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INTEGRATING WITH DIFFERENT CLOUD ENVIRONMENT: RESOURCE ALLOCATION CHALLENGES AND COUNTERMEASURES

Dr.S. Soundararajan
Vice Principal
Computer Science and Engineering,
Velammal Institute of Technology,
Chennai, Tamilnadu, India

Prof. L. Maria Michael Visuwasam
Assistant Professor
Computer Science and Engineering,
Velammal Institute of Technology,
Chennai, Tamilnadu, India

Prof. J. Indra Mercy
Assistant Professor,
Computer Science and Engineering,
Saveetha Engineering College,
Chennai, Tamilnadu, India

Abstract— In modern era there are several computing applications requirements to serve the enormous service requests. As more organizations adopt cloud computing, cloud service providers (CSPs) are developing new technologies to enhance the cloud's capabilities [13]. That too in a cloud based application environment, the applications tend to interact with various cloud service providers and with different cloud servers. In terns which causes some applications to behave differently in many situations due to following situations [6]. i) migration from one cloud server to another, ii) data sharing and security issues, iii) Resource allocation and load balancing. In this paper, we have addressed the above problems and the solutions for the above mentioned issues. Our approach proves that there is a significant improvement in collaborative cloud application interactions and the load balancing behaviour of the virtual machines.

Keywords— Keywords: VM's, Cloud collaboration, CSP, Security issues, TPC, DRA.

I. INTRODUCTION

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models[NIST][13][16]. While there are benefits, there are privacy and security concerns too. Data is travelling over the Internet and is stored in remote locations. In addition, cloud providers often serve multiple customers simultaneously. All of this may raise the scale of exposure to possible breaches, both accidental and deliberate [7, 8].

There is always a concern over data migration and its challenges. The migration can be done based on the data and load balancing factors [9]. Another issue to be solved in the cloud computing domain is the resource allocation [15]. We have proposed a dynamic resource allocation mechanism for Virtual machine based data centers.

II. LITERATURE SURVEY

The TPC-W (Transaction Processing Council's web) benchmark is designed to exercise the web server and transaction processing system of a typical e-commerce web site. TPC-W was implemented as a collection of Java servlets, and presents an architectural study detailing the memory system and branch predictor behaviour of the workload. It can evaluate the effectiveness of a coarse-grained multithreaded processor at increasing system throughput and other commercial workloads.

It also studies about Cache to Cache transfers performances and none of the transfers are dirty misses in Java Servlet Engines. Branch predictor which shares Branch History Register that can be shared among all threads [1]. It measures the CPU utilization despite Cache misses. It measures the system throughput improvements from 8% to 41% for a two context processor and 12% to 60% for a four context uni-processor over a single-threaded uni-processor. This has the demerit of the addition of multiple threads to the processor also increases conflict misses and contention in the memory system.

Xen, an x86 virtual machine monitor which allows multiple commodity operating systems to share conventional hardware in a safe and resource managed fashion, but without sacrificing either performance or functionality. It is achieved by providing an idealized virtual machine abstraction to which operating systems such as Linux, BSD and Windows XP, can be ported with minimal effort. Xen is targeted at hosting up to 100 virtual machine instances simultaneously on a modern server. Xen is extremely efficient, that allow operating

Corresponding Author: Dr. S. Soundararajan, Velammal Institute of Technology, Chennai, Tamilnadu , India.

systems such as Linux and Windows XP to be hosted simultaneously for a negligible performance overhead. Xen enables applications such as server consolidation, co-located hosting facilities, distributed web services, secure computing platforms and application mobility [2]. It avoids overhead of data copying, Concurrent Operating System with Best Performance Isolation, Scalability, Network Performance [14]. The efficiency of virtual block devices still needs to be improved. A shared universal buffer cache indexed on block contents can obtain the efficiency. The controlled data sharing sacrifices isolation. Better physical memory performance is to improved, which can be brought up by a last-chance page cache (LPC) — effectively a system wide list of free pages, of non-zero length only when machine memory is undersubscribed [11].

It Provides Sharing multiple resources among multiple applications [3]. Current Virtualization techniques are inadequate in achieving service level objectives with time varying multiple resources demands for applications. Auto-control which are resources control that automatically adapts to dynamic changes in shared virtualized infrastructure to achieve application SLO's. Auto-control is a combination of an online model estimator and Multi-Input Multi-Output (MIMO) resource controller. The Controller can detect resource bottlenecks across time and application tiers, it can adjust resource allocations to overcome these bottlenecks, and controller can handle different application workloads. Controller can enforce performance targets for metrics including average throughput and response time. Migration is deal with bottlenecks.

Resource allocations in collaboration with virtual machine are static. It concentrates on allocating the resource as per the request according to the priority by considering the process completion based on the weightage of the VM [12]. It Schedules the resource allocation strategies between the Virtual machine based on the priority given to the virtual machine. In this system, they do not concentrate on object creation and modification that are used in order to do specific task. And the control time to start or to resume the task was not concentrated [4].

The proposed two-tiered system is intended to serves data requirements of both static and dynamic applications either locally or globally, on demand. It concentrates on the priority for sharing the resource between VM as well as scheduling the process based on the priority as per the demand. It overcomes the drawback of existing by concentrating on measures such as creation and modification of object in order perform some specific task and to manage the task. It also concentrates on scheduling the object as and when created to complete the task [5, 10].

There is always an issue of security in every application. Especially in cloud computing there are large volumes of data resides in datacenters. The paper [6][17] suggests various security terminologies and its counter measures. But how to solve the security issue in cloud integration and how different cloud data can be manipulated [6][18].

As the new ides and methodologies and created there is always a hope for improvement. The security in cloud computing is more of a hot topic. The security issues can be identified and its counter measures can be applied. Among all kind of threats, to identified kind of thread they listed [7] based on categories of threat. But there is no concrete solution for all the cloud security threats.

