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A Task Scheduling Approach in Grid Computing

Shilpa Rani
(M. Tech Student)
Computer Science
Eternal University
Baru Sahib, HP, India

Rupinder Kaur
(Assistant Professor)
Computer Science
Eternal University
Baru Sahib, HP, India

Abstract- Grid Resource Management is defined as the progression of classifying requirements, matching resources to applications, allocating those resources, and scheduling and monitoring grid resources over time in order to run grid applications as professionally as possible. There are several auction based resource selection policies for users in grid, help them in choosing the resources according to user preference. While selecting the resource addition of some policies and try to optimize parameters like request and availability of resources, access time, cost, loyalty measures and number of jobs finished within deadline according to user preference.

Index Terms- Grid, Resource Allocation, Distributed Computing, Computational Grid, Task Scheduling.

I. INTRODUCTION

The last decade has seen a considerable increase in commodity computer and network performance, mainly as a result of faster hardware and more sophisticated software. Nevertheless, there are still problems, in the fields of science, engineering and business, which cannot be dealt effectively with the current generation of supercomputers. In fact, due to their size and complexity, these problems are often numerically and/or data intensive and require a variety of heterogeneous resources that are not available from a single machine. A number of teams have conducted experimental studies on the cooperative use of geographically distributed resources conceived as a single powerful computer. This new approach is known by several names, such as, met computing, seamless scalable computing, global computing, and more recently grid computing.

Grid computing has recently enjoyed an increase in popularity as a distributed computing architecture. Grids are very large-scale virtualized, distributed computing systems, which allow users to access the computing resources of many unlike machines spread around the world. They shield multiple administrative domains and enable virtual organizations. Such organizations can share their resources mutually to create an even larger grid. In a grid environment, resources are dynamic, autonomous, heterogeneous, and wide-area distributed. Due to these exclusive characteristics, resource scheduling in grid systems is considerably complex and particularly challenging.

Grid computing is based on an open set of standards and protocols and enables communication across heterogeneous (computers with different platforms, hardware/software architecture, and computer languages), geographically dispersed environments. It involves sharing heterogeneous resources, located in different places belonging to different administrative domains over a network using open standards. These standards are publicly available specifications for achieving a specific task, by allowing anyone to use the standard to increase compatibility between various hardware and software components since anyone with the technical know-how and the necessary equipment to implement solutions can build something that works together with those of other vendors. This large virtual computing system emerges by sharing of resources.

We focus on the resource scheduling problem in computational grids. In particular, we address the issues of optimizing incentives for both resource consumers and resource providers so that every participant has sufficient incentive to stay and play in it.

II. RELATED WORK

Before talking about the different models and mechanisms for allotting resources in the Grid, we must first define what the Grid really is. There was substantial doubt as to what grid computing actually referred to Grid system is facilitates resource-sharing among a set of participants (some provide resources, others consume them). The shared resources are then put to use by some of the participants.

Xiao build such a global computational grid that every participant has enough incentive to stay and play in it. There are two parties in the grid: resource consumers and resource providers. Thus the performance objective of scheduling is two-fold: for consumers, high successful execution rate of jobs, and for providers, fair allocation of benefits.

Buyya this paper identifies challenges in managing resources in a Grid computing environment and proposes computational economy as a metaphor for effective management of resources and application scheduling. It identifies distributed resource

management challenges and requirements of economy-based Grid systems, and discusses various representative economy-based systems, both historical and emerging, for cooperative and competitive trading of resources such as CPU cycles, storage, and network bandwidth.

Manjula Grid technology is finding its way out of the academic incubator and entering into commercial environments. Here geographically distributed resources, such as storage devices, data sources, and supercomputers, are interconnected and exploited by users around the world as single, unified resource. This helps in use the idle time of these resources, which is otherwise lost.

Broberg n this paper author consider the problem of maximizing utility in linked market-driven distributed and Grid systems. In such systems, users submit jobs through brokers who can virtualizes and make available the resources of multiple service providers, achieving greater economies of scale, improving throughput and potentially reducing cost.

