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Load balance in cloud on the basis of size of packet

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ABSTRACT

Cloud computing helps to share data and also provide many resources to users so, the users can pay only for those resources as much they used. The aim of cloud computing is to stores the data and distributed resources in the open environment over the network, where the users can get data easily. The goals of cloud computing are to use the resources efficiently and gain maximum profit. Multiple users request for information at a time. Due to such a huge amount of data request from users, the problem of load balancing arises which becomes the main challenge in the field of cloud computing. To handle such requests efficiently and effectively, various load balancing approaches have been proposed in the past years. Scheduling of incoming users request is a critical problem in cloud computing because a cloud provider has to serve many users in cloud computing. A good scheduling technique is used to bits of help in proper and efficient utilization of the resources. This system designed a better scheduling technique. Here we also use the VMs for handling the user's requests. Scheduling is performed on the basis of available disk space and file size to be processed.

Keywords— *Virtual Machines (VMs), Cloud computing, Load balancing*

1. INTRODUCTION

Cloud computing is work on providing a plethora of services and applications to users all around the world through the internet. Cloud computing is work on the basis of resource pooling, rapid elasticity, measured service, and broad network access. On-demand service ensures that the cloud delivers services to the users whenever and whatever they demand. Cloud services can be accessed from anywhere at any time due to their broad network access characteristics. The number of cloud users can scale up or scale depending upon the need because cloud computing has the elasticity and scalability characteristics [1].

Cloud computing is an easy way to share processing power, storage space, bandwidth, memory and software over the internet [2].

Cloud computing is nothing but outsourcing of computer program in which users can access the software and applications from wherever they are; the computer programs are being hosted by an outside party and reside in the cloud.

In cloud computing environment so many processes are running at a time but processing such many jobs in the cloud computing environment is a very complex problem [2]. In cloud computing to handle the request of users, it uses the concept of the virtual machines and stores data on virtual machines, instead of physical machines [3].

Virtualization in cloud computing is the process of making a virtual platform of server operating system and device storage. This helps the user by providing multiple machines at the same time and also allows sharing a single physical instance of resource or an application to multiple users. Cloud virtualizations also manage the workload by transforming traditional computing and make it more scalable, efficient, and economical. One of the important features of virtualization is that it allows sharing of applications to multiple customers and companies.

Cloud computing relies on the basic concept of virtualization. Virtualization is a process of creating multiple virtual machine instances for a single host machine in order to serve more number of users. Virtual machines make possible to allow multiple operating systems and various applications to be run on the same server node at a time. Flexibility and security of the cloud are incremented due to virtualization technology [4].

Cloud computing provides a flexible and easy way to keep and retrieve data and files. For making large data sets and files available for a number of users around the world it requires the several techniques to optimize and streamline operations and to improve the performance of users [3].

In the field of cloud computing, load balancing is one of the most important issues. As we know cloud computing stores the data and distributed resources in the open environment, hence the amount of data storage is increases quickly in an open environment**.** Load balancing is the process of distributing workloads across multiple computing resources. Load balancing is used to improve the performance and reliability of applications, databases and other services by distributing the workload across multiple servers instead of a single one. There

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are thousands of users who have accessed a website at a particular time, so it's challenging for applications to manage the load that comes from all these requests at a time. Sometimes, it may result in a breakdown of the entire system. Because of load balancing, the workload is divided among two or more servers, network interfaces, hard drives and other and system response time. Load balancing allows enterprises to manage workload or application demands by allocating resources among multiple computers, networks or servers. Cloud load balancing involves hosting the distribution of workload traffic and demands that reside over the Internet. The main benefit of Load balancing is that work load is distributed among resources in such a way that no one resource should be overloaded and each resource can have improved performance [5][6].

Load balancing can help to avoid the condition where nodes are either heavily loaded or under load in the network. Load balancing is the process of ensuring the equal sharing of workload on the group of system node so that without disturbing, the running task is finished. Load balancing improves the performance of the system, maintain the system stability, and accommodate future modification.

This paper is based on the dynamic load balancing algorithm which will serve heterogeneous environments and will consider the resource-specific demands of the tasks by using virtual machines. Here we designed the task scheduling process which handles the user requests and file processing the users demand efficiently and improves the performance of the system by good utilization of disk space and file size.

2. RECENT CONTRIBUTIONS

This section has includes some recent contribution to the field of cloud computing. Many researchers use the different load balancing algorithm to solve the problems in the area of cloud computing.

