Comparison between Deadline Based and Improved cost based Task scheduling Algorithm: a Perspective View

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ABSTRACT

Cloud computing systems rely heavily on task scheduling for their operation. Task scheduling cannot be achieved by relying on just one factor, but rather it must be achieved by following a set of agreed upon rules and guidelines. A contract is nothing but the degree of service that a customer demands from a provider. One of the most important tasks of the providers is to provide high quality service to their users. At the same time there are a lot of other things going on behind the scene. In this paper we focuses on Task scheduling problem with two of the algorithms.

The task scheduling problem is Finding the best way to map/assign sets of subtasks of various tasks to available sets of resources so that we can accomplish our desired goals for each task. We are going to compare Two algorithms for their suitability, feasibility, adaptability in the context of cloud scenarios. To improve the quality and reliability of cloud services.

Used Keywords Basic of Cloud computing, it's Architecture and its scheduling, its types, some algorithms.

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1. INTRODUCTION

A cloud is a collection of interconnected computers that may consist of more than one unified computer. Cloud computing has helped simulating quick arrangement of interconnected data centers that are geographically dispersed for providing high quality and reliable services [1]. Cloud computing has been developing rapidly and is now becoming increasingly popular. It also presents many challenges for traditional IT [3]. Cloud computing has recently risen as an alternative internet-based model for empowering consumers. It allows access to a shared pool of configuration assets on-demand, which can be immediately provisioned and de-provisioned with very little administrative or cloud provider cooperation [4]. With this new technology, many advantages such as better benefits in the market place, lower costs, stack adjustment, and storage can be achieved Cloud computing allows all apps to run in a virtualized environment. All resources are shared across multiple computers [5]. They're not related because each app is different.

Figure1: Introduction to cloud computing

Cloud computing systems rely heavily on task scheduling. Tasks cannot be scheduled on the basis of a single criterion but under a lot of agreements between users and providers of cloud computing. This contract is nothing

but the level of service that you expect from the customer. Providing high-level quality services to the users according to the agreements is a crucial task at the provider end. They must also deal with various other tasks working on the provider side.

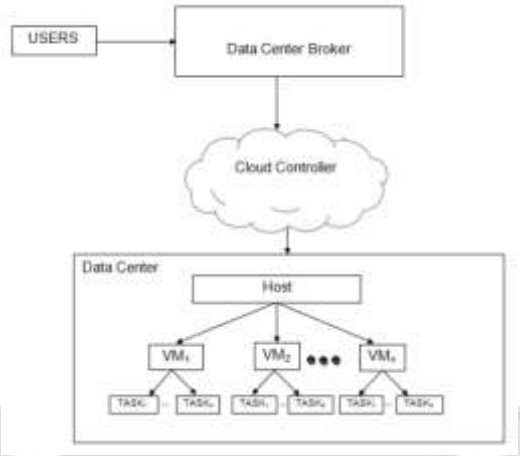

Figure2: Task Scheduling Architecture

2. RELATED WORK: Previous research has shown that `Task scheduling is an NP-hard problem [3]. Scheduling is an NP - hard problem, so we can safely say that it has been solved by various known heuristic methods which give solutions for problems within a limited scope.. An algorithm is nothing but a set of rules that guarantee For finding an approximate optimal solution within less than polynomial time It searches for finding the best path through the available solution set by ignoring and eliminating the rest of the possible solutions that might seem possible. Heuristic algorithm is divided into:-

1) Cluster-scheduling

2) List-scheduling

In case of Clustering algorithm of scheduling that is based on the assumption that for the execution of number of subtask , a number of processors are been present for work so focus on using a number of processors so as to reduce the make span for the schedules generated.

Most of the known heuristics are listed under the list scheduling classes section. A search in list scheduling is usually performed in two phases: -

1. The phase First focuses on providing priority to each subtask on the basis of some criteria and accordingly scheduling them in decreasing priority and storing as list.

Once the different processors become available and the highest priority task becomes available, the processor which best suits the task is chosen in the second phase.

The drawback of this is that it does not provide a consistent result in the heterogeneous computing environment. Along with these algorithms, meta–Heuristics algorithm provides a better solution in some situations. These include Simulated Annealing [6], PSO algorithm [7], and Ant colony based algorithm [8]. These algorithms require a sufficient sampling in given space but there is a drawback that is they have higher side on computational cost and are less efficient.

3. TASK SCHEDULING TYPES

Cloud computing means choosing the most suitable resource available for executing a task or allocating computers to tasks so that the completion time is minimized. Scheduling algorithms create lists of tasks by assigning priorities to each task based on various parameters. For example, some scheduling algorithms prioritize tasks by their importance (e.g., high-priority tasks take precedence over low-priority tasks), whereas others prioritize tasks by their deadline (e.g., tasks due soonest get scheduled first Tasks are then chosen on basis of their priorities and are allocated to the available processing units and computers that satisfy a pre-defined objective function [9].

