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Comparison of Models In Cloud Computing and Their Issues

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***Abstract*—Now-a-days one of the rapidly exploiting technology in our growing trend is cloud computing. Most of the organizations are storing their data, explore their products, extend their business by means of cloud. Some of the cloud providers are IBM, Microsoft Azure, Amazon and IBM etc. they provide availability, flexibility, integration and scalability. The developers of cloud applications can have flexibility to develop and access from anywhere and anytime. The virtual space is provided by techniques of cloud and can be deployed their applications to run their operations. In this paper, we highlight scheduling methods exploited in allocating and monitoring challenges in cloud based environment and their solutions to overcome the specific issues.**

***Keywords*—Cloud computing, Scheduling algorithm, Data Access, Heuristic selection, SWARM Optimization**

I. INTRODUCTION

In cloud, there are three layers of services they are PaaS (Platform as a Service), SaaS (Software as a Service), and IaaS (Infrastructure as a Service). As the cloud imparts on-demand availability, universal to users of cloud providers as the cloud contains a pool of resources. The CSP (cloud service provider) will provide services over the cloud [6] to cut the costs of expenditure and also to schedule the task, by using recent technologies and services. This paper proceeds with the study of the data scheduling and monitoring challenges in cloud computing.

Some of the features of cloud are,

- Network access
- Resource pooling
- On-demand self service

Scheduling of task is a great challenge to cloud computing environment. In this paper Section II presents the scheduling objectives of our systematic review. Next, in Section III we define in depth problem in scheduling. Later, in Section IV we will analyze the scheduling algorithms used in Cloud Computing with their pros and cons in clouds. Finally, we provide some conclusions.

II. SCHEDULING OBJECTIVES

In cloud all the process is automated to get information frequently (simultaneously). The automation is for monitoring the availability, scalability the service given by CSP (cloud service provider). While automating, the CSP will manage hundred thousand of tasks per seconds of day at a single point in time. Load sharing [1] is the amount of task will be able to perform on time, by managing the techniques of the cloud through the network, operating system, hardware, storage by means it also provides security for the user data at each stage of the process.

This paper focuses on different scheduling algorithms to be used by CSP in a cloud based environment. Those algorithms are categorized in terms of characteristics, challenges and strategies. Scheduling the task in a cloud environment [3] will handle an optimal number of systems in order to reduce the total cost (CAPEX) with regard to SLA (Service Level Agreement) whenever it is validated. Most preferable cloud is highly dynamic and so it is easy to address the problems of cloud allocation, to monitor available/non-available over the time.

III. ISSUES IN CLOUDS

As there are many problem for cloud service [4] provide for providing the services with respect to scheduling.

- Provisioning resources
- Enhancing the space for resources
- Increases the speed of computing

The scheduling of the cloud services to the consumers (student, organization, and employee) by service providers changes the cost benefit of these cloud computing.

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The services can be provided to the customers (student, organization, and employee), which may change in accordance with cost and time(period) in cloud.

There are so many algorithms to be exploited and so the task can be scheduled,

1. Scheduling Based on Cost and Time (Period)

This technique is based on how long the resources[3] will get to be utilized at which cost. Assigning the task with minimum cost is the objective of scheduling. There is no need to waste the cost and time.

2. Priority Based Scheduling

This type of scheduling will give the priority[2] only to necessity of consumer. In terms of both favorable and unfavorable conditions, the shortest job first among all the jobs with larger length is selected to be assigned with high priority.

3. Energy efficient scheduling

There is large number of hardware andsoftware resources[10] exploited by organization. So the energy needs to be reducing from the overall consumption. CSP are trying to reduce the energy consumption. The organization will have to create relationship between energy and task.

4. Location based Scheduling

This scheduling implies how to reduce the wastage [7] of resources while utilizing for computing. Thus it provides a way for effectively overcome the issue by frequently satisfying the client/server request.

5. Dynamic Scheduling

The task is separated and distributed in all the locations in order to secure the information. Hadoop is used in cloud, uses the Map Reduce [5] technique for processing. In this paper each task have time slot. During that period task gets to be executed.

This paper provides various approaches for scheduling, and priorities are the parameters for a detailed estimation in the proposed approach.

IV. SCHEDULING ALGORITHMS

Scheduling can be performed with respect to task/job in the cloud. Since the cloud consists of a large number of data, they can be scheduled in order to achieve high performance and high throughput. Various scheduling techniques can be used to assign the task, easy way to search the data.

A. Heuristic Scheduling

The heuristic used to scheduling is the way of finding solutions from all possible solutions. This type does not guarantee that this will produce high performance. This type of scheduling [8] is one of the optimization techniques.

