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Cloud Broker System with Data Deduplication Technique: A Review

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ABSTRACT: - To meet the increased demand from corporate customers for exclusive use of inter-datacenter bandwidth, cloud providers now buy a lot of bandwidth from Internet service providers. Cloud providers can't make the most money by boosting revenue or lowering costs for exclusive bandwidth services. The complexity of scheduling services to satisfy user demands from cloud providers is exacerbated by the wide range of bandwidth prices and the unpredictable arrival time of user requests. We propose in this work to assist cloud providers in maximizing their service profitability by effectively picking which user requests to serve rather than attempting to meet all of them. We formulate and establish the NP-hardness of the problem of service profit maximization. We offer a system to handle offline request submission that maximizes service profit by alternating between maximizing service revenue and decreasing service expense. We offer an online scheduling algorithm that carefully addresses the risk of not being able to pay off the incremental service cost and makes scheduling decisions in real time to optimize service profit under online request submission. Our comprehensive tests show that our solutions can generate more than 1.6 times the service revenues of traditional systems.

KEYWORDS: Cloud computing, Broker, Profit, Deduplication.

I. INTRODUCTION

Now a day's cloud computing is rapidly becoming an effective and efficient way of computing resources and computing services. Cloud provides dynamic resource pools, virtualization, and high availability. Cloud computing is the delivery of resources and computing as a service rather than a product over the Internet, such that accesses to shared hardware, software, databases, information, and all resources are provided to consumers on demand. Customers use and pay for services on demand without considering the upfront infrastructure costs and the subsequent maintenance cost. New IT commercial model, profit is an important concern of cloud service providers. The cloud service providers rent resources from infrastructure providers to configure the service platforms and provide paid services to customers to make profits. Cloud computing is a computing paradigm, where a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. With the advent of this technology, the cost of computation, application hosting, content storage and delivery is reduced significantly. One important feature of cloud computing is pay-as-you-use, which contains two meanings. First, according to the customer resource demand such as CPU, memory, etc., the physical machines are dynamically segmented using virtualization technologies and provided to customers in the form of virtual machines, and customers pay according to the amount of resources they actually consumed. Second, the VMs can be dynamically allocated and de-allocated at any time, and customers should pay based on how long the resources are actually used. Nevertheless, the pay-as-you-use pricing model is presently only conceptual due to the extreme complexity in monitoring and auditing resource usage.

The cloud systems primarily focus on finding an effective resolution for the resource management. It is web based mostly computing wherever virtual shared servers provide infrastructure, platform, software, devices and other resources and hosting to customers on a pay-as-you-use basis. In business ideas the profit is that the main issue to be exists within the field of the specific environment. Obviously, the requirement of profit maximization in cloud computing environment is needed. By delay scheduling the low priority requests, the purchased instances can be fully utilized and broker's profit can be increased considering the priority of requests. Hence, in this paper, we will take advantage of jobs' priority to design new algorithms to maximize the profit of cloud broker. After the broker has

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reserved resources from cloud providers, the next step is to price the resources to users. Pricing is one of the most critical component of cloud computing since it can directly influence the revenue of cloud providers/brokers and the budget of customers.

However, most previous researches about brokerage service mainly focus on designing resource reservation approaches from providers, while seldom consider the pricing schemes for users. In this paper, we notice that priority is of huge benefit for broker's resources reservation, because low priority jobs can be delayed to the future. Accordingly, we need to design a priority aware pricing for the broker. Today's the sixty billion servers are working in this world. Therefore the server required a large amount of power. Normally between the user and server has some agreement i.e., service level agreement. In this service level agreement, defined the Quality of service need to provide for the user and the maximum needed execution time. If the service provider violates this service-level agreement no charge is provided for the specific service. So there will be the loss of the profit. Here valuation of the optimal speed and size of the input the SLA is provided and here a pricing model is developed consistent with optimal size and speed and service charge is calculated. Therefore the service supplier or provider can maximize the profit.