III. PROBLEM FORMULATION

A Grid market is the open market in which number of customers and suppliers are available to perform the request and the allocation of services or the product. In such grid market the main issues include the resource allocation as well as job scheduling. In this proposed work we are dealing with resource allocation. In this proposed work numbers of customers are available and performing the job or resource request. The work is about to allot the resources to customers based on some prioritization. Here the prioritization factors include the least cost, request and availability ratio and frequency of job request performed by the customer. A decision making algorithm will be defined by using these three factors collectively and allocate the resource to most deserving candidate.

Resource Sharing and the Scheduling are the most common problem in the consumers and Supplier problem.

- It is always required to increase the success rate of job execution and to minimize the fairness deviation among resources.
- It present a scheduling scheme based customer loyalty, user interest and cost. It means the system will check for the user interest respective to his last requirement and access time.
- It is very time consuming task and have probable results.

It will utilizes a peer-to-peer decentralized scheduling basis, a set of native heuristic algorithms, and parameters like request and availability ratio, resource cost, access time, and loyalty of a user's.

IV. TASK SCHEDULING APPROACH

We use oracle 10g database or Sqlplus that will collect my data in the form of table. It contains a large number of tables as we enter the values or give the input that will save in the database. So that will compare all the parameters and generate a result for that particular input. Another tool is Java where we perform all my coding and specify all my parameters as needed in my thesis. My thesis totally work on these two tools i.e. java and oracle10g.

In task scheduling approach, parameters include the cost of the product, access time, loyalty basics and the request-availability ratio. These parameters work together and find the respective results. There are some resources and a huge amount of processes or users that take part in the bid. When parameters are satisfied then one resource is allocate to that one process, a process can have more than one resource but vice versa is not true.

