



Cloud Resource Optimizer and Recommendation: A Survey

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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

Cloud computing's key features are the accomplishment to pay only in the case when a resource is actually used and the elimination of high upfront costs for consumers respectively. Businesses and companies will still be confident in using cloud services to host their IT networks because of the low costs and ease of access. Cloud storage is offered by cloud vendors, with the most well-known being:

1. AWS- Amazon Web Services
2. Google Cloud
3. Microsoft Azure

Every cloud provider has a different pricing approach; They do, however, sell two types of goods to evaluate the resources: on-demand and private cases. On demand instances are effective machines for which needs to finance only when utilized. Cloud consumers can append and eliminate an on-demand instance with the highest flexibility.

Alternatively, reserved cases are computational resources and compensated for a particular timestamp, with an upfront fee. The next class involves a high degree of trustworthiness for the user; therefore, if extensively utilized, they result to be cheaper during a long-term utilization. To avoid the unneeded operating expense, cloud computing user required to do careful planning. Researchers are now looking at resource optimization in cloud computing. Nonetheless, there are certain drawbacks to today's new approaches. AWS has a number of Elastic

Compute Cloud (EC2) instances that can be used for various tasks. A number of CPU, memory, storage, and network bandwidth configurations are available for these instance models.

Users will choose from a number of EC2 instance forms in the cloud to provide the best balance of resources for their programmer and workload. Currently, choosing an instance type is often based on a heuristic approach, which does not guarantee that the best option in terms of efficiency and cost is chosen. Here, an attempt is made represent structure for an efficient task of workloads to servers so as to decrease cost with exploiting the resource utilization.

II. LITERATURE SURVEY

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

Subhas Chandra Misra et al. developed a system that primarily supports multinational businesses by analysing the uniqueness of their industry in addition to current IT tools to determine their suitability for cloud migration. Despite the cost, a standard Return on Investment (ROI) representation has been clarified for consideration of the various indefinable effects of Cloud Computing. To the possible adopters of Cloud Computing, the review offered herein offers a much wider perspective and methodology.

Advantages

- In a rather lucid and straightforward way, the device offers an in-depth study of CC's financial perspective.
- It offers both an analytical and emotional decision-making method for determining a company's suitability for CC adoption.

B] Title- Monetary cost optimizations for hosting Workflow-as-a-Service in IaaS Clouds.

We've recently seen that functions flow from research and other data-intensive applications are increasing on Infrastructure-as-a-Service (IaaS) clouds, with a large number of progress service providers providing Workflow-as-a-Service (WaaS). The key aim of WaaS providers is to reduce the financial impact of death penalty workflows in IaaS clouds.

The sort of virtual machines (instances) used has a big influence on the project's cost and performance. As a result, we conclude that WaaS providers should consider delivering probabilistic production guarantees for specific workflows to expressly report the accuracy and value of their services. Dyna provides a hybrid instance configuration refinement for victimization spot instances, as well as an A-based instance configuration approach for performance dynamics.

Experiments with three scientific advancement programmers on Amazon EC2 and a cloud machine show the following:

- (1) The Dyna has a core feature in that it is flexible in meeting the users' probabilistic point assurances.
- (2) as opposed to current methods, the productivity of compressing financial value.

What they have proposed?

- 1) At the time of the Software-as-a-Service division of cloud computing, there is an approximate criterion for WaaS (Workflow-as-a-Service) perception.
- 2) The selective success in shot is assured, implying that the complex deadlines are met.

What we have referred?

- 1) The concept of the settled deadlines is used to perform the static task execution.
- 2) Thus for given dynamic nature task of elastic cloud computing there need tend for additional rigorous notion for deadlines.

3) By selecting the acceptable form of instance and dynamicity of progress there is the Value improvement as well.

C] Title- Minimum-Cost Cloud Storage Service Across Multiple Cloud Providers [IEEE 2017]

Liu et al. provides a model to decrease the payment value of shoppers and at constant time is guarantee their SLOs (service level objective) with the globally distributed information canters belonging to totally different CSPs with different resource unit costs.

