for their clients to utilize and make their web administrations, much like network

access suppliers offer costumers rapid broadband to get to the web. The developing worldview of distributed computing gives another approach to address the limitations of constrained vitality, capacities and assets.

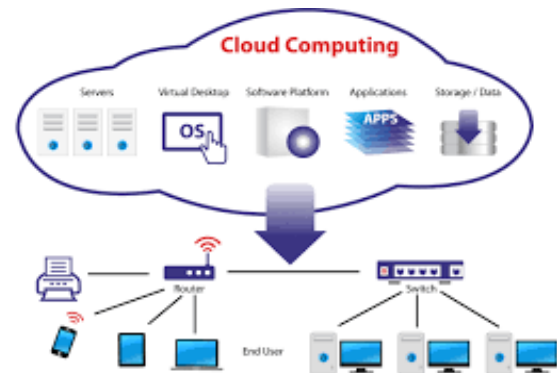


Figure 1.1: Cloud Computing [6].

Cloud computing is the term used for long term computation on internet. Cloud computing has the social and computational implications. It can be represented as a sub set of grid computing that concerned with the use of special shared computing resources while we talk about on the basis of computation. It can also be defines as hybrid model which can be used to exploit computer network resources, increase the features of the client approach [4]. There are many old or new concepts on which cloud computing is based for example SOA, distributed and grid computing etc. By providing software application, program platform, data storage there are several service models that are quickly evolved in harnessing of the technology.

II. ADVANTAGES OF CLOUD COMPUTING

- 1) **Easy Management:** It is very simple to maintain the infrastructure of hardware and software hence no extra effort is needed.
- 2) **Cost Reduction:** The main advantage of cloud computing is that it reduces the cost of the resources like hardware, software and provides the infrastructure to the customers. By using the simple applications like messenger box for sending the messages to one another is an example for the reduction in cost[11].

- 3) **Uninterrupted Services:** most of the cloud provides the reliable services to the users and services.as long as user is active on the internet connection cloud provides the uninterrupted services. They access the services anywhere and anytime without any disturbance of the sources and services.
- 4) **Disaster Management:** In case of disaster cloud always keeps a backup of all the data on it. In crucial time of disaster cloud provides all the data to the organizations which stores their data on it and provides them when they need. Cloud provides the best disaster recovery[8].
- 5) **Green Computing:** In large organization the number of system used is also in a high volume theses system emitted a lot of electronic waste and this waste is very harmful for the environment. This can be reduced by using the cloud computing services. The amount of e-waste is minimum in the cloud and it helps in reducing effects.
- 6) Cloud computing handles the high load situations without any help of the external hardware. Resources used in virtual form which manages themselves. In physical, resources may be span in multiple computers or in multiple data centers.
- 7) Storing the data on cloud has some merits for the client based access. It is possible to access the data from anywhere without any special hardware or any resources. User can access their email online and also access data from any location.

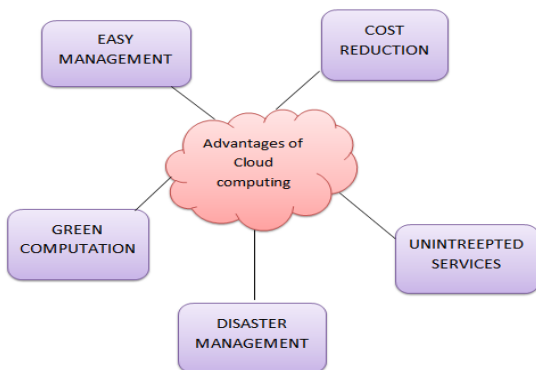


Figure 1.2: Advantages of Cloud Computing

III. DIS ADVANTAGES OF CLOUD COMPUTING:

- **Users are often tied with one cloud provider:** It is very difficult to change the same application on different cloud. It is costlier to develop a separate platform to cloud. Computing components are tightly coupled.
- **Lack of supports in SLA:** SLA is a big hurdle which uses to prevent wide adoption for cloud computing [3].

- **Lack of Multi-tenancy supports:** The three types of multi tenancy enablement approaches are explained below.
 1. Sharing of Resource: To provide the resources at low cost.
 2. Isolation of Security: To protect the potential of unauthorized access, conflict and interference among tenants.
 3. Customization: To support tenant-specific UI, access control, process, data, etc.
- **Less Flexibility in User Interface:** User interface is a crucial and most wanted application in cloud system but cloud systems are limited with user interface choices.[1]

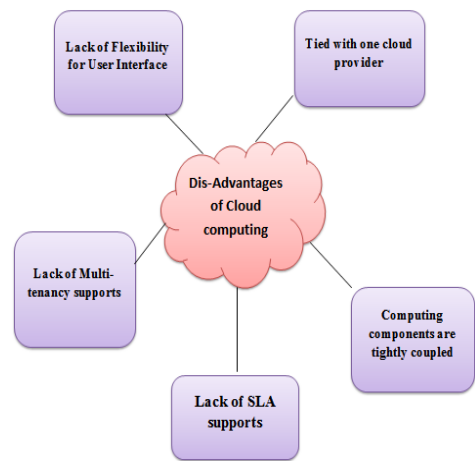


Figure 1.3: Disadvantages of cloud computing

IV. CHARACTERSTICS OF CLOUD COMPUTING

- User can access the data or application with the help of browser and location of users. Third party infrastructure can also be access by using internet. There is a reduction in the cost as infrastructure is given by third party [2].
- It is simple to work i.e. less information of IT is needed for implementation.
- It provides multi sites hence reliable service will acquired for development of business and to recover disaster [1].
- Appropriate utilization of infrastructure is permitted by sharing resources and cost between a large scales of users.
- They did not need any installment on user’s computer hence it provides simple and convenient maintenances.
- We have to pay according to uses facility which helps in the measurement of application used per client regularly [2].
- Performance can be evaluated and monitored.
- Security system provided by cloud computing is far better than that of provided by traditional system.

