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Survey on Static and Dynamic Load balancing in Cloud Computing

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Abstract - *Nowadays, Cloud computing is very important in the Information Technology. The cloud computing provides very large amount of computing and storage service provided to users through the internet. Load Balancing is important for doing operations in cloud. As cloud computing has been growing and many clients all over the world are demanding more services and better results, so load balancing is important. Many algorithms have developed for allocating client's requests to available remote nodes. Load balancing assure efficient resource utilization to customers on his demand and build up the overall performance of the Cloud. In this paper we have to improve the load balancing performance with the help of Dynamic Time Wrapping Algorithm. Load balancing is archived with the help of analyzing CPU and RAM usage.*

Key Words: Load Balancing, Cloud Computing, IaaS, PaaS, SaaS.

1. INTRODUCTION

The definition of Cloud Computing provided by Vangie Beal says that: "Cloud computing is defined as a type of computing that depend on sharing computing resources rather than having local servers or personal devices to handle applications. Cloud computing is suitable to grid computing, a type of computing where unused processing cycles of all computers in a network are belt to solve problems too intensive for any stand-alone machine."

Cloud computing is nothing but access or store large amount of data over a Network to access cloud database remotely from anywhere. The Fig 1 shows the clod computing environment:

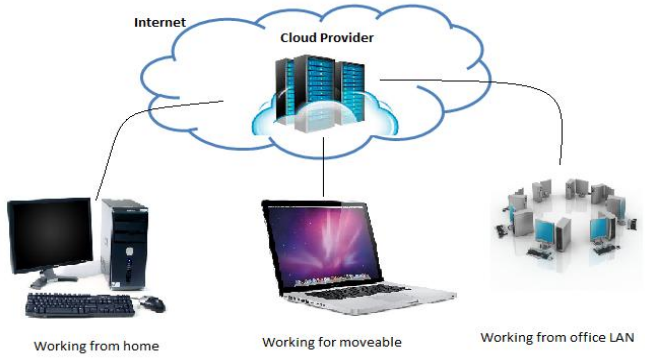

Fig -1: Cloud Computing

Cloud Computing is divided into following types:

1.1 Public Cloud

Public Cloud is type of cloud which can be access from anywhere in the world and can be access by anyone. Examples of the cloud are Amazon's or Google's cloud which are open to all after specific SLA between user and provider.

1.2 Private Cloud

Private cloud the specific organization's or company's employee can only get access and it will be access only within organization's premises and by authenticating each and every user, it is not open to all.

1.3 Hybrid Cloud

Hybrid cloud is combination of both private and public clouds. These types of cloud are combination of both public as private cloud. Most of the economic use is influenced by this type of cloud.
The Fig 2 shows the types of cloud computing:

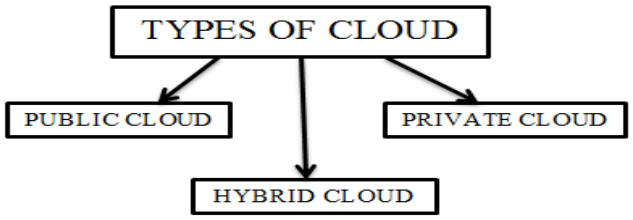

Fig -2: Types of Cloud Computing
There are three services provided by the cloud computing for use of cloud according user requirement.

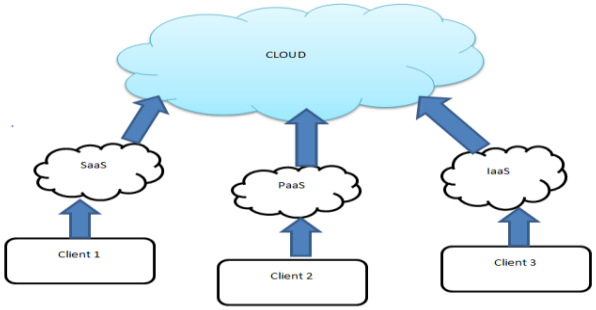

Fig -3: services of Cloud

1.1 Infrastructure as a Service (IaaS)

IaaS can be implemented by using file, network, caching, ligancy etc. IaaS is interact with client directly means without any interface of other application. IaaS provide service as on-demand. Generally IaaS can be collect as public or private infrastructure or a combination of the two. "Public cloud" is considered infrastructure that consists of shared resources, expand on a self-service basis over the Internet. By contrast, "private cloud" is infrastructure that make like some of Cloud Computing features, like virtualization, but does so on a private network. Additionally, some introduce providers are beginning to offer a combination of traditional dedicated hosting alongside public or private or both cloud networks. This combination approach is broadly called "Hybrid Cloud".

1.2 Software as a Service (SaaS)

SaaS applications are created for end-users, delivered over the web. SaaS can be work as service on demand. SaaS provides with completed product that is run and managed by the service provider. In most cases, people refer to Software as a Service is referring to end-user applications.

1.3 Platform as a Service (PaaS)

PaaS can be defined as a computing platform allows the creation of web applications quickly and easily and without the complexity of maintaining software and infrastructure underneath it. PaaS remove the need for organizations to manage the underlying infrastructure and allow you to focus on the deployment and management of your applications. This helps you be more efficient as you don't demand to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other identical heavy lifting involved in running your application.

