DIFFERENT SCHEDULING ALGORITHMS IN DIFFERENT CLOUD ENVIRONMENT

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Abstract: Cloud computing is a promising technology for future computing platforms and is expected to provide easier access to remote computational resources that are usually locally limited. Scheduling with meta-heuristic algorithms is one of the active research area in cloud computing. The goal of cloud task scheduling is to achieve high system throughput and to allocate various computing resources to applications. The Complexness of scheduling problem increases with the size of the task and becomes highly difficult to solve effectively. Many different techniques have been proposed to solve this problem. Some of the methods are based on heuristic techniques that provide an optimal or near optimal solution for tasks i.e, large in size. In this paper we study different scheduling algorithms in different environments with their respective parameters.

Keywords: cloud computing, scheduling algorithms, importance, compare, parameter

I. INTRODUCTION

Cloud computing is one of the latest technology that is very popular now a days in IT industries as well as in R&D. This cloud computing technology is a model of development that comes after the introduction of distributed computing[1]. As compare the cloud computing with the distributed computing in this there is a multilevel virtualization. The whole work that is related to cloud computing works in a virtual environment. To get the advantages of cloud user needs to only connect to the internet and after that user can easily use the powerful computing and capacity of storage[1]. Cloud computing services provided by CSP (cloud service provider) as per user requirements. In order to fulfil the demand of different users, they provide different quality of services[3]. In order to conclude the term cloud is an executable environment having dynamic behaviour of resources as well as users providing multiple services.

Scheduling is the one of the most prominent activities that executes in the cloud computing environment. To increase the efficiency of the work load of cloud computing, scheduling is one of the tasks performed to get maximum profit.

The main objective of the scheduling algorithms in cloud environment is to utilize the resources properly while managing the load between the resources so that to get the minimum execution time.
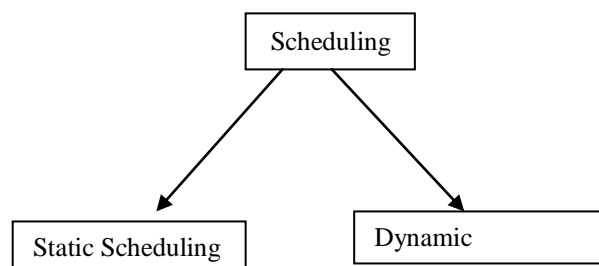

Fig 1: Types of Scheduling

Why Scheduling

Cloud computing has recently received considerable attention, as a promising approach for delivering Info and Communication Technologies (ICT) services as a utility. In the mechanism of providing these services it is necessary to improve the utilization of datacenter resources which are operating in most dynamic workload environments. Datacenters are the essential parts of cloud computing. In a single datacenter generally hundreds and thousands of virtual servers run at any instance of time, hosting many tasks and at the same time the cloud system keeps receiving the batches of task requests. During this context, one has to notice few target servers out many powered on servers, which can fulfil a batch of incoming tasks. So Task scheduling is an valuable issue which is greatly influences the performance of cloud service provider. Traditional approach that are used in optimization are deterministic, fast, and give perfect answers but often tends to get stuck on local optima. Complexity of the task scheduling problem belongs to Non Polynomial -complete involving extremely large search space with correspondingly large number of potential solutions and takes much longer time to find the optimal answer. There is no readymade and well outlined methodology to solve the problems under such circumstances. However in cloud, it is tolerable to find near best solution, preferably in a short period of time. In this framework IT practioners are focusing on heuristic methods.

Scheduling In Cloud:

There are so many algorithms for scheduling in cloud computing. The main advantage of scheduling algorithm is to obtain a high performance. The main examples of scheduling algorithms are FCFS, Round-Robin, Min-Min algorithm, Max-Min algorithm and meta- heuristic

algorithms (ACO, GA, Simulated annealing, PSO, Tabu search and many more).

FCFS: First come First serve basis means that task that come first will be execute first.

Round-Robin algorithm(RRA): In this Scheduling algorithm time is to be given to resources in a time slice manner.

Min-Min Algorithm: Min-Min algorithm selects the smaller tasks to be executed first.

Max-Min algorithm: Max-Min algorithm selects the bigger tasks to be executed first.

In this paper we will discuss other scheduling algorithms i.e, Heuristic algorithms.

Procedure Of Scheduling

Scheduling in cloud computing can be categorized into three stages.

