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ENHANCING ENERGY USING ANT COLONY SYSTEM TO CONSOLIDATE VMS

S. Kanimozhi* & K. Adlin Suji**
* PG Scholar, Department of Master of Computer Applications, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamilnadu
** Associate Professor & Head, Department of Master of Computer Applications, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamilnadu

Abstract:

In high energy consumption of cloud data centers is a great concern of data accessing of dynamic consolidation of virtual machines in this present method if used to significant opportunity to save energy in large data centers. In this method the VM consolidation approach the use of live migration of VM that time the under loaded physical machines can be switch off or put into low power mode. At same time to achieving the exact level of quality of services provide between the cloud provider and the users is very critical, in this paper id main challenge is reduce the energy consumption of data centers for providing require Quality of Services. In this paper we providing distributed virtual machines consolidation to reduce the energy consumption of cloud data center. finally we done the nearest optimal virtual machines method and this paper automatically allocate the virtual machines machine without buy new virtual machines in cloud computing.

Index Terms: Dynamic VM Consolidation, Ant Colony System, Cloud Computing, Green Computing, Energy-Efficiency & SLA

1. Introduction:

Cloud computing is a relatively new computing paradigm. It leverages several existing concepts and technologies, such as data centers and hardware virtualization, and gives them a new perspective. Cloud computing provides three service models and four deployment models. The three service models are Infrastructure as a Service, Platform as a Service (PaaS), and Software as a Service (SaaS). Similarly, the four deployment models are private cloud, community cloud, public cloud, and hybrid cloud. With its pay-per-use business model for the customers, cloud computing shifts the capital investment risk for under or over provisioning to the cloud providers.

Therefore, several public IaaS, PaaS, and SaaS cloud providers, such as Amazon, Google, and Microsoft, operate large-scale cloud data centers around the world. Moreover, due to the ever increasing cloud infrastructure demand, there has been a significant increase in the size and energy consumption of the cloud data centers. High energy consumption not only translates to a high operating cost, but also leads to higher carbon emissions. Therefore, energy-related costs and environmental impacts of data centers have become major concerns and research communities are being challenged to find efficient energy-aware resource management strategies. On the other hand, achieving the desired level of Quality of Service (QoS) between cloud providers and their users is critical for satisfying customers' expectations concerning performance. The QoS requirements are formalized via Service Level Agreements (SLAs) that describe the required performance levels, such as minimal throughput and maximal response time or latency of the system. Therefore, the main challenge is to reduce energy consumption of data centers while satisfying QoS requirements.

2. Related Works:

Most of the existing works on VM provisioning and dynamic resource allocation for web-based systems can be classified into two main categories: Plan-based approaches and control theoretic approaches. Plan-based approaches can be further classified into workload prediction approaches and performance dynamics model approaches. One common characteristic of all of these existing works is that they do not use shared hosting. Another common characteristic is that they only provide a server-level scaling mechanism. Whereas, our proposed approach for web applications [1] also provides a separate mechanism for scaling of individual web applications. There are currently only a few approaches for cloud-based distributed video transcoding. However, they do not address VM provisioning problem for on-demand video transcoding. Server consolidation approaches, such as [5], dynamically reallocate VMs to physical nodes with the aim of reducing total number of required nodes. However, in the context of cost-efficient VM provisioning from an IaaS cloud, we require a different type of server consolidation. It should periodically migrate all active web applications and user sessions from the least loade under-utilized VMs to other VMs. Thus, releasing the least loaded VMs for termination. Therefore, our goal is to reduce number of provisioned VMs and their renting durations, rather than reducing number of physical nodes. Admission control approaches, such as aim to prevent server overloading under high load situations. One common characteristic of these traditional approaches, except, is that they make decisions only on acceptance or rejection of incoming user load. The approach in has its own disadvantages. The discount-charge model of requires additional web pages to be included in the web application and it is only effective for e-commerce web sites when more users place orders. In the context of cloud computing, it may also be possible to defer the incoming load until some new VMs are provisioned or some existing VMs become less loaded. Therefore, there is an opportunity to develop an admission control mechanism, which may choose between using an existing VM or provisioning a new VM for accommodating new incoming load.

3. Proposed Work:

The main problem that we intend to tackle is cost-efficient VM provisioning with augmented server consolidation and overload control on provisioned VMs. We seek solutions for multi-tier web applications and on-demand video transcoding. Although there are many similarities between VM provisioning for web applications and VM provisioning for video transcoding, each one of them also has its own challenges. In this section, we present the proposed approach while providing a brief overview of some of the most important challenges that it addresses. We propose a cost-efficient VM provisioning approach for multi-tier web applications [1], and on-demand video transcoding [3]. Moreover, for preventing servers from becoming overloaded, the VM provisioning approach is augmented with an admission control mechanism. Similarly, the underutilization of VMs is minimized by providing a VM consolidation mechanism.

VM Provisioning Delay In practice, it takes a few minutes to provision a VM from an IaaS provider. Due to the inevitable VM provisioning delay, handling of a sudden spike in the incoming user load becomes a challenge. Some of the strategies that we use to overcome this drawback of public IaaS clouds include provisioning multiple VMs at a time [1], using additional VM capacity [1], and using load prediction to provision proactively [3].

Module:

- ✓ Authentication Module
- ✓ Access service
- ✓ Creating new VM using VMM
- ✓ Updating VM details to local agent
- ✓ Schedule the VM from local agent
- ✓ View All Reports from PM

- ✓ Buy new VM

Authentication Module: The user authentication module is to check whether the authorized user is logged in this authentication process is verify the user name and password is valid. Before logged in one time registration is mandatory. In this module has been followed the Register page all fields fill into the mandatory. And us well enter into user name and password servers as regular log in confidential.

