A Survey on Effective Endowment of Multiple-Level Auction Mechanism in Cloud

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ABSTRACT

At present the auction mechanism followed in the market is that of the one round type, hence the values or the price don't change rapidly over the market trends which often lead to the overprizing or under prizing. We find a method in which the allocation of the cloud space is poll based on multiple levels so as to balance between demand and supply. We use the primal dual algorithm to enhance it to multiple levels and allocate the resources accordingly. We also use the binary search algorithm and best fit approach to find the already existing auction to add the biding price or creation of new auction based, on the requirements. This method ensures that the cloud space is not held by particular person and the value changes according to the market trends so that the cost efficiency is maintained in the market. The demo installation of this methodology in real time auction proved very useful and increased the profit and as well as the distribution of the cloud space.

KEY WORDS: cloud computing, bidder, virtual machine.

1. INTRODUCTION

Cloud computing is a term used for allocation of resources on demand from the users using the existing technologies such as virtualization and map reduce. Here the computing resources are available in a central repository or distributed to various geographical locations wholly called a data center. Auction is a system where potential buyers place competitive bids on assets and services. The asset or service in question will sell to the party that places the highest bid. Online auctions are places that people can go in order to buy or sell goods or services online for a small fee. Anyone can sell an item and anyone can bid on an item. During online auctions bidders compete on a particular service or product and submit their bids online or over the internet. Internet auctions have become an important part of electronic commerce because of the flexibility and possibilities they provide.

In this type of auction, the property is put on sale on the internet. Therefore, there are no on-site bidders. Typical sale of the property on sale is conducted over computers connected to the internet. Auctions done on the internet have specific timelines (opening and closing dates), and sometimes with fixed increments of bids. Bidders enter their bids against other competing bidders on the internet for the same item. Sometimes, proxy bids are used when a bidder would like to set a predetermined highest bid he or she can make.

In cloud computing the available physical resources are partitioned into several virtual machines using the concept of virtualization and allocated to the users based on their demand of resources.

The two most predominant people involved in cloud computing are providers and users. Providers are the companies offering computing resources and users are those who are in need of resources and request their demand to the providers. The aim of a provider is to maximize his revenue with his existing physical architecture. The provider must be able to meet the demands of the user dynamically. The users move to cloud resources to reduce the cost incurred in maintenance and installment of the resources individually.

The efficient allocation of resources is a major problem in cloud computing.

Previously if a cloud user needs to request a resource, he needs to directly contact the provider or through an agent and sign a service agreement. This method does not serve the market demand and was not transparent which left to over pricing by the provider since the pricing policy followed was fixed.

To overcome the problems associated with this methodology of allocating resources, online auctions were considered for cloud computing similar to auctions of physical objects, In order to meet the demands of the users and to make the allocation transparent and competitive.

The storage space and the virtual machines are auctioned to each user based on their requirements of the virtual machines and bandwidth. When the market is based on fixed values it leads to the over prizing or under prizing which is not cost efficient for both the companies and cloud provider. We suggest a auction mechanism that uses both the cloud storage and the number of virtual machines into account. A auction mechanism that uses both the cloud storage and the number of virtual machines into account. This allows us to have multiple level auctions instead of only one round auctions hence increasing profit for industry and cost efficiency for the users.

Existing System: Mu'Alem and Nisan (2008), they aim at efficient allocation when there is limited resources and large number of demand by enhancing the AEM algorithm used in spectral allocation to support the resource allocation in cloud and named it AEM. The paper mostly concentrates on multiple unit combinatorial auction where the users are allowed to auction for multiple instances instead of auctioning for individual instances. A separate auction is considered for each resource requested by the user and the mechanism greedily selects the winner of entire auction based on their match with their request made to confirm whether the resources won will serve the bidder need. The paper concentrates on the property of monotonicity and critical value. This approach obtains polynomial computational complexity and eliminates the collusion and supports truthfulness. The payment is given in the hands of users instead of the provider.

