An Analytical Study of Load Re-Balancing with Public Cloud Computing Atmosphere: A Broad Outline

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Abstract:

Now a day's an organization frequently used the most powerful technology to do their work in an efficient way that technology is called cloud computing which provide a platform for storing data as pay-per-use and available all time for everyone over the internet As the use of this technology increased during the lockdown, security, failure rates, and most crucially load balancing concerns increased as well. This research article has provided insight into load balancing and offers a solution to the issue of node load during work. Cloud computing is having a verity of load like memory load, CPU load and also network load so this proposal minimize the load when nodes are over burdened with many jobs. Through this technique load must be hold and disperse according the requirement when nodes are overloaded. As there are two basic methods for balancing loads—static load balancing and dynamic load balancing this proposal complies with requirements set out by cloud computing technology. This work presents a solution to the issue of excessive node load due to load balancing in the public cloud using cloud partitioning, which supports a control mechanism by choosing different approaches for various circumstances.

Keywords: Cloud Computing, Load Balancing, Public Cloud.

I INTRODUCTION

The telecoms industry first used the term "cloud" while utilizing VPNs (virtual private network). VPN offers data communication services. The cloud computing paradigm described by NIST (National Institute of Standards and Technology) allows for on-demand network access to a shared pool of computing resources, such as networks, servers, storage applications, and services that may be quickly consumed and released by the cloud computing provider. Therefore, we may utilize this technology without having to save any kind of data on desktops, portable devices, etc. Instead, we can use and store the data as the internet requests. Additionally, big data distributed resources can be effectively used with cloud computing, and they can be accessed remotely via the internet. We divided this research paper into four parts. These are as

1: part one describe review of the literature that has previously been done in this field.

2: part two describe LOAD BLANCING

3: part third describes SYSTEM ARCHITECTURE

4: part fourth describe Conclusion gives the findings of this research.

II. LITERATURE SURVEY

In order to categories the fundamentals of cloud computing and maintaining data security on the cloud, a range of literatures have been analyzed. This section contains a review of the literature as a foundation for discussing various data security features.

DR. JITENDRA SINGH CHOUHAN, PRIYA JAIN [1] there is many security issues pertinent to cloud infrastructure of which most serious ones are discussed in this research paper. Next cloud computing security considerations are discussed which must be integrated in each cloud for the data in it to be protected. Next protected cloud architecture is proposed to protected the data from outside attacks.

PACHIPALA YELLAMMA , N ARASIMHAM CHALLA AND V SREENIVAS[2] The achievement of this paper has important meaning to the automation of information and popularization of national economic information network, and has extremely high reference value to the research of network security expertise.

CLIENT BASED PRIVACY MANAGER [3] this technique helps to reduce the loss of private data and threat of data leakage that processed in the cloud, as well as provides additional privacy related benefits.

TAKESHI TAKAHASHI, GREGORY BLANC*Y*, YOUKI KADOBAYASHI*Y*, DOUDOU FALL*Y*, HIROAKI HAZEYAMA*Y*, AND SHIN'ICHIRO MATSUO[4] this research paper introduced technical layers and types, with standard and structured security challenges and approaches of multi-tenant cloud computing.

SABAHI [5] discussed about the security issues, availability and reliability for cloud computing. He also planned a feasible key for only some security issues

MATHISEN, E [6] discussed about a number of the key security issues that cloud computing are bound to be confronted with, as well as recent implementations that give a solutions to these vulnerabilities.

BIN CHEN AND XIAOYI YU [7] discussed a scheme for smart power grid cloud computing, and explains the various benefits with the cloud computing, and the existing security issues and preventive measures.

ANJALI SHARMA, DR GARIMA SINHA [8] this research paper introduced data security services and types, with standard and structured security challenges and approaches of cloud computing.

HOTA, A., MOHAPATRA, S., & MOHANTY, S.[9] Survey of different load balancing approach-based algorithms in cloud computing and a comprehensive review In Computational Intelligence in Data Mining.

