Research Paper Management

User Reliability Analysis Approach to perform Resource Allocation in Grid Market

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ABSTRACT

When we deal with any market where the sharing or the assignment of the resources or the services is done, in such market area generally the requirement is greater then the availability. In such case there is always the requirement of an efficient and unbiased resource allocation approach. In this present work we are providing the solution of same problem in case of bid based grid market. In this present work number of resources are available in an open grid market and customer place the bid to buy the products. The problem in such market is the user reliability in terms of chances that he will buy the product. The present work is the parametric approach to find the solution of defined problem. The obtained results shows that the resource allocation is done here significantly.

Keywords : Resource, Grid, Incentive, User Interest, Request availability ratio

I Introduction

Grid Computing is about to collect and sharing of the distributed computational, data and the associated resources in a single, unified resource to solve the large scale computing and to provide data intensive computing environment and application. In such kind of Grid systems, the Management is a major resource component. The structure becomes more complex when these resources are distributed at different physical locations These systems also provides the heterogeneity in terms of data types, cost models, load, availability etc. Because of this heterogeneity there are more chances of occurrence of any fault in the system. These faults can be in the form of wrong decisions, invalid resource allocation, System failures, data losses etc.

Because of this, there is the requirement to improve the grid based system so that the scalability and the robustness of the grid system will be improved. Applying dynamic, heterogeneous and autonomous characteristics of computing resources for grid computing to manage resources while allocation. The scheduling mechanism deploys which jobs are being going to be executed at what time, which machine, etc.

The major issue in grid based system is the resource allocation. There are number of traditial resource allocation schemes that are controlled by the centralized servers. These approaches uses different scheduling mechanism to perform the source allocation and to manage the user jobs and the requests. These management schemes are static as well as dynamic and provide the effective allocation to the system without failure. But even then there is the improvement required respective to the application as well as the scenario. In this work, a bid market based resource allocation scheme is presented to improve the tradition allocation approach. In the second section of this paper, the existing work in the area of grid market and grid allocation is shown, in section III, the proposed approach is explored. In the section IV, the results are shown to represent the effectiveness of the work. Finally the conclusion driven from the approach is defined.

II Literature Survey

In the earlier work these kind of gird markets are presented with two main concepts called Price-Directed and Resource-Directed Approaches. Non-price approaches are either selfish or cooperative and they are based on Game theory or cooperative mechanisms. In the price directed approaches, consumers and producers interact via market mechanisms for allocating resources. Two main broad of mechanisms for setting prices are: commodities markets and auctions. In both the mechanisms, the main components are consumers, producers and a third party that acts as a mediator between consumers and producers. The third party in auction models is auctioneer that determines the sale of an individual resource (or a resource bundle) based on the bids. The basic philosophy behind auctions is that the highest bidder always gets the resources, and the current price for a resource is determined by the bid prices. The third party in commodity market, sets a price for a resource (or a bundle of resources) based on demand and supply. The price is calculated based on tatonnement process. The tatonnement process varies the price of the individual or bundle of resources until an equilibrium is reached. Commodity markets rely on polling aggregate supply and demand repeatedly to calculate the equilibrium price and all allocations are performed in this price. As in ad hoc Grids the resources are not dedicated and supply/demand of resources is very dynamic, the complexity of implementing such centralized market which rely on the aggregate supply/demand of resources becomes infeasible. Therefore, we have selected auction models as the platform for matchmaking of consumer and producer of resources in ad-hoc Grids.