Deek (2011), the truthful online spectrum auction design was implemented to avoid time- based cheating and the tackling of bid among the bidders. They proposed a mechanism called topaz that improves allocation efficiency, smooth critical value based pricing and it effectively reduces from bid cheating, the auction revenue can also be improved and it resists all misreports about the bidder.it ensures truthfulness by giving bidders no incentive to cheat against it. The auction Efficiency can be calculated as the sum of winner's bids and the auction revenue. Hence this paper focusses on addressing only individual bidders cheating and it does not focus on addressing when bidders manipulate their Requests together.

Alicherry and Lakshman (2012), distributed clouds are developed by using efficient resource allocation algorithms. For a large number of computational task to be performed and completed, a specific approach of 2-approximation algorithm has been implemented for the best selection of data centers in the distributed cloud environment.by this implementation communication costs and the latency can be effectively improved. In this paper performance can be evaluated by using a random and greedy algorithm and the allocation of a virtual machine can be measured and allocated by using heuristic approach to the selected data center. Hence this paper suffers from a problem of resource usage that leads to allocation of poor racks and servers and a sometimes resource may get wasted.

Wang (2012), they introduced a dynamic auction mechanism by combining the benefits of on demand and bid based resource allocation mechanism. The proposal overcomes the problem of fixed price allocation in offline auction and the shortcomings in the Amazon EC2 Spot instances, where the users whose bid value is below the spot price are removed from auction. The random auction makes use of near optimum allocation scheme for choosing the amount of virtual machines to be considered for an auction and dynamic truthfulness guaranteed payment scheme for providing the instances to the user. The evaluation of the performance of approach proves to reduce the computational complexity of numerical dynamic programming used inconstant price from $O(C^3)$ to $O(C^2)$, reduces the overpricing and obtains truthfulness in which a user can truthfully provide bid and number of resources required. As a result, the auction was able to increase the revenue by 30 percent and obtain an optimum revenue for higher demands and near optimum revenue for lower demands with a loss of 2 percent.

Wang (2013), this paper dynamic auctions are conducted based on the user demand overtime in order to increase the revenue in the cloud environment. Hence, they previously introduced the approach of two-dimensionality truthfulness that determines capacity allocation mechanism when there is a high demand. Thus the adopted algorithm for the number of available instances and the allocated capacity by the insertion of virtual bidder as it simplifies the revenue expression. The problem faced in this paper is such that VM allocation problem for spot markets by solving a static optimization problem, without considering the user's behavior and expectations.

Zaman and Grosu (2012), the paper aims at designing an efficient auction where a user bids for a combination of items. Here they consider the allocation of resources and the payment and not the manner of allocation. Here suggest the use of three algorithms. For fixed price, two algorithms were designed. CAGREEDY which allocates resources according to the availability, CALP for assigning integer values to the winning and losing user for dynamic provisioning, CAPROVISION is used. In order to evaluate the performance of the algorithms CALP and CAPROVISION are compared with FIXED PRICE. CALP outperforms other algorithm and achieves higher revenue than fixed. CAGREEDY has a faster execution time than CALP. EBS is suggested for bidding which is efficient than existing strategy.

Zhang (2013), the truthful-online auction mechanisms are conducted based on the heterogeneous demands from the user's request, thus it address the problem in fluctuation of supply-demand relation shown in the paper. They proposed compatible online cloud auction (COCA) mechanism to avoid the demand and supply to the cloud users. In final the performance of COCA is compared with offline VCG mechanism that results in worst case performance of COCA can be well resolved. The problem identified in this paper is, the comparison of COCA with existing online auction mechanism has not made since there are no truthful auctions achieved when compared to previous results.

Fu (2014), they explain the main causes of degradation in the performance of cloud centers distributed across various locations occurs due to the distance between datacenters and virtual machines within the data center and across the data centers increases, they propose two algorithms, 2-approximation algorithm for choosing the data centers of virtual machine and a heuristics algorithm for allocation of virtual machines. The performance of the algorithms were assessed by considering different constraints and requests. Approximation algorithm outplays other algorithms by 79% and heuristics algorithm proved to be better than other algorithms by 4.8%.

