

A Survey of Various Scheduling Algorithms and types of Resources Provisioning in Cloud Environment

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Abstract: Cloud computing is referring as simply “the cloud,” which is the delivery of on-demand computing resources-everything from applications to data centers-over the Internet on a pay-for-use basis. In Cloud computing it contain four types of deployment model Private cloud, public cloud, hybrid cloud, community cloud. Cloud Services are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). As cloud charge you for what you use only, it is necessary to manage the resources. So, The managing of cloud resources and handling user’s request is important things for cloud computing. In this paper present various types of scheduling algorithms for resources managing and also define the resources provisioning techniques. Also define the comparison between scheduling Algorithm.

Keywords: Cloud computing, Need of scheduling, Scheduling Techniques, Resources Provisioning.

1. INTRODUCTION

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released[7].The cloud is Internet-based computing, shared resources, software, and information are provided to computers and other devices on demand – pay per use[8].

Cloud Computing is a platform which aims to Provide shared data to its clients at the same time. It is amongst the buzzwords in today’s era.Clouds can be categorized into three classes depending on the service which they aim to provide to the user. These classes are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS)[7].To make effective use of the tremendous capabilities of the cloud, efficient scheduling algorithms are required. These scheduling algorithms are commonly applied by cloud resource manager to optimally dispatch tasks to the cloud resources. Cloud computing provide some important characteristics which are Flexibility, Measured service, Rapid elasticity, Work from anywhere, Broad network access.

There are relatively a large number of scheduling algorithms to minimize the total completion time of the tasks in distributed systems [9].

Cloud Computing enables users to acquire resources dynamically and elastically. Resource provisioning means the

selection, deployment, and run-time management of software(e.g., database management servers, load balancers) and hardware resources (e.g., CPU, storage, and network)for ensuring guaranteed performance for applications.

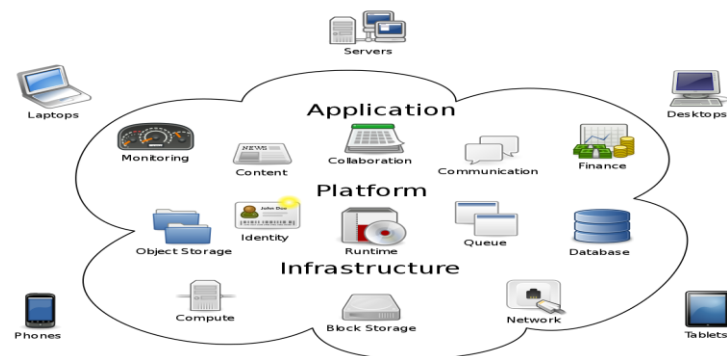


FIG. 1 OVERVIEW OF CLOUD COMPUTING

The objective of this paper is to be focus on various scheduling algorithms and resources provisioning techniques. The rest of the paper is organized as follows. Section 2 presents the need of scheduling in cloud. Section 3 presents various existing scheduling algorithms and section 4 Resources Provisioning Techniques Section 5 and 6 describe result and concludes the paper with a summary of our contributions.

2. NEED OF SCHEDULING IN CLOUD

The primary benefit of moving to Clouds is application scalability. Unlike Grids, scalability of Cloud resources allows real-time provisioning of resources to meet application requirements. Cloud services like compute, storage and

bandwidth resources are available at substantially lower costs. Usually tasks are scheduled by user requirements. New scheduling strategies need to be proposed to overcome the problems posed by network properties between user and resources [1]. The primary benefit of moving to Clouds is application scalability. Unlike Grids, scalability of Cloud resources allows real-time provisioning of resources to meet application requirements. Need of scheduling is important for the managing cloud's resources.

3. EXISTING SCHEDULING ALGORITHMS

The Following scheduling algorithms are currently prevalent in clouds.

3.1 Improved Cost-Based Algorithm for Task Scheduling: Mrs.S.Selvarani, Dr.G.Sudha Sadhasivam [1] proposed an improved cost-based scheduling algorithm for making efficient mapping of tasks to available resources in cloud. The improvisation of traditional activity based costing is proposed by new task scheduling strategy for cloud environment where there may be no relation between the overhead application base and the way that different tasks cause overhead cost of resources in cloud. This scheduling algorithm divides all user tasks depending on priority of each task into three different lists. This scheduling algorithm measures both resource cost and computation performance, it also Improves the computation/communication ratio.

