Proc. of Int. Conf. on Current Trends in Eng., Science and Technology, ICCTEST

Prototype Design for Resource accomplishment in Cloud Computing

Santhosh Kumar G [1], Veena Maruthi Naik[2],
[1]Assistant Professor, Dept. of CSE, Don Bosco Institute of Technology, Bengaluru.
[2]Assistant Professor, Dept. of CSE, Don Bosco Institute of Technology, Bengaluru

***Abstract*— The Cloud resource accomplishment of cloud resources is an fascinating and yet unfamiliar part in cloud computing. Cloud vendors choose a permanent pricing approach for pricing their resources and do not present any inducement to their users. That's why to choose only automates the selection of an appropriate cloud vendor and also to implement the dynamic pricing. A cloud broker which can execute the accomplishment module enables users to mechanize the choice of cloud vendor along with different assistance and also to execute the dynamic pricing in the cloud.**

***Keywords:* Prototype Design, Cloud Computing, Resource Accomplishment, Cloud broker, dynamic pricing.**

I. INTRODUCTION

Many companies like Amazon, IBM, Google, Salesforce.com, Unisys, and so on, now offer cloud services. The main advantage of cloud computing is the ability to provision IT resources on demand. The resources offered may include storage, CPU processing power, IT services, and so on. A cloud user is a person or an organization that offers cloud services for use on payment. A cloud broker is a middleware that intermediate between the user and service providers.

Resource procurement there are cloud vendors who provide versions of that application at different prices and with varying quality-of-service (QoS) Parameters. The user has to go through the specifications of each cloud vendor to select the appropriate one, to obtain the service within budget and of the desired quality. In case of an organization acting as a user, this selection is quite complex and challenging. Also, the companies offering cloud services, and their offerings, change continually. So, given the large and varying multitude of cloud vendors, it is very tedious to select the most appropriate one manually. Hence, there is a need for a scalable and automated method to perform resource procurement in the cloud. Observe that while cloud vendors do not yet offer standardized services, they will need to do so, and that the "federated cloud has huge potential." In that event, it would become possible to mix and interchange resources offered by different cloud vendors and to automate the procurement of such resources.

If resource accomplishment is automated, then the challenge would be to find the appropriate location where the solution can be deployed. One manner in which our solution may be deployed is by the use of a cloud broker that implements our approach. Cloud brokerages form an important research area, and the cloud brokerage business was expected to be worth $150 billion Dynamic pricing is the solution for these of problems. State that uncertainty about the prices of goods and lack of knowledge about market participants

Grenze ID: 02.ICCTEST.2017.1.119

are obstacles to dynamic pricing. If the buyer is an auctioneer and the suppliers are bidders, then the auction is called a reverse auction.

Cloud vendors follow a fixed pricing method for pricing their resources and do not provide any incentive to their users to adjust consumption patterns. A user who wants to use a service in the form of an application hosted on a cloud. There are cloud vendors who provide the varying quality-of-service parameters at different prices. The user has to select the appropriate one with in the budget. This selection is complex and challenging one because the companies offering cloud services changes continually. So it is very difficult to select the appropriate one manually. Because the user has does not about knowledge of best services. So there is a need for scalable and automated method to perform the resource procurement in the cloud.

Reverse auctions are widely used across many industries, and also especially by governments to procure resources. Reverse auctions are preferred over other auctions for procuring resources because competitive bidding in these type of auctions reduces accomplishment costs and limits the influences of undesirable factors like nepotism and political ties of cost and QoS by the broker. The cloud broker assigns weights for different QoS parameters using analytic hierarchy process (AHP), which are scaled before computing a weighted QoS score. This step is called normalization. If normalization is not done, then it is not possible to compare different QoS specifications. The cloud broker implements one of optimal (C-OPT) mechanisms. The winner is determined based on the mechanism implemented. The cloud broker notifies both winner and user. Finally, the cloud broker pays money to the cloud vendors according to the payment function of the mechanism. This is called the accomplishment cost