Rich Wolski performed a work," Analyzing Market-based Resource Allocation Strategies for the Computational Grid". In this paper, Author investigate G-commerce — computational economies for controlling resource allocation in Computational Grid settings. Author define hypothetical resource consumers (representing users and Grid-aware applications) and resource producers (representing resource owners who "sell" their resources to the Grid). Author then measure the efficiency of resource allocation under two different market conditions: commodities markets and auctions. Mathias Dalheimer performed a work," Formal Verification of a Grid Resource Allocation Protocol". In this paper, Author present Presented resource allocation protocol that suits the needs of commercial solution providers. Aram Galstyan performed a work,"

Resource Allocation in the Grid with Learning Agents". In this paper Author examine a simple algorithm for distributed resource allocation in a simplified Grid-like environment that meets the above requirements. Presented system consists of a large number of heterogenous reinforcement learning agents that share common resources for their computational needs. Bismi has identified the resource allocation problem so that the effective resource scheduling can be performed. The author has discussed existing allocation approaches as well as defined the new effective scheduling approach for the grid market. Aram Galstyan performed a work," Resource Allocation in the Grid Using Reinforcement Learning". In this paper Author study defined a decentralized approach for resource allocation in a Grid environment. Yang-Suk Kee performed a work," Improving Grid Resource Allocation via Integrated Selection and Binding". This paper presents a new formulation of the resource selection problem and a new solution to the resource selection and binding problem called integrated selection and binding.

III Proposed Work

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 number 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.

The presented be implemented in an Open Grid market where number of customers and the suppliers are connected for the resource sharing. The proposed system grid market will support the following properties.

- The market area is an open area where new customers and suppliers can participate
- There are multiple suppliers and multiple customers in the network
- The customers will perform the request and supplier will take decision to allocate the resources to these customers.
- A customer can perform one request for one product or the service

In this proposed work we have to assign the resources to customers by considering the following parameters

- Cost quote by the customer
- Ratio of Request and Services
- Frequency of Job Requests

The proposed system will not allot the resource only by considering the cost factor, Instead of that the person previous history in terms of reliability also matter. These three factors are considered here in a sequence and some times parallely. The first categorization is done by the Request and availability ratio. According to this if the request is less the availability then all the user who will quote more then the base cost will get the product. The second criteria is the cost. The cost factor will work when the request is more then availability. Now the maximum cost users will get the first preference. Finally the reliability will be checked before allocating the resource to the ser. The reliability is based on the frequency of resource allocation to a user. A user having more number of allocation is more reliable.

The reliability of a user is based on the previous history of the user for the grid market. It means the preference will be given to old reliable customer instead of a new customer. The complete flow the work is presented in the form of flow chart presented in figure 1

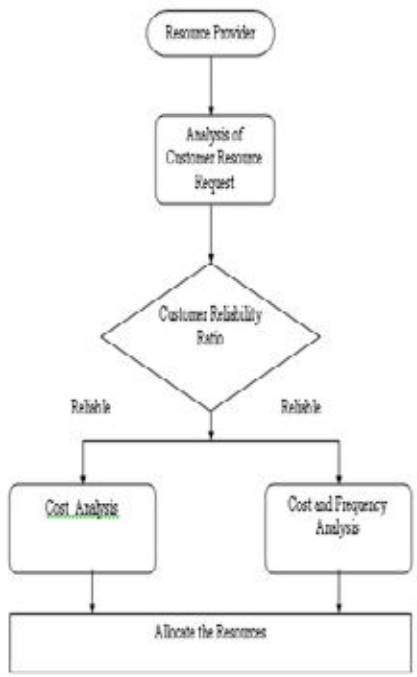

Figure 1 : Proposed Work

IV RESULTS

The presented work is implemented using Gridsim environement that is integrated in Netbeans IDE. Along with this the database is managed to perform the work effectively. We have generated a backend grid market with n number of resources. Each resource is defined with specific cost and number of available units of that product. The authenticated user can interact with the market to purchase the product. The user friendly environment is build to perform the user registration and the its authentication to the grid market.

Once the user registered, he can interact with the market and place the close bid. It means user will not know the bid information of other users. A user can post one bid for one resource. In the database, we have maintained the resource information, request information as well as the resource allocation information. The presented work has perform the resource allocation based on three criteria i.e. request-availability ratio, cost and the user reliability.

IV Conclusion

In this present the open bid market is implemented in grid environment. We have used the gridsim as the simulation tool and the matlab for the graph generator. While performing the resource allocation the reliability played a significant factor such that the allocation is done accurately and effectively.

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