R. H. Goudar, Santosh Kumar, *et. al.* Presents research issues, challenges, architecture, platforms and applications in the field of cloud computing. They have also presented a comparison between cloud computing and grid computing. Grid is constructed to complete a specified task, where cloud computing is designed to meet general application They introduced the issues in cloud computing like the privacy of users personal data, Interoperability of cloud, Reliability on cloud servers, Compliance. Security of data, Costing of Model, Charging Model, Service Level Agreements between the providers and consumers are the challenges in cloud computing [1].

Gaochao Xu, Junjie Pang, Xiaodong Fu *et. al*. have introduced A Load Balancing Model Based on Cloud Partitioning for the Public Cloud. This paper presents a better load balance model for the public cloud based on the concept of cloud partitioning with a switch mechanism which can choose the different strategies for different situations. Public cloud is divided into several cloud partitions. The cloud has a main controller that chooses the suitable partitions for arriving jobs where the balancer for each cloud partition chooses the best load balancing strategy. Game theory is applied to the load balancing strategy to improve the efficiency in the public cloud environment [2].

Aarti Vig, Rajendra Singh Kushwah, Shivpratap Singh Kushwah *et. al*. have invested an Efficient Distributed Approach for Load Balancing in Cloud Computing. In this paper concept of the virtual machines is used to store data on virtual machines instead of physical machines. In this model total load is distributed among the various node of the system to make effective use of resource utilization and to improve system performance [3].

Gaochao Xu, Junjie Pang, Xiaodong Fu ***et.al***. have presented a load balancing model based on cloud partitioning for the public cloud. This paper introduced a public cloud with numerous nodes with distributed computing resources in many different geographic locations. This model divides the public cloud divided into several cloud partitions [4].

Rajwinder Kaur and Pawan Luthra have introduced Load Balancing in Cloud Computing. This paper contains the concept of cloud computing and load balancing. There are various types of load are possible in cloud computing like memory, CPU and network load. The load balancing is classified into a static load balancing algorithm and dynamic load balancing algorithm. The author also introduces the various loads balancing algorithm which help to achieve better throughput and improve the response time in a cloud environment. These algorithms are Task Scheduling based on LB, Round Robin, Randomized Min-Min Algorithm, Max-Min Algorithm, Compare and Balance, Shortest Response Time First. These algorithms consist of many factors like scalability, better resource utilization, high performance, better response time [7].

Radhika Pathak has been invented a Survey of Load Balancing in Cloud Computing Challenges and Algorithms. Cloud computing provides shared resources, information, software packages and other resources as per client requirements at a specific time. Load balancing is one of the main issues in cloud computing. The load can be a memory, CPU capacity, network or delay load. Load balancing has many challenges in the field of cloud computing. Throughput is the total number of tasks that have completed execution. Associated Overhead is the amount of overhead during the implementation of the load balancing algorithm. Fault tolerant defines the ability to perform load balancing by the appropriate algorithm without arbitrary link or node failure. Migration time, response time, resource utilization, scalability, and performance are the challenges of load balancing [8].

3. METHODOLOGY

As we studied the many load balancing algorithm in which incoming request is distributed evenly without considering the current state of nodes which will process the user request and hence node is getting overloaded or under loaded. This will affect system performance.

This system model is designed to evenly distribute the file across the processing nodes so that files are evenly distributed and overloading condition can be avoided.

The goal of this system is as follow:

- Assigning the users request to the virtual machine so that load gets distributed evenly.
- Checking the file size to be processed.

This system contains the cloud controller, load balancer, virtual machine unit to process the incoming request from users. First, the user sends the request to the cloud controller which automatically moves the incoming request on cloud storage where data made available to the user. The task scheduler is used to process the data that require to the user in good manner.

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Here we use the virtual machine A and B. Task scheduler assigns the task to these machines and then the machine answers the user's request and require data or information is given to the user. A system flow diagram is given in fig.1. This figure contains the following units.

3.1 Users
The user sends the request for required information, data or file, application over the cloud.

3.2 Cloud controller
Cloud controller controls the task processing. It decides which node controller or load balancer should be selected for the next allocation.

3.3 Task scheduler
The task scheduler unit makes a decision about which machine node should process the user request, and this decision is taken on the current state of the virtual machine. it is used to schedule tasks to the Virtual Machines in accordance with adaptable time, which involves finding out a proper sequence in which tasks can be executed [9][10].