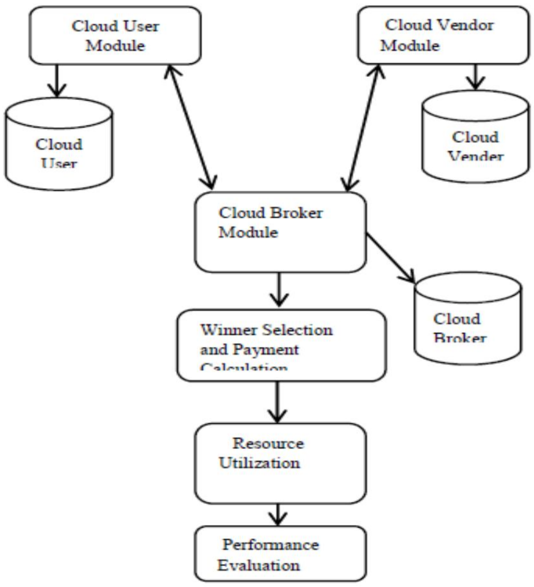

Figure 1. Resource accomplishment Methodology

II. GROUNDWORK

In [2] authors used to change management approach cloud backed business process models. It has more efficient to changes in a cloud supported business process model. It has used to handle the agility of a process using cloud services. The cloud broker has supported the business process. The existing service offering from the marketplace are used in the current cloud instantiation and the current relations between the business processes and the cloud services. The cloud broker manages a repository of all providers and services which are relevant to the value chain of a company. This allows the Cloud Broker to change the cloud configuration when necessary. Currently working on a framework/language to describe the different cloud services. In [3] Cloud computing is a model for enabling resource allocation to dynamic business workloads in a real time. This approach could be moved to a public cloud environment from a private data center. It has based on the price model for hosting workloads on a pay-per-use basis. In [4] authors introduce a federated cloud that would consist of several cloud providers joined by mutual collaboration agreements. It could share their infrastructure with members in need of additional resources. In [5] which virtualized resources provide reliable and guarantee service for users demand. These applications reaches geographically separated storage or data resource with even cross-continental-networks. Then, the performance degradation of networks will surely affect the cloud application performance and user request. To ensure guarantee eservice of bulk data transfer in cloud computing, the reservation and combined resources utilization become critical issues which include data and network resources. User's Quality of Service constraint dynamic resource selection algorithm has been implemented for optimization of combined resources allocation. In [6] model where a business acts on behalf of consumers of one or more cloud services to intermediate and add value to the service being consumed Providers of cloud services can benefit as well through establishment of an ecosystem of partners, such as brokerages, who enhance the provider's service and draw customers to it. In [10] authors Dynamic pricing is the dynamic adjustment of prices to consumers. It depends on the value these customers attribute to a product or service. Fixed pricing paradigm is giving way to a dynamic pricing paradigm in e-business markets and that dynamic pricing strategies, when properly used, outperform fixed pricing strategies. The role of reinforcement learning based approaches for dynamic pricing and discussed a single seller example with nonlinear pricing used for different quantities.

Resource Allocation in Grid and Cloud Resource allocation is an important challenge in today's Internet, especially in large distributed systems like Grid, cloud, and so on. These resources are owned by the companies and are mostly distributed geographically. Resource allocation algorithms are generally based on one of these types of models: 1. conventional models, and 2. economic and game-theoretic models. The cost models of the centralized algorithms derive cost based on the usage of the resources. Economic models for resource allocation are very popular. Economic models of resource management are not only decentralized but also offer incentives to participants. Most resource allocation algorithms based on economic models rely on single market mechanisms. Generally, an Internet Service Provider (ISP) sets the price without consulting the consumers.

This pricing scheme is not Pareto optimal. They model the pricing as a cooperative bargaining game. Also, they extend the work for two competitive ISPs and compute a Nash equilibrium point so that the ISPs and the user cannot decide the price arbitrarily. Sometimes, economic models are ineffective with respect to sharing. Mechanism Design The main goal of mechanism design is to implement system wide solutions to problems that involve multiple self-interested agents. It can also be viewed as the design of a framework of protocols that would foster particular ways of interaction among agents with known behavioural characteristics, to bring about a globally desirable outcome. In nonstrategic social choice theory, agents have preferences but they do not try to obfuscate them to maximize their utility. Mechanism design is a strategic version of social choice theory where agents try to maximize their individual payoffs. The goal of mechanism design is to design social choice and payment functions. They design three mechanisms for procuring resources in Grid. The mechanisms presented are incentive compatible and optimal.

They also design incentive compatible broadcast protocols for adhoc networks. In traditional auctions, only price is considered. It is difficult to account for non-numerical attributes like quality, and so on, which are important in the real world. On the other hand, multi attribute auctions take attributes like quality, and soon, into account. Hence, multi attribute auctions are interesting and challenging. Once the final score is computed, then the traditional auction is performed. In the first stage, the winner is determined. In the next stage, bargaining is performed for desired quality. According to the authors, multi attribute auctions achieve higher market efficiency compared to traditional single attribute auctions. They also prove that if the dependence between the agents' valuations is bounded, then the approximation ratio achieved is close to 1.

