A FAIR SOLUTION FOR RESOURCE ALLOCATION USING EFFECTIVE BIDDING STRATEGIES IN CLOUD ENVIRONMENT

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Abstract: ***Now a days the use of Cloud computing increases day by day. Every user who uses Cloud service wants better services with cheapest price. For this reason the Providers choose the option of getting bid for the available resources so that the resources offered to those who bid highest which increase revenue of the cloud providers. In this type of on demand service some time might happen some of the customer not get the requested service only because same service demanded by the another person with higher rate again and again. Secondly it might be possible a customer get the requested service many time after the end of bidding process and may not get services sometime because of some other customer bid for same service (may first time) with higher prize. It may be an issue one user may send request more than once for the same resource. This type of issue arise for provider which may be single or multiple providers. So two solve both the issue mentioned above We propose an efficient bidding method which aim is to increase the trust level of customer towards the Cloud service provider by providing required services based on Price bidding strategy. Using this proposed scheme we also aim that the customer gets the desired service even with efficient cost being valuable customer.***

Key words-Resource allocation, price biding Strategy Cloud service, provider Multiple server/resource allocation, on demand/Spot instance services, Single User multiple Request, Quality of service

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I. INTRODUCTION

Due to Cloud computing expandability, resource-sharing and cost-efficiency, Cloud has been an inevitable part of day to day life and its usage has drastically increased in last decade. Also it explores various services like IaaS, PaaS, and SaaS. These services can be utilized on demand bases by the customer at any instant of time. To accomplish these services, cloud service provider provides shared pool of configured resources such as server, VM, network, storage resources, etc. For the allocation of such resources various resource allocation biding strategies are used to allocate resources to the customer/user. That balance the on the network of computing resources.

Cloud Computing

"Cloud Computing refers to theweb-based computing,providing users or devices with shared pool of resources,information or software on demand and pay per-use basis".It allows end userandsmall companies to make use of various computationalresources like storage, software and processing capabilitiesprovided by other companiessuch as Amazon or Microsoft. [8]

Infrastructure as a service (IaaS): In the IaaS model computers are offered as physical or asvirtual machines, servers, network, and storage devices. And provides virtualized IP address to the clients for direct access to hardware resources. Examples of IaaS are Amazon EC2, IBM Computing on Demand.

Platform as a service (PaaS): The PaaS model of cloud provides acomputing platformincluding operating system, programming language execution environment, database, and webserver. Without the cost and complexity of buying and managing the respective hardware andsoftware layers, application developers can develop and run their software solutions on a cloudplatform.

Software as a service (SaaS): In the SaaS model, providers install andoperate applicationsoftware in the cloud and cloud users access the software from cloud clients. The cloud users donot manage the cloud infrastructure and platform on which the application is running. Thiseliminates the need to install and run the application on the cloud user's own computerssimplifying maintenance and support.

RESOURCE ALLOCATION STRATEGIES (RAS) AT A GLANCE [7]

In cloud computing paradigm refers to various resource allocation strategies and input parameters for the optimal resource allocation based on various services. Infrastructure and the nature of applications which demand resources. The following figure depicts the classification of Resource Allocation Strategies (RAS) and following section further discusses about it.

A. Execution Time

Actual execution time and scheduling of resources considers for the problem of resource contention and increased usage. Estimation about execution time is tough and make high error rate. To overcome such situation VM model and anti scheduling criteria for job assignment for IaaS in heterogeneous environment.