II. LITERATURE REVIEW

1. Mohsin Nazir , "Cloud Computing: Overview & Current Research Challenges", This paper shows what cloud computing is, the various cloud models, and the architecture of cloud computing. This research will define the security risk and challenges occurred in these technologies. Various issues defined in this projects like: Platform Management, Data Encryption, Interoperability, Cloud Data Management and security, SLA (Service Level Agreement) and so on. Limitation: Security is one of the major issues which hamper the growth of cloud.
2. Monjur Ahmed, Mohammad Ashraf Hossain, "Cloud Computing And Security Issues In The Cloud", This paper presents a review on the cloud computing concepts as well as security issues inherent within the context of cloud computing and cloud infrastructure. Location transparency is one of the prominent flexibilities for cloud computing, which is a security threat at the same time – without knowing the specific location of data storage, the provision of data protection act for some region might be severely affected and violated. Trust is another problem which raises security concerns to use cloud service for the reason that it is directly related to the credibility and authenticity of the cloud service providers.
3. Victoria Paulsson, Vincent C. Emeakaroha, John Morrison, Theo Lynn "Cloud Service Brokerage: A systematic literature review using a software development lifecycle", The paper aims to provide an overview of CSB research status, and give suggestions on how CSB research should proceed. A descriptive analysis reveals a lack of contributions from the Information Systems discipline. A software development lifecycle analysis uncovers a severe imbalance of research contributions across the four stages of software development: design, develop, deploy, and manage. This paper provides two key contributions to the research community. First, it provides an overview of the CSB research community on how they are evolving. To the best of our knowledge, a systematic review, like this, is the first of its kind on the emerging CSB topic. Second, it highlights areas that future research contributions in the CSB are required, both in Computer Science and Information Systems. Limitation: CSB is clearly a complex software system, in which insights from other disciplines apart from Computer Science and Information Systems, such as economics (e.g. profit maximisation), and law (e.g., service level agreement, and territorial jurisdiction) are required.
4. Ravi Khurana, Rajesh Kumar Baw, "Quality Based Cloud Service Broker for Optimal Cloud Service Provider Selection", Cloud consumers (CC) are confounded while taking the choice of selecting Cloud service provider (CSP) to accomplish Cloud services. Large number of CSPs are present in the market, which provide diverse cloud administrations viz Platform-as-a-Service PaaS, Infrastructure-as-a-Service IaaS and Software-as-a-Service SaaS. CSPs are conveying their Cloud services to CC in light of Service Level Agreement (SLA). In this archive, every one of the transactions have been obviously characterized, what nature of administration will CSP give and what the consumer should pay have been dispassionately characterized. Unfortunately, SLA is not strictly pursued; quality of service is not accomplished. Cloud service broker (CSB) is an entity which can resolve all these issues. They are shifting their sensitive data on the cloud. To get a cloud service, they have to contact cloud service provider. Now, huge number of providers are available in the market. To locate a perfect provider who can fulfill their need is a skillful job. This job can be accomplished by cloud service broker.
5. Rajesh Pal, Samaresh Mishra and PrasantKu.Patnaik, "Study on Cost Estimation of Service Delivery in Cloud Computing Environment", Cloud computing allowed multiple providers to offer basic computational resources to consumers as a digital service with the benefits of 'on-demand' and 'pay-per-use' characteristics of cloud. Basically Cloud Computing is an internet based distributed computing where user only concentrate

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on more on their business process rather than spending time the managing process. Here estimating cost is very important for cloud application when it needs remaining a certain services level at the same time interval.Moreover estimating cost of business applications or scientific applications in cloud computing environment, recently a biggest challenge for software developers, when the application has quality of service requirements. Cloud services offer a range of economic benefits to their users and to the economy as a whole. This paper summarizes how the cost estimation occurs in the cloud computing environment and how it will be more efficient to calculate the actual cost of different services with the help of proposed models and techniques.