Mashayekhy (2014), the resources are allocated based on the user's request for the available period of time. The user's will make use of their VM instances for the entire requested period.in this paper, the mechanism used in which the incentives are given to the user's to use their resources in compatible manner. Due to this the performance does not reach exact optimal value for online mechanism and it is only optimal for offline mechanism by the approach of Vickrey-Clarke-Groves has been simulated and so the researchers decided to investigate new monotone allocation functions to lead better performance for the online mechanism. The problem in this paper is that it does not consider about the future demand and supply of VM as they implement only in real cloud setting.

Linquan Zhang (2014), they build an efficient alpha-approximation algorithm for dynamic VM instances and they also implemented the design in a randomized combinatorial auction that guarantees the social welfare and reaches the approximation factor up to 2.72. Polynomial approximation algorithm has been designed for the social welfare problem in IP and detected. This auction shows the result better than the previous survey and it was verified by Google cluster traces and that results in improving the absolute truthfulness and seller revenue can also be improved.

System Architecture: The available configurations of resources are provided by the cloud provider. The user who wishes to obtain a cloud resource registers providing his personal details .After successful registration, the user logs in and request the resources needed by bidding. Bidding consist of information such as type of virtual machines needed, amount of virtual machines needed and money they are ready to pay for the requested virtual machines. The user is not prevented from participating in more than one auction. The User can participate in any number of auctions. The users who require similar configuration of virtual machine compete in the auction. Otherwise a separate auction is conducted for different configuration of virtual machines. The winner of auction is determined based on social welfare and resources are allocated by the provider. The diagrammatic representation of the proposed architecture is given below.

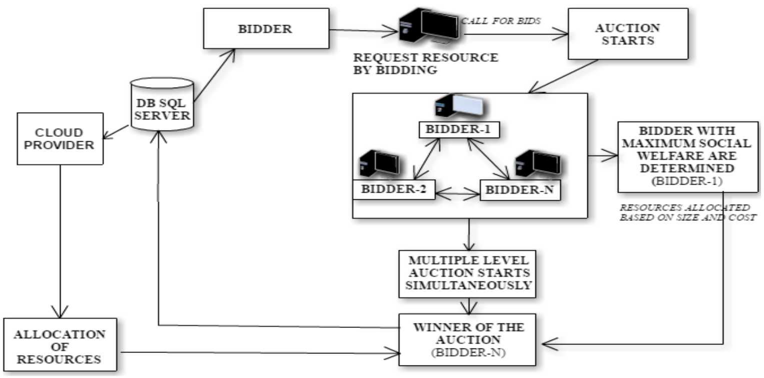

Figure.1. Proposed architecture

2. PROPOSED SYSTEM

The proposed system introduces multilevel auctions. Users can participate in any number of rounds at a time irrespective of their money. If a user participates in a single round and loses the auction the time and energy becomes wasted and ultimately leads to user dissatisfaction and loss of revenue to the provider.

The proposed system does not restrict the user from participating in different auctions of a provider based on money. A user in need of a resource should send a request to the provider. Once a request is received, the auction begins. If no other requests arrive for that particular resource within a particular time, the resource will be allocated to that user. If requests arrive, then the auction begins and the winner of the auction is allocated with the resource. The user can participate in any number of auctions he wishes. Every time the winner of the auction, receives a prompt for his approval. The resource is allocated only on his approval. The final payment will be calculated based on the user's approval.

We use best fit search algorithm to identify the most appropriate auction for the user to participate based on the type and configuration of resources rather than random selection of an auction. We further modify the primal-dual algorithm to support multilevel auction. This algorithm is generally good for LP solution-based technique and the different variables can easily find out for NP-based problems that are converted as integer based values. It improves the feasible point when the users request and bid their values. The suggested approach use different variables as integers and decimal values to detect and allocate the resources for user and also determines the minimum cost and path for bidders. An identity matrix is used as a vector of all variables so that the two variables for the restricted primal dual can be improved.

The method proves to improve the social welfare and competitive ratio in effective.

Advantages of Proposed System:

- Provides a transparent auction mechanism.
- Improves the competition among the users.
- Prevents one sided auctions.
- Prevents wastage of resources.
- Allows efficient allocation of resources.

- Achieves user satisfaction.
- Increases the revenue of provider and efficient utilization of provider resources.

3. CONCLUSION

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