3.2 Enhanced Max-min Task Scheduling Algorithm in Cloud Computing: Upendra Bhoi, Purvi N. Ramanuj[2] Proposed enhance max min task scheduling algorithm. In this paper the author has done change in improve max-min task scheduling algorithm and make enhance max min task scheduling algorithm. Both algorithms based on the expected execution time instead of completion time. But the only difference between Improved Max-min algorithm and Enhanced Max-min is that assign task with Maximum execution time (Largest Task) to resource produces Minimum completion time (Slowest Resource) in improved max-min while in proposed algorithm assign task with average execution time (average or Nearest greater than average Task) to resource produces Minimum completion time (Slowest Resource). Largest task is too large compared to other task so it take more time for execution and increased makespan and load is imbalance across resources. Therefore, instead of selecting largest task if we select Average or Nearest greater than average task then overall makespan is reduced and also balance load across resources.

3.3 A New Task Scheduling Algorithm in Hybrid Cloud Environment: Wang Zong jiang, Zheng Qiu sheng [3] Proposed Task Scheduling. A hybrid cloud is offer the cost and scale benefits of public clouds while also offering the security and control of private clouds. Task scheduling is an optimization problem which plays a key role in the hybrid cloud environment. This paper authors proposed a graph-based task schedule algorithm to achieve minimize the user's cost in hybrid cloud and also this algorithm takes into account not only the private resources but also the public resources. Task scheduling process in cloud can be generalized into three stages namely:

1. Resource discovering and filtering: Datacenter Broker is discovers the resources present in the network system and collects status information of them.

2. Resource selection: Resource is selected based on certain parameters of task.

3. Task submission: Task is submitted to resource selected.

The simulation results shown that in hybrid clouds proposed graph-based algorithm reduces the cost by more than 30%, while take a little time later by 12%.

3.4 Scalable Heterogeneous Earliest-Finish-Time Algorithm (SHEFT): Cui Lin, Shiyong Lu [4] proposed an SHEFT workflow scheduling algorithm to schedule a workflow elastically on a Cloud computing environment. The experimental results show that SHEFT not only outperforms several representative workflow scheduling algorithms in optimizing workflow execution time, but also enables resources to scale elastically at runtime.

3.5 Multiple QoS Constrained Scheduling Strategy of Multi-Workflows (MQMW): Meng Xu, Lizhen Cui, Haiyang Wang, Yanbing Bi [5] worked on multiple workflows and multiple QoS. They has a strategy implemented for multiple workflow management system with multiple QoS. The scheduling access rate is increased by using this strategy. This strategy minimizes the make span and cost of workflows for cloud computing platform.

4. RESOURCES PROVISIONING TYPES

4.1) Static Provisioning: For applications that have predictable and generally unchanging demands/workloads, it is possible to use "static provisioning" effectively. With advance provisioning, the customer contracts with the provider for services and the provider prepares the appropriate resources in advance of start of service. The customer is charged a flat fee or is billed on a monthly basis.

4.2) Dynamic Provisioning: In cases where demand by applications may change or vary, "dynamic provisioning" techniques have been suggested whereby VMs may be migrated on-the-fly to new compute nodes within the cloud. With dynamic provisioning, the provider allocates more resources as they are needed and removes them when they are not. The customer is billed on a pay-per-use basis. When sometimes referred to as cloud bursting.

4.3) User Self-provisioning: With user self provisioning (also known as cloud self service), the customer purchases resources from the cloud provider through a web form, creating a customer account and paying for resources with a credit card. The provider's resources are available for customer use within hours, if not minutes.

5. RESULTS AND DISCUSSION

We have to shown in section III , Various scheduling algorithms which are used for scheduling in cloud. The following table summarizes above scheduling strategies on scheduling parameters, other factors and tool used for experimental purpose. These all are done in cloud Environment.

Scheduling Algorithm	Scheduling Parameters	Findings	Tools
Improved Cost-Based Algorithm for Task Scheduling[1]	Cost, Performance	1.Mesurs both Resources cost and computation Performance 2.Improve the computation/c ommunication ratio	Cloudsim
Enhanced Max-min Task Scheduling Algorithm[2]	Makespan	1.It is Use to reduced the Makespan	Cloudsim
Graph-based task schedule algorithm[3]	Cost, time	1.It is used to reduced the cost and time in hybrid cloud.	Cloudsim
SHEFT workflow scheduling algorithm[4]	Execution time, scalability	1.It is used for optimizing workflow execution time. 2.It is also enables resource to scale	Cloudsim
Multiple QoS Constrained Scheduling Strategy of Multi-Workflows[5]	Makespan, cost, execution time	1.It is used to schedule the workflow dynamically. 2.minimized the execution	Cloudsim

		time,cost	
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6. CONCLUSION

Scheduling is one of the key issues in the management of application execution in cloud environment. In this paper, we have surveyed the various existing scheduling algorithms in cloud computing and tabulated their various parameters along with tools and so on .In this Paper also defined the various types of resources provisioning in cloud. We concluded that managing resources is important things in cloud.

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