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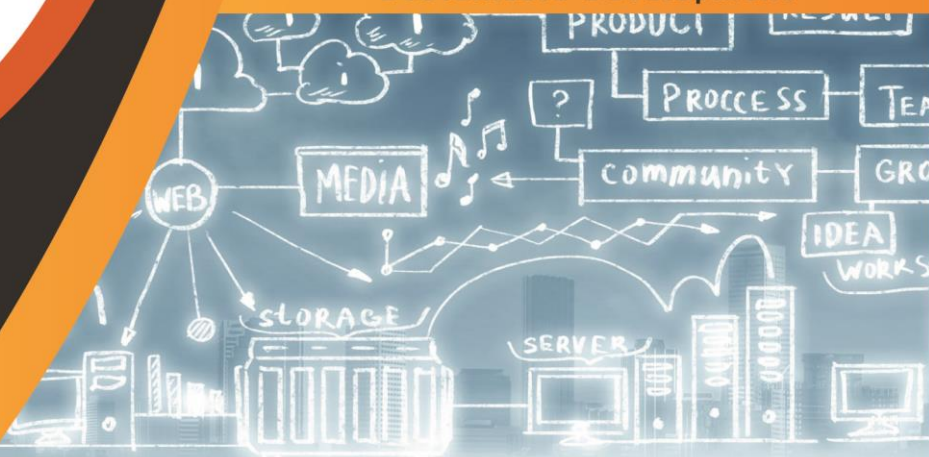
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OPTIMAL RESOURCE SCHEDULING TECHNIQUE FOR IAAS CLOUD COMPUTING

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ABSTRACT

In cloud computing, for the effective performance of any system, there is a need of effective resource scheduling. A resource scheduling problem in IaaS cloud computing is considered in this paper. Resource scheduling problem is proved to be NP-hard. A recently developed cuckoo search (CS) meta-heuristic algorithm is presented in this paper, to minimize the execution time, makespan and throughput for the resource scheduling in IaaS cloud computing. Simulation results show that CS algorithm outperforms many other meta-heuristic algorithms.

Keywords: Resource Scheduling, IaaS, Meta-heuristic, Cuckoo Search

INTRODUCTION

Resources scheduling assigns the precise and accurate task to CPU, VMs, network, node and storage. The aim behind this is the extreme usage of resources. However, well-organized scheduling is needed for both cloud providers and cloud users [1]. The Most challenging problem is the resource scheduling for IaaS in cloud computing for handling and providing efficient utilization of resources [2]. Our work aims to define an efficient resource scheduling algorithm for cloud computing, which will effectively manage resources based on the quality metrics.

Cuckoo search (CS) algorithm is a new nature-inspired meta-heuristic algorithm developed by Yang and Deb. CS algorithm is inspired by the obligate brood parasitic behaviour of some cuckoo species in combination with the Levy flight behaviour of some birds and fruit flies in nature [3]. Yang and Deb [4] have solved several optimization problems using the CS algorithm. Yang and Deb [5] have also proposed a multi-objective CS algorithm for design optimization problems. Gandomi et al. [6] have solved the structural optimization problems using CS algorithm.

In this paper, we propose an optimal CS meta-heuristic population based algorithm for resource scheduling in IaaS cloud computing. The parameters used for measuring the performances of scheduling algorithms in the simulation are based on three factors – Execution Time, Makespan and Throughput. The proposed technique is also compared

with familiarized meta-heuristic techniques for resource scheduling is IaaS cloud computing.