III. Design Issues And Techniques

In this model to implement system wide solutions to problems that involve multiple self interested agents, given private information about their preferences. It can also be viewed as the design of a framework of protocols that would foster particular ways of interaction among agents with known behavioural characteristics, to bring about a globally desirable outcome. The goal of mechanism design is to design social choice and payment functions. to solve sponsored search auctions and resource procurement in grid computing. They design three mechanisms for procuring resources in Grid. The mechanisms presented are incentive compatible and optimal. They also design incentive compatible broadcast protocols for ad hoc networks. Cloud vendors are represented by $N = \{1, 2 . . . n\}$. In this procurement auction, each cloud vendor responds by bidding with total cost **ci** and promised QoS parameters. These parameters are converted into numbers **qi** using the technique presented in the previous section. Hence, the bid is an ordered pair (ci , qi).

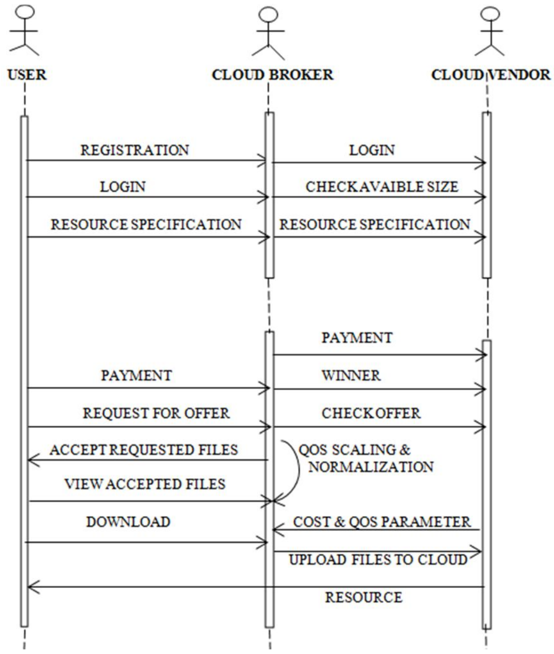

Figure 2. Cloud –Broker Interaction

It is based on game theory, assuming that players are rational and have common knowledge and private information. Rationality implies that goal is to maximize payoff. In our model, cloud vendors are rational. Hence, cloud vendors are risk neutral. Each cloud user has resource requirements. The users perform reverse auctions for procuring resources which are also called procurement auctions. Cloud vendors offer resources, but with varying costs and quality metrics. The goal of the cloud user is to minimize the total cost of procuring resources without compromising quality of service. To minimize the procurement cost, it is necessary for the cloud user to know the real costs of cloud vendors. A user announces its specifications for desired resources and quality of service to all cloud vendors, with the broker acting as a middleman. The cloud vendors decide whether to participate in the auction based on the user information and submit their bids to the broker. The broker aggregates the bidding information and selects the appropriate cloud vendor. Cloud vendors are rational and intelligent. Hence, one of them might bid with a false valuation to maximize its utility. The goal of providing incentives is to encourage truthful bidding.

Cloud vendors provide different resources with different quality-of-service levels. Hence, the QoS parameters are not the same for all cloud vendors. For example, one cloud vendor may guarantee 99 percent uptime and another 99.9 percent uptime, and so on. Also, A QoS parameter is called positive if a higher value of that parameter denotes a higher quality of service, and it is called negative if a lower value of the parameter denotes a higher quality of service

IV. PROPOSED PROTOTYPE DESIGN DETAILS

Cloud-Dominant Strategy Incentive Compatible Mechanism Dominant strategy incentive compatibility is one of the methods for truth elicitation. In this, truth telling is the best response of the participants, irrespective of other participants' strategies. Non dictatorial vendor's zero. Cloud-Bayesian Incentive Compatible the VCG mechanism is not budget balanced. Hence, the Non dictatorial compatibility which is weaker than VCG. The design of a Bayesian incentive compatible (BIC) vendor contributes money. Since cloud vendors themselves pay money for this mechanism hence budget balanced. The other cloud vendors do not get any money. In C-BIC, every cloud vendor contributes a participation fee, but only the winner gets paid. Hence, the procurement cost is less than C-DSIC. Therefore, the other cloud vendors suffer a loss. This loss is regarded as the participation fee. Since the allocation rules of C-DSIC and C-BIC are the same, C-BIC is also allocative efficient. The C-BIC mechanism cannot guarantee individual rationality. This is an important property—even though ex ante individual rationality is preserved (there is no loss to the cloud vendor if it withdraws from the auction before it submits a bid), interim individual rationality is not preserved. This implies that the cloud vendors suffer a loss if they withdraw from the auction after they submit bids.