6. Almomani, "A variable service broker routing policy for data center selection in cloud analyst", proposed a Variable Service Broker Routing Policy, which aims to achieve the minimum response time through considering the communication channel bandwidth, latency and the size of the job. The proposed service broker policy can also reduce the overloading of the data centers by redirecting the user requests to the next data center that yields better response and processing time. Improving the financial cost and power consumption is still to be researched and improved if possible.
7. Srinivasan, "Profit maximization scheme with guaranteed quality of service in cloud computing", To assure the quality of service requests and maximize the profit of cloud service providers, this paper has proposed a novel Double Quality Guaranteed renting scheme for service providers. This scheme combines both short term renting and long term renting, which can reduce the resource waste greatly and adapt to the dynamical demand of computing capacity. Further, we improving the user interface, by having graphs for profit and time taken for handling service request. Profit maximization problem is a heterogeneous cloud environment.
8. Chaturvedi, "Profit Based Data Center Service Broker Policy for Cloud Resource Provisioning", In this paper, the author suggest & propose a Cloud Brokering Framework that supports all the brokering steps along with proposed profit optimization consideration. The simulation scenario is carefully generated to show the effectiveness of algorithm. As a future scope of work, the framework can be extended with more effective policies at each level of lifecycle. The work can be extended for evaluation of Service Level Agreements (SLAs).
9. Buyya, "Revenue Maximization with Optimal Capacity Control in Infrastructure as a Service Cloud Markets", In this paper, the author presented a revenue management framework to tackle the problem of optimal capacity control for allocating resources to customers. The main challenge is that the provider must find an optimal capacity to admit demands from the reservation market such that the expected revenue is maximized. The future direction of this work involves the extension of the revenue management framework with overbooking strategies.
10. Zhang, "Dynamic Resource Allocation for Spot Markets in Cloud Computing Environments", In this paper, we consider the case of a single cloud provider & address the question how to best match customer demand in terms of both supply and price in order to maximize the providers revenue and customer satisfactions while minimizing energy cost. To model this problem as a constrained discrete-time optimal control problem, used Model Predictive Control to find its solution, proposed solution achieves better net income and minimizes the average request waiting time. Further, we are also interested in conducting more extensive experiments using workload datasets that contain price information.

III. PROBLEM STATEMENT

In the existing system, the problem is that if many customers request a large number of cloud services simultaneously, the cloud service broker cannot purchase sufficient cloud services from CSPs to satisfy the demand of all the customers. Then, a peak-demand problem arises in which customers cannot complete their work. Hence, dynamic conditions not only could result in economic problems but also could have a negative impact on the work of customers. The number of cloud services that can be purchased by the cloud service broker is limited. When the demand of all customers increases greatly and reaches the limit, the peak-demand problem arises, and the demand-response mechanism starts to work.

Existing System solution:

In the existing system, the problem is that if many customers request a large number of cloud services simultaneously, the cloud service broker cannot purchase sufficient cloud services from CSPs to satisfy the demand of all the customers. Then, a peak-demand problem arises in which customers cannot complete their work.

In the proposed system main focus on guaranteed the service quality of all requests, reduce the resource wastage, provide more security and optimize profit maximization. All jobs are scheduled by the job scheduler and assigned to different VMs in a centralized way. An optimal configuration problem of profit maximization is formulated in which

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many factors are taken into considerations, such as the market demand, the workload of request, the SLA, the rental cost of services, and so forth.