User screen

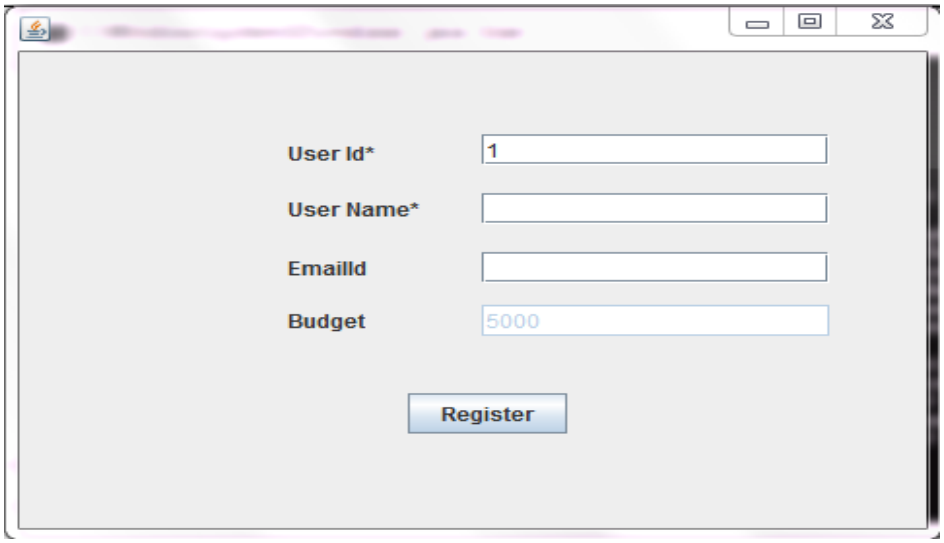

Figure no 1: enter the user detail

Table no 1: Table representing detail of the User

USERID	NAME	EMAIL	BUDGET
1	depika	depikasharma@gmail.com	5000

Resource Screen

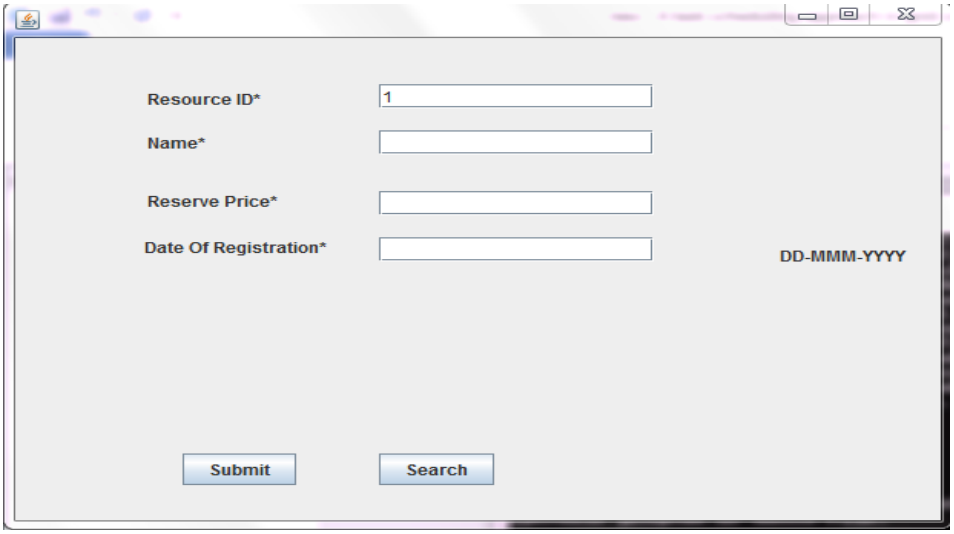

Figure no 2: Enter the resource name

Table no 2: Table representing the detail of the resources

RESOURCEID	RESOURCENAME	RESOURCECOST	DATEOFPURCHASE
1	r1	1000	20-JUN-13

Bid screen

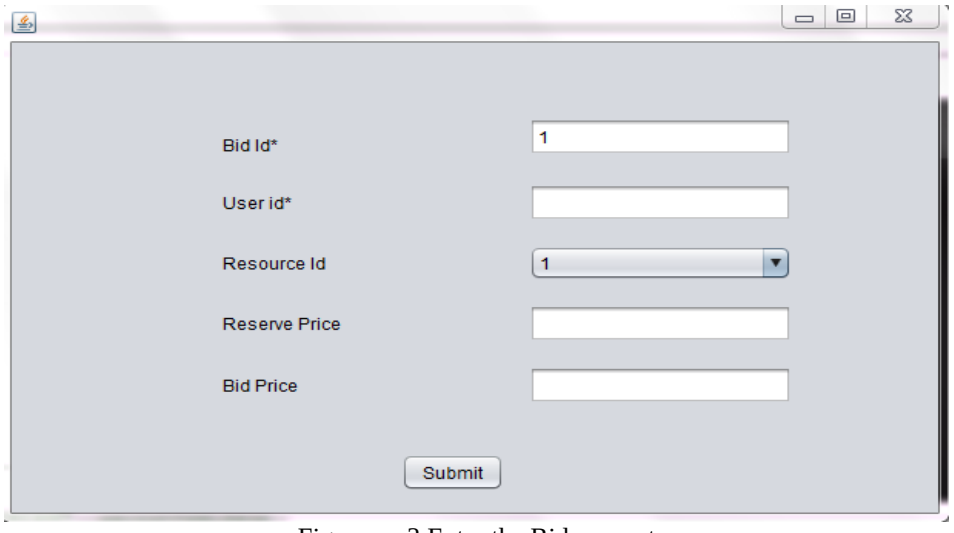

Figure no 3 Enter the Bid amount

Table no 3: Table representing detail about Bid

BIDID	USERID	RESOURCEID	BIDPRICE
1	1	1	500

Resource allotted screen

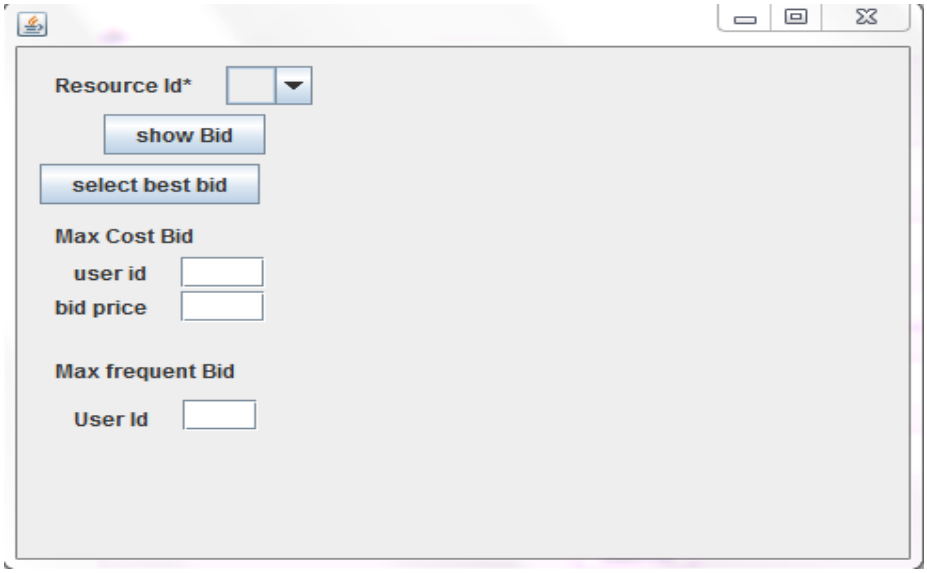

Figure no 4: Results of Bidding

Table no 4 Table representing final result of Resource allocation to a user

RESOURCEID	USERID	BID	OPER	DATE_ALLOTED
1	1	500	product sold	02-JUL-14

In the user screen, user or the processors can enter their details carrying a unique user id that will automatically change as the number of user increases. Firstly user will enter the name, email id and budget is predefined mention as 5000. Budget is constant so that every user cannot exceed the limit and bid will process in this amount only. As user can spend the amounts on bid then that amount will decreases respectively.

In the resource screen, as in the previous a user enter the user detail, in respect of that various resources entered. It contains corresponding entries first is the resource id, resource name, reserve price and last is the date of registration. Reserve price is the basic price of the resource which resources can mention for all users. User will not bid below the reserve price. The highest bid amount and the loyalty can decide that who will get the resources.

In the bid screen, users perform the bid and process the resources according to the parameters specified. It contains the bid id, user id, resource id, reserve price and bid price. User id is entered by the user and that one user can select one resource and bid for that resource. Particular resource mention the reserve price and by considering that bid price must be higher than that of the reserve price and that process will get that resource.

In the final screen, this will allot the resources as per the bidding. Just select the resource id from the checklist, it will show the win user id. After selecting the resource click on the button i.e. select best bid then it will show the user id and bid price which is the maximum cost bid. This screen also shows the user who frequently takes part in biding, get high preference.

Last resulted table show the output of the whole procedure that resource 1 is sold to user 1 with the 500 bid amount. This will show how the whole process will work to schedule the task using grid computing.

This paper mainly focused on proposing design, description and implementation of task scheduling approach.

V. CONCLUSION

In this present work we have proposed an approach to perform the resource allocation for a Grid market. The resource allocation is being performed based on some parameters. These parameters include the Cost of the product, time, loyalty and the Request-Availability Ratio. The first parameter considered here is Request Availability Ratio. If request is less than availability then all the resource will be allocates in the sequence, it will also check the quoted cost is greater than actual cost of the product. If the availability is less than request then along with cost the reliability of the user will be verified. The loyalty is measure by the past experience for specific process. The third parameter considers the time taken by each processes in the resource scheduling process and also in the task. The fourth parameter is the total cost to do the work. If these parameters are applied without any faults then it's a successful task scheduling system. Main approach in this is to design such a database which helps in scheduling the resources.

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