

Broker Aware Data Migration Strategy For Optimizing Down Time and Migration Time

Mehak Gandhi

Department of Computer Science & Engineering
Lovely Professional University,
Phagwara, Punjab, India
Mehak.23620@lpu.co.in

Keshav Dhira

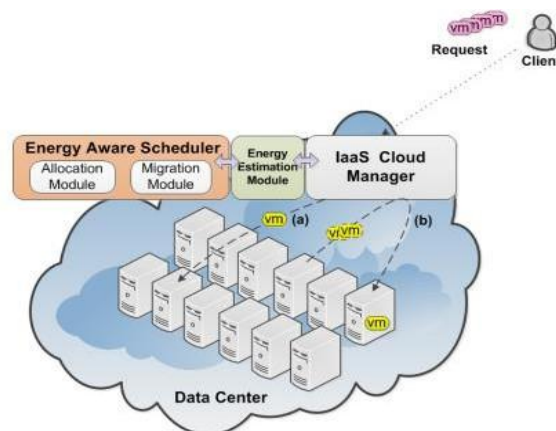
Department of Computer Science & Engineering
Lovely Professional University,
Phagwara, Punjab, India
Keshav.25128@lpu.co.in

Abstract: As Cloud applications are developing quickly, requests for expanding the scalability of data centers is now raised to dependable high. Late investigations have proposed a few assignment approaches construct for the most part in light of energy utilization of servers. Host temperature, in any case, is infrequently considered as an observing parameter. This paper focuses on a power and warm mindful virtual machine (VM) designation component for data centers of cloud. Proposed literature focuses on minimization of energy consumption by using modified data migration strategies. Data migration strategy with redundancy handling is proposed that significantly minimize downtime and migration time. To initiate migration, broker analysis process is used. Overall result in terms of downtime and migration time is improved by 12% and space required during migration is also reduced. Simulation setup is established using cloud sim and net beans.

Keywords: Cloud computing, data centers, downtime, migration time.

I INTRODUCTION

As of late, the multiplication of logical, trade, and applications in development of web has



presented colossal requests for substantial scale figuring data centers. Power utilization has turned into a basic worry as data centers devour impressive measures of energy. Lacking a legitimate asset providing mechanism, poor use of asset and problem area issues may emerge. Power-mindful provisioning components can, bring significant vitality reserve funds, as well as lessen operationalexpenses.

Figure 1: Cloud System Model

Virtualization is one of the key systems for lessening energy utilization. By making a few virtualized machines (VMs) on an actual host machine which further enhances the use of assets and diminishes lingering of strategically computing gear. An appealing instrument for dynamic asset administration is live VM relocation [8]. It is the way toward relocating a VM starting with one physical machine then onto the next, which expects to yield a superior asset portion or unite the machines onto lesser nodes. In this research work, a VM allotment system, which takes into consideration both vitality utilization and host temperature, is proposed shown in Figure 1. Another warm mindful capacity is presented for VM choice and distinguishing appropriate hosts for VM movements.

Reproduction comes about appear demonstrate the promising execution of the proposed component in vitality sparing while at the same time keeping the movement number less without forcing critical infringement on framework imperatives.

The framework under consideration is a customary Cloud server farm with $M(X)$ heterogeneous VMs and $N(Y)$ heterogeneous physical hosts. Demands for the provisioning of available VMs along with asset demands as portrayed by the host parameters can be submitted by clients. With migrations and unions, numerous VMs might be allotted onto a solitary physical host[7].

In the recreation, we receive distinctive calculations in to recognize if a single host is over- burden.

- 1) Static Threshold: Fixed estimations of use limits are decided for choosing the movements of VMs.
- 2) Interquartile Range: set an upper usage limit contingent upon the contrast between the first and third quartiles in CPU use.

3) Median Absolute Deviation: set the edge as per the outright separation from the middle of host CPU use.

4) Local Regression Robust: fit a pattern polynomial to the last k perceptions of CPU usage to gauge the following perception and check whether it fulfills a few states of host over-burdening discovery.

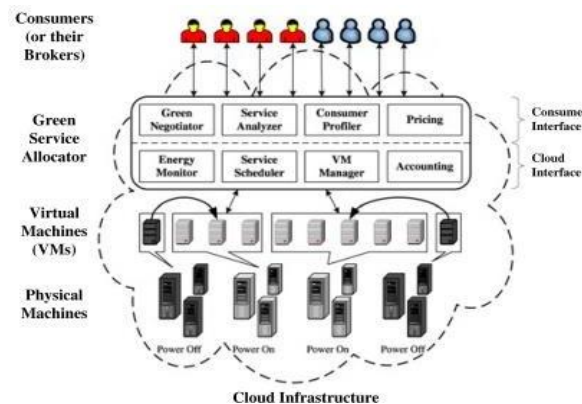


Figure 2: High level System Architecture

VM Selection Policies- Four VM determination strategies are chosen for examination.