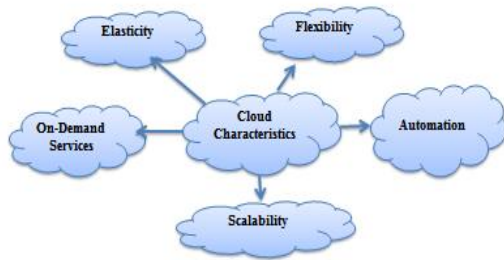


Figure 1.4 Characteristics of Cloud Computing

V. SERVICE MODELS OF CLOUD

Due to rapid growth of cloud computing, its services are enhanced day by day. On the basis of services given by the cloud it is split into three models. These three models are named as IaaS, PaaS and SaaS.

- 1. Infrastructure as a service:** IaaS provides the virtual resources on the internet. In this the third party offers the software, servers and storage space to the users. It provide storage for big data of the corporate offices, provides good bandwidth for data connection and a large storage space. Amazon EC2 is an example of IaaS.
- 2. Platform as a service:** PaaS provides a platform to the user from where they develop, initialize and manage the applications. It provides the operating systems and tools for the application development.it is also called as middleware between the IaaS and PaaS. It provides the platforms on the rental basis to the users. Users gave charges of the services they used according to the time. It provides database, web-servers and development tools.
- 3. Software as a service.** SaaS model uses the web to deliver the services manages by third party vendors to the user. These applications run directly from the user system there is no need to install the application on the users system. The user does not manage or control networks, servers, storage and operating systems. It provides e-mail collaboration, virtual desktop, communication and games as a service.

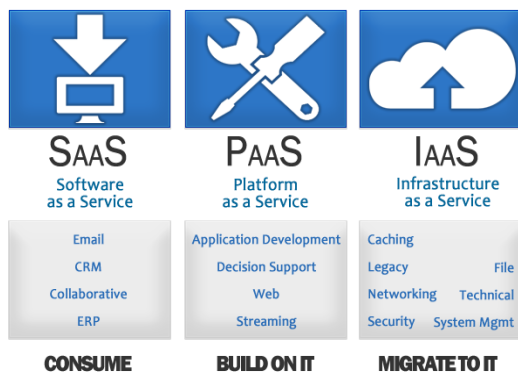


Figure 1.5 Cloud Computing Models [7]

Related reviews on Balancing load in distributed system

Baran, Mesut et al represents an approach related to provide the solution of the feeder reconfiguration problem for loss reduction and load balancing is given. Search on different radial configuration is created by assuming switching of the branch exchange type issued for given solution and two different methods of power flow approximation with varying degree of accuracy is proposed and tested to guide the search. Accuracy analysis and test result demonstrate that estimated method is used in searches to refiguring the given system if the system is not well compensated. In case of load balancing, a load balancing index is defined and demonstrates as the search and power flow estimation methods developed for power loss reduction is used for load balancing when there are two problems similar [8].

Ghosh, Arindam,et al. represents a new approach to generate current for active filter ad static compensator. Author considers that compensator connected with load in star or delta formation. The main objective of compensating scheme is to stable the load as well as making supply side a desired value. To acquire an algorithm to calculate three phase references current author uses theory of instantaneous when injected to power system to generate result as per required. They propose a suitable compensator structure which is able to track the references current in a hysteresis band control scheme. Then at last simulation study is done to demonstrate the feasibility of scheme as a result[9].

Zhou, Qin,et al. [10]This paper gives a description on two feeder reconfiguration algorithm for service restoration and load balancing in real-time operation environment. For efficiency and robust performance developed methodology combines the optimization techniques with heuristic rules and fuzzy logic. The developed algorithms have been implemented as a production grade software. The result demonstrates PG &E distribution feeders have efficient ad robust performance.

Zhao, Yi et al.[11] explained an adaptive distributed load balancing algorithm . This algorithm is implemented on the virtual machine by transferring the load to another machine. This machine shared the storage space and fulfills the zero downtime relocation. Proposed algorithm first compare and then balance the network nodes. The result of the paper shows effective load balancing.

Soni et al. [12] discussed a central load balancer algorithm for balance the load on the virtual machines. Load balancing in virtual machines helps to provide user satisfaction and proper resource utilization. This can be achieved by using fair allocation of resources to client. The results of this paper

shows the better load balancing on large scale cloud computing.

M Randles et al. [14] studied the various techniques of the load balancing which provides the better results in cost, flexibility and availability. Author also discussed about the merits and demerits of the schemes. These algorithms provide the features of fault tolerance and scalability in the cloud environment.

VI. CONCLUSION

Cloud Computing to achieve a complete definition of what a Cloud is, using the main characteristics typically associated with this paradigm in the literature. More than 20 definitions have been studied allowing for the extraction of a consensus definition as well as a minimum definition containing the essential characteristics. This paper pays much attention to the Grid paradigm, as it is often confused with Cloud technologies. We also describe the relationships and distinctions between the Grid and Cloud approaches.

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