MAIN RESULTS

For the initial results, we create a datacenter with two hosts and run a cloudlet on it. The cloudlets run in VMs with different MIPS requirements. The cloudlet takes different time to complete the execution depending on the requested VM performance. CloudSim uses the First Come First Serve (FCFS) algorithm by the default. In this scenario, execution time has reduced, in order to increase the MIPS for the cloudlet on the request of VM as shown in Figure 1 and 2.

$$\text{Exe Time} = \text{FnhTime} - \text{StrTime} \tag{1}$$

Where

ExeTime = Execution Time

FnhTime = Finish Time

StrTime = Start Time

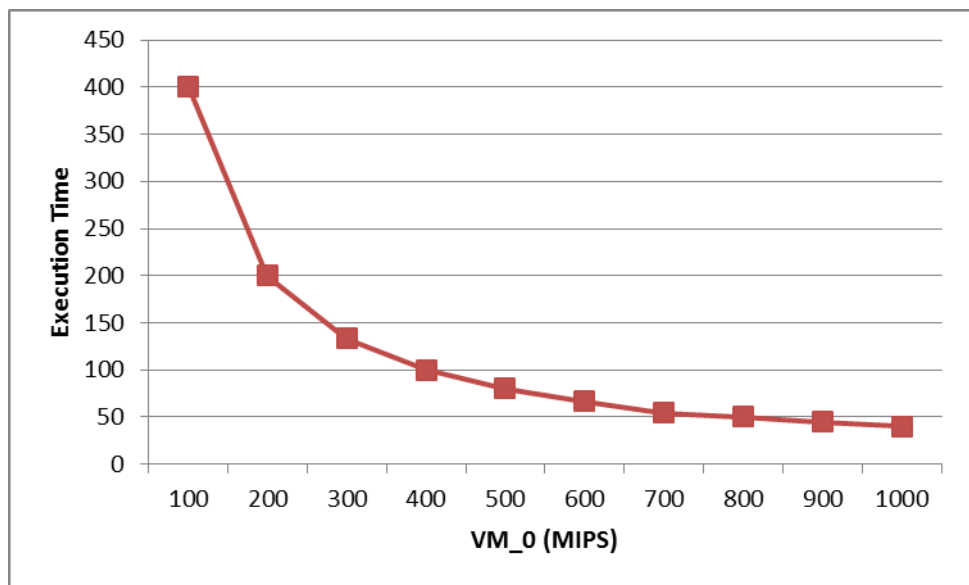


Figure 1. VM_0 runs the cloutlet and reduce the execution time

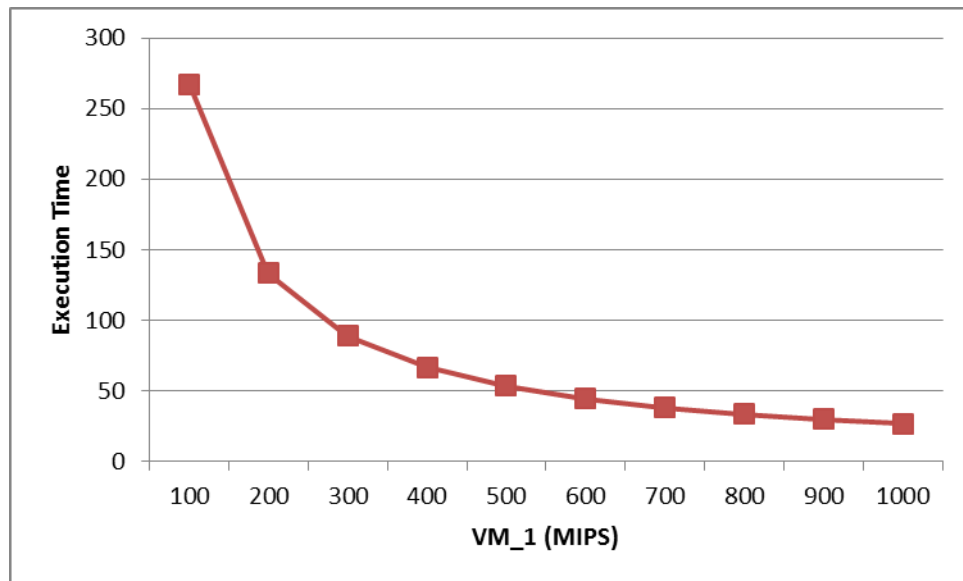


Figure 2. VM_1 runs the cloutlet and reduce the execution time

CONCLUSION

In this study, an attempt has been made to improve the performance through the execution time, makespan and throughput in the resource scheduling for IaaS in cloud computing. For this purpose, an optimal cuckoo search algorithm is used for optimal performance.

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