- 1) Maximum Correlation (MC): Relocating a machine with the most noteworthy connection of CPU usage with different VMs on a similar host.
- 2) Minimum Migration Time (MMT): move a machine with the most limited hour to finish relocation.
- 3) Minimum Utilization (MU): Moving a machine with the base use.
- 4) Random Selection (RS): Selection of a machine to be moved haphazardly.

Selecting VM for data migration is critical since overloaded VM selection could cause load to increase and performance to degrade. To tackle the issue, strategies described above are considered for selecting optimal VM for operation. Data to be migrated first of all examined for redundancy handling. Figure 2 depicts the High level system architecture of the VM model.

II LITERATURESURVEY

Fault tolerance is critical since users heavily depending upon the cloud for operation [1]. In case of failures data and other resources stored over the cloud could be lost. In order to overcome this problem, fault tolerance strategies become critical. In fault tolerant data migration strategies, migration of resources starts once prediction of failures initiated [5]. The migration to the fittest machine takes place. The fittest machine is selected on the basis of parameters. These parameters include downtime, migration time and overall execution time. Overall migration enhances the performance since resources and data is already migrated to fittest physical machine. The rest of the task will initiate at the physical machine. Efficient fault tolerance techniques are divided into following twocategories

- 1)Proactive faulttolerance
- 2)Reactive Faulttolerance

A. ProactiveScheduling

Proactive fault tolerance techniques are the mechanism in which action is taken before the failure of virtual machines [15]. The entire process is based on the prediction. The proactive fault tolerance techniques include

B. Software rejuvenation

Periodic reboots are performed under this approach [3]. Every time system reboots, it starts from new state.

C. Self-Healing

It is the mechanism of controlling the failure of instance of process running on multiple virtual machine [1]. The process once recovered is required to be restarted.

D. Preemptive scheduling

In this scheduling, resources are prompted from the processastheprocessgoesinthestateoffailure [10, 12].Theseresourcesareassignedtosomeother

optimal process. The time consumption in execution of process is considerably removed. Determining optimal process is critical.

E. ReactiveScheduling

Reactive fault tolerance is the mechanism in which failure impact is reduced. In other words this technique is implied only through the application of failure. Techniques under reactive fault tolerance is listed as under

F. Check pointing

This is the mechanism in which progress is saved up to the established point [2, 18]. Once the progress reaches that point, it is automatically saved. The progress saved is known as savepoint. This mechanism is implemented as the reactive approach and it consume time in order to perform recovery.

G. Replication

Task is replicated which is executed on virtual machine [14]. This task is executed on several machines and in case of failure progress is recovered from the earliest finishing job. Replication however is space ineffective mechanism.

H. Load Balancing MigrationStrategies

This strategy improves the scalability of the server [19]. The servers are analysed for load. The load is presented in terms of data and resources. In case load on the machines increases, load is shifted to the other server having least load. Load balancing strategy for migration is effective enough for tackling issues of downtime and migration time for data migration.

I. Energy Efficient Migration Technique

When Data between VM is to be migrated three factors must be considered. 1) Physical Memory image associated with virtual machine 2) network connection and virtual device state 3) Serial cum serial interface (SCSI). In order to optimize migration time, critical point of choosing technique to migrate required being decided. VM migration strategies are considered to be many

and one of them is Pre-copy approach [4, 11, 17, 20]. It provides significant improvement in terms of down time. But this approach is not optimal in every situation. E.g. in case of memory intensive job, downtime and migration time increases drastically. Pre-copy approach also may not work properly in case of low bandwidth WAN environment. To resolve the issue, energy efficient strategy to maintain energy efficiency for fault tolerance in data migration across distinct host[6, 16].

All the above listed strategies are efficient enough but still modification for improvement could be desired and migration time can be further optimized using energy efficient mechanism.

Objective of Proposed System

- Fault tolerance can be increased by applying load balancing technique
- The downtime and migration time can be reduced
- The utilization of resources is increased as redundancy is removed

III PROPOSED METHODOLOGY

Initially user login and upload its data over the cloud that is to be migrated and redundancy check for discovering duplicate data is performed. If the data is redundant then remove the redundancy and update the file otherwise file is stored as given. After that check VMs for load balancing, if the VM is not overloaded then allocate the jobs to the VM and perform execution. Obtain the results in terms of migration time and execution time. Otherwise select the different VM from list and continue processing. The proposed flowchart for VM availability can be shown in Figure 3.

