Abstract: Now a day there is a new trend in storing and accessing resources and data in computers due to advanced network technologies. One of such trend is cloud computing where resources are stored and accessed on network. In cloud computing providers provide users with two providing technique first is reservation and second is on-demand. Reservation scheme is much cheaper than on-demand scheme as reservation is done in advance and on-demand is done at the moment of need. Along with this, in a cloud the two main disadvantages are that they do not have provision for managing over-provisioning (more than required resources) and under-provisioning (less than required resource) that occurs during allocating resources to the user. In this paper, we are providing a cost effective Map Reduce and cure service model that manages these two disadvantages and also increases the revenue at the provider’s side. We are making a model that manages the disadvantages in a cloud and also maximizes the revenue at the provider’s side.

Index Terms: Map Reduce, Cloud Computing, cost-effectiveness.

I. INTRODUCTION

Cloud computing has recently gained a lot of popularity into IT industry. While industry has been focusing on Cloud research and development at high pace, academic community has recently joined which is seen through rise in workshops on cloud computing. It also emerges as a new computing model which aims to provide reliable, customized and QoS (Quality of Service) for end users environment. It is a large scale distributed computing model where a pool of resources is available to users (also called as cloud consumers) for using it. The main purpose of cloud computing is that the user stores all its data and resources in a data center rather than storing them locally on a machine.

Cloud computing also provides hardware and software services along with data storage services which is available to general public as well as to business market. Each such service is respectively called

- Infrastructure as a Service (IaaS),
- Platform as a Service (PaaS) or
- Software as a Service (SaaS) [7].

A crucial feature of cloud computing that makes it different from other computing models is its infinite capacity of storage (CPU, Resources, Database, Memory, Network etc.)

The most attractive approach towards such huge data is using Map Reduce. Map Reduce is a software framework for processing and generating large datasets. It’s a programming model that allows distributed execution of jobs on commodity hardware. Map Reduce mainly enterprises can simply create virtual Map Reduce clusters to analyze their data. [9] Map Reduce mainly works on per-job scheduling where the resource optimization is restricted to single user or single job.

There are numerous advantages of cloud computing, the most basic ones being lower costs, re-provisioning of resources and remote accessibility. Cloud computing lowers cost by avoiding the capital expenditure by the company in renting the physical infrastructure from a third party provider. [8]

II. SIGNIFICANCE OF RESOURCE PROVISIONING

Resource Provisioning means selection, deployment and run-time management of software and hardware resources for establishing guaranteed performance for applications. In resource Service Level Agreement (SLA) is taken into consideration while interacting with the consumers or users. SLA is considered an agreement between the user and the provider that ensures QoS parameters like performance, availability, reliability, response time etc. Based on the need and use of application allocation of resources has to be made in order to efficiently make use of resources without violating the SLA and QoS parameters?

There are two problems in provisioning namely,

- **Over-provisioning:** The user demands for resources more than what actually it need for its application which leads to wastage of resources.
- **Under-provisioning:** The user demands for resources less than the required amount for its application which leads to increase in cost of application.

These restrictions are managed in our paper by using MapReduce and Cura technique. Resource provisioning can be categorized into two categories that are mainly used for provisioning of resources in a cloud. These categories are:
- **Reservation:** In this category the user or the customers’ demands for its resources before only in bulk for its computing. This is cheaper and more reasonable for the users as its cost is less than the other. Once the reservation is made the user has to pay for that much of resources whether he uses or does not use all those resources.

- **On-demand:** When a user is in sudden need of resources then he uses on-demand provisioning technique for the provisioning of resources. This technique is costlier than reservation as it is demanded on urgent bases.

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**TYPES OF RESOURCE PROVISIONING**

**A) Static Provisioning:**
For applications that do not change their demand or workloads and that they are predictable use “Static Provisioning” for effective working. With prior provisioning the user makes a contract with the provider for services and provider prepares the relevant resources to be allocated to the user in advance of start of services. The user has to either pay the whole fee immediately or the bill is paid on monthly bases.

**B) Dynamic Provisioning:**
For applications that change their demand or may vary use “Dynamic Provisioning” technique. In dynamic provisioning the VMs (Virtual Machines) may migrate to compute a new node in the cloud. In this type of provisioning the provider allocates more resources than required and discard them when they are not in use. The user in this technique is billed on the bases of its use.

The amount of use of resources that much amount has to be paid to the provider.

**C) Objectives/Parameters of Resource Provisioning**

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<tr>
<td>Response Time</td>
<td>[5]</td>
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<tr>
<td>Minimize Cost</td>
<td>[1],[5]</td>
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<td>Revenue Maximization</td>
<td>[17],[18]</td>
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<td>Fault Tolerant</td>
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<td>Reduce SLA Violation</td>
<td>[14],[15],[16]</td>
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<td>Reduce Power Consumption</td>
<td>[12],[13],[18]</td>
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**III. PROPOSED SYSTEM**

**A) Proposed System Architecture/System Flow:**
The main and ultimate goal of our system is to provide a model that reduces the over-provisioning and under-provisioning of resources while allocating VMs. The flow of the proposed system and its architecture is:

The user requests for the resources which are send to a virtual machine. This virtual machine repository checks for the availability in the cloud and further processes the request to the Cura model. Cura model verifies the user details and analysis if the user is a new user or an already registered user. If the user is already registered then his request is further send to the provider who checks for the best available VM for the user according to its requirements.
IV. METHODOLOGY

A) MapReduce

MapReduce is a process where large data sets are divided into smaller data sets and distributed among various application components. MapReduce provides powerful computation ability based on scale-out clusters of machines. MapReduce automatically creates the best cluster configuration for the job submitted. It can analyze data up to TB(Terabytes) and PB(Peta bytes) of storage limit. MapReduce has two models for its cluster formation namely, dedicated cluster model and per-job cluster model. In this we are using per-job cluster model for the cluster formation in the cloud.

B) Cura

Cura model is used for reducing response of short jobs. It provides unique optimization opportunities while dealing with workloads that can withstand some unsteadiness. By effectively dividing the available cloud resources among the jobs according to the job requirements, Cura achieves lower resource usage costs for the jobs.

V. CONCLUSION

In this paper we are presenting the reduction in the problems of provisioning that are over-provisioning and under-provisioning using MapReduce and Cura models. In distinction to existing system, we are managing the provisioning problems and increasing the revenue of the provider by using Cura and MapReduce. Apart from these benefits, Cura automatically generates the best cluster for the jobs using MapReduce profiling.

VI. FUTURE WORK

Future work on this includes experimental implementation of the proposed Live VM migration policy using some of the known techniques and proposing an optimized version of these techniques. Extend the approach to support multi objective scheduling for example cost and performance optimization. Continue to investigate specific concepts and methods in the areas of resource provisioning. Improve the design and current architecture of the proposed system.

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