Advantage: -

- The drawback of price minimization will be overcome by applying victimization whole number programming.

D] Title- Cost-aware cloud profiling, prediction, and provisioning as a service.

Description – The author has succeeded in introducing a new approach to Scalable Cost-Aware Cloud Infrastructure Management and Provisioning in this article (SCRIMP). This is a service-based architecture that allows web developers and customers to outsource the challenge of cloud computing provisioning with confidence. The effort is made to reflect application for, forecasting competitive market dynamics, and mechanically provisioning infrastructure in accordance with user-defined policies and time period conditions, with the expectation that once using industrial clouds, our system can reduce prices by an order of magnitude.

Advantages

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

What they have proposed?

- 1) Harnessing the Cloud for Research Computing.
- 2) Identification Application Performance on Heterogeneous Infrastructure.
- 3) Provisioning and Managing Instances during a Multi-Cloud Environment.

What we have referred?

1) Given the character of complexities in varied cloud computing services furthermore as among a particular cloud computing service for instance AWS, 3 areas particularly identification, prediction and provisioning are integrated to deliver a versatile cloud computing expertise.

2) we'd like to use a middleware but, effective and economical use of cloud infrastructure is technically difficult, and these challenges are displeased during a multi cloud surroundings.

E] A Pricing Algorithm for Cloud Computing Resources

An algorithmic law for assessing cloud computing capability was introduced by G. Tang et al. . The authors viewed the cloud agent model as a resource agency from a broad perspective. The key goal of the cloud agent model is to provide analysis and input to all participants. Chi Chow and colleagues propose the Dyna solution, which is a planning process that eliminates the expected financial gain assigned to user-specified guarantees. The Dyna approach uses an instance design technique for performance dynamics to optimize a hybrid instance configuration. Experiments on Amazon EC2 and a cloud machine yielded three technical advancement implementations.

- (1) the capability of Dyna on satisfying the user-specified guarantees.
- (2) the aspect of reducing the financial value retevly compared with the previous approaches.

F] Title- The Method and Tool of Cost Analysis for Cloud Computing [2009 IEEE]

Xinhui Li and colleagues In the Cloud universe, the author has presented a framework for bridging the gap between cost estimate and calculation. Through considering some primary features of Cloud infrastructure as well as broadly applied virtualization technology in the Cloud, as well as some core features of Cloud computing and frequently used virtualization technologies, metrics and measurements are used to measure Cloud Total Cost of Ownership (TCO). This measurement and analysis methodology has been turned into a web platform that is used in the internal Cloud environment to show its analysis capabilities on the cost allocation and consumption imbalance aspect.

Advantages

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

The structure for studying the expense was implemented by Krishnadas Nath et al. . A judgment on the adaptability of cloud infrastructure is considered in order to make a profit. The number of computers, power needs, and other computational and non-computational tools are all taken into account by an enterprise. As an enterprise transitions to cloud computing, a three-tier approach is used for cost-benefit learning and draws immediate on competitiveness in each layer. The three layers listed are base cost estimation, data pattern driven cost estimation, and project specific cost estimation. These layers are meant to include various stages of decision making to assist managers in determining the viability of implementing cloud infrastructure in their business.

III. PROPOSED SYSTEM

The overall growth of the business industry is now calculated in several ways such as financial growth, success rate, and application success rate, and the factor of "user interface" alone is no longer sufficient. Revenue, trust, and brand value are both harmed when there is a lack of supply. The key goal is to provide a flexible CLOUD description that can handle the needs of a stock brokerage company without compromising efficiency, scalability, or cost. The architecture of the proposed framework, which will track VMs (EC2 Instances) on private clouds such as Amazon or Google and offer solutions to mitigate infrastructure costs, is seen in the diagram below.

