Convinient Load Balancing by Dynamic Memory Allocation for Cloud Computing Model in Virtual Machines

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Abstract:- **In this paper, a dynamic resource allocation technique for cloud computing is proposed. Instead of using local servers or computer hard drives, cloud computing uses remote servers hosted on the internet to store and access data and programs. The three service models offered by cloud computing are IAAS (Infrastructure as a Service), PAAS (Platform as a Service), and SAAS (Software as a Service). Cloud computing is also known as International Computing. Hardware as a Service (HAAS) is another name for IAAS. It is an internet-managed computing infrastructure. Users can avoid the expense and complexity of buying and maintaining real servers by using IAAS models. Providing mechanisms for effective resource management is a key goal of cloud computing in the future.**

We present a novel approach in this paper called dynamic scheduling and consolidation mechanism, which distributes resources according to the demand of virtual machines (VMs) on infrastructure as a service (IAAS).With the use of this technique, users can add, remove, or modify instances dynamically based on user-specified conditions and load.

Our goal is to create a virtual machine monitoring-based load balancing algorithm that maximizes or minimizes various performance parameters (such throughput) for clouds of varying sizes.

Keywords:- Infrastructure-As-A-Service , Amazon Ec2, Optimizing VM Load, Load Balancing, Platform-As-A-Service, Software–As-A-Service, Cloud Computing, Amazon AWS.

I. INTRODUCTION

The acronym "cloud" describes the practice of storing and gaining access to data and applications on distant servers hosted over the Internet as opposed to local servers or computers' hard drives.

Any type of material, including files, photos, documents, audio, video, and more, can be included. Or, to put it another way, "cloud computing refers to computing on the Internet, as opposed to desktop computing." [12]

Three fundamental components make up cloud computing: software, operating systems (platforms), and hardware (infrastructure). The primary distinction in this case is that, instead of being maintained locally, all three components are "Rented" via the Internet via cloud computing.

Numerous applications, like Microsoft Windows Azure Cloud Services, are provided by cloud computing. which Infosys makes use of. Google App Engine is used by Best Buy's gift bag applet, allowing.[1]

II. CLOUD COMPUTING OFFERS FOLLOWING THREE TYPES OF SERVICES

➢ *SaaS (Software as a Service):*
Another name for it is Cloud Application Services. SaaS applications run directly through web browser means we do not require to download and install these applications. Some Important example of SaaS given as , Google Apps, Salesforce Dropbox, Slack ,Hub spot, CISCO ,WebEx.

➤ *Platform as a Service(PAAS):-*

It is also known as Cloud Platform Services . It is Similar to SAAS, main differences that PAAS Provides Platform for software creation , but using saas we can access software over Internet Without any Platform. Examples: Magneto Commerce Cloud, Windows Azure, Force.com, Open Shift.

➤ *Service-based Infrastructure (IAAS):*

Another name for it is Cloud Infrastructure Service. Its responsibilities include middleware, runtime environment, and application data management.

Amazon Web Services, Cisco Metapod, and Google Compute Engine are a few examples. A company or organization can use cloud computing to pay only for the capacity that is really used.

What Cloud Computing Is Like The manner that fuel, water, and electricity are consumed under the pay-for-what-you- use model It's also called computing at times.[7]
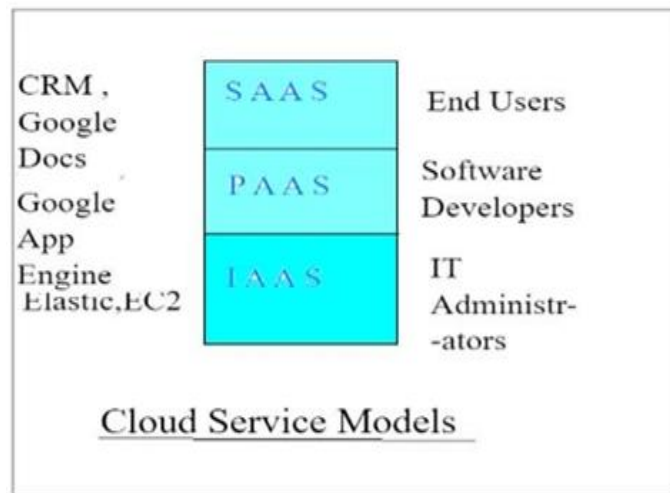

Fig 1: Structure of Cloud Service Model.

