

Strategies of Task Scheduling Algorithm in Cloud Computing: A Review

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Abstract

Cloud computing manages a ramification of virtualized assets, which makes scheduling an important element. Inside the cloud there are many purchaser may also make use of several virtualized resources for each mission. It is the one of the maximum essential troubles with cloud computing is project scheduling. Hence, manual scheduling is a poor business strategy. The last concept at the back of the venture Scheduling is to minimize time loss and maximize overall performance, workload, and throughput. So the task scheduling is just too necessary to hold it accuracy and correctness on whole of project. There are many researcher given his attempt have tested task scheduling in the past. This paper present approximately exceptional mission scheduling algorithms in the cloud computing surroundings. And we can also talk the several authors applied various parameters like throughput, QOS, makespan time and fee to check the gadget troubles.

Key Words: Cloud computing, Cloud services, Task scheduling.

Introduction

Cloud computing is shipped computing gadget that can provide so many form of services through the net. It is also gives software, CPU, memory and other computing sources. It provides on demand availability sources as a pay-per-use offerings thru the internet. In this time cloud computing brings the compatibility and adjustments the infrastructure technology commercial enterprise. It's also developing the software and merchandising, as well as face numerous difficulties within the progress of conventional IT [1]. The cloud computing surroundings can provide the carrier providers and net businesses. The operating of the provider company is liable for the community, software program software, and facilities to crate offerings. Simultaneously of internet vendors it's also referred to as patron of the cloud [2]. In the cloud computing environment the cloud running system are used with character and business cause due to cloud generation unexpectedly increase. The server's

strolling system that unpacks the application program me is the cloud running tool. The user or consumer do now not need to installation utility. The click on the hyperlink and app through an internet browser from the [3]. At a present Time cloud computing has boom as a few other net-based totally definitely totally model for criminal clients. It is able to set up method to a joint pool of configurable assets-onrequest [4]. In the cloud computing the cloud employer is answerable for decrease the fee, storing and handling cloud garage facts and strongly improve character experience [5]. within the

assignment scheduling the scheduling set of rules allocates to patron responsibilities to the cloud assets to reduce final touch time, maximize usage fee and stability the cloud infrastructure to keep away from unsuspecting sports from overburdened [6] Within the cloud computing generally scheduling categorized into exclusive classes. The

primary category is primarily based on challenge scheduling is assessed into static scheduling and dynamic scheduling. And the second is assignment. Essentially the static scheduling operating on the scheduler identifies the specifics of the duties and resources. And the dynamic scheduling the element of sources and mission undefined. The scheduler will select the proper sources for each person's activity in a dynamic scheduling plan. [7].

Cloud Services & Type

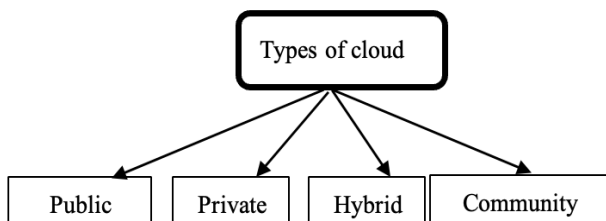


Figure. 1

Public cloud: essentially these cloud use for all people it permit purchaser to use the cloud via web browser interfaces. Patron want to pay-in step with-use sources or services. it's miles without difficulty available from Amazon, Google, Microsoft, etc. it is provide infrastructure and services to the general public or any employer[8].

Private Cloud: The operating of this type of cloud is described employer or enterprise. It is also called internal cloud. It's far given more safety by the general public cloud[9].

Hybrid Cloud: This sort of cloud dispensed offerings among private and public. This form of cloud is partly secured because the services are running on the general public cloud can be accessed anyone however the nonpublic cloud accessed best one by means of the company patron.[10] **Community Cloud:** it's miles provide the services and infrastructure to groups with similar pursuits[11].

SaaS: - On this model they offers utility through an internet browser or through specific service primarily based on cloud. Just like Gmail, Google doctors and so forth on this model does now not

purchase any form of licenses, deploy application and improve [12].

Pass: - its miles provide unique form of computing offerings to the consumer for implementation, testing, execution and hosting software. Inside the cloud carrier company gives to run and maintain each gadget software this is computing sources [13].

IaaS: - It's far use for virtualization era to transform bodily resources to logical sources that may be dynamically launched with the aid of consumer as want.

Task Scheduling

The cloud scheduling idea is referred to in the challenge scheduling as the technology for mapping jobs to more than a few VMsto use the sourcesto be had to meet person requirements (Zeebre, Ahmed,et al.,2021). The intention of the use of task scheduling in cloud computing is to decorate the burden balancing, makespan time, growth useful resource usage, reduce processing time, and keep electricity (Zeebaree, D. A. Hussan, B. okay., Hasan 2021).there are many job scheduling there are numerous blessings of venture or process scheduling algorithm to obtain the great performance and maxi mum system throughput. (M. A. Sadeeq, M. Abdulraheem, Abdulla 2020).The process scheduling set of rules can be labeled into diverse shape. (BHMA) Batch Mode Heuristic Scheduling algorithm), online Mode Heuristic set of rules, Dependency Mode algorithm (I. C. Anju Bala, 2017). Whilst the project scheduling techniques are used to find the order of sports have to be completed. It makes distinctiveness of mapping the person obligations to the available resources. Essentially the backbone of project scheduling in cloud computing is virtualization (Yousif Sufyan Jghef & Subhi R. M. Zeebaree 2020). In the task scheduling it could be categorized into a few group cloud service, workflow static, and dynamic, load balancing and heuristic. (Amandeep Kaur, Dr. Raman Maini, 2018). Task scheduling algorithm in cloud computing are essential for optimizing resource utilization, reducing cost, and enhancing

performance. Here’s an overview of some common task scheduling algorithm used in cloud computing

Round Robin (RR):

In this algorithm, tasks are scheduled in a circular order. Each task is given a fixed time slice, and the switches form task to task in a round –robin fashion. This algorithm is sample and fair, but it may not be optimal for tasks with varying resource requirements.