ANJALI SHARMA, DR PANKAJ GUPTA [10] The purpose of this paper is to explore the specific risks in cloud computing due to Multi-Tenancy and the measures an overview of multi-tenancy architecture with data security in cloud which are used to regardless of whether it is at rest, on the way, or in use.

III LOAD BLANCING

Load balancing is the main utility to balance the load during the heavy burdens on nodes, then this utility will shift the over load to other respective nodes as required in the network without interrupt the running task. Like web application used the hardware based load balancer which is a regular way to balance load by using IP address to entire communications.
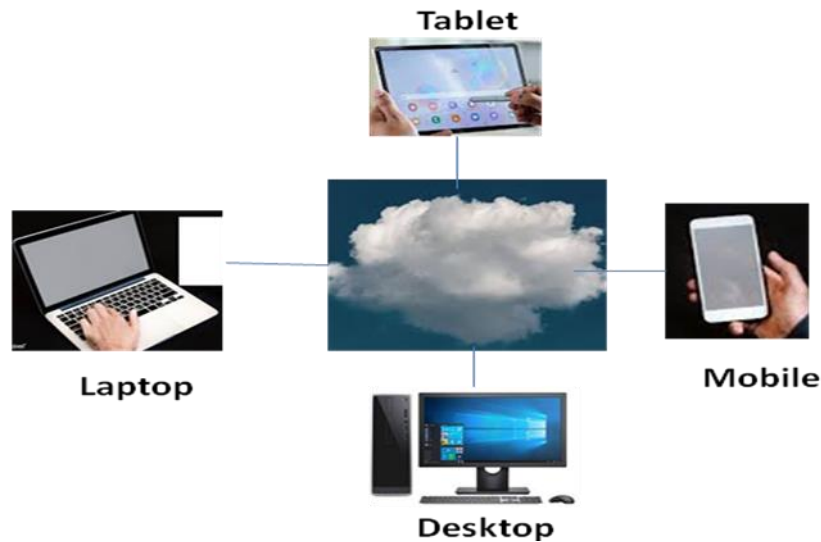
Cloud Computing

Example OAD, it is the oldest hardware load balancer which works on web applications frequently. First the user session is established then It starts the balance load on the web applications by connected one or more identical web servers in the back-end, at the same time load balancer overcome the load problem by forwarding the data packets to different web servers for processing, and also distribute the load on each web server .it can easily balance the load on web applications or Large capacity of load easily tackled by it, this is the main advantage of hardware load balancer. However a hardware-based load balancer uses application which based on hardware component, so it is exclusive. Because of a hardware based load balancer is exceptional occurred by cloud service providers as a service. Instead of that general server which is running on the software applications.

A) Load Balancing Algorithms types

Static Algorithms

Static algorithms distribute workload evenly among servers. These algorithms are sufficient for systems with less variation in loads, but they require information about system resources at the start of execution because the main disadvantage of static algorithms is that when jobs are assigned to nodes, load balancing cannot be used to shift jobs during execution to another node. Static algorithms function similarly to round robin algorithms, which demonstrated many problems that were improved by weighted round robin algorithms. In this algorithm, each server is assigned a weight based on its capacity, and jobs are distributed to each server with the highest weight value receiving the most jobs. When all weights have the same value, traffic is balanced.

Dynamic Algorithms

A dynamic algorithm operates in real time. For example, in dynamic algorithms, the lightest server in the system is sought and selected to balance traffic. This is the main point: it responds to the actual system state when making load transfer decisions. When existing system state is used to build dynamic load balancing decisions, processes are allowed to dynamically shift from one used machine to another used machine in real time, which is the main disadvantage of static algorithms.

C) Types of cloud

Public Cloud	Private Cloud	Hybrid Cloud
No rate of maintenance	keen and secure	strategy driven
Provide more scalability and elasticity	Regulate according demands	Provide more scalability and flexibility
decrease complexity	Customizable	fewer risk
fewer price	High price	customizable

IV SYSTEM ARCHITECTURE

A) Present System

If we consider the current system, every cloud customer's data is stored on a single higher configuration in a single storage cloud. Even if the server has a lot of resources like RAM, hard disc, and processing power, it has a limit. When it reaches that definite limit, specific resources such as RAM, hard disc, and processing power slow down.

