IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 8, Issue 12, December 2019

AWS Cloud Cost Analyser and Optimizer: A Survey

Akshay Ingale[1], Abhishek Jagtap[*2], Sneha Malbhage[3], Pramila Shinde[4], Sandesh Pawaskar[5]

Computer Science, Savitribai Phule Pune University

Abstract: The use of Cloud Computing Services offers significant cost advantages for both the enterprises and end-users. Particularly start-up companies benefit from these advantages; meanwhile often they do not operate an internal IT infrastructure. But are costs associated with cloud computing services are very high as most of them not used in an optimal way. So there is the need for the system/ tool that can give the solution for the most favourable usage of cloud resources to reduce the infrastructure cost on the private clouds like Amazon or Google as big companies are investing billions of money in buying cloud infrastructure. This paper gives a survey of different techniques used by the researchers for price reduction strategy and abstract view of the proposed system that we are going to implement to reduce the infrastructure cost of cloud usage and evaluate the performance of workloads on EC2 instances.

Keywords: Cloud Computing, Cloud Resource Optimizer, Cost Advantages, Private Clouds, Performance Evaluation, Price Reduction

I. INTRODUCTION

Recent advances in Cloud computing [1][2] [4] are pushing virtually even further since it can provide economical, scalable, and elastic access to computing resources over the Internet and users can access third-party software components, hardware physical resources or full application stacks that support execution and automatic management of Cloud-based applications, and pay only for the resources they use.

By offering more services to their clients ranging from Infrastructure as a Service (IaaS)[8], Platform as a Service (PaaS), Software as a Service (SaaS), Workflow-as-a-Service (WaaS). These services minimize client-side management overheads and benefit from a service provider's global expertise consolidation and bulk pricing, and helps users avoid the capital expense in acquiring computing resources. Cloud computing can reduce costs while enabling greater business agility and flexibility [2]. The cloud computing provides the ability to scale resources practically infinitely, the capability and reliability [10] to pay only when a resource is used [2], and the elimination of large upfront costs for users. Every cloud provider has a different pricing approach; yet, for computing resources, they offer two categories of products: on-demand instances and reserved instances. On-demand instances are virtual machines created and paid for only when utilized.

The main purpose of the system is to create a private cloud (testbed) by using (Amazon Account) along with monitoring critical resources like RAM, CPU, memory, bandwidth, partition information, running process information and utilization and swap usages, etc. We build up a system that monitors VMs (EC2 Instances) on private clouds like Amazon or Google and provides solutions to decrease infrastructure costs from the customer's point of view.

II. LITERATURE SURVEY

A. Minimum-Cost Cloud Storage Service Across Multiple Cloud Providers[IEEE 2017]

Liu et al.[3] provides a model to decrease the payment cost of clients and at the same time is guarantee their SLOs (service level objective) with the globally distributed data centres belonging to different CSPs with different resource unit prices. The cost minimization problem can be solved by using integer programming.

B. Autonomic Metered Pricing for a Utility Computing Service [2010]

Yeoa set al.[6] analysed the difference between fixed and variable prices. Fixed prices were easier to recognize and clear-cut for users. However, the fixed price could not be fair to all users because not all users had the same needs. The proposed charging variable prices with the sophisticated condition, where users know the exact charges that are computed at the time of reservation even though they were based on variable prices.

C. A Pricing Algorithm for Cloud Computing Resources

G. Tang et al.7] proposed a pricing algorithm for cloud computing resources. The authors proposed the cloud bank agent model as a resource agency from a global perspective, which provides analysis and guidance for all members.

IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319-5940
International Journal of Advanced Research in Computer and Communication Engineering
Vol. 8, Issue 12, December 2019

Chi Zhou et al.[8] presents a scheduling system known as Dyna to minimize the expected monetary cost given the user-specified probabilistic deadline guarantees. Dyna includes an A-based instance configuration method for performance dynamics and a hybrid instance configuration refinement for using spot instances. Experimental results with three scientific workflow applications on Amazon EC2 and a cloud simulator show (1) the capacity of Dyna on satisfying the probabilistic deadline guarantees required by the users; (2) the efficiency of reducing monetary cost in comparison with the existing approaches.

D. Identification of a company's suitability for the adoption of cloud computing and modelling its corresponding Return on Investment

Chandra Misra et al. [9] gives a framework for helping companies analyse several characteristics of their own business as well as pre-existing IT resources to identify their favourability in the migration to the Cloud Architecture. A general Return on Investment (ROI) model considers various intangible impacts of Cloud Computing, apart from the cost. The analysis presented herein provides a much broader perspective and insight into Cloud Computing to its prospective adopters.

