Communication in Cloud-of-Clouds Environment for Brokers

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***Abstract*—** In advancement of cloud brokers for communication between different cloud providers, and the cloud-of-clouds territory denoting the integration of different clouds- including clouds offering different abstractions and services (e.g., Infrastructure as a Service vs. Platform as a Service) present new challenges to software developers. Actually, while support for developing specific types of applications to run in different individual cloud infrastructures is slowly becoming acceptable, there is little support for programming applications that run across several clouds or types of clouds. Combination of application, datacenters, and programming techniques in the multi-cloud environment poses numerous difficulties to framework engineers. Diverse cloud suppliers offer distinctive communication abstractions, and applications shows distinctive correspondence designs. By abstracting from hardware addresses and lower-level communication.

Keywords *- Cloud Computing; Communication; Cloud-of-Clouds; Brokers; Cloud Service Providers;*

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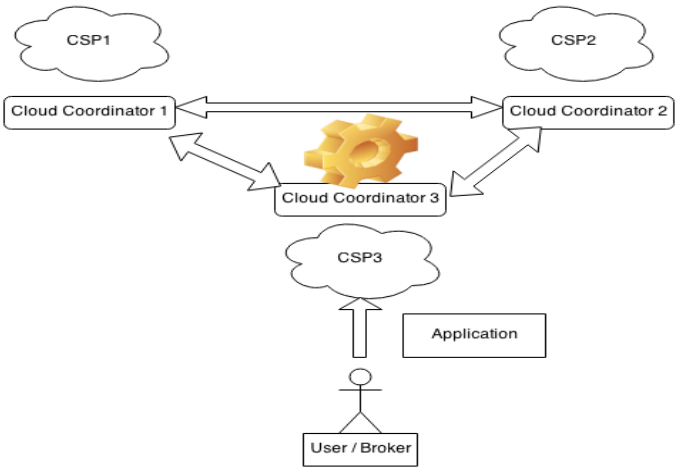
I. INTRODUCTION

The advancement of cloud brokers for arbitrating between different cloud Service providers, and the cloud-of-cloud prototype denoting the integration of different cloud including clouds proposing different abstractions (e.g., infrastructure as a service versus platform as a service) lay new challenges to software developers. So, while support for developing specific types of applications to run in different individual cloud infrastructures are slowly becoming gave, there is somewhat support for programming tools and applications that run throughout several clouds or types of clouds. The cloud-of-cloud prototype needs integration of multiple data-centers, cloud abstractions, and applications. Different cloud providers offer different communication patterns, and applications demonstrate different communication patterns [1].

Cloud technologies and models have yet to reach their full potential and many of a level that allows their development to a full degree. Currently, there is a lack of efficient automation of the processes underpinning the management of internal clouds and interaction between public-private clouds[2].



II. NEED OF THE BROKERS

A) Cross cloud provisioning engine

This is the key part. In the event that you simply have this and overlook each other viewpoint, you'll have cloud broker software prepared to tackle genuine migrations. This motor ought to have the capacity to procurement server cases crosswise over single or numerous cloud platforms– which is perfect for undertakings embracing hybrid cloud methodology, gives limit arranging and burden examination and in particular, help dataportability and conceivably application interoperability. Sounds a considerable measure like software layer running on Paas cloud. The engine ought to likewise cover key security and privacy.

B) Application Discovery

Should empower revelation of different Saas applications crosswise over distinctive cloud offerings. There must be a system to control and prioritize application revelation focused around the needs of the enterprise.

C) Identity Management

A character and qualification administration segment which controls access to different cloud administrations for the customer. It might conceivably give abstraction to the native identity and access control and administrations of the individual cloud providers.

D) Billing

This is basic to cloud achievement. Coupled with provisioning engine, the cloud user will have the capacity to discover the best fit for their enterprise applications and information being served out of the cloud. Cloud broker software ought to give a charging framework which precisely logs uses focused around genuine utilization information over the complete cloud arrangement of an enterprise.

E) Extensible

Cloud broker software itself ought to be offered as an cloud application which can be deployed with any cloud provider. Besides, it ought to be extensible so the enterprise can add its own particular custom segments to it.

With the expansion of cloud providers in all shapes and sizes (Paas, Iaas and Saas and so on), its presently critical to have a norms based stage which facilitates the procedure of migratioand administration of a enterprise's cloud portfolio.

III. Cloud Service Broker System Architecture

The model consists of N users {C1,C2, ..,CN} and M CSPs {P1, P2, .., PM} which are connected together through a Broker. Broker maintains few databases about the current system to aid users and CSPs to make their business decisions. A detailed architecture for the Broker is illustrated in Figure. This Broker architecture consists of three major components as described below.

