EFFECTIVE LOAD BALANCING AND SCHEDULING ON HETEROGENEOUS NETWORK USING NAERR AND AWSQP IN CLOUD ENVIRONMENT

A THESIS

Submitted by

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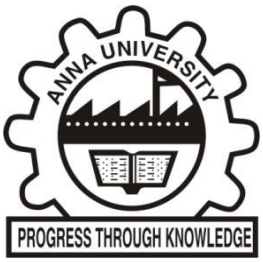

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ABSTRACT

Cloud computing is an emerging Internet-based computing technology that provides different Infrastructure, software and Platforms on-demand and pay-as-you-go basis. The two main components of the cloud computing are task scheduling and resource allocation**.** The unbalanced workloads of the VMs in the data center, delay in scheduling and higher cost for execution of the tasks are the critical issues in the existing techniques. Accordingly, the proposed techniques are mainly focused on balancing the workloads of the VMs in the data center, effective task scheduling and resource utilization.

In this first phase of research, a Novel and Adaptive Enhanced Round Robin (NAERR) algorithm is proposed to balance the workload of the VMs in the system. The arrived tasks are gathered and allocated to all the VMs participating in the network based on the VMs capacity and task length using both static as well as dynamic schedulers. Then the NAERR technique is appertained in the load balancer for performing load balancing. The proposed NAERR technique enables uniform distribution of workloads on all the VMs. The Cloud resource broker is enabled to increase the no of VMs. The proposed NAERR algorithm's performance is analyzed from the experimental results. It proves that compared to the existing LBWRR and LBA algorithms, the NAERR mechanism is well applicable for handling the resource utilization effectively for heterogeneous tasks.

In the second phase, the Adaptive Work Size based Queuing Process**(**AWSQP) is proposed to overcome the core issues in the system such as high data cost for data accessing and higher completion time. The proposed AWSQP is picked up the best cost-effective data path for averting the above issues and it facilitates the VMs to get rapid data access from the data centers and enables them to perform effective overall scheduling performance by priority portioning the tasks. With our proposed AWSQP mechanism, experimental work is carried out based on CPU utilization, communication cost, computation cost, bandwidth and execution time. A comparison analysis is carried out with the AWSQP mechanism and also with the existing approaches based on overall

scheduling performance. The analyzed results state that our AWSQP works effectively on the aspect of delay and successful scheduling at minimum costs.

In the final phase, AWSQP performance is enhanced by employing a VM pair implementation and partition-based priority system into three levels by the proposed Dynamic Group of Pair Scheduling and Optimization algorithm (DGPSO). The arriving tasks are prioritized based on their size into three levels such as low, medium and high. According to the task size and VM capacity, the VM pairing is carried out. The proposed DGPSO is applied for scheduling with the priority level and allocate the available pair VM to the high priority task initially. This mechanism increases the successful execution rate on higher size files to a greater extent comparing to other traditional methods. At the same time, low priority files can be computed quickly with minimum time. This enables successful completion of the entire dataset within the deadline. The NAERR technique is employed for balancing the workload of the VMs. A comparison analysis DGPSO is carried out with the AWSQP and NAERR mechanisms and with the existing approaches based on overall scheduling performance. The analyzed results states that our DGPSO works effectively on the aspect of delay and successful scheduling with the balanced workload on the VMs at minimum cost.