Cloud-Optimal Mechanism:

The C-Dominant Strategy Incentive Compatible mechanism is not budget balanced. On the other hand, even though the C-Bayesian Strategy Incentive Compatible mechanism is budget balanced, it is not individually rational. The C-OPT mechanism to address the limitations of both the C-DSIC and C-BIC mechanisms. If a mechanism is Bayesian incentive compatible and individually rational, then the mechanism is optimal. Reverse auction can be applied only to single items with unit demand. In this model, both cost and Quality of Service are correlated. Hence, the design of an optimal auction is not trivial. In propose an optimal mechanism for procurement auctions for suppliers who have finite production capacity. Hence, assume that cloud vendors have finite Quality of Service. It is an important work with respect to building an optimal mechanism. Prove a set of theorems to prove a mechanism as optimal. In these theorems and prove that C-OPT mechanism is optimal.

Description of the Proposed Algorithm:

The C-OPT mechanism with allocation rule and payment rule is Bayesian incentive compatible, individually rational and revenue maximizing. C-OPT is an optimal mechanism and is more general compared to both C-DSIC and C-BIC. Assume that cloud vendors are symmetric in C-DSIC and C-BIC. But in realistic scenarios, different cloud vendors may have different price distributions. On the other hand, C-OPT can be applied when φ1, φ2 ... φn. C-OPT reduce to C-DSIC under the following conditions:

- Cloud vendors are symmetric.
- The joint distribution function is regular.

C-DSIC is prone to bidder collusion and is not budget balanced. In C-BIC, losing cloud vendors lose their money. In COPT, the cloud vendor can neither overbid nor underbid. If the cloud vendor overbids, then incentive is not paid. On the other hand, if it underbids, then it will not be the winner. C-OPT are suitable in a larger set of real-world contexts than C-DSIC and C-BIC. The mechanisms presented in this paper havelinear time complexity. They are appropriate for implementing procurement auctions

Step 1: Generate the input values on set of bids b1, b2...., bn.
Step 2: Output values in the winner and payments for participants (h1, h2...., hn).
Step 3: Calculate the minimum bid of value.
Step 4: Check the below condition for each bidding.
For I = 1 to n do
Compute Hi;
If (Hi<min) then min □Hi;
Winner = I;
End
For i=1 **to** n **do**
Hi (bi) = cigi (b) + $\int X_i(y,q_i)d_i$
Step 5: Select the winner on the basis of minimum bid value.
Step 6: Each cloud vendor I can be calculated.
Step 7: End.

The C-DSIC mechanism is not budget balanced. On the other hand, even though the C-BSIC mechanism is budget balanced, it is not individually rational. Hence, to propose the COPT mechanism to address the limitations of both the C-DSIC and C-BIC mechanisms. According to Myerson, if a mechanism is Bayesian incentive compatible and individually rational, then the mechanism is optimal. Myerson's optimal auction can be applied only to single items with unit demand. In our model, both cost and QoS are correlated. Hence, the design of an optimal auction is not trivial. Iyengar and Kumar propose an optimal mechanism for procurement auctions for suppliers who have finite production capacity (capacitated suppliers). Practically, it is not possible for cloud service providers to \ guarantee infinite QoS for every cloud user. Hence, assuming that cloud vendors have finite. By Myerson, a mechanism that satisfies the above constraints and maximizes cloud user profit is optimal. In our model, the cloud user has QoS requirement and QoS plays an important role in the selection of cloud vendor. This multidimensional attribute of cloud vendors makes this a nontrivial problem. The properties of optimal procurement mechanism with capacitated suppliers are: The expected surplus of the winning vendor is called the information rent of the vendor. Classically, surpluses like supplier surplus and consumer surplus are examples of information rent. Vendors are symmetric in CDSIC and C-BIC. But in realistic scenarios, different cloud vendors may have different price distributions. On the other hand, C-OPT can be applied when _1 6¼ _2 6¼ _ _ _ 6¼ _n. C-OPT reduces to C-DSIC under the following conditions: Cloud vendors are symmetric. The joint distribution function is regular. C-DSIC is prone to bidder collusion and is not budget balanced. In C-BIC, losing cloud vendors lose their money. In C-OPT, the cloud vendor can neither overbid nor underbid. If the cloud vendor overbids, then incentive is not paid. On the other hand, if it underbids, then it will not be the winner. Hence, C-OPT is suitable in a larger set of real-world contexts than C-DSIC and C-BIC. The mechanisms presented in this paper have linear time complexity. Hence, they are appropriate for implementing procurement auctions.