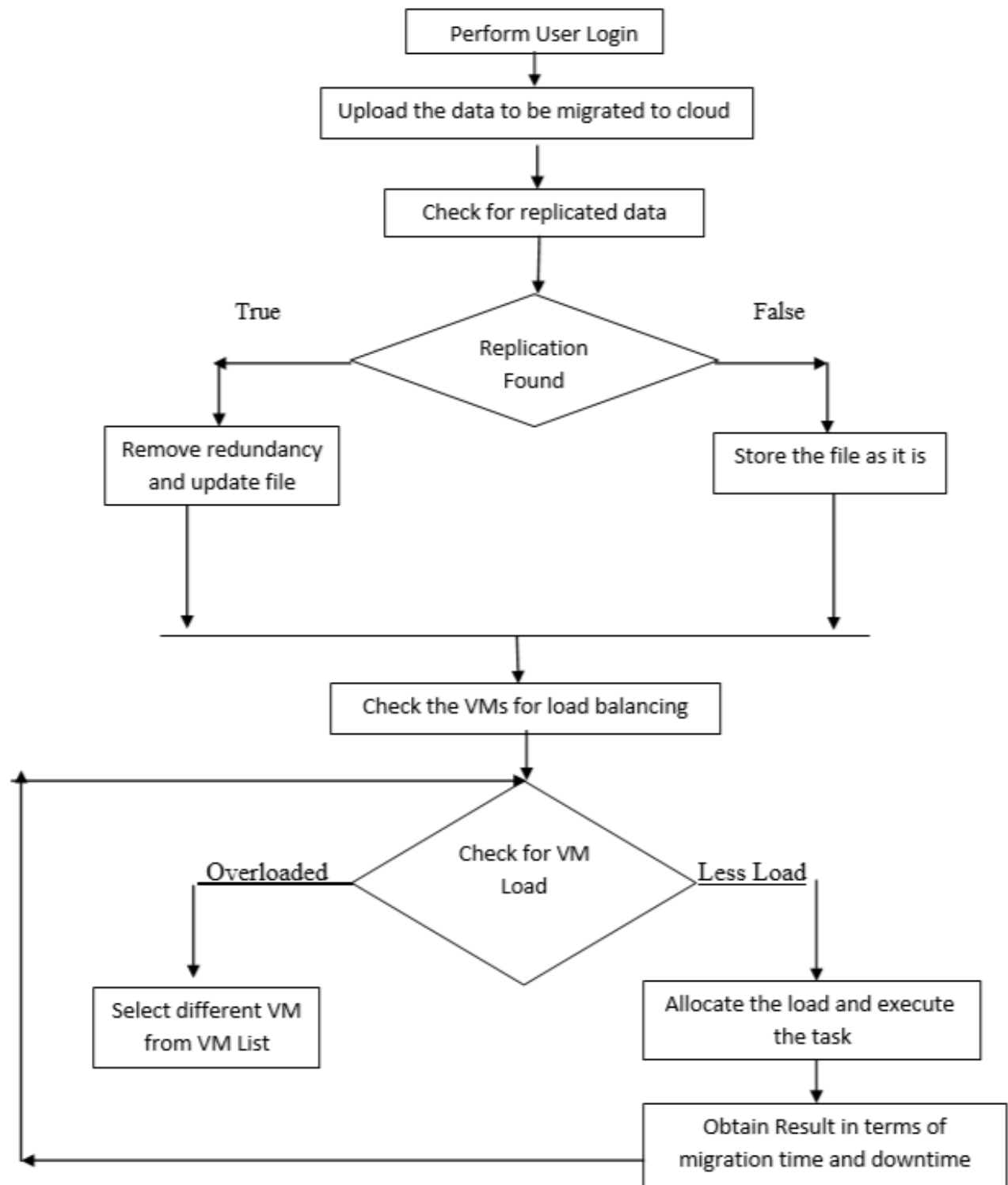


Figure 3: Flowchart to provide the available VMs to users

IV RESULTS AND DISCUSSION

The result comparison as shown in Table 1, 2, 3 can be used to see the benefits in various parameters of the proposed system.

Parameter	Existing	Proposed
Down time	4.5	3
Migration Time	6	4
Space consumed	50	40

Table 1: when File Size is 50kb then the migration time, down time and space consumed

The comparison in terms of time and space can be judged based on the Figure 4, 5, 6 given based on various file sizes (in Kb).

