CHAPTER 53

TECHNOLOGY
COMPUTER ENGINEERING

Doctoral Theses

01. CHAUDHARY (Divya)
Performance Evaluation & Design of Techniques for Efficient Load Scheduling in Cloud Computing.
Supervisor : Prof. Bijendra Kumar
Th 24215

Abstract
(Verified)

The cloud computing is one of the widely used forms of distributed computing to process multiple requests. Load scheduling in cloud computing is performed to reduce the transfer time and total computational cost. The algorithms are static, dynamic and heuristic providing near optimal solutions. Swarm based algorithms use the behavior of the birds, ants, bees and particles to locate and exploit their food source for scheduling. The Newton's law of gravitation plays an important role in scheduling by performing efficient optimization in mathematical scenario. In this thesis, our first work PBPSO focuses on designing a new fitness function based on the weighted average of the time and cost. The second approach NPSO focuses on parallel processing of the cloudlets and an improvised cost evaluation function. The third work Cloudy-GSA focuses on the law of gravitation to schedule the cloudlets on the VMs based on acceleration and force acting between the particles. The fourth work LIGSA-C focuses on a linear gravitational function for evaluating the force acting on the particles. The fifth work GAGSA incorporates a genetic algorithm (crossover and mutation) along with the gravitational search algorithm to find the best position for virtual machines for execution by cloudlets. The sixth G2PGSA, seventh HG-GSA and eighth COM_GGSA approaches proposed a hybrid genetic gravitational search algorithm. Our last scheme IBSO-C discusses a bee swarm based optimization algorithm based on behavior of bees to locate and extract the food from the food source. We have performed the analysis of algorithms on the CloudSim simulator with10 to 25 cloudlets over 8 virtual machines on the parameters viz. transfer time and total cost of computation. Through the results with statistical and convergence analysis, we conclude that the proposed algorithms reduce transfer time and total cost of computation of the cloudlets than existing algorithms.

Contents

1. Introduction 2. Literature survey 3. Proposed particle swarm optimization approaches 4. Gravitational search algorithms (cloudy gsa & ligsa-c 5. Genetic algorithm – gravitational search algorithm approaches 6. Hybrid genetic gravitational search algorithm approaches (HG – GSA & COM_GSA) 7. Improved bee swarm algorithm in cloud (IBSO-C) 8. Conclusion and future scope. List of publications. References.