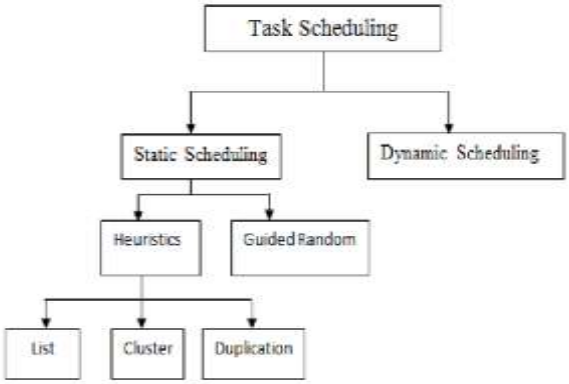

Figure 3 – TYPES OF TASK SCHEDULING

1. A **Static scheduler** schedules tasks in advance, regardless of the current state of the system or the availability of resources.
2. A **Dynamic scheduler** depends on both the submitted tasks and the current state of the systems and computers to make scheduling decisions.

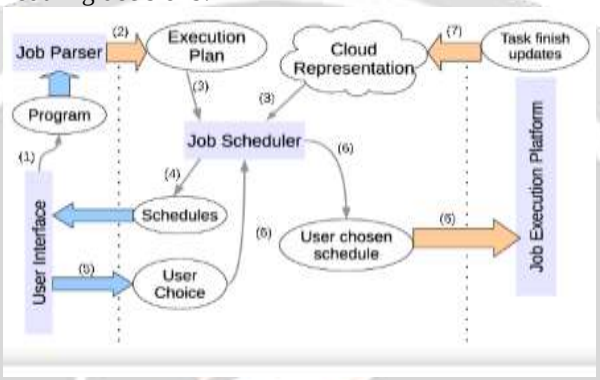

Figure 4: STATIC SCHEDULING

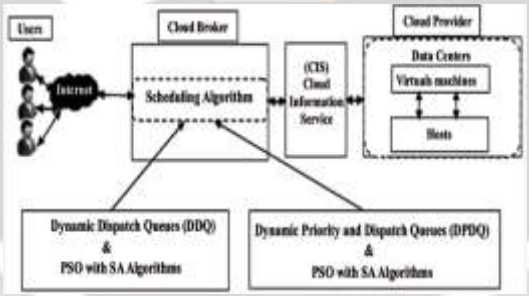

Figure 5: DYNAMIC SCHEDULING

Cloud computing uses virtualisation techniques to map the resources of the cloud to the virtual machine level, implement the tasks for users, so the task scheduling achieved at the application layer and the virtual layer of resources.

3. TASK SCHEDULING ALGORITHMS

3.1 DBD-CTO ALGORITHM:

a) The approach considers two constraints that are: Deadline of task and Budget.
b) This algorithm achieves its objectives by completing its tasks before the given deadline and at the same time minimizes the cost of computing occurring during the implementation.

3.2 IMPROVED COST BASED TASK SCHEDULING ALGORITHM:

a) It measures the performance of computations and the cost of resources. It also improved the performance of tasks by combining multiple tasks into one task. Combining tasks is usually done by analyzing the capabilities of different resources and their processing times.

b) Cloud sim is been used for the purpose of testing the algorithm
c) The result shows that the improved cost based task scheduling takes very less time in execution as compared to deadline based scheduling algorithm.

4. COMPARISON BETWEEN DBD-CTO ALGORITHM AND IMPROVED COST BASED ALGORITHM:

Algorithm	Tools	Factors	Result
1.DBD-CTO [11]	JAVA Environment	Cost, Time	Low computation cost
2.Improved Cost based [10]	Cloud Sim	Performance ,Cost	Measure Resource

FIGURE 6: COMPARISON BETWEEN TWO ALGORITHMS

The Following Figure shows the differentiation between the two algorithms along with the parameters used. The comparison shows that the second one is better over the first one. in the context of first algorithm that is DBDCTO algorithm, which is based on deadline lowers computation cost and completes the given in a particular deadline. On the other side of comparison , Improved cost based task scheduling focus is on measurement of resource cost along with improvement of computation ratio.

5. CONCLUSION

Through this paper we tried to find out the comparison between two algorithms and their working in the different environments. The comparison shows that the second one is better over the first one. in the context of first algorithm that is DBDCTO algorithm, which is based on deadline lowers computation cost and completes the given in a particular deadline. On the other side of comparison , Improved cost based task scheduling focus is on measurement of resource cost along with improvement of computation ratio.

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