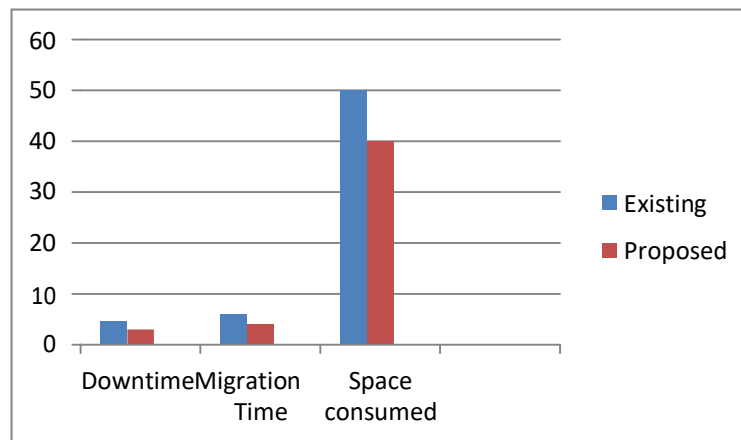


Figure 4: when File Size is 50kb then the migration time, down time and space consumed

Parameter	Existing	Proposed
Down time	3	2
Migration Time	5	3
Space consumed	30	20

Table2: when File Size is 30kb then the migration time, down time and space consumed

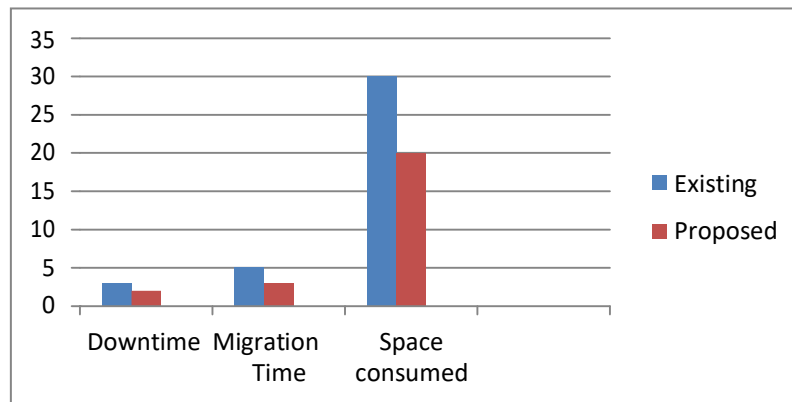


Figure 5: when File Size is 30kb then the migration time, down time and space consumed

Parameter	Existing	Proposed
Down time	2.5	1.5
Migration Time	3	2
Space consumed	20	10

Table 3: when File Size is 20kb then the migration time, down time and space consumed

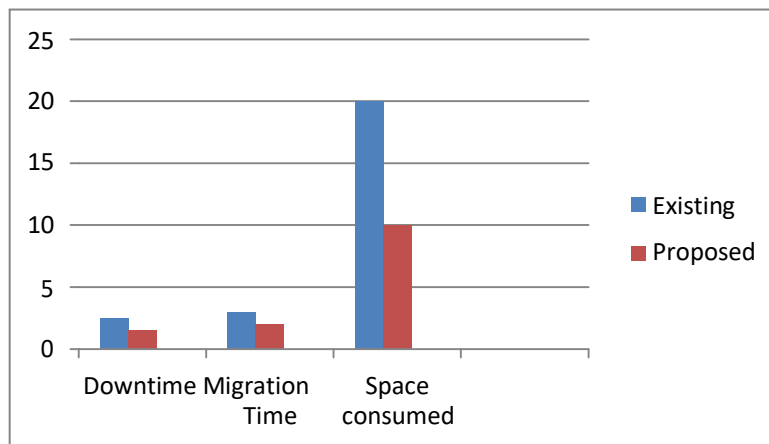


Figure 6: when File Size is 20kb then the migration time, down time and space consumed

V CONCLUSION

Virtual machine (VM) area system for a large networked group of computer servers as typically used by officialdoms for the remote storageis proposed in this paper. The proposed instrument chooses and designates VMs to have in light ofhost's temperature. Accordingly, the proposed

mechanism decreases vitality utilization and movement number fundamentally while maintaining a strategic distance from SLA infringement. It can coordinate well with various host over-burdening identification calculations under various sorts of workloads. The execution of the proposed component has been checked utilizing broad recreation tests in view of CloudSim. Broker aware data migration strategy is implemented using proposed system. Overall down time and migration time is reduced considerably by the margin of 12 %. In future hybrid migration strategy using inter cloud migration can be used.

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