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A Critical Review on Cloud Brokerage Services

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ABSTRACT-Cloud Brokerage Service (CBS) budding technology that has become popular with cloud computing. CBS is a middleman providing value added services. This paper provides a systematic literature review on this topic, covering multiple publications during last preceding 10 years. The paper is aiming to provide an overview of CBS research status, and give suggestions on how CBS research should proceed.

KEYWORDS: Cloud Brokerage Service, CBS, Cloud Computing, Cloud Provider

I. INTRODUCTION

Currently, one cannot deny that Cloud computing is one of the biggest trends in the IT industry today. Recently a research based on survey from Eurostat [5] indicates that 46% of European enterprises are highly dependent on cloud computing. The definition of cloud broker service cited by US National Institute of Standards and Technology (NIST) as "an entity that manages the use, performance, and delivery of cloud services, and negotiates relationships between Cloud Providers and Cloud Consumers" [13]As quoted by Bikram Singh Bedi, MD, Google Cloud India Traditional companies will accelerate their transition to cloud in 2024; therefore, more stress will be given to AI in coming time in Indian market. 'The Hindu' on its website reported that the overall India public cloud services market is expected to reach $13.0 billion by 2026.

II. BACKGROUND

A cloud denotes the inter-connection of several computer systems in a network. The cloud providers offer their service via virtualization technologies to cloud user. The system stores the client credentials on the company server at a remote or far-flung location. All the actions taken by the client is executed in a distributed environment and as a result, the complexity of maintaining the software or infrastructure is minimized. Usually cloud providers provide three types of services namely: Infrastructure-as-a-Service (IaaS), Software-as-a-Service (SaaS), and Platform-as-a-Service (PaaS). Mell, P., Grance, T. [11] mentioned that the Cloud Computing services are characteristically identified by service type differentiated by a given resource (e.g., application (SaaS), platform (PaaS) and infrastructure (IaaS) level).Through cloud computing a client can store information on a remote site and hence there is no need of storage infrastructure. The role of web browsers is of an interface between the client and remote machine to access data by logging into the user account. Clients or users always prefer cloud resources at a low cost with high efficiency in terms of time and space. In a condition where most of the cloud service providers (CPs) provide nearly similar services, customers or users will find it difficult to select the appropriate service provider. Cloud Broker Services (CBS) play a major role as a middleware to combat with this confusing selection issues. Cloud broker works as a negotiator between the user and cloud service provider. Firstly, cloud provider needs to register with cloud broker all the details on offerings and then the user submits request to broker. Then the broker will suggest the best provider based on the service type and requirement given by the cloud user. Upon confirmation from the user, broker establishes the connection to the provider. Kapgate [9] They have developed a CBs by integrating the advantages of 'Service Proximity Service Broker' and 'Weighted Round Robin Service Broker' Algorithm. The algorithm developed optimized the number of connections and reduced the average DC request service timing and hence, researches illustrated that proposed algorithm improves the performance of existing SPSB algorithm.

