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A User Interest Centric Approach to Allocate Resource in Grid Market

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ABSTRACT

In a grid market, there are number of grid servers integrated with vast number of users. In such case the major issue is the ratio between the availability and the available resources. When the available resources are quite low then there is requirement of some effective resource allocation approach. In this present work, a user centric approach is been defined for grid market in which the allocation decision will be taken based on the user reliability. In this paper, the algorithm for the resource allocation is defined under the user reliability analysis. The user reliability is here defined in terms of number of frequent requests as well as based on history of earlier allocation to that user.

Keywords : Resource Allotment, User Centric, Reliable

I Introduction

A grid market is the public area where number of users from different location interacts with the system to request the resources. The grid server is actually responsible to handle these parallel requests and to perform the allocation of resources to the users. From this point of view, Grid Computing looks like a great answer to numerous problems without prodigious management requirements. Convenience does not always imply simplicity and grid enabled applications have to meet two prerequisites: first, the application must be executable remotely and with low additional operating cost; second, the remote machine must meet any special hardware, software, or resource requirements needed to run the application. Hence, remote computing is not only a matter of sending jobs to distant machines but also choosing the correct machine that has all the required software and hardware.

From the scheduling viewpoint, each resource provider is modeled with three parameters: capability, job queue, and unit price. Capability is the computational speed of the underlying resource, expressed as a multiple of the speed of the standard platform. The job queue of a resource provider keeps an ordered set of jobs scheduled but not yet executed. Each job, once it is executed on a resource, will run in a dedicated mode on that resource, without time-sharing or preempting. A provider charges for a job according to its unit price and job length. Unit price refers to the price that the resource offers for executing a job of unit length. When a provider with capability 5 bids to execute a job of length 20 at a unit price of 2 and if the consumer accepts the bid and decides to send the job to run there, the job will take.Intuitively, consumers are attracted to a grid, because it offers high quality of computational service at low cost. This could lead to many potential metrics of consumer incentives. However, a fundamental incentive requirement is that a grid should have a high successful-execution rate of jobs, where a successful job execution means that a job is executed without missing its deadline. When this rate is too low, even if the cost is zero (as in the case when a grid is advertising funded), the consumers will lose faith in the grid and quit it. Therefore, we choose the successful-execution rate _ of the grid system as the incentive for consumers.

A) Grid Computing

Many of the basic ideas behind the Grid have been around in one form or other throughout the history of computing. For example, one of the “novel” ideas of the Grid is sharing computing power. Nowadays, where most people have more than enough computing power on their own PC, sharing is unnecessary for most purposes. But back in the sixties and seventies, sharing computer power was essential. At that time, computing was dominated by huge mainframe computers, which had to be shared by whole organizations. In 1965 the developers of an operating system called Multics (an ancestor of Unix, which in turn is an ancestor of Linux - a popular operating system today) presented a vision of “computing as a utility” - in many ways uncannily like the Grid vision today. Access to the computing resources was envisioned to be exactly like water, gas and electricity - something which the client connects to and pays for according to the amount of use. Ironically, “utility computing” is all the rage again these days, and used more or less as a synonym for the Grid by some people. So, yes, there is a certain amount of “reinventing the wheel” going on in developing the Grid. However, each time the wheel is reinvented, it is reinvented in a much more powerful form, because computer processors, memories and networks improve at an exponential rate which is associated with Moore’s law.

II Literature Survey

A work is presented by Raj Kumar Buyya to combine multiple markets across the grid environment. It was a grid architecture the include market agent, market server, market resource broker, market trader and the scheduler. It allow the scheduling and negotiation also. David E. Irwin presented bid market environment along with value added scheduling. In this paper opportunity and the risk factor is included with scheduling process. An incentive based grid scheduling was proposed by Lijuan Xiao. Chia-Hung also present the distributed grid market for job scheduling. It was based on market agents to control the workflow. It will also check for confliction of resources. It uses shorest job first scheduling for job assignment. Li Chunlin presented a utility based job assignment scheme in market grid. It gives an iterative approach to serve user requrest based on utilization. It also correlate the pricing along with resource allocation.