We proposed an approach to counter measure the security and resource allocation called the DRA for VM based data centres.

III. METHODOLOGIES

In this module, the request raised from the IO devices are received and processed. This checks the accessibility between the virtual system and the main system requests and processes it accordingly. Resourcing can be defined as provision of financial support for someone or something. Resourcing ensures that a person or organisation is well equipped in order to function effectively.

In this module, the utilization of resource between the main system and virtual system for completing a task has been tracked. Request from the virtual system as well as the main system has been completed on the basis of the precedence first given to the task [9]. In this module, the precedence for completing the task has been formulated. Object are instance that are created to perform a task. In this, we are creating an object that is used to perform a specific task in the system. A good visualization certainly has to do more, but these criteria are useful to draw the line between lots of things that are often called visualization. In this, we considering a set of factor to inspect and examine the resource allocation, object creation/Scheduling, task scheduling, priority and attempting to provide a visualisation graphically.

The local resource scheduler controls resource allocation to VMs within a server. It adds a set of on-demand resource allocation algorithms based on the technical support on dynamic resource allocation provided by the existing VMMs. To maintain high resource utilization as well as guarantee the

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quality of applications, the local resource scheduler automatically optimizes the resource allocation to VMs via adjusting CPU time slots and memory assigned to each VM, according to its resource utilization as well as quality and activity of the application hosting in the VM. In a shared virtual computing environment, dynamic load changes as well as different quality requirements of applications in their lifetime give rise to dynamic and various capacity demands, which results in lower resource utilization and application quality using the existing static resource allocation.

Furthermore, the total required capacities of all the hosted applications in current enterprise data centres, for example, Google, may surpass the capacities of the platform. In this paper, we argue that the existing techniques by turning on or off servers with the help of virtual machine (VM) migration are not enough. Instead, finding an optimized dynamic resource allocation method to solve the problem of on-demand resource provision for VMs is the key to improve the efficiency of data centres.

However, the existing dynamic resource allocation methods only focus on either the local optimization within a server or central global optimization, limiting the efficiency of data centres. We propose a dynamic resource allocation mechanism consisting of the local and global resource allocation with feedback to provide on-demand capacities to the concurrent applications.

We model the dynamic resource allocation using optimization theory. Based on the proposed dynamic resource allocation mechanism and model, we propose a set of dynamic resource allocation algorithms. Our algorithms preferentially ensure performance of critical applications named by the data centre manager when resource competition arises according to the time-varying capacity demands and the quality of applications. Using Rainbow, a Xen-based prototype we implemented, we evaluate the VM-based shared platform as well as the two-tiered on-demand resource allocation mechanism and algorithms.

The experimental results show that Rainbow without dynamic resource allocation (two tier) provides 26 to 324 percent improvements in the application performance, as well as 26 percent higher average CPU utilization than traditional service computing framework, in which applications use exclusive servers.

The dynamic resource allocation further improves performance by 12 to 20 percent for those critical applications, 75 percent of the maximum performance improvement, introducing up to 9 percent performance degradations to others, with 1 to 5 percent improvements in the resource utilization in comparison with two tier approach.

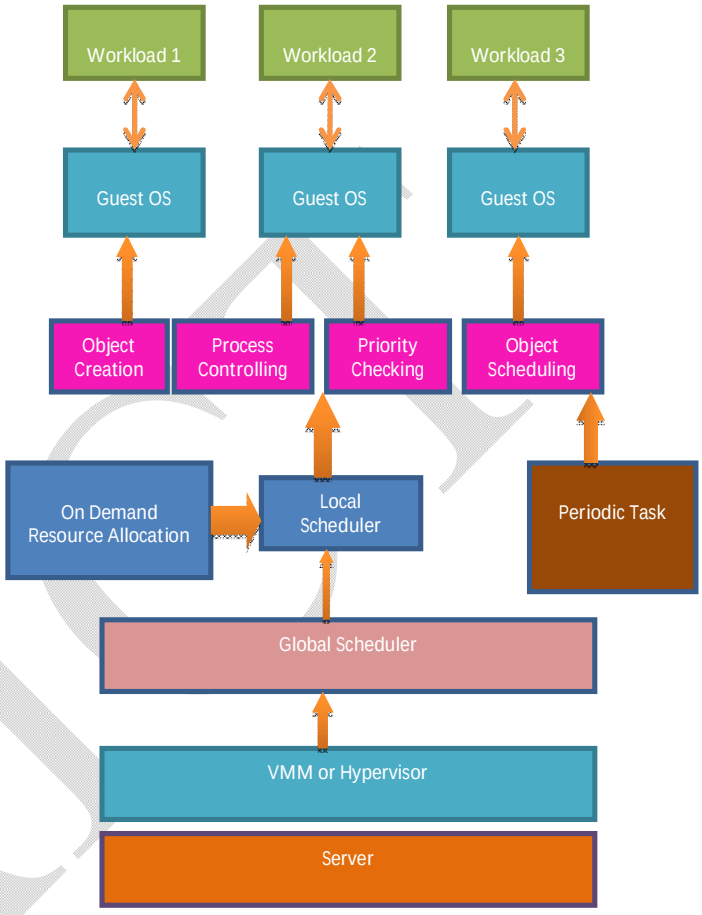

Fig1 : Dynamic Resource Allocation Architecture

IV. CONCLUSION

Thus the growing nature of network and the data, the cloud computing and data centres need high performance computing. In order to increase the speed of data store and retrieval in the cloud data centres, we have proposed a dynamic resource allocation mechanism for virtual machine based data centres. And the increase in data processing also increases the security and migration issue and that should also be considered.

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