The proposed framework will track VMs (EC2 Instances) on private clouds like Amazon or Google and provides infrastructure cost reduction solutions. Cloud Node Resource Monitoring:

1. In our proposed model, we will be doing **Cloud Setup** - Creating private cloud (test bed) by using (Amazon Account)
2. **Resource Monitoring** - monitoring critical resources like RAM, CPU, memory, bandwidth, partition information, running process information and utilization and swap usages etc.
3. **Authentication and authorization** – we need to connect to existing user's amazon account using user id and password and fetch all the performance matrix like CPU, RAM, storage etc.
4. **Testing** - In order to evaluate the performance of complete setup, need to deploy resource monitoring and load balancing tools on test bed and evaluate need of available resources.

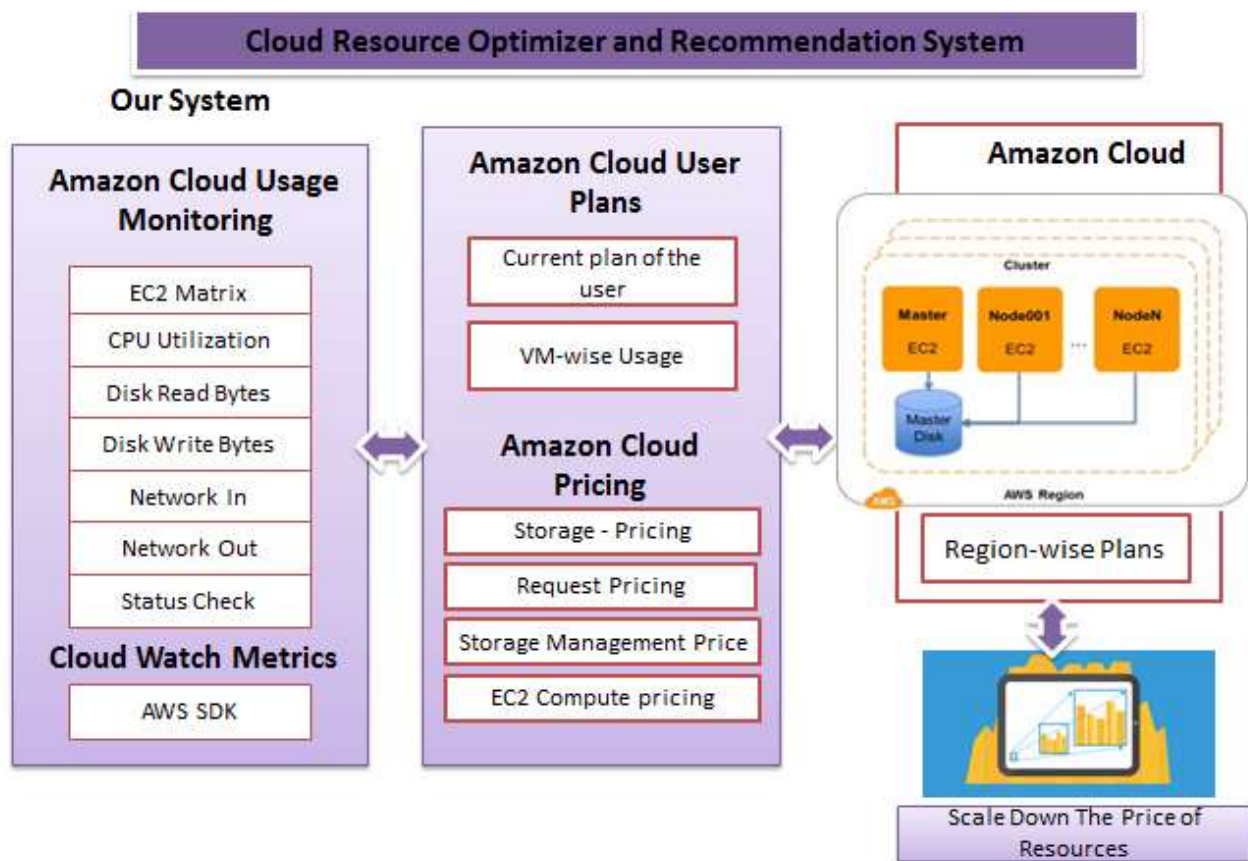


Figure 1: System Architecture

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 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.

IV. 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.

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