Kyong Hoon Kim presented a new model for market based resource allocation in grid network. It uses the QOS based adaptive resource allocation. The scheduling machinism is

used for the resource allocation. (2006) Kai Shen presented a cost and opportunity based algorithm to perform resource scheduling. It is the extension of budget based algorithms. The method covers the concept of opportunity along with risk assessment (2007)

Furo-cho presented a economic scheduling system based on market model. It uses the lexicographic and Euclidean Distance algorithm for scheduling. The algorithm will improve the quality of service for job scheduling. (2007) Zhu Tan also presented a market-based Grid resource allocation mechanism. This paper present a novel Stable Continuous Double Auction (SCDA). the SCDA delivers continuous matching, high efficiency and low cost, allied with low price volatility and low bidding complexity.(2007) Lijuan Xiao present an incentive-based scheduling scheme, which utilizes a peer-to-peer decentralized scheduling framework, a set of local heuristic algorithm. it allow resource providers and resource consumers to make autonomous scheduling decisions, and both parties of providers and consumers must have sufficient incentives to stay and play in the market.(2008). Qi Weiyi presented a new model for resource sharing called DSM(Differential Service Model). It uses the Strictness Factor, Greediness Factor and Credit Score to describe the characteristics of the users and resources, like service requirement and service level. A series of related strategies, including resource evaluating, job risk exposure rating, operation adjustment etc., have been developed to conduct the market players' behavior. (2008)

Bing Tang presented a dynamic resource price-adjusting (RPA) strategy in computational Grid. he new algorithm improves the performance of Grid in aspect of increasing the task accomplishment ratio and solving the problem of load imbalance.(2008) Laiping Zhao presented an approach according to customer interest. It will schedule the resources if a person like it and offer such resources to him. It improve the HRED algorithm using hierarchical mechanism and resource selection mechanism, which cooperate with resource providers' trust degree, making it more suitable, practical and credible for Grid market.(2009)

Bin Wu work on dynamic and autonomic characteristics of grid market. He considers resources set availability and can be extended easily. It utilizes statistics method to describe resource availability and improves the availability of resources set effectively. Then a resources composing based batch scheduling algorithm framework is proposed.(2009). Ang Li, Nianming Yao presented Min-Min scheduling algorithm. This paper consider both cost and makespan, and focus on scheduling parallel tasks from Grid users considering a commodity market. (2010) Amritava Chaudhuri present an effective scheduling of job and resource plays an essential role to optimize and enhance the quality of services provided to the service consumers by the service providers.(2010)

III Proposed Work

The proposed work is presented in an open market where customers are interacting to the supplier for specific product or the services. The market area works on the bid based system in which multiple customers performs the job assignment in the form of bidding for the specific product. This whole process is represented as the Job Request and registered to the supplier side. Now as multiple bids are accepted by the supplier, these are treated as the Job Requests. The analysis process will be done on this supplier side.

The supplier will open the bid on some defined date and as the bid will open the decision will be taken regarding the resource allocation to specific user. In this work we have defined three main parameters while performing the bid allocation. These three parameters will be analyzed in a sequence and applied parallely.

These three parameters are

1. Request-Availability Ratio
2. Price of Bid Quoted
3. User Reliability

The complete logic of the proposed work is presented here in the form of algorithm, shown as under

1. Define a Grid Network with N Number of Resources with some parameters like cost and available units
2. Perform the User Bid for specific resource along with price specification
3. Supplier Decide the Bid Close then perform the decision regarding to assign the bid to specific person.
4. for i=1 to Length(Request)
{
5. If (NumberofRequest(I,ProductA) <= NumberofUnits (ProductA))
{
6. Assign Products to All Request users
}
7. Else
{
8. Price=FindMaxBid(ProductA)
Frequency=Frequency(UserA)
9. If (RelibleUser (Frequency,Threshold) =True and Price=Max)
{
10. Assign Product to UserA
}
}
11. Endt

IV Conclusion

In the case of computational grids the consumers and providers share their resources and schedule the decision In a bid market there are some chances when a user get the product but he do not want to purchase at this time.

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