Scientific Journal of Impact Factor (SJIF): 4.72

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 4, Issue 4, April -2017

Real Time Load Analysis Using Profiling as a Service

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Abstract — *Cloud Computing is emerging technology nowadays. It integrates data, applications, users and servers on a vast scale and enables a global optimization of computing resources. Usually, a cloud has a large number of resources on data centers that are geographically spread. Such resources must be continuously monitored. Now a days as the usage of cloud is increased need to manage the resources efficiently. In proposed architecture profiler is integrated with cloud architecture. It will monitor resource manager to optimally use cloud resources. By using proposed work we can monitor and manage the cloud resources efficiently.*

Keywords- *Cloud Computing, Profiling, Cloud Monitoring, Cloud Controller, Resource Manager*

I. INTRODUCTION

Cloud computing is web based computing where basically shared servers give software, infrastructure, platform, devices and other resources to clients on a compensation as-you-utilize premise. Clients can get to these administrations accessible on the "Web cloud" without having any past know-how on dealing with the resources included

Profiling is a type of dynamic program analysis that measures, for instance, the use of specific instructions, or the frequency and duration of function calls. Profilers may utilize various diverse procedures, for example event-based, statistical, instrumented, and simulation methods.

Cloud Monitoring provides clients with the capacity to see a series of dynamic graphs representing the execution of their Cloud Servers, make alert-driven notices using thresholds based on this data, and deal with their Cloud surroundings by arranging intense auto scaling abilities

In the proposed model we use a profiler which is integrated with cloud architecture. Usage monitor will monitor cloud resources and based on this monitoring information resources manager will manage the resource efficiently.
The rest of the paper is organized as follows. Section II presents the related work. Section III illustrates the proposed model. In section IV implementation and displayed the results. Section V concludes the paper.

II. RELETED WORK

Kuai Xu, Feng Wang, Lin Gu[1] proposed layered profiling based multi-tenant cloud architecture. Main objective is to join dynamic scaling up and scaling down of resources without damaging the Service Level Agreements (SLA). This architecture not only provide an in-depth understanding on traffic patterns of cloud tenants, but also enhance the security of cloud computing by collaboratively detecting and filtering unwanted traffic towards cloud instances.

Ryan Chard, Kyle Chard, Bryan Ng, Kris Bubendorfer, Alex Rodriguez, Ravi Madduri and Ian Foster[2] present a service that supports automatic profiling of application performance on different instance types to create rich application profiles that can be used for comparison, provisioning, and scheduling. This approach is applied to several genomics tools and shown that the resulting profiles can significantly improve performance and cost in real-world cloud provisioning scenarios.

Xuan Feng, Qiang Li ,Qi Han ,Hongsong Zhu, Yan Liu , Jie Cui , Limin Sun[3] proposed a scalable framework for physical device profiling. It leverages banner grabbing to identify device types and running services, and uses clock skew to determine a device ID. This framework scales well. The prototype system is implemented and use to profile Webcams and industrial control device. The results show that system can effectively profile and identify Webcams in real time.

Prasad Pulikal, Claudio Giovanoli[4] proposed Cloud Consumer Profile called the ”Enterprise Information Technology Profile” or EITP**.** It improves the process of finding a service within the Cloud Brokering Systems by using profiling and Cloud services of an Enterprise Customer. The main aim of this research was to see if having a profile of the Cloud Consumer could have a positive effect on the process of searching and discovery of Cloud Services.

Guilherme Da Cunha Rodrigues, Rodrigo N. Calheiros, Vinicius Tavares Guimaraes, Glederson Lessa dos Santos, Márcio Barbosa de Carvalho, Lisandro Zambenedetti Granville, Liane Margarida Rockenbach Tarouco, Rajkumar

Buyya[5] presents an overview on cloud monitoring and a comparison among relevant cloud monitoring solutions. Resource management is an important mean to improve clouds, and resources monitoring is the key to achieve it.

III. PROPOSED MODEL

The main goal of this research is to improve the resource utilization and energy efficiency using proposed architecture which will be helpful to improve resource utilization. We use cloud monitoring service which scales up and scale down virtual machines based on requirement.