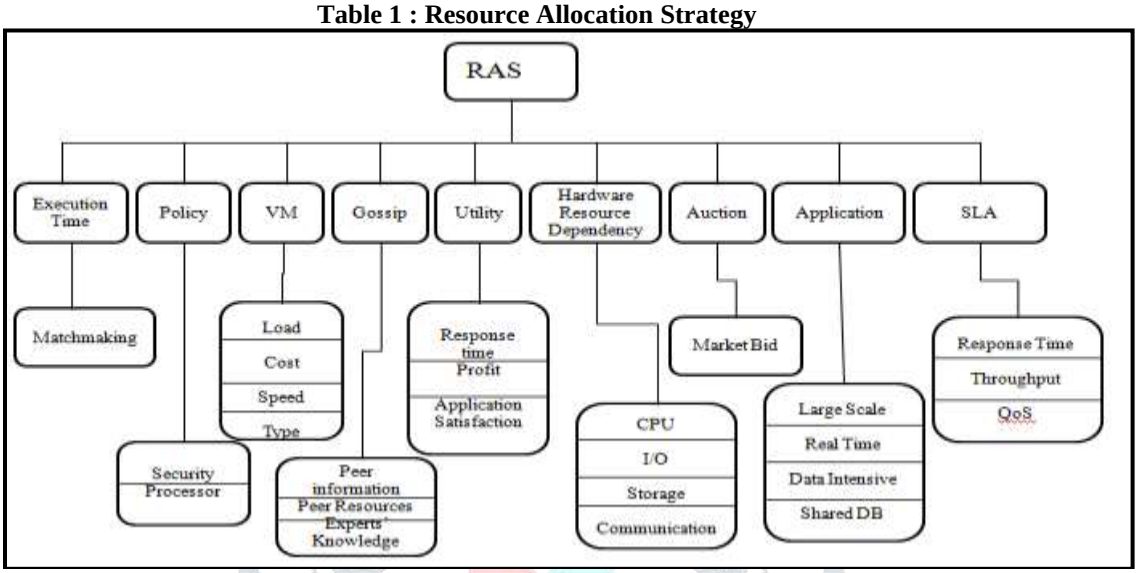
B. Policy

For the scalable management users, resources and organization-level centralized security policy preferable. That manages a leftover processor distribution, leading to the most number of immediate subsequent job allocations as well as complex searching process. Also Job migration is required when load sharing activities occur.

C. Virtual Machine (VM)

A virtual machine can automatically scale its infrastructure resources are composed of a virtual network of virtual machines capable of live migration across multi-domain physical infrastructure. By using dynamic availability of infrastructure resources and dynamic application demand, a virtual computation environment is able to automatically relocate itself across the infrastructure and scale its resources.

Table 1 : Resource Allocation Strategy



D. Gossip

General Gossip protocol is proposed for fair allocation of CPU resources to clients. Gossip based co-operative VM management with VM allocation and cost management is introduced. By this method, the organizations can cooperate to share the available resources to reduce the cost.

E. Utility Function

There are many proposals that dynamically manage VMs in IaaS by optimizing some objective function such as minimizing cost function, cost performance function and meeting QoS objectives. The objective function is defined as Utility property which is selected based on measures of response time, number of QoS, targets met and profit etc.

F. Hardware Resource Dependency

To improve the hardware utilization, Multiple Job Optimization (MJO) scheduler is proposed. Jobs could be classified by hardware-resource dependency such as CPU-bound, Network I/O-bound, Disk I/O bound and memory bound. MJO scheduler can detect the type of jobs and parallel jobs of different categories. Based on the categories, resources are allocated. This system focuses only on CPU and I/O resource.

G. Auction

The cloud service provider collects all the users' bids and determines the price. The aim of resource allocation strategy is to maximize the profits of both the customer agent and the resource agent in a large datacenter by balancing the demand and supply in the market. It is achieved by using market based resource allocation strategy in which equilibrium theory is introduced.

H. Application

Real time application which collects and analyzes real time data from external service or applications has a deadline for completing the task. Suchtypes of applications arelightweight, web intended. To enable dynamic allocation of cloud resources for backs-end smashups, a prototype system is implemented and evaluated for both static and adaptive allocation with a test bed cloud to allocate resources to the application.

I. SLA

In cloud, the works related to the SaaS providers considering SLA are still in their infancy. Therefore in order to achieve the SaaS providers' objective, various RAS specific to SaaS in cloud has been proposed. With the emergence of SaaS, applications have started moving away from pc based to web delivered-hosted services. Most of the RAS for SaaS focused towards customer benefits.