The inability to customize, security, availability, and performance are just a few of the problems with cloud computing. Since the cloud is actually extremely complicated, performance issues may arise in non-cloud environments.

On a cloud computing environment, virtualization technology can be effectively used to manage dynamic resources. including all necessary services in a virtual machine image, which will then be transferred onto a physical server. Using the aforementioned method, the platform irrelevance and heterogeneity of resources problems were resolved.

The process of generating a virtualized version of a server, operating system, desktop, or network resources is known as virtualization. Different programs and numerous operating systems can run on the same machine thanks to virtualization techniques.

The process of generating a virtualized version of a server, operating system, desktop, or network resources is known as virtualization. Different programs and numerous operating systems can run on the same machine thanks to virtualization techniques. Users can store data on the cloud with virtualization, but there are additional benefits to sharing In a cloud computing case of fracture. Vendors in the cloud computing space can handle the physical resources needed, however these cloud providers charge exorbitant fees for these services, which can have an impact on individuals, businesses, or organizations.

The way virtualization functions in cloud computing is by assisting users' businesses or organizations in sustaining the services that the business needs from outside parties, hence reducing costs to the business.

The way virtualization functions in cloud computing is by assisting users' businesses or organizations in sustaining the services that the business needs from outside parties, hence reducing costs to the business. There are various.

This paper focuses on the dynamic allocation technique for virtual machines (VMs) load balancing. This page is divided into six sections, the first of which is an introduction to virtualization and cloud computing. The current system and experimental setup are described in Section 2, results and analysis are described in Section 3, and a bibliography is described in Section 4.

III. VM LOADBALANCING

A. Overview

An operating system and any applications running on it can be abstracted from the hardware thanks to virtual machines. A Datacenter component for managing service requests in the simulator models the internal hardware infrastructure services that correspond to the Clouds.

The cloud computing environment uses the load balancing algorithm to operate efficiently. To process client requests directed toward cloud nodes, numerous algorithms have been developed. To manage the user load as the number of users grows dynamically, load balancing is necessary. The load balancing method improves throughput while reducing data center processing times.

Effective throttled Compared to the throttled load balancing method, which sends the virtual machine ID to the data center controller and has the controller distribute the optimal VMs, the load balancing algorithm increases the total response time by 6.47% and the average data center processing time by 20.74%. The Active Monitoring Load Balancer keeps track of every VM's details and which VM is currently receiving which requests.

Two load balancing techniques for cloud computing were examined in this research. Specifically, the algorithms are the active monitoring load balancer and the throttled load balancer. In order to improve response time, cost, and processing time, a novel algorithm that modifies the active monitoring load balancing algorithm in the cloud computing virtual machine environment has been submitted.

B. Proposed VM Load Balancing Method

a procedure for transferring the entire load to each Virtual Machine Boost to make resource use productive and boost job response times.

If the load balancing method is dynamic in nature—that is, it depends on the current behavior of the system—then the system's past state or behavior is not taken into consideration. When developing these algorithms, factors like load estimation, load comparison, the type of work to be transmitted, virtual machine performance, virtual machine selection, and many more must be taken into account.

Consideration of load includes CPU load, delay, network load, and memory requirements. The task is broken down into several smaller tasks, each of which is assigned a single job.

A two-level task scheduling technique is used to address the dynamic requirements of users with high resource use. To accomplish load balancing, assign tasks to virtual machines (VMs), and then use VMs to host resources. Increases for Cloud Computing Environment in Response Time, Resource Usage, and Overall Performance. Finding each virtual machine's available CPU cycle, memory, CPU utility, and necessary memory is the first step. Required and available resources are compared in the second phase. The availability of resources is verified; if they are, the instance should be added; if not, users should not be informed of the instance status.