Advantages

- The system provides an in-depth analysis of the financial perspective of CC in a very lucid and simple manner.
- It provides both the objective as well as the subjective decision-making tool to find the suitability of a company for -adopting CC.

E. Cost-Aware Cloud Profiling, Prediction, and Provisioning as a Service [IEEE 2017]

Chard et al.[12] proposes Scalable Cost-Aware Cloud Infrastructure Management and Provisioning (SCRIMP) a service-based system that enables application developers and users to reliably outsource the task of provisioning cloud infrastructure. It shows that by understanding application requirements, predicting dynamic market conditions, and automatically provisioning infrastructure according to user-defined policies and real-time conditions that our approaches can reduce costs by an order of magnitude when using commercial clouds while also improving execution performance and efficiency.

Advantages: SCRIMP optimizes the cloud provisioning process for batch workload-based applications.

F. Performance Analysis of High-Performance Computing Applications on the Amazon Web Services Cloud [IEEE]

R.Jackson.netal. present a system whose performance of as toft he Benchmarks designed to represent a typical HPC workload run on AmazonEC2. The system clearly shows a strong correlation between the percentage of time an application spends communicating and its overall performance on EC2. Also, variability in EC2 performance is given.

G. The Method and Tool of Cost Analysis for Cloud Computing [2009 IEEE]

Li et al. [14] fills the gap in between cost calculation and analysis in Cloud environment using suits of metrics and formulas for the calculation of Cloud Total Cost of Ownership (TCO) and Utilization Cost, considering the elastic feature of Cloud infrastructure and widely adopted virtualization technology in Cloud. This provides a foundation for evaluating the economic efficiency of Cloud and provides indications for cost optimization of the Cloud. This calculation and analysis approach into awebtoolwhichisusedintheinternalCloudenvironmentanddemonstrateinitially its analysis capability on the cost distribution and utilization imbalance factor.

Advantages: The system provides Cloud TCO and Cloud Utilization Cost, to evaluate the economy efficiency of Cloud.

I. Proposed System

Due to the increase in functionality of the mobile devices, it results in high computational Cloud computing is a promising commercial infrastructure paradigm that assures to remove the expensive computing services by companies when not required. The figure shows the architecture of the proposed system.

The objectives of the proposed system are as follows:

- Developing a tool to monitor and analyse cost patterns on cloud accounts.
- Developing a tool capable of giving suggestions about cost optimization and delivering cost containment.
- Analyse the usage of the user and give suggestions for plans according to the user's usage.
- To evaluate the performance of workloads on EC2 and reduce infrastructure costs from the customer's point of view.
- It also gives the optimum utilization of cloud resources.

In our proposed model, we are creating a private cloud (testbed) by using an Amazon Account. By connecting to the existing user's Amazon Account with user Id and Password cloud Usage Monitoring System can fetch all the Performance Matrix-like RAM, CPU, memory bandwidth, and exchange usages, etc. To estimate the output of the whole setup, We require arranging resource examine and load balancing tools on the testbed and calculate the need for available resources

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 8, Issue 12, December 2019

like Storage Pricing, CPU pricing, Request Pricing, and Storage Management Price. This result can be geographically dispersed and contain a large number of purchasers and agents.