II. Related work

Author at [1] explore resource usage formultiple usersbased on price biding strategy using proposed frame work of near equilibrium price biding algorithm (NBPA).They take an account the problem of conversing game theoretic perspective into non-cooperativegame for multiple users. In this, combination of net profit and time efficiency designed utility function to maximize its value. Mechanism for user's own utility and

to decide for usage of cloud services also provided. Initially their proposed framework leads to the solution of Nashequilibrium algorithm under certain condition applied. Thusthey revised it and gain that the near equilibrium solution is close to the Nashequilibrium.

In this paper author [2] focus on "pay as per use" model of cloud computing which leased resources and services for requested period of time and pay out according to usage. It uses demand based preferential resource allocation technique. It further divided into two steps. First one is market driven auction process, this one required competitive biddingthat bid price for required resources and paying capacity of user. the other one is a preference driven payment process that select winner and allocate resources which ensures profit to service provider and quality of services with the reflection of Its best paying capacity. comparison of this technique drawn to the VCG auction mechanism that results in a performance benefits in revenue toservice provider, payment of cloud users an optimum resource use.

Author [3] explore cloud services based on the spot instance in the paper. That describes bidding for optimizing resource user's utility and pricing strategies for provider's revenue. Impact of correlation in prosof a spot service over on demand services are identified in two dimensions under some simplified assumption.

This Paper Author [4] work on pricing policies in competitive cloud computing market to attract customer in the fever of their benefit as they rely on cloud service provider to utilize cloud computing resources.To regarding this,they uses continuous double auction mechanism(CDA) to match order and facility trading for both customer and CSP based on an electronic auction platform. They also build novel bidding strategy and BH- strategy which is two stage game biding strategies. At the end three simulation scenarios are comparison drawn to that better result achieved by BH strategy and they also discussed that CDA mechanism is feasible for resource allocation.

Author [5] proposed for the same CDA mechanism as Author [4] uses but additionally they uses feedback analyzer that used to calculate Quality of service of storage. Cost efficiency and time individually. Based on that resources are allocated.

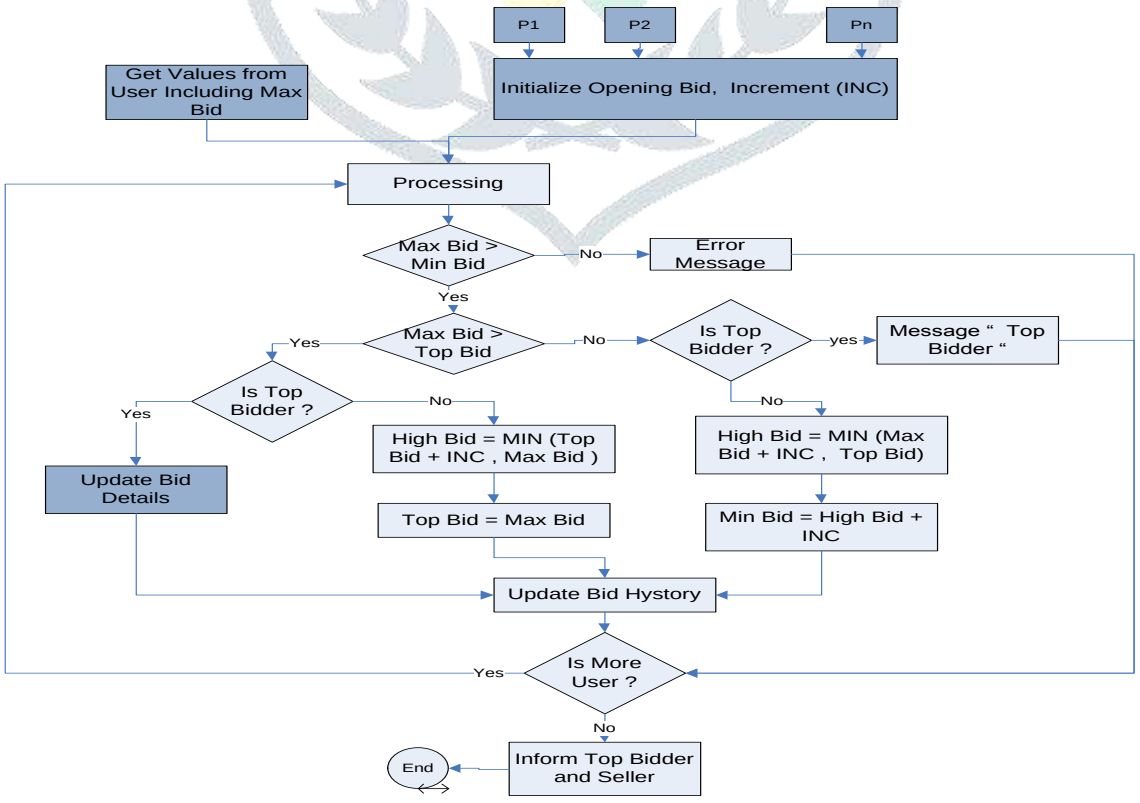
III.COMPARISON OF VARIOUS RESEARCH SCHEMES