Access Service: This module the user going to access the services from the service provider. Here the register users only access the service. User access service will be updated to the local agent the agent only getting the from accessing service user. And updated to the PM at the time of access service.

Creating New VM Using VMM: This module will use it creating new VM for the user access the services it created by the VM Monitor. VM does not create VM without use of all VM here any VM will free means the VMM allocate the service the free VM. Here all the VM monitor by the VMM.

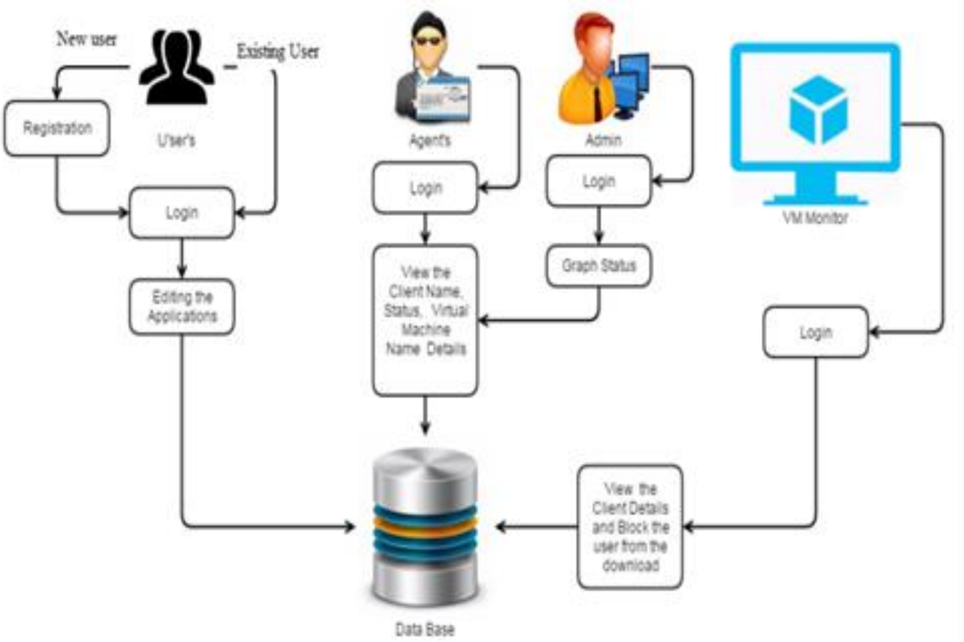
Updating VM Details to Local Agent: This module all the VM details like (Access service, free VM, load of the VM etc.,) updated to the local agent. At the same time the local agent update the VM details to the VM Monitor, here the VMM easily find the free VM and free services.

Schedule the VM From Local Agent: Here this module local agent will allocate the services to the VM, VM always will get the details and services from the local agent, here the local agent will get the service information from the VM Monitor, and local agent also update the service details to the VM Monitor.

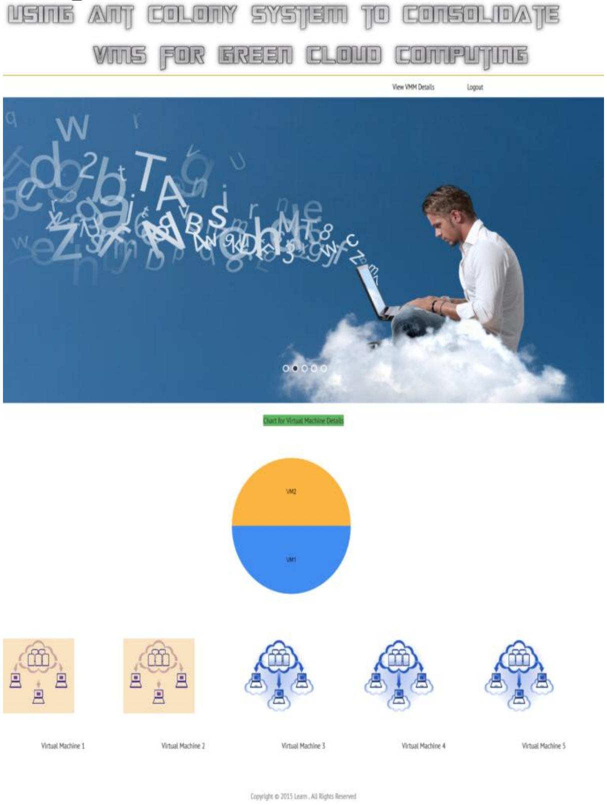
View All Reports From PM: In this module the PM (VM Monitor) will collect all the details from the local agent and also view over the entire VM load and allocated service details, here the VM Monitor will get the pie chart report about the VM and service details.

Buy New VM: In this module the VM monitor need any new VM they buy the new VM system at the time of all VM will busy, here the VM Monitor only buy the new VM. Before that the VM Monitor will check all the VM details.

4. System Architecture:



Network Based Spamming Bots:



5. Conclusion:

In this paper, we presented a novel dynamic Virtual Machine (VM) consolidation approach called Ant Colony System based VM Consolidation. It reduces the energy consumption of data centers by consolidating VM into a reduced number of active Physical Machines while preserving Quality of Service requirements. Since the VM consolidation problem is strictly we used the Ant Colony System (ACS) the main challenge is to reduce energy consumption of data centers while satisfying Quality of Service requirements. In this paper, we present distributed system architecture to perform dynamic VM consolidation to reduce energy consumption of cloud data centers while maintaining the desired Quality of Service.

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