In heuristic technique, methods to be used are
i) Identifying
ii) Selecting task among the filtered ones
iii) Filtering
iv) Submission

As the consumer request the cloud by querying through CSP (cloud service provider). The consumer data can be scheduled in cloud terms of

i) Availability
ii) Feedback on individual customer/organization

A1. ADVANTAGES

i) Better search optimization
ii) Better performance approximation
iii) Better completeness and accuracy

A2. LIMITATION

i) Fail to find any exact solution
ii) It is an expensive system

B. H-Green Scheduling

H-Green has no impact on the environment that explores task in the cloud. This H-Green will be implemented in energy efficient units in order to regularly recycle and reduce to

i) Resource consumption
ii) Power consumption
iii) Minimize the e-waste

Virtualization in H-Green [13] cloud will save the resources, cost and energy. The operational cost (OPEX) can be reduced, then CAPEX to the consumer, by means of

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saving energy and power. The utilization of resources will be related to energy consumption.

B1. ADVANTAGES

i) Reduce the power consumption
ii) Reduce the energy consumption

B2. LIMITATION

i) CAPEX is high

C. List Scheduling with Genetic Algorithm

Genetic algorithms operate on the list of data stored in the cloud. It is a concept taken from bio-genetics for the generation of data in terms of a list. Those tasks can be scheduling [14] in terms of execution time. Here scheduling technique and their comparisons are made in terms of Min-Max and Max-Min.

C1.Min-Max type

This genetic algorithm uses minimum time as one priority that mean the priority will be given to the completed task. The set [9] of task T referred as unmapped task. The minimum time needed to complete task

Mtime= {min {time {t: mtime}}}
Mtime - Total time to unmap the process
mtime – Minimum time to schedule task

The newly mapped process is to be rejected by task T and this scheduling takes place until all are mapped.

C2.Max-Min type

The longer jobs are allocated using this technique. This will reduce runtime and better allocate [10] the resources according to the storage capacity of task to be scheduled in the cloud.

C3.ADVANTAGES

i) Reduces the completion time.
ii) Concurrent execution of task with high probability

C4.LIMITATION

i. Rescheduling the task many times

D. A Particle SWARM optimization based Algorithm

Particle SWARM optimization (PSO) is a stochastic based optimization technique. From the group of data stored in the cloud, this technique searches for closer value from the set of source. The best (optimal) value can be chosen from those of the closer value. This Particle SWARM optimization (PSO) [5] can be applied in many research and application areas.

The cost of customer can be minimized. The customer gets the best value for which

$f(a1) \leq f(a2)$. For all, a2 can be defined in space

Where,
a1 – minimum
a2- maximum
f – Function

The mapping of the task will take,

i) Uniform weights will be provided for all tasks
ii) Weight with equal task have a cost of task resources mapping relative to PSO

We formalize the PSO algorithm as,

V1q+1=WV1q + Acc1Random1*(pbest-Y2) +Acc2Random2*(popbest-Y2)

Where,
V1q - velocity of object at iteration q
V1q+1- velocity of the object at iteration q+1
Y2 – number of resources
W-weight of object
Acc1-Acceleration coefficient j=1, 2..
Random1-random number between 2 and 3
pbest -position of best object
popbest -best position of object in the population.

D1.PROCEDURE

- Set the node with weight was an average.
- While transferring data, the weight of each object will get to be changed.
- Compute cost [4] of each node using Particle SWARM optimization.
- The resource will be allocated to each node as per the calculated solution.
- Dispatch the resource to the task.

- Calculate the time of completion.
- Compute the progress.

D2.ADVANTAGE

i) Resources are allocated optimally to the task.
ii) Optimal completion of task within time.

D3.LIMITATION

i) Lack of availability
ii) Time consumption while updating

E. Improved Cost Based Algorithm

The scheduling can be carried out by assigning priority to each process. Those available resources are allocated to the major priority task than the minor priority task. The cost of each task will be calculated that depends upon computation done by each process. The priority will be given the notations as high, middle and low. The cost [14] may not depend on the priority, because sometimes low priority will do the computations as equal to that of higher priority process. But lower priority will have the time consumption. Some of the parameters we need to denote is maximum time and minimum time.

The priority of each task that depends upon the need and maximize availability cost of the resources. Such that the priority of nth task is

Prio=ΣResourcesi,k X Cost
Where Prio-priority
Resourcesi, k-time of service
Cost- resources used

E1.ADVANTAGE

i) Improves the computation and allocation
ii) Predefined calculation of need

E2.LIMITATION

i) Need to minimize the time for total scan

CONCLUSSION

In this paper, we surveyed various existing workflow scheduling algorithms and tabulated them based on the scheduling algorithm, objective criteria and the environment in which scheduling the work flow algorithm are applied. From the review, it is clear that a lot of work has already been in the area scheduling, workflow, but still there are many research areas that need attention. In this paper, a high-performance algorithm presented to find better scheduling solutions for cloud computing systems. The proposed algorithm uses detection algorithms that will automatically determine when to change the low and high-level heuristic algorithm and the solutions obtained by low and high-level algorithm to further improve the scheduling results in terms of make span.

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