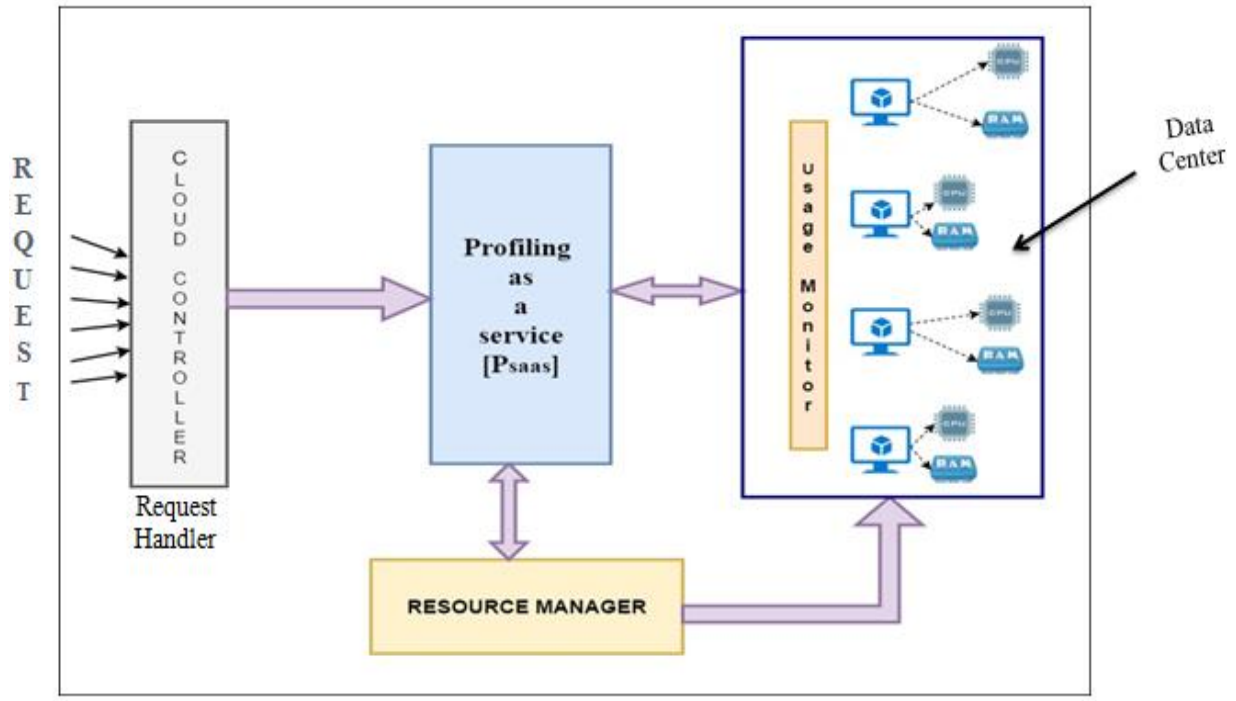

Figure:1 Proposed Architecture

Proposed architecture shown in figure. Here the usage monitor will calculate the usage of each virtual machine in the data center and pass this information to the profiler. Here we calculate parameters like cpu usage, memory ,threshold value, waiting time etc. Then based on this usage information profiler will find the least loaded vm among all vm's. And pass this information to the resource manager. Resource manager will scale up and scale down vm in the data center by using the information given by profiler. In the scale up condition resource manager will automatically increase one vm in pool while in scale down decrease vm from the pool. This way Resource manager efficiently manage resources in data center.

IV. IMPLEMENTATION RESULTS

The proposed model is described above was implemented using AWS- Amazon web service. The AWS Toolkit is an open source plug-ins. For executing our proposed work, we utilize the AWS Toolkit for eclipse. By using AWS Toolkit developers can easily develop, debug, and deploy java application that utilization Amazon Web Service.

Figure 2 shows the console output. It contains information reading CPU usage, memory usage also calculate the value of load threshold and dynamic threshold . Then remove the vm which is least loaded. And at last print the queue in this it shows only one vm instead of two, as one is removed in down scaling.


```
Info: Algorithm execution start...
Info: Collecting data...
Info: Collecting data complete.

Info: VM CPU Info...
i-0292776a12ede9697 CPU: 0.0%
i-033926e0e7a14da8c CPU: 5.0%

Info: VM RAM Info...
i-0292776a12ede9697 Memory: 79.99795%
i-033926e0e7a14da8c Memory: 80.366646%

Info: Calculating Load thresold of each VMs
Load-Vector of VMi-0292776a12ede9697: 39.998974%
Load-Vector of VMi-033926e0e7a14da8c: 42.683323%

Info: Calculating Dynamic thresold of each VMs
Dynamic Thresold of VMi-0292776a12ede9697: 43.498974%
Dynamic Thresold of VMi-033926e0e7a14da8c: 49.683323%

Info: Down scaling called
Info: VM i-0292776a12ede9697 will removed.
Info: Printing queue....
i-033926e0e7a14da8c is in average queue with ip 35.154.253.230

Info: Wait time... 2min
```

Figure:2 Console output-1

Thus, the experiment results proved that the proposed system can handle the cloud resources efficiently and also solve the problem of energy efficiency

V. CONCLUSION

Cloud computing is an emerging trend and as the resource demands are increasing there is need to provide efficient resources to them with ease. In our research, we represent the novel approach of profiler, which is integrated with the cloud architecture as software as a service. Here based on information provided by profiler, resource manager will scale up and scale down virtual machines in the data center. By using the proposed model one can continuously monitor the cloud resources and based on that monitoring can manage the resources in the pool. Thus this research helps to provide efficient cloud monitoring and resource utilization and solve the problem of managing huge amount of cloud resources.

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