2. LITTERER REVIEW

A lot of researchers have carried out their work in In this section we are discuss about previous work related to load balancing in cloud by using different technique. This paper presents here a couple of such techniques and enlists the major research work in this area.

In paper [1] author proposes some common load-balancing tactics will be introduced in this paper, which include: round-robin, weight round-robin, least-connection, weight least connection and shortest expected delay. Cloud computing enables shared servers to arrange resources, software and data for collaborative services on demand with high operability and scalability and better uses of the resources. This present a feasible resource-aware load balancing structure by using existed proven technologies to meet higher SLA and the return of investment as well. The contributions of this paper proposed two tactics where resource-fit is shown the best policy by simulation.

In paper [2] In order to avoid the system burden caused by duplicate data, proposes novel data canter architecture of Index Name Server (INS), which find duplication and access point selection optimization techniques, enhanced the performance of the cloud storage system. With the attempt to earn load balancing, this uses several limited INS parameter to dynamically monitor the parameters, like IP information, to avoid the network congestion or the long waiting time during data transmission. INS improves the efficiency of the cloud storage system. The proposed INS data center management mechanism skip the scanning procedure of important backup and reduces the backup cost and established efficient backup of all schemes and methods.

In paper [3] is to design a load rebalancing algorithm reallocates file block such that the block can be distributed to the system as consistently as possible while reducing the movement cost as much as possible. The movement cost is assigned with the number of chunks used to balance the loads of the chunk servers. Advantage of this paper is to balance the loads of nodes and reduce the abuse movement cost as much as possible, while catching advantage of physical network locality and node heterogeneity. This proposal is comparable with centralized approach and considerably outperforms the prior distributed algorithm in terms of load inequality factor, movement cost, and algorithmic overhead.

In paper [4], authors illustrate and define the load rebalancing problem in cloud DFSs. We publicist file systems in clouds shall organize decentralized load rebalance algorithms to remove the performance barrier and the point of failure. The resources in a load-balanced cloud can be well find out the maximizing the performance of Map Reduce established application. The centralized approach for design distributed file system. This proposal is comparable to the centralized algorithm in the Hadoop HDFS production system and dramatically outperforms the go after distributed algorithm in terms of load imbalance factor, movement cost, and algorithmic overhead.

In paper [5], presents the analysis of three contemporary algorithms namely Round Robin, Equally Spread Current Execution Load (ESCE), Control Load Balancing in cloud analyst tool to resolve the issue of cloud load balancing as a construction phase for load balancing technique. This helps to enhance the overall cloud performance. This paper proposed a new VM load balancing algorithm as Weighted Signature based Load Balancing (WSLB) algorithm proposed to minimize the user response time.

In paper [6], provides a comparative study between the three load balancing architectures in cloud computing as centralized, decentralized and hierarchical load balancers. Load balancers promote achieving three main objectives. First improve overall system performance by reaching high resource utilization ratio. Second, avoid system bottleneck that occurs due to load imbalance. Finally, achieving high provides and user's satisfaction by striving to increase the system throughput and decrease the job processing time. Load balancing solutions that are capable of maintaining low values for response time and server loads.

In paper [7], Load rebalancing algorithm is implemented so that central node should not overload. The implementation is completed in Hadoop distributed file system. As apache Hadoop is used, security problem are arises. To solve these security issues and to improve security, Kerberos authentication protocols are used to handle multiple nodes. This paper shows real time implementation experiment on cluster. Cloud computing has enhanced performance, reduced software cost, instant software updates, enhanced document format compatibility, unlimited storage capacity etc. As Hadoop's use and demand grew in the network, handle big data security develop into critical, So that authentication structure Kerberos is used. This approach has the advantage that one could continue to use the tokens to supplement a different primary authentication mechanism.

In paper [8], we design hybrid cloud computing model with the help of Proactive workload management technology. The proactive workload is help us to design new architecture for cloud computing as well as it provide new environment to cloud computing using hybrid cloud computing. So it provides a separate and shared resource platform serves flash crowd peak load. Give the flexible nature of the cloud infrastructure.

3. PROPOSED WORK

In this paper we study about dynamic load balancing with the help of dynamic time wrapping algorithm. By using DTW algorithm we have to improve the performance of cloud and to design the strategy as we can easily scale-able the cloud. The system is dived in to four models as followed:

3.1 Cloud Setup

Cloud setup can be using cloud provider to access the cloud for the implementation of system.

3.2 CPU and Memory usage access

In module is found the CPU and Memory usage of client as well as workload of system.

3.3 Load Balancing

In this module we implement the two level load balancing as:

3.3.1 User Level

In this module, here develop an user level load baling to reduce workload by removing not working state user.

3.3.2 Resource Level

In this module, develop resource level load balancing on the basic of CPU and Memory usage and shifted the load to another cloud.

3.4 Performance evaluation

In this module develop as compression of load balancing with previous system.

4. CONCLUSIONS

In this paper we created private Cloud setup using Ubuntu, and that we use as a test bed for carrying out implementation of DTW algorithm. We also did literature survey of existing load balancing algorithms and come up with different types of algorithm for different architecture with increased performance.

In this paper, we have to implement architecture of cloud with improved the performance. By using or with the help of DTW algorithm by finding the CPU and MEMORY usage of particular cloud to improve the performance of cloud workload shift to another cloud.

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