Time series are the focus of special storage engine services like Cloud Watch Monitoring. Data that is periodically collected from servers and services and fed into the monitoring storage.

C. Detailed Design

The load balancing service is specifically made to cope with DNS issues and manage availability zone failures. Its primary function is to distribute load among many instances. Amazon Cloud Watch offers resource and application monitoring for AWS clients' apps. It can be used by developers and system administrators to gather and monitor metrics, obtain knowledge, and take immediate action to maintain the smooth operation of their applications and organizations. In addition to monitoring specific metrics produced by a customer's apps and services, Amazon Cloud Watch keeps an eye on AWS resources including Amazon EC2 and Amazon RDS DB instances. With Amazon Cloud Watch, you gain system-

wide visibility into resource utilization, application performance, and operational health [16].

➢ *Our Suggested System's Features Include:*

● *Bucket Creation—*

Using an S3 browser to construct Amazon S3 Buckets in any location where Amazon S3 is supported. By only joining up, users can create a new bucket for the lowest possible cost. Once a bucket is created, users can upload and download files from Amazon S3 for a very low cost, as well as construct virtual folders to organize audio, video, and other materials. [12][15].
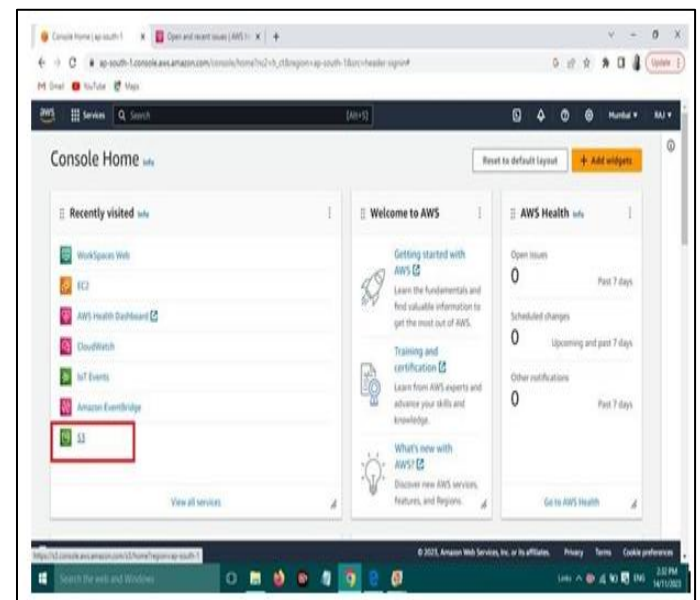
● *Below:-*