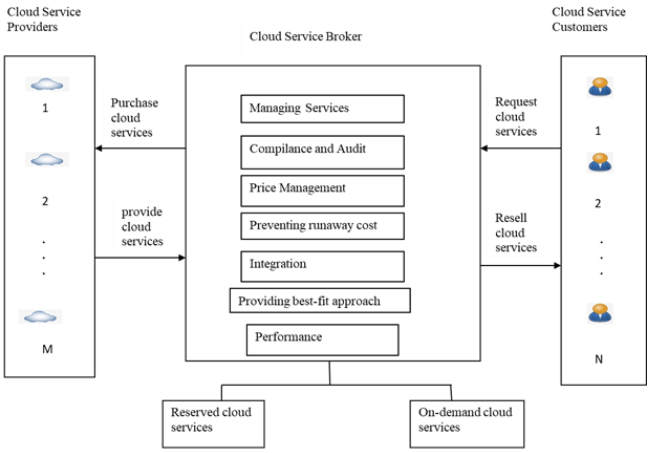

Fig 1. System Architecture

In the proposed system main focus on guaranteed the service quality of all requests, reduce the resource wastage, provide more security and optimize profit maximization. All jobs are scheduled by the job scheduler and assigned to different VMs in a centralized way. An optimal configuration problem of profit maximization is formulated in which many factors are taken into considerations, such as the market demand, the workload of request, the SLA, the rental cost of services, and so forth.

We also implement Data de-duplication is a technique for eliminating duplicate copies of data, and has been widely used in cloud storage to reduce storage space and upload bandwidth. However, there is only one copy for each file stored in cloud even if such a file is owned by a huge number of users. As a result, de-duplication system improves storage utilization while reducing reliability. Furthermore, the challenge of privacy for sensitive data also arises when they are outsourced by users to cloud.

Deduplication

In recent time, there are many problems of storage places in cloud. If data holder store file in cloud which is already available in cloud, so this is waste of memory.

So, in this paper we remove the deduplication. Also, security issues are occur during the cloud server data storage. We are solving these problems with the help of double encryption technique and hash code techniques for generate hash value

Data Holders

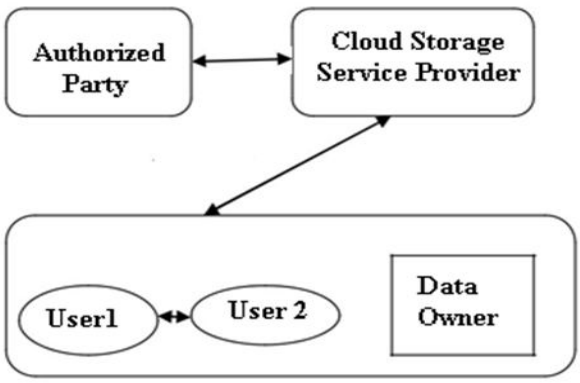

Fig 2: Deduplication

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- **CSP:** The CSP is allowing to data owner for storage services of data. It cannot be fully trusted. Therefore it is curious about the contents of stored data. It should perform honestly on data storage in order to gain profit.

- **Data Holder:** The data holder can uploads and saves their data and files in the CSP. In this system is possible to number of data holders could save their files in encrypted raw data in the CSP. The file is regarded as data owner by the data holder that produces or creates the
  File. The data holder is in normal form than the higher priority of owner.
- **AP:** an authorized party (AP) that is fully trusted by the data holders. The data holders to verify data ownership and handle data deduplication. It does not collude with CSP. In this case, CSP should not know the plain user data in its storage. AP cannot know the data stored in CSP.

Algorithm:

1. Blowfish Algorithm for Encryption.

Step 1: Data owner Select File
Step 2: Encrypt File (For encryption we use BlowFish).
Step 3: Upload file on cloud or store the file on secondary storage.
Step 4: CSP or Controller check the duplicate file available on cloud or secondary storage.
Step 5: If found then remove the duplication and maintain index.
Step 6: On non-duplicate data CSP again check resemblance detection of similar chunk.
Step 7: If resemblance found then reduce it create delta store.
Step 8: Again on non-similar data check resemblance detection.
Step 9: If resemblance found then reduce it store similar data in delta store.
Step 10: Finally non similar data stored into secondary storage or Cloud storage

IV. CONCLUSION

We focus on the profit maximization problem of cloud brokers. In this project we try to guide cloud brokers on how to configure the virtual resource platform and how to price their service such that they can obtain the maximal profit.

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