First come first Serve (FCFS):

In this algorithm, tasks are scheduled in the order they arrive. The first task to arrive is the first to be executed. This algorithm is easy to implement and ensures fairness, but it may not be optimal for tasks with varying resource requirements.

Shortest job First (SJF) :

In this algorithm, tasks with the shortest execution time are given priority. This algorithm minimizes the average waiting time and enhance the overall system performance. However, it may not be optimal for long-running tasks or real –time system.

Priority-Based Scheduling:

In this algorithm, each task is assigned a priority level, and the CPU executes tasks based on their priority level. This algorithm is flexible and can be

used in various scenario, but is may not be optimal for system with a large number of tasks.

Genetic Algorithm:

This algorithm is a heuristic-based approach that mimics the natural evolution process to optimize task scheduling solution and generates new solutions by applying genetic operator. This algorithm can handle complex scheduling scenario, but it may be computationally intensive.

Ant Colony Optimization (ANT):

This algorithm is inspired by the foraging behavior of ants and uses a pheromones a set of ant colonies that explore the search space and deposit pheromones on the best solutions. This algorithm is effective in solving complex scheduling problem, but it may require a large number of iterations to converge

Comparison and Discussion
This work aims to evaluate several algorithms for task scheduling in cloud computing that have been developed by scholars in earlier studies. There are numerous hard in issues in cloud computing infrastructure like load balancing, make span time, QOS and aid utilization. The table highlights the previous review of the publication or research work that is linked to project scheduling in cloud computing.

Literature Review

CITATATION	Author	YEAR	APPLIED ALGORITHM	PARAMETER	PURPOSE
[31]	An-Ning Zhang Hui Wang	2022	Advanced Phasmatodea Population Evolution(APPE)	Resource cost, make span, load balancing	In this research, we describe the (APPE) algorithm, which shortens the time needed to locate solutions by enhancing the convergence of the nearest optimum solutions, in a heterogeneous cloud environment.
[32]	K. Rajakumari, M. Vinoth kumar	2021	DWRR Algorithm	Waiting time, Throughput, makespan time	Compared the DWRR algorithm for resource competencies, task priorities & the Fuzzy HPSPACO improve waiting time minimize execution time and

					system throughput to maximize resource allocation.
[34]	Neeraj Arora	2021	Heuristic and Metaheuristics algorithm	QOS	In this paper combination of two or more algorithm and Improve the Quality of services
[35]	Walid EI-Shafai	2020	Particle Swarm Optimization (PSO) & Salp Swarm Optimization (SSO)	Makespan, task scheduling	Combination of the Two algorithm, It reduce the execution time and computational cost and balance the virtual machine's workload
[36]	Prasanth C S R, Vijayalakshmi A. Lepakshi	2020	Efficient Resource Allocation with Score (ERAS algorithm)	Makespan time, Reliability	Differentiating between the ERAS algorithm and the EFT method for allocation will improve performance and boost dependability.
[37]	Nebojas Bacanin, Timea Bezdán	2019	Meta-heuristic algorithm	Completion time, efficiently	Compared to the meta-heuristic algorithm for efficient and the grey wolf Optimizer prove the quality of robustness and reduce makespan time.
[38]	Tareq AlKhraishi, Abdulsalam Alsmady	2019	Memetic algorithm	Cost, Completion Time	In this study, the Memetic algorithm beat the Genetic Algorithm (GA) and PSO algorithms in terms of makespan time.
[39]	Mohit Agarwal, Gur Mauj Saran	2018	Cuckoo Search Algorithm	QOS, response time	With this research, we will offer the cuckoo search-based task scheduling method, which aids in efficiently allocating the jobs among the available virtual machines (VMs) and maintains a low overall response time (QoS).
[40]	Ling TAO, Shuang YIN	2018	Double Fitness Algorithm	Load Balancing, Cost	In these paper the combination of LGA (Load balancing Genetic algorithm) based on task completion cost (CGA).
[41]	Nasim Soltani, Behrang Barekatain	2017	Heuristic algorithm	Space Complexity, Execution Time	The heuristic task scheduling techniques that are currently in use are examined in this research. The key constraints for enhancing the quality of service, evaluation techniques of algorithms, applied tools for evaluating these ideas, and practical experimental employed methods were reviewed and compared first.

[42]	Mohit Agarwal	2016	Genetic Algorithm	Load Balancing, Cost effective, QOS	This paper will introduce a task scheduling method based on genetic algorithms that effectively distributes the workload among virtual machines to ensure a low overall response time (QoS).
[43]	Nidhi Bansal, Amitab Maurya	2015	QOS-Driven task Scheduling algorithm	Allocation cost	In this study, the cost of a QoS-driven job scheduling method in a cloud computing environment is computed and compared to a typical task scheduling algorithm.

Conclusion

Within the term of cloud computing is a massive source, in step with the requirement of purchasers, garages, computational power and some of other facilities. Within the cloud putting the important thing goal is distribution of available sources in the best structure to the undertaking. There are many number of set of rules analyzed in this newsletter. That has been studied based on one-of-a-kind parameters or dimensions, process, guidelines, devices, and condition. Future research will concentrate on more efficient two to three algorithm combinations that will enhance response time and quality of service.

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