



Job scheduling algorithms in Grid Computing

– An Bird View

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Abstract— Grid computing is one the emerging field in computer science and engineering. The main reason of grid computing is familiar due to high performance and distributed computing rather than parallel computing. The widespread availability and lowest cost are added more advantage to grid computing. Scheduling is a predefined procedure that control over all job process in the grid system procedures. Load balancing denotes the assign the different types of jobs to attain the performance enhancement with improved resource usage. The biggest challenge was resources are vibrant one, based on these the scheduling allocates the jobs with its configuration. Poor resource allocation leads to idle processor.

Keywords— distributed computing, lowest cost, Scheduling, Load balancing.

I. INTRODUCTION

Grid computing shares the resources in the form of storage and network. Scheduling is one of the major part in grid computing. If the available jobs are heterogeneous [1] in form there is more complex to execute them. It does not support the traditional based scheduling algorithm like First in First out method. The important metrics that decides the effective scheduling was minimize the throughput and makespan. In enhanced adaptive scoring job scheduling methods tries to reduce the job failure rate compared to conventional method.

II. JOB SCHEDULING ALGORITHMS – AN OVERVIEW

The literature review consists of various scheduling algorithm that are previously used by researchers in grid computing environment. Ants are unique in character. If any source of food available they share and follow with their neighbour ants. In Ant colony optimization [2] the drawback was more number of iterations. Grid computing groups various computational resources from various network in

geographical area with high performance computing that helps to solve complex problem effectively. Genetic algorithm consists of crossover, mutation and so on. In genetic algorithm first they identified the basic solution from the nearest population. The scheduler obtains the basic optimal solution it stops its execution. It fails to find out accurate solution for the problem. EDSA [3] the time span taken was 60% less than the conventional based scheduling.

In computational grid, to find out the best scheduling algorithm for NP hard problem [4] was a complex part. The grid system attains full usage if the resources are fully utilized. The mapping based information between software and hardware application simultaneously. The scheduling system was based on user requirements in terms of communication and priority within the job. The ultimate aim of parallel and distributed system tries to attain with minimum makespan and lower throughput.

The mapping basic information system judges the effective usage of system resources. Grid computing consists of type of distributed computing and synchronized resource sharing and problem solving in vibrant virtual organizations. The vibrant feature was dependable in progress programming and vital in grid atmosphere. Different job scheduling algorithms creates hardly in terms of reliability. The grid system main focused on fault tolerance rather than the resources not absolutely employed. Dependable Workflow Scheduling System (DGWS) predicts [5] the resources based on Markov chain method that will increase reliability. The results this paper shows the performance analysis was reduce due to the length of schedule in progress and amplify the reliability progress execution.

The major problems like repeated failures and error conditions, resource failure happen that ends up in the condition wherever jobs fail typically. The chance of failure in grid computing was owing to the resource characteristics. The resources are breakdown the hardware and software, network



and Quality of services that can't be guaranteed. Fault-tolerance mechanisms, includes the job migration while not checkpoint, the job migration with checkpoint and therefore the job replication mechanisms square measure integrated to additional cut back failure of jobs in dynamic grid surroundings.

The vibrant and heterogeneous nature of Grid computing makes it a lot of at risk of various faults that enforces the failure of job, delay in completion of job execution of job from the beginning point. The empirical analysis for various faults was carried out and conjointly mentioned fault tolerant approaches to upset these faults, for every approach comparative measure was distributed. There was a huge demand higher resource sharing, enhanced resource utilization and machine speed for computationally concentrated applications. It supports the combination of RFOH [6] and application checkpoint approach offers strong fault tolerant job programming.

The entire environment of grid computing differs in terms of failures will occur due to various reasons like hardware, packet loss, timeout while interaction and temporary malfunction of specific system parts. The different faults, in fault tolerant programming techniques and various problems associated with it.

Totally different optimal performance metrics was distributed conjointly their nature, merits and demerits measure provided for fault tolerant programming approaches with best resource consumption, minimum execution time, small average waiting time and maximum grid utilization fitted to the plan performance driven fault tolerant job programming.

The increasing demand for the computing resources capacity and supply towards collaborative engineering was doubled. The grid systems play a central role to make sure that the accessible resources are allotted and measurable when utilized optimally. The grid computing was vast search area and vibrant use of the system. Genetic algorithm has increased the quality among the researchers for job scheduling issues on the grid systems. GA schedules [7] purpose was to reduce the turnaround time of job. To ensure the resource assignment as per the job demand they consider the priority and communication cost are the metrics.

Genetic algorithm was used to find out the results in two ways namely rank selection and roulette wheel approach for picks the chromosome with different mutation rates. The drawback was which ranking method produces optimum result for the problem. Large sized virtualization that consists of heterogeneous sharing of different types of hardware, software and network resources. Resources are handled in a decentralized form. It applies in all the fields of both government and private. It was huge and powerful virtual machines that share different kinds of resources.

Grid Computing was on the emerged field as high scale distributed system to supply leads to vibrant matched resources sharing and high performance computing. It brings together the resources that aren't subject to centralized management. It uses normal open, general purpose protocols and its interfaces. It delivers non-trivial individuality of service like the response time, throughput, accessibility and security.

It applied [8] in various domains like education, business, research and development and firms. It collaborates the business, manpower, compute and communication. A poor scheduling policy could leave several processors idle whereas a consume NP hard problem, the overall CPU cycles. They utilize the resources with efficiency and to satisfy the necessity of the users, different programming algorithms are projected by researchers for varied applications. It shares different ideas, the assorted standards related to it, the terms related to programming and reconciliation and the tools related to Grid computing.

It is intended to propose a scheduling algorithm to improve the performance in an E-Governance application for effective scheduling of the various tasks. Grid computing has become most prevalent due to the vast availability and the reduced cost. But without appropriate scheduling mechanisms, under utilization may occur. The need of effective and efficient scheduling algorithms is necessary to use the capabilities of large distributed systems optimally. For reducing overall completion time and enhancement of load balancing, numbers of algorithms were proposed from the beginning. In this paper, a new scheduling algorithm named as MiM - MaM is proposed based on renowned task scheduling algorithms, Min-Min and Max-Min. The drawback was rectified by using combined usage of these two algorithms. The experimental outcome shows that the proposed algorithm improved the Makespan.

There were no suitable scheduling mechanisms, low usage that occur. The necessity of successful and inexpensive job scheduling algorithm was necessary to utilize the capabilities of enormous distributed systems optimally. It reduces the taken as a whole completion time and improvement of load reconciliation, huge number of algorithms was proposed from the begging. Renewed job algorithm named as Minimum - Maximum was projected supports job scheduling algorithms, Min-Min and Max-Min.

In this paper a new MiM - MaM [9] algorithm is proposed and evaluated. The experimental results proved that the proposed algorithm consistently works well in all the three situations. The experimental outcome shows that the proposed algorithm outperforms with better makespan and also helps load balancing. During the experimental it is found that the dynamic ETC segregation method may give better result than one stage implementation of ETC segregation as proposed in



this paper. This study is only concerned with the merits and drawbacks of two well known traditional algorithms, Max-min and Min-min. It neglects deadline of every job, arrival rate of jobs, cost of each resources, communication cost are not considered.

III. CONCLUSIONS

There are numerous number of job scheduling was designed by the researcher. They did not meet the user quality satisfaction in terms of zero defects. They also aims at minimize the systems idle time and also balancing the system load maintenance.

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