The table-1 shows above gives detailed comparison about the various measures proposed by a researcher. That describe about the basic measures used with the benefits that researcher gets as well as the limitations found in schemes.

Criteria Group	**Resource allocation/ Cloud Computing oriented measures**						
Individual Criteria Providers ↓	**Resource allocation**	**price biding Strategy**	**Cloud service provider**	**Multiple server/ resource**	**On demand / Spot instance**	**Single User multiple Request**	**Quality of service**
[1]	√	√	√	**X**	√	**X**	√
[2]	√	√	√	**X**	**X**	**X**	√
[3]	√	√	√	**X**	√	**X**	**X**
[4]	√	√	√	**X**	√	**X**	**X**
[5]	√	√	√	√	**X**	**X**	√
[6]	√	**X**	√	**X**	√	**X**	**X**

Table 1. Comparison study

IV. PRPOSED METHODOLOGY



Algorithm Steps:

Step 1: Initializing Opening Bid, Max Bid, INC to the users.
Get values from users including Max Bid.
Step 2: Processing.
Step 3: CHECK Max Bid > Min Bid
If YES go to next step else If NO show error message and go to step---10
Step 4: CHECK Max Bid > Top Bid
If YES go to next step Else If NO go to step----7
Step 5: CHECK IS Top Bidder?
If YES Update bid detail and go to step---- 9 Else If NO go to next step.
Step 6: High Bid= Min (Top Bid + INC, Max Bid) and Top Bid= Max Bid.
Go to step----9
Step 7: CHECK IS Top Bidder?
If YES go to next step Else If NO Message "No Top Bidder" go to step----10.
Step 8: High Bid= Min (Max Bid + INC, Top Bid) and Min Bid=High Bid+ INC
Go to next step.
Step 9: Update bid History.
Step 10: CHECK Is more users?
If YES go back to step 2 else go next.
Step 11: Inform Top Bidder and Seller.
Step 12: End.

At initial stage opening price will taken as the average resource usage valuation according to time slot. For each user, based on resource features and QoS of resource it will become different. And INC is same for all users but different for different users. While Max Bid can be taken from the users who want to use that particular resource and want to pay for it. In Processing it will set all this initial parameter. Min Bid and Top Is Initially Null so that at first time for any resource it will follow the left side flow in the diagram. After One one-iteration of the entire diagram for particular resource Min Bid and Top Bid will identify. While if the Max Bid is higher than the top Bid for any user then it will follow the mid flow of the diagram. The third or the right most diagram flow will be followed while the Top Bidder for the same resource will try to Bid in the less then his previously bid in the same bidding. If it will found it is top Bidder then at starting it will Removed from flow and may try to Bid again.

All the above explanation of proposed methodology is based in the flow that is till the date decided. It may vary in future if it is necessary.

V. CONCLUSION

By Taking all the above discussion into consideration analysis we
Can conclude that…

- The Proposed methodology support Multiple Cloud provider scenario in auctioning.
- Same users multiple times bidding is also handled.
- Provide maximum profit to the providers
- User can get the good services from multiple providers

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