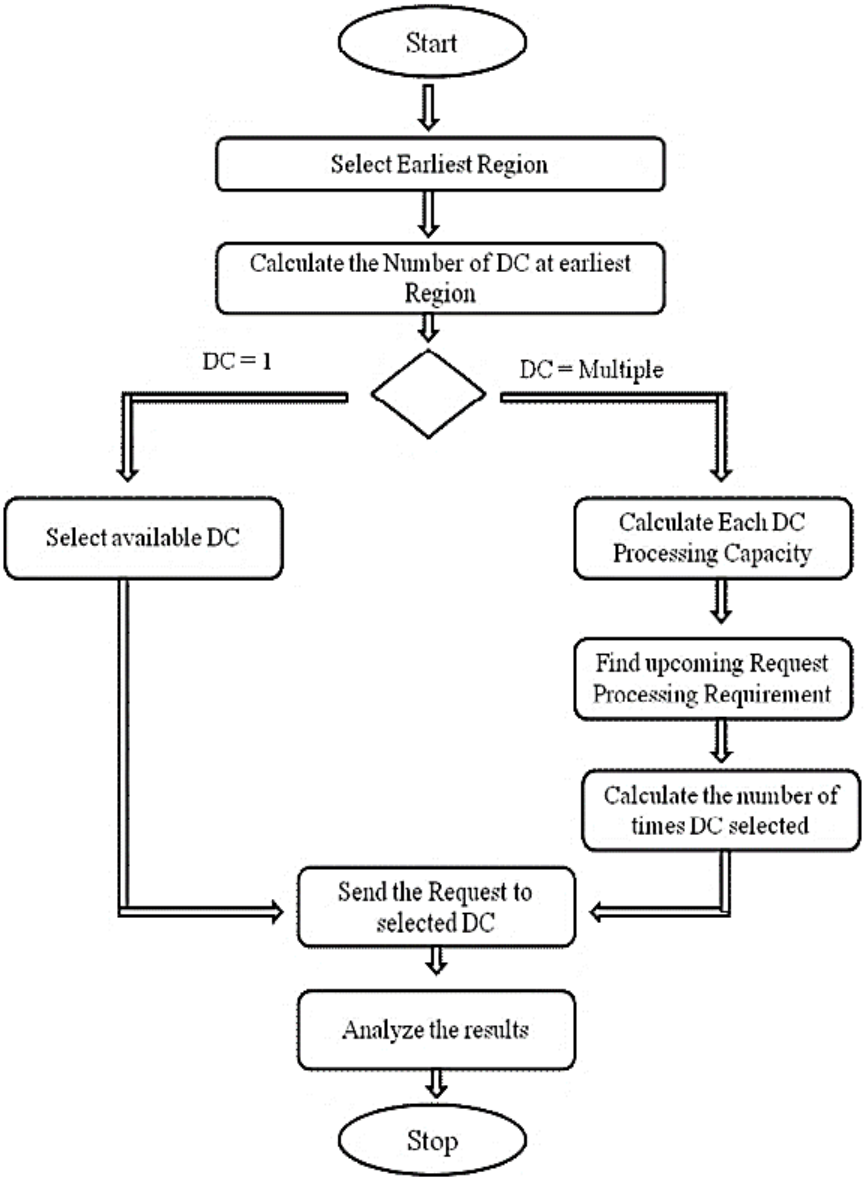

Figure 1. Proposed CBs algorithm [9]

III. LITERATURE REVIEW

Al-E'mari et, al.[1] did a survey based review study on the selection of CBs. They compared the CBs policies, highlighting their strengths and limitations and concluded that DC selection remains a noteworthy challenge within cloud computing environments. Kumar et. al. [10]. They proposed 'OPTCLOUD', a broker-based framework for cloud service and this framework includes three distinct components namely;

- Cloud broker,
- Cloud benchmark service provider, and
- Cloud service repository.

The researchers did a study on the effects of the correlation of QoS criteria and anticipated a novel cloud service selection algorithm which combines PCA and BWM. The framework OPTCLOUD demonstrated better feasibility and efficiency through a series of experiments with real datasets and the result outperformed the other frameworks. Chauhan et. al.[2] stated that during the recent years many researchers introduced and discussed various techniques to solve cloud service selection problem using multi-criteria decision making approach. Chauhan & others designed and developed a BSS model for Service selection by employing integrated weighting approach. Both the Subjective and objective weights are combined to obtain integrated total weight of QoS parameters. Simulation based evaluation of service selection method with a case study has been done. They analyzed the results by employing sensitivity analysis to validate the rank reversal problem. Later the researchers concluded that their proposed algorithm BSS, works similar to existing methods for cloud service ranking. Hussain et al. [7] have developed a CC framework, 'CSSaaS' for cloud service selection in cloud computing environment. CS-SaaS designed with two folds, namely; monitoring & indexing and filtration & recommendation. The first part of monitoring & indexing contains a benchmarking or monitoring service, an indexing service with an indexed services database. The later part of the filtration & recommendation component contains a need base identification service, a filtration service, and a ranking or recommendation service. The results obtained via this model shows that CS-SaaS performs better compared to

other state of the art solutions. CS-SaaS do not consider discrete values for evaluation of cloud services. Elhabbash et al. [4] provides a systematic survey on cloud brokerage. They identify the different approaches of cloud brokerage and classified it. They characterize the cloud broker by creating a novel taxonomy. They have created few research questions and based on the question they have created the taxonomy of the broker. The different functionality of the broker includes decision support, enforcement of policies, monitoring the service, negotiation of SLA, migration, deployment of application, interoperability and so on.Thakur, A., & Goraya, M. S.[14] They did a survey based review by introducing a taxonomy of load balancing and concluded that the Load balancing helps to improve resource utilization, performance, and energy conservation by optimally distributing the workload among multiple computing machines in the datacenter.Peddi, et. al.[12] prepared a broker based on cloud computing data processing algorithm for mobile e-health multimedia applications, and verified its feasibility and performance by integrating it with Eat Health Stay Health (EHSH), a specific mobile application. The application of EHSH contains food image processing, deep learning for food recognition and classification with calorie estimation. They found that the developed framework resulted positively and recorded a 45% gain in the overall time taken to process the images in the cloud.Jayapriya et al. [8] proposed 'CorQosCloudRank' framework for recommending Cloud service based on the QoS ranking forecast method. The average rate of successful delivery and response time for the given request from the cloud consumer is the primary factor in ranking the framework.Ghosh et al. [6] have developed a framework called SelCSP (Selection of Cloud Service Provider) for selecting the best cloud service provider by analyzing the risk with them. They said that due to the rapid improvement in the cloud technology, the service providers are increasing with similar offerings.Dharmesh Mistry [3] mentioned a CC-based analytics solution as a service from a cloud broker which could considerably minimize costs for the client, though supporting Independent Software Vendor (ISV) to maximize profit. As the data comes, it is divided and indexed and lastly it is mapped to original values through analysis. Large entities and businesses are preferring such software as a 'SaaS' as a substitute of obtaining and hosting software internally. But for ISVs that constructed their business by the traditional model. The cloud broker acts as middleware between the ISV and cloud providers. ISV yields solution to meet customer demands from for existing services. The services provided by broker like; entitlement, analytics, billing and payment, security and context provisioning. ISVs usually rely on pre-module licensing models and software audits to confirm that the appropriate number of users access the modules and functions for which the customer will be paid.

IV. CONCLUSION

This paper presented the very recent work of authors designed a broker -based cloud service model. A Cloud Broker service provider supplies technology to take on some of the activities of the brokerage function, and offers combined technology, people, managed services and methodologies to implement and manage CBs-related projects and requirements. A cloud service model with the inclusion of cloud broker and its desirable features, appropriate service selection and its ranking towards fulfilling the customer's service requirements is the main projection for upcoming future work.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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