3.4 Virtual machines
Virtualization provides everything like real though it does not exist in reality. A virtual machine is actually an abstraction layer between hardware components and the end-user. Virtual machines have the ability to run any operating systems on them.

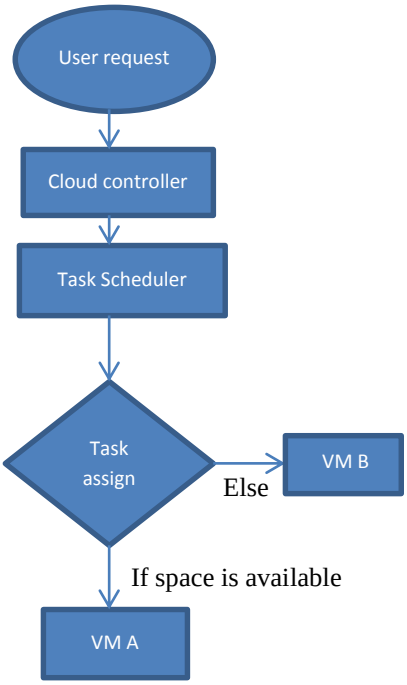

Fig. 1: System Architecture

First, the system initializes the VMs with their specific resource types, capacities of each resource and also the status of VM. When the task scheduler assigns the task then it checks if the virtual machine is available to process the file. The task is processed by sequence and also disk size is also considered while processing the file. On client request for any file handling, get available resource information from all VMs with allotted data on it. If VM A is available then the task is given to the VM A. Suppose VM A is busy means it processing another file then the task is given to VM B. At the same time scheduler checks the file size which is processed by VMs. When file size is too large and VMs does not have enough space to process it then the file is spitted and distributed to VMs to handle the file.

4. EXPERIMENTAL RESULT
Following figures show the experimental results with the existing system and with our new system. Figure 2 shows the result of an existing system file is added to the local server.

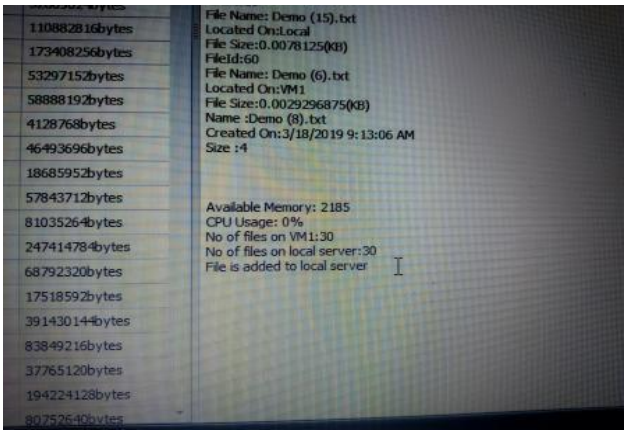

Fig. 2: Experimental result I

In figure 3 result of this system, model is given, these results show good memory utilization. In this system, incoming files are added to the virtual machines. Files size is greater than files processed in the existing system.

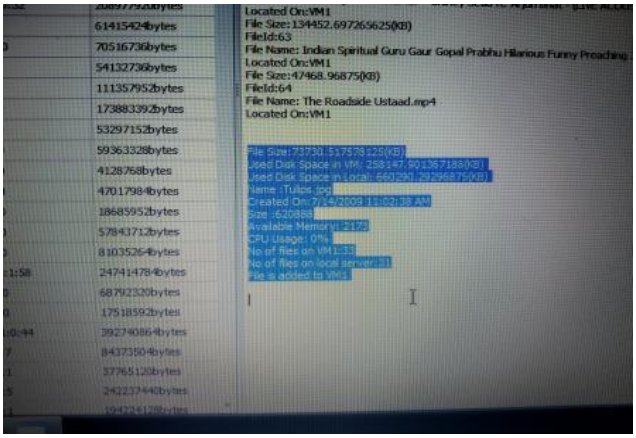

Fig. 3: Experimental result II

5. CONCLUSION
This system overcomes the problems of the scheduling of incoming request by using the file size and available disk space to process the files. VMs are used for avoiding the problem of load balancing. This system improves the performance of the system by using a virtual machine to process the files instead of a local server which helps in load balancing.

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