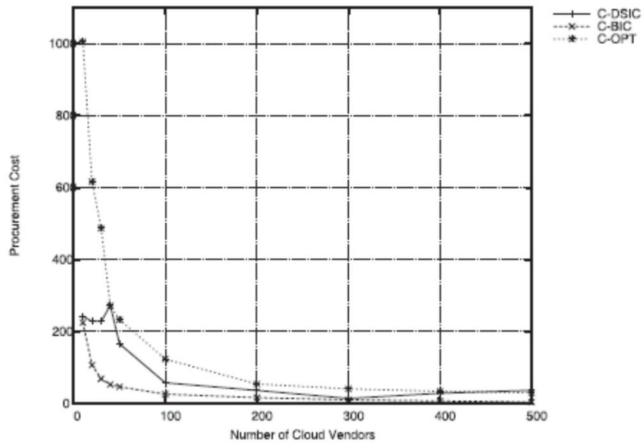

Figure 3. Resource accomplishment Cost Comparison

V. CONCLUSION

The Cloud Resource accomplishment of cloud resource is not only an important problem in cloud computing but is also an unmapped area. Currently, cloud resource accomplishment is done manually and there is a pressing need to automate it. To mechanize cloud resource accomplishment, we have presented three mechanisms: C-DSIC, C-BIC, and C-OPT. C-DSIC are a low bid auction. It is allocated efficient and individual rational but not budget balanced.IN CDSIC truth telling is the best response of the participants, irrespective of other participants' strategies and Non dictatorial vendor's zero. In CBIC this mechanism is budget balanced and every cloud vendor contributes a participation fee, but only the winner gets paid. Hence, the accomplishment cost is less than C-DSIC. The C-OPT mechanism to address the limitations of both the C-DSIC and C-BIC mechanisms. C-DSIC is prone to bidder collusion and is not budget balanced. In C-BIC, losing cloud vendors lose their money. In C-OPT, the cloud vendor can neither overbid nor underbid. If the cloud vendor overbids, then incentive is not paid. On the other hand, if it underbids, then it will not be the

REFERENCES.

[1] P. Mell and T. Grance, The NIST Definition of Cloud Computing, NIST Special Publication 800-145, Nat'l Inst. of Standards and Technology,USDept.ofCommerce,http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf, Sept. 2011.

[2] S. Grivas, T.U. Kumar, and H. Wache, "Cloud Broker: Bringing Intelligence into the Cloud," Proc. IEEE Third Int'l Conf. C loud Computing (CLOUD), pp. 544-545, July 2010.

[3] M.F. Mithani, M. Salsburg, and S. Rao, "A Decision Support System for Moving Workloads to Public Clouds," GSTF Int'l J. Computing, vol. 1,no. 1, pp. 150-157, Aug.2010,doi:10.5176_2010-2283_1.1.25.

[4] B. Rochwerger, J. Tordsson, C. Ragusa, D. Breitgand, S. Clayman,A. Epstein, D. Hadas, E. Levy, I. Loy, A. Maraschini, P. Massonet,H. Mun˜oz, K. Nagin, G. Toffetti, and M. Villari, "RESERVOIR—-When One Cloud is Not Enough," Computer, vol. 44, no. 3, pp. 44-51, Mar. 2011.

[5] Y. Yang, Y. Zhou, L. Liang, D. He, and Z. Sun, "A Sevice-Oriented Broker for Bulk Data Transfer in Cloud Computing,"Proc. Ninth Int'l Conf. Grid and Cooperative Computing (GCC), pp. 264-269, Nov.2010.
[6] B.J. Lheureux and D.C. Plummer, "Cloud Services Brokerages:The Dawn of the Next Intermediation Age," Research Report G00208731,Gartner, http://www.gartner.com/DisplayDocument?doc_cd=208731, Nov. 2010.
[7] F. Ridder and A. Bona, "Four Risky Issues When Contracting for Cloud Services," Research Report G00210385, Gartner, http://bit.ly/S6L4Zx,Feb. 2011.
[8] R. Weiss and A. Mehrotra, "Online Dynamic Pricing: Efficiency, Equity and the Future of E-Commerce," Virginia J. Law and Technology, vol.6, no. 2, 2001.
[9] M. Bichler, J. Kalagnanam, K. Katircioglu, A.J. King, R.D.Lawrence, H.S. Lee, G.Y. Lin, and Y. Lu, "Applications of Flexible Pricing in Business-to-Business Electronic Commerce," IBM Systems J., vol. 41, no. 2, pp. 287-302, 2002.
[10] Y. Narahari, C. Raju, K. Ravikumar, and S. Shah, "Dynamic Pricing Models for Electronic Business," Sadhana, vol. 30, pp. 231-256, 2005.