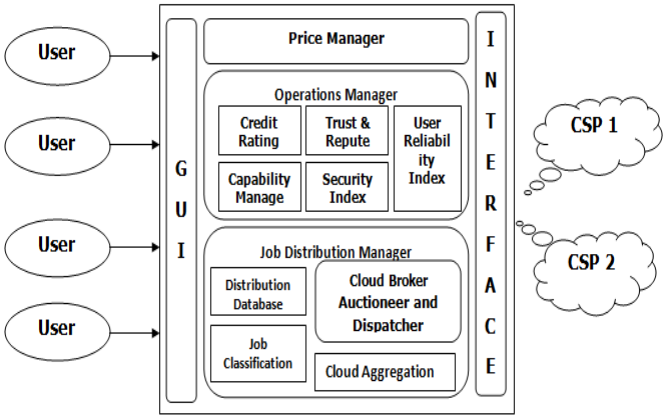


Figure : Architecture of the Proposed Multiple-Cloud Orchestration Mechanisms

A) Job Distribution Manager (JDM)

Job Distribution Manager is responsible for receiving User's job requirements, choose appropriate CSP selection strategy, informing appropriate CSPs about the jobs, and maintaining the job distribution statistics. When a user submits job requirements, the Job Classification module analyzes the job requirements and decides the preferred CSP selection strategy (either Cloud Service Arbitrage or Cloud Aggregation). In this thesis, we discuss three Cloud Service Arbitrage mechanisms wherein the users and CSPs behaves according to market situation to maximize their corresponding utilities. If the policy is Auction-based mechanism, then the Auctioneer module will control the auction process and decides the winners. If the user wants aggregate its application across multiple Clouds, then the Cloud Aggregation unit will perform the necessary action. In all schemes, the Dispatcher module dispatches the job to corresponding CSPs after the CSP selection process is completed. Further, the Distribution Database maintains a database about the job distribution statistics such as the winning CSP. This helps both CSPs and users to analyze their performance in the past with respect to other competing players in the market. For choosing appropriate CSPs and consolidating price information, JDM communicates with other components in the Broker.

B) Operations Monitor (OM)

Operations Monitor (OM) monitors, manages and maintain various information pertaining to both users and CSPs. The Capability Management module maintains databases about different resources and services offered by various CSPs. It also updates this information periodically when it notices any changes in the services offered by existing CSPs or when new CSPs enter the market. JDM makes use of this information to short-list the list of CSPs for participating in the game whenever a new job request arrives at JDM. The modules Trust and Reputation and Security Index maintain information about the Reputation and security values of various CSPs from time to time. These values are supplied to users when requested. Users, based on their preferences use these values to choose appropriate CSP. A cumulative credit value is also derived based on these indices and user feedback which is maintained by the Credit Rating module. Moreover a user reliability index is maintained by the User Reliability Index module. This is derived based on the trustworthiness of the feedback received from the users. This value is used by CSPs in making their price offer and by other users in forming their utility functions.

C) Price Manager (PM)

The Price Manager (PM) maintains the price offers supplied by CSPs from time to time. It is also responsible to calculate the current market price for different resources. This is used by CSPs to adjust their price offers. It also maintains other financial matters such as maintenance of integrated billing information which can collectively calculate, display and manage the billing information from all the CSPs for the users.

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IV. Conclusion

Developing and composing application framework executing in the cloud-of-clouds requires generic communication mechanisms. Existing frameworks though providing generic communication abstractions lack flexibility for wide applicability since they do not operate efficiently across communication patterns, exhibiting large performance gaps to more specific solutions. Thus we can observe that for a given load and application, Broker can derive optimal number of processors required for processing as well as the fraction of data for each processor based on network heterogeneity. In this way, Broker can incorporate some important intermediation services which can help users to reduce their application execution time and the total monetary cost.

REFERENCES

[1] Chamikara Jayalath, Julian Stephen, and Patrick Eugster "Universal Cross-Cloud Communication" IEEE TRANSACTIONS ON CLOUD COMPUTING, VOL. 2, NO. 2, APRIL-JUNE 2014.

[2] Ganesh Neelakanta Iyer "Broker-Mediated Multiple Cloud Orchestration Mechanisms for Cloud Computing" Department of Electrical and Computer Engineering National University of Singapore A thesis submitted for the degree of Doctor of Philosophy 2012

[3] Optimized Infrastructure Services "Requirements and Architecture of a Cloud Broker"

[4] M.Geethanjali, J.Angela Jennifa Sujana T.Revathi "Truthful Dynamic Scheduling Algorithm Based on Multi objective for Multi cloud Environments" 2014 IEEE International Conference on Innovations in Engineering and Technology (ICIET'14)

[5] Kiran Bala1 and Sahil Vashist2 "Machine Learning based decisionmaking by brokers in cloud computing" International Journal of Application or Innovation in Engineering & Management (IJAIEM) Volume 3, Issue 7, July 2014

[6] Neeraj Kumar SrivastavaȦ*, Pankaj SinghȦ and Sarvpal SinghȦ CSP Scheduling on basis of Priority of Specific Service using Cloud Broker International Journal of Current Engineering and Technology, Vol.4, No.3 (June 2014)

[7] Y. Kessaci, N. Melab & E-G. Talbi,A Multi-start Local Search Heuristic for an Energy Efficient VMs Assignment on top of the OpenNebula Cloud Manager,Future Generation Computer Systems Journal, 2013.

[8] Abhinandan S. Prasad, Member, IEEE, and Shrisha Rao, Senior Member, IEEE "A Mechanism Design Approach to Resource Procurement in Cloud Computing" IEEE TRANSACTIONS ON COMPUTERS, VOL. 63, NO. X, XXXXXXX 2014