1)   Discovering a resource and filtering them.
2)   Selecting a target resource (Decision stage).
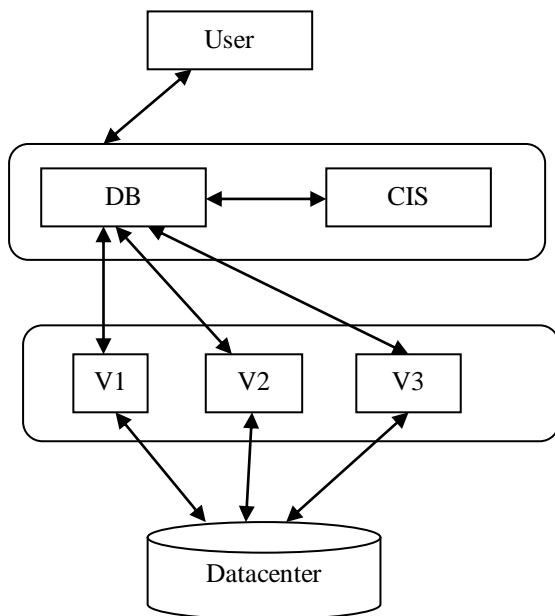3)   Submission of a particular task to a target resource

Fig 2: stages of scheduling

DB: - Datacenter Broker
CIS: - Cloud Information services
V1,V2,V3 are the virtual machines

II.   LITERATURE SURVEY:

Following are the scheduling algorithms that are currently implemented in cloud. The main motive of all these traditional and meta-heuristics scheduling algorithms are proper utilization of resources. Some of the algorithms are studied below with respect to the author and their work.

Pre-emptable shortest job next scheduling algorithm (PSJN)[6]: This algorithm is proposed in a private cloud. In this paper they combine the pre-emption technique of Round-robin algorithm with shortest process next

(PSN).This algorithms gives cost benefits and improve the response time and execution time.

Shortest Job scheduling[7]: this algorithm is proposed in a public cloud environment. In this paper includes the allocation of resources on different clouds under over-load and under-load conditions.

Optimized Activity based Costing algorithm[5]: In this paper implementation of the optimized algorithm is compared with the traditional task scheduling algorithm. The main goal of this optimized algorithm is to gain more profit as compare to the traditional ones. ABC is the scheduling algorithm of measuring the object's cost as well as the performances of activities.

Improved Cost Based algorithm[4]: This algorithm improves the traditional cost-based scheduling algorithm for making appropriate mapping of tasks to resources. It grouped tasks according to the processing capabilities of available resources.

User-Priority Guided Min-Min scheduling Algorithm[3]: In this paper an improved load balanced algorithm is introduced on a base of Min-min algorithm in order to minimize the makespan and maximize the utilization of resource.

Scheduling algorithm based on QOS[2]: In this paper the proposed algorithm is based on quality of service driven. It computes the priority of tasks on the basis of different attributes of tasks and after that apply sorting on tasks onto a service which can further complete the tasks.

Ant colony Optimization[8,9,10,11]: The basic idea for Ant colony optimization is to simulate the foraging behaviour of ant colonies. When a group of ants tries to search a food, they use a pheromone (chemical) to communicate with each other. Another paper that implements the ACO based modified algorithm in scheduling but in grid environment and proposed the modified pheromone rule . ACO based algorithm is proposed in a paper written by S. Aranganathan and K. M Mehta to schedule the data intensive usage which further mixed with usage centric and system centric benefits.

There are number of scheduling algorithms that are already implemented not only in a private cloud but also in a hybrid cloud.

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III.   COMPARISON

Scheduling algorithm	Scheduling Parameters	Objective	Tool	Scheduling factors	Environment
PSJN	Cost and time	Effective and fast execution of task	Private cloud	Group task	Cloud environment
Shortest Job scheduling	Arrival time, process time, deadline and I/O requirement	Effective resource allocation under defined parameters	MATLAB	Group task	Cloud environment
Optimized ABC Algorithm	Cost, profit and priority	Measure the cost and performance more accurately	SimGrid	Array of task	Cloud environment
Improved Cost Based algorithm	Cost and task grouping	Minimizing the cost and completion time	Cloudsim	Group task	Cloud environment
User-Priority Guided Min-Min scheduling Algorithm	Makespan	To promised the guarantee regarded the provided resources.	MATLAB	Independent task	Cloud environment
Ant Algorithm	Pheromone updating rule	Enhance the performance of basic ACO	Cloudsim	Independent task	Cloud environment
MACO	Pheromone updating rule	Improve the performance of grid system	Gridsim	Independent jobs	Grid environment
ACO for scheduling data intensive application	Cost and time	Improves the efficiency and reliability in all conditions	Gridsim	Group task	Grid environment

IV.   CONCLUSION

In this paper we discuss the different types of scheduling algorithms. Most appropriate technique for scheduling is the heuristic technique. Scheduling is one in all the foremost vital task in cloud computing atmosphere. during this paper we've got analyze varied programming algorithmic rule and tabulated varied parameter. we've noticed that disk space management is vital issue in virtual atmosphere. Existing programming algorithmic rule provides high turnout and is value effective however they are not working on availableness. Therefore we'd like algorithmic rule that improve availableness and time in cloud computing atmosphere

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