B) Propose System

The goal of this paper is to propose a proposal to balance the over load on public cloud, which worked on many nodes with distributed computing resources and phased the problem of over burden in many geographic locations at different times. As a result, in this proposal, the public cloud is divided into numerous cloud partitions. When the environment faces a large and complex overload problem, these divisions make it easier to balance the load. In this concept, we focus on two key terms: key controller and cloud balancer. First, the key controller selects the appropriate cloud partitions for new jobs, and then the balancer balances the load on each cloud partition using the best load balancing strategy. This load completely based on the cloud partitions like after selection of the cloud partitions, load balancing starts.

When a large number of jobs appear in the public cloud system, this key controller determines which cloud partition should receive the job first. The balancer then balances the load by selecting the best load balancing strategy and deciding how to distribute the jobs to the nodes. When the load status of a cloud partition is normal, the main three possibilities will be counted, such as when this partitioning can be done locally. If the load status of the cloud partition is not normal, this job should be moved to another cloud partition. A public cloud is a standard cloud computing model in which services are provided by a service provider, but a large public cloud includes a large number of nodes in various geographical locations. So this proposal overcome the big public cloud problem by this cloud partitions which used as subarea of the public cloud which implement by partitioning of the big public cloud in the form of different locations. This shown as fig.1

A) Key Controller and Balancer

This proposed solution used the key controller and balancer to overcome the load problem of public cloud. First, this key controller assigns jobs to the appropriate cloud partition, which is implemented by the division of the large public cloud, and then communicates with balancers to balance each partition and return the information status. Smaller data sets will be directed to the advanced processing rates because the key controller organizes all information for each partition. Every partition's balancers collect information from every node and then choose the best strategy for job distribution. The relationship between the balancers and the key controller is shown in Fig.1
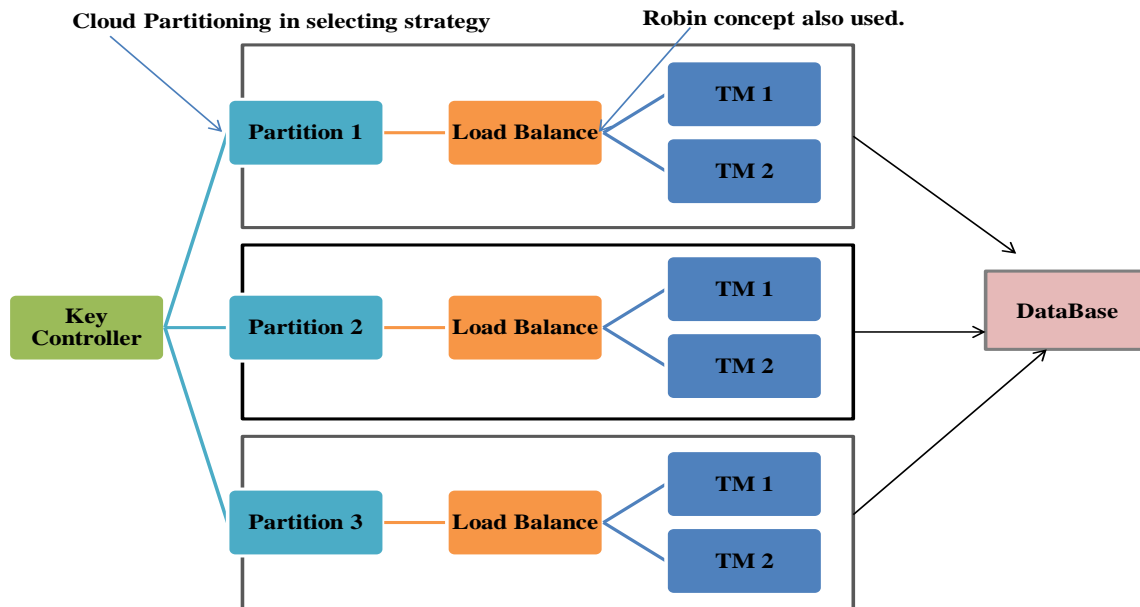
Figure 1 : Relationship of Key Controller and Balancer.

