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"Proposed Model in Grid Computing"

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Abstract

Grid computing is a form of distributed computing that involves coordinating and sharing computational power, data storage and network resources across dynamic and geographically dispersed organizations. Grid computing is a term referring to the combination of computer resources from multiple administrative domains to reach a common goal. The resources in the Grid are heterogeneous and geographically distributed. A model has been proposed using auction oriented approach. Each bidder offers a bid for a collection of resources rather than placing a bid on each item separately. It has also been implemented. Dependencies and complementarities can also been expressed between various resources. It can have various types' selection such as Industrial Procurement, Telecom Spectrum and Bus Routes.

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Keywords: *Grid computing, Resource management, Economic models, Bus Routes and Proposed Model*.

1. Introduction

Grid computing is a form of distributed computing that involves coordinating and sharing computational power, data storage and network resources across dynamic and geographically dispersed organizations.

As defined by Ian Foster: Grid computing is concerned with

"*Coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organization*."

Grid size can vary by a considerable amount. A set of individuals and institutions defined by some sharing rules form what we call a virtual organization (VO) [6].Grid computing can be seen as a journey along a path of integrating various technologies and solutions that move us closer to the final goal. Interconnected computer systems where the machines utilize the same resources collectively. Grid computing usually consists of one main computer that distributes information and tasks to a group of networked computers to accomplish a common goal. Grid computing is often used to complete complicated or tedious mathematical or scientific calculations. [10] Grid Resource Management means identifying application requirements, resource specification, matching resources to applications, allocating/scheduling and monitoring those resources and applications over time in order to run as effectively as possible.Auctions are used extensively in the real world, particularly for selling goods/items within a set duration.

Grid RM Mechanism includes resource information dissemination i.e. published by the resource(push) or gathered by GIS (pull) and on-demand dissemination (by agents),resource discovery i.e. centralized or distributed queries, agents, distributed queries + agents and resources are described in schema/language or objects ,resource scheduling/job execution i.e. assigning resources, centralized, hierarchical, distributed, resource monitoring and re-

scheduling. Monitoring can be done by application (polling) or by resource (notification to the app or periodic status updates).Multiple layers of schedulers is an open issue. The higher level scheduler has less information about the remote resources, local resource managers actually control the resources .There is lack of control over resources. Grid scheduler does not have ownership or control over the resources. Shared resources and variance can be there. No dedicated access to the resources (resources are shared) and this results in a high degree of variance and unpredictability. Conflicting performance goals can be due to many participants having different/conflicting preferences and many different local policies, cost models and security.

There are many challenges in Grid Resource Management. Resources are heterogeneous in nature (processors, disks, data, networks, other services), application has to compete for resources and lack of available data about current systems, needs of users, resource owners and administrators [11] The three key players involved in auctions are: resource owners, auctioneers (mediators), and buyers Many e-commerce portals such as Amazon.com and eBay.com are serving as mediators (auctioneers) [9]. Most of the related work in Grid computing dedicated to resource management and scheduling problems adopt a conventional style where a scheduling component decides which jobs are to be executed at which site based on certain cost functions (Legion [3], Condor [8], AppLeS [1],Netsolve [2], Punch [7]).

Auctions can be classified into four types:

1. English Auction (first-price open cry) [5]
2. First-price sealed-bid auction
3. Dutch Auction [4]
4. Continuous Double Auction

In this model, each bidder offers a bid for a collection of resources (of the bidder's choosing) rather than placing a bid on each item separately. This enables the bidder to express dependencies and complementarities between various resources. The auctioneer selects such set of these combinational bids that result in the highest revenue without assigning any item to more than one bidder. It can have various types selection such as Telecom Spectrum, Bus Routes and Industrial Procurement.

2. Comparison of Traditional and Proposed Auction Model

1. In this model, the auctioneer selects such set of these combinational bids that result in the highest revenue without assigning any item to more than one bidder.
2. Telecom Spectrum, Bus Routes and Industrial Procurement can be used as an application.
3. In this Auction, each bidder offers a bid for a collection of resources (of the bidder's choosing) rather than placing a bid on each item separately.
4. It enables the bidder to express dependencies and complementarities between various resources.

3. Proposed Auction Model implementation

Algorithm used:

The generic procedure for Proposed Auction is:

1. Each bidder offers a bid for a collection of resources rather than placing a bid on each item separately.

2. The bidder expresses dependencies and complementarities between various resources.

3. The auctioneer selects such set of these combinatorial bids that result in the highest revenue without assigning any item to more than one bidder

Table for Proposed Auction Model

Type	Buyer 1	Buyer 2	Buyer 3
Telecom Spectrum	100	**110**	105
Bus Routes	**200**	120	150
Industrial Procurement	300	**310**	305

4. Evaluations Results of Proposed Auction Model

The next experiment considers a proposed model 2. There are three types in this from which one has to be selected. The three types are-Telecom Spectrum, Bus Routes and Industrial Procurement. The winner for type 1 is Buyer 2. The winner for type 2 is Buyer 1 and the winner for type 3 is buyer 2.

Table for Proposed Auction Model

Type	Buyer 1	Buyer 2	Buyer 3
Telecom Spectrum	100	**110**	105
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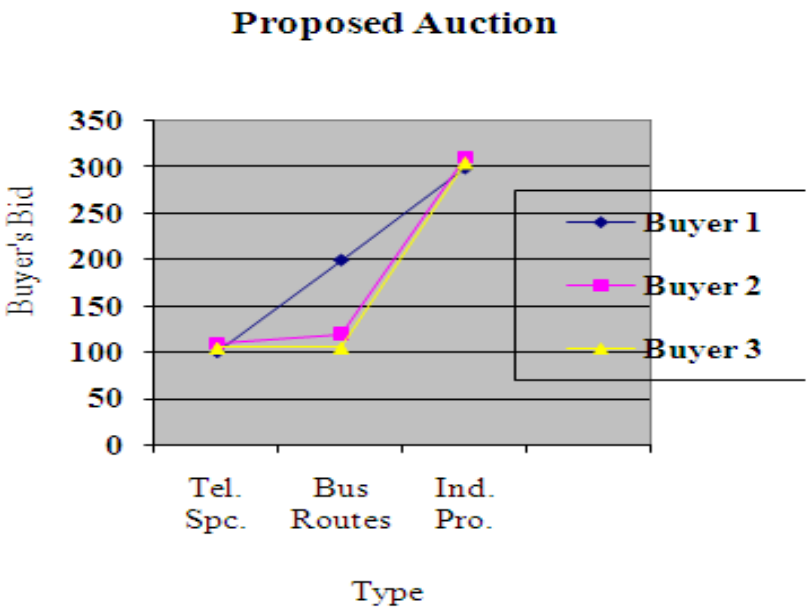
According to this table, graph has been plotted for this Auction.



Graph between various types and Buyer's bid for Proposed Auction Model

5. Conclusion and future work

In this Proposed Auction model, each bidder offers a bid for a collection of resources rather than placing a bid on each item separately. This enables the bidder to express dependencies and complementarities between various resources. It can have various types' selection such as Telecom Spectrum, Bus Routes and Industrial Procurement.
In the future, it is possible to develop agents that can automatically choose one out of a set of auction protocols according to the requirements of the Grid environment.

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