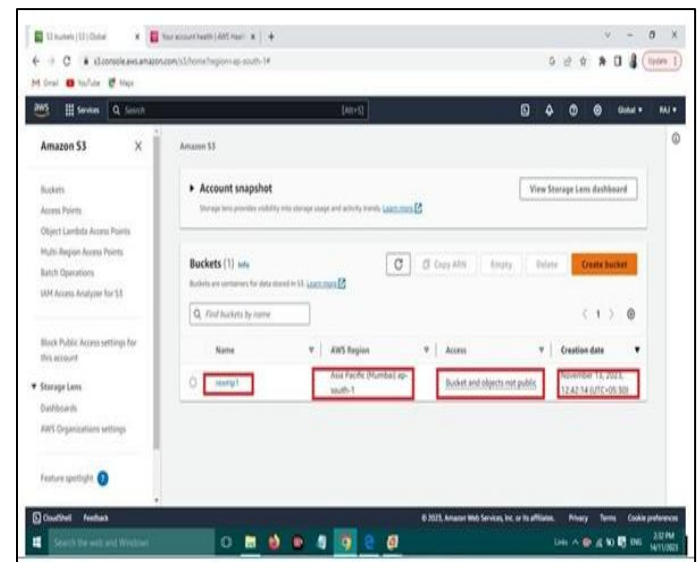**Fig 2: Home Page for Amazon AWS .**

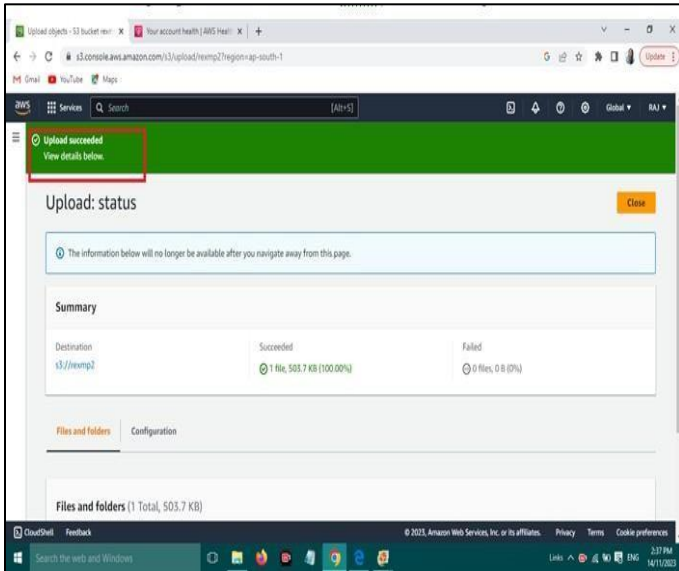**Fig 3: Upload Audio, Video Files at Amazon AWS**

Fig 4: Audio, Video Files at Amazon AWS Uploaded Successfully.

➢ *Uploading an Instance:*

Virtual Machine images from an existing environment can be simply imported into Amazon EC2 instances and exported back to an on-premise environment using the VM Import/Export feature. By consistently integrating those Virtual Machines into Amazon EC2 as ready-to-use instances, this product allows one to use current investments in the Virtual Machines that one established to meet IT security, configuration management, and compliance needs. Workloads can be distributed throughout your IT infrastructure by simply exporting imported instances back to your on-premise virtualization infrastructure [3].

One example of a monitoring instance is Amazon Cloud Watch, which provides a dependable, scalable, and adaptable monitoring solution that can be used right away. Elimination of the need to install, maintain, and grow your own infrastructure and monitoring systems Out of use. You can effortlessly monitor as much or as little statistic data as you need with Amazon Cloud Watch. With Amazon Cloud Watch, you can examine graphs, set alarms, and programmatically retrieve your monitoring data to assist with troubleshooting, trend identification, and automated action based on the health of your cloud environment[15].

Elastic Load Balancers, Amazon RDS DB instances, Amazon EC2 instances, and Amazon EBS volumes may all be instantly monitored using Amazon Cloud Watch. For certain AWS resources, metrics like CPU usage, latency, and request counts are provided automatically.

IV. EXPERIMENTAL SETUP

Java is used to implement the VM load balancing technique. Cloud Computing EC2 Workflows was selected because of its characteristics, which included auto scaling and Two Factor Authentication, as well as its widespread use. Unlike tightly-coupled applications in which tasks communicate directly via the network while stable commercial workflows like EC2 are loosely coupled parallel applications has set of computational task connected via data and control flow dependencies. In order to achieve an unbiased comparison of the performance of workflows on EC2 the experiments account for differences by (a) running experiments using the local disk on EC2 and (b) running all experiments on single nodes. Although single-node experiments do not enable us to measure the scalability of Cloud services they do provide an application- oriented understanding of the capabilities.

V. RESULTS AND ANALYSIS

A screenshot displays an interface that makes it easy for users to send requests to the instance monitor and build buckets in the cloud. The client offers the following options: i) create a bucket; ii) delete a bucket; iii) update your Amazon Web Services account; and iv) download the contents of the bucket.

VI. CONCLUSION

In this Paper, we propose The Convenient Load Balancing by Dynamic Memory Allocation For Cloud Computing Model in Virtual Machines. we use Amazon AWS free Cloud Services for storing audio, video files at cheapest rate.

Unlike tightly-coupled applications in which tasks communicate directly via the network while stable commercial workflows like EC2 are loosely coupled parallel applications has set of computational task connected via data and control flow dependencies. In this way Convenient Load Balancing by Dynamic Memory Allocation For Cloud Computing Has achieved.

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