B) Status of jobs according to proposal idea

When numbers of jobs arrive at the public cloud, then the first step is to select suitable cloud partitions for new jobs and then balance the load. So the cloud partition status can be divided into three statuses like idle, normal and overload status. According this proposed solution key controller select the cloud partitions if state of cloud partition is overloaded then again it will select the cloud partition again else the status of cloud partitions are ideal or normal then job arrive the cloud partitions after that assign the jobs to particular node according strategy. So through this way we can rebalance the load on particular partitions. Like figure 2

Here we are discussing following status for executions

(1) Idle status: When the numbers of idle nodes exceeds (α),

Then change to idle status.

(2) Normal status: When the numbers of the normal nodes exceeds (β),

Then change to normal load status.

(3) Overload status: When the numbers of the overloaded nodes exceeds (γ),

Then change to overloaded status.

Here α, β, and γ are the variables set by the cloud Partition balancers.

The load problem overcomes by this *Re-* Balancing Approach which intends to reduce the load imbalance factor in each partition. Through simulation tools and virtual servers, we can do its virtually which overcome the charge of equipment and get better the testing objective in distributed environment/public cloud. We can use cloud SIM and can do it without difficulty. Once the whole thing is place in this atmosphere, we can run the simulation and search out the outcome.
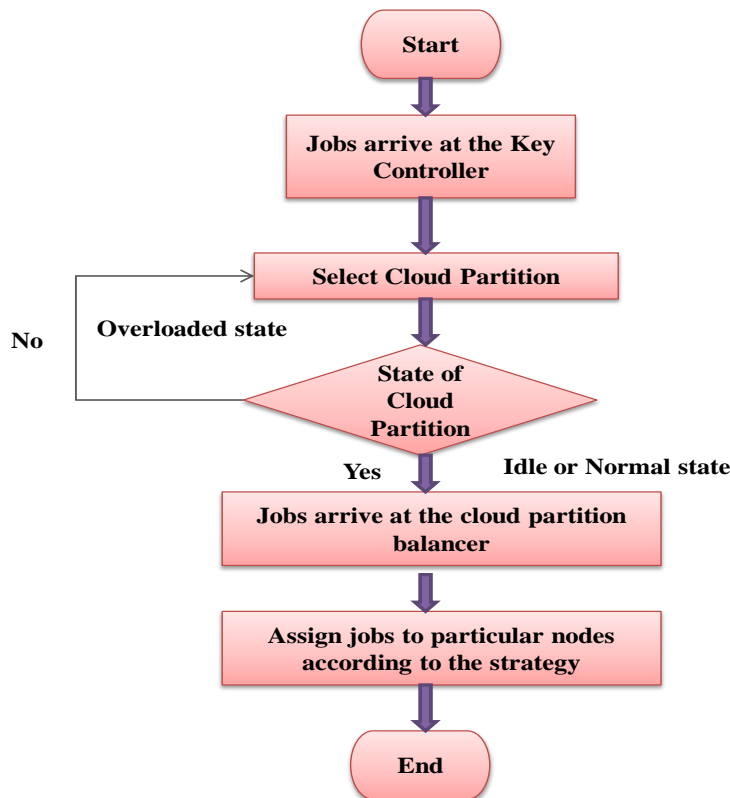
Figure 2 : Job Assignment representation by Flowchart

V Conclusion

The goal of this paper is to propose an idea for a Cloud Computing system, which is currently being widely adopted by industries. Many existing issues exist, such as load balancing, virtual machine migration, and server unification. This paper investigates the concept of load balancing because it is the most important issue in the system to distribute load in an efficient manner. We can overcome this problem by using a key controller and balancer with a load balancing strategy based on three main states: idle, normal, and overload. It also ensures that all computing resources are distributed efficiently and fairly. Present load balancing technique has been focused mainly on reducing the overhead, reducing the migration time and improving the system performance. But it works on reduce the over burden on public cloud.

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