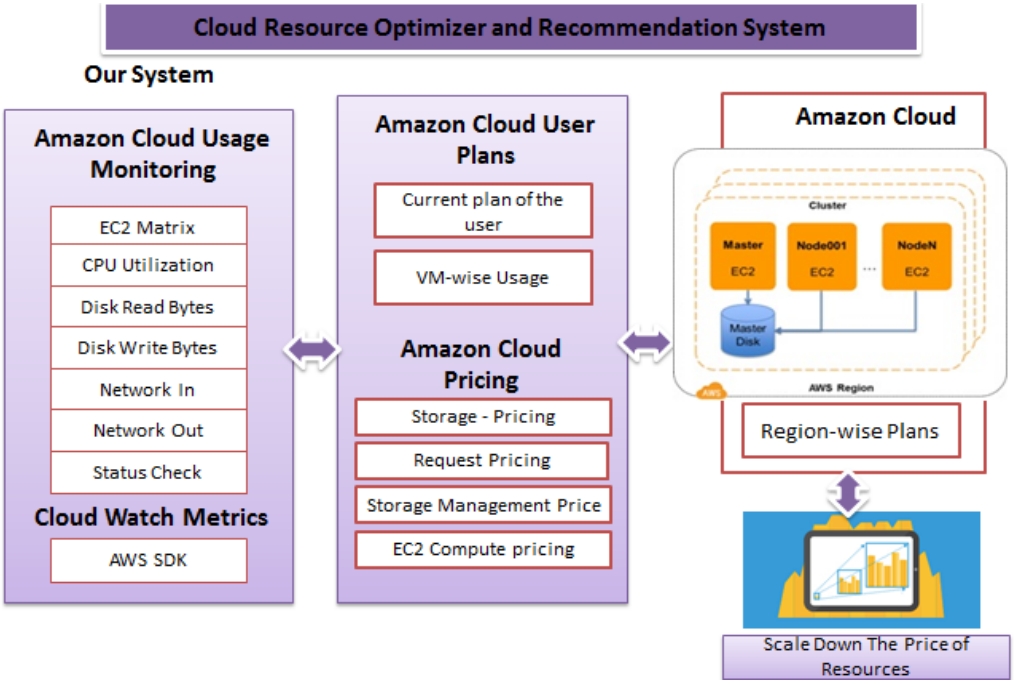

Figure 1: System Architecture

III. CONCLUSION

The success of any application is depending on factors like ease of use, reliability and product image. Cloud computing refers to a standard for accessing computing resources which is progressively more popular. Although having a cloud infrastructure is frequently cheaper than maintaining a physical data center, owners of large and complex IT infrastructure might incur large costs. Therefore, the problem of cost optimization in cloud computing is becoming increasingly important. This paper gives a survey of different techniques used by the researcher for cost optimization in cloud computing. The proposed system provides a solution for cost optimization in cloud computing by evaluating resource monitoring and load balancing tools.

REFERENCES

[1]. Fernando Koch, Marcos D. Assun ̧ao, Marco A. S. Nett,"A Cost Analysis ofCloud Computing for Education".
[2]. Aviv Kaufmann and Kerry Dolan, ESG LabAnalysts,"Price Comparison: Google Cloud Platform vs. Amazon Web Services",June 2015.
[3]. Guoxin Liu and Haiying Shen, Senior Member, IEEE, Member, ACM , "Minimum-Cost Cloud Storage Service Across Multiple Cloud Providers",IEEE/ACM TRANSACTIONS ON NETWORKING 2017.
[4]. Derrick Kondo, Bahman Javadi, Paul Malecot, Franck Cappello, David P. Anderson,"Cost-Benefit Analysis of Cloud Computing versus Desktop Grids"
[5]. Artan Mazrekaj,Besmir Sejdiu,Isak Shabani,"Pricing Schemes in Cloud Computing: An Overview"(IJACSA) International Journal of Advanced Computer Science and Applications,Vol. 7, No. 2, 201680| P a g ewww.ijacsa.thesai.org.
[6]. C.S.Yeoa, S.Venugopalb, X.Chua & R.Buyyaa, Autonomic Metered Pricing for a Utility Computing Service, Future Gene Comp Syst., vol.26, no.8, 2010
[7]. H. Li, J. Liu and G. Tang, A Pricing Algorithm for Cloud Computing Resources, Proc. Int. Conference on Network Computing and Inform. Security, 2011.
[8]. Amelie Chi Zhou, Bingsheng He and Cheng Liu Nanyang Technological University,"Monetary Cost Optimizations for Hosting Workflow-as-a-Service in IaaS Clouds",IEEE TRANSACTIONS ON CLOUD COMPUTING, VOL. X, NO. X, AUGUST 2014
[9]. Subhas Chandra Misra ∗, Arka Mondal1 "Identification of a company's suitability for the adoption of cloud computing and modelling its corresponding Return on Investment".
[10]. Partha Dutta ; Tridib Mukherjee ; Vinay Gangadhar Hegde ; Sujit Gujar ,"C-Cloud: A Cost-Efficient Reliable Cloud of Surplus Computing Resources", 2014 IEEE 7th International Conference on Cloud Computing.
[11]. Mehdi Bahrami,"Cloud Computing for Emerging Mobile Cloud Apps", 2015 3rd IEEE International Conference on Mobile Cloud Computing, Services, and Engineering.
[12]. Ryan Chard,Kyle Chard,Rich Wolski,Ravi Madduri,Bryan Ng and Kris Bubendorfer,IanFoster,"Cost-AwareCloudProfiling,Prediction,andProvi- sioning as a Service",PUBLISHED BY THE IEEE COMPUTER SOCIET, 2017.
[13]. Keith R.Jackson,Krishna Muriki,Shane Canon, Shreyas Cholia, John Shalf Harvey J.Wasserman, & Nicholas J.Wrig,"Performance Analysis of High Performance Computing Applications on the Amazon Web Services Cloud", 2nd IEEE International Conference on Cloud Computing Technology & Science.
[14]. Xinhui Li, Ying Li, Tiancheng Liu, Jie Qiu, Fengchun Wang ,"The Method and Tool of Cost Analysis for Cloud Computing", 2009 IEEE International Conference on Cloud Computing.