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Lie Transparent Migration for Virtual Machines for Cloud Computing

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Abstract: **Cloud computing allows business customers to scale up and down their resource usage based on needs. Many of the touted gains in the cloud model come from resource multiplexing through virtualization technology. In this paper, we present a system that uses virtualization technology to allocate data center resources dynamically based on application demands and support green computing by optimizing the number of servers in use. We introduce the concept of "skewness" to measure the unevenness in the multidimensional resource utilization of a server. By minimizing skewness, we can combine different types of workloads nicely and improve the overall utilization of server resources. We develop a set of heuristics that prevent overload in the system effectively while saving energy used. Trace driven simulation and experiment results demonstrate that our algorithm achieves good performance.**

Keywords: **server, skewness, cloud, VMMS, PM, SLA**

1. LITERATURE SURVEY

Literature survey is the most important step in software development process. Before developing the tool it is necessary to determine the time factor, economy n company strength. Once these things r satisfied, ten next steps are to determine which operating system and language can be used for developing the tool. Once the programmers start building the tool the programmers need lot of external support. This support can be obtained from senior programmers, from book or from websites. Before building the system the above consideration r taken into account for developing the proposed system. Modern business service engagements are becoming increasingly more numerous and more complex. We consider service engagements in the broad sense. Thus we include not just traditional examples of service engagements, such as customer relationship management or business process outsourcing, but also other business interactions, such as manufacturing and software licensing. Because service engagements are specified via business contracts, the expansion of the importance of service engagements in modern business is seen in the increasing number of contracts.

The above business trend exposes some new broad challenges in service computing. The first challenge is how, during enactment, a contractual party can understand a contract so as to determine its actions (and design its IT systems) to support its participation in the service engagement. Virtual machine monitors (VMMs) like Xen provide a mechanism for mapping virtual machines (VMs) to physical resources. This mapping is largely hidden from the cloud users. Users with the Amazon EC2 service, for example, do not know where their VM instances run. It is up to the cloud provider to make sure the underlying physical machines (PMs) have sufficient resources to meet their needs. VM live migration technology makes it possible to change the mapping between VMs and PMs While applications are running. The capacity of PMs can also be heterogeneous because multiple generations of hardware coexist in a data center.

- A policy issue remains as how to decide the mapping adaptively so that the resource demands of VMs are met while the number of PMs used is minimized.
- This is challenging when the resource needs of VMs are heterogeneous due to the diverse set of applications they run and vary with time as the workloads grow and shrink. The two main disadvantages are overload avoidance and green computing.

2. INTRODUCTION

Computing is being transformed to a model consisting of services that are commoditized and delivered in a manner similar to traditional utilities such as water, electricity, gas, and telephony. In such a model, users access services based on their requirements without regard to where the services are hosted or how they are delivered. Several computing paradigms have promised to deliver this utility computing vision and these include cluster computing, Grid computing, and more recently Cloud computing. The latter term denotes the infrastructure as a "Cloud" from which businesses and users are able to access applications from anywhere in the world on demand. Thus, the computing world is rapidly transforming towards developing software for millions to consume as a service, rather than to run on their individual computers. The main objective of this project is to evaluate the performance analysis of cloud computing centers using queuing systems. To obtain accurate estimation of the complete probability distribution of the request response time and other important performance indicators such as mean number of tasks in the system, blocking probability, and probability.At present, it is common to access content across the Internet independently without reference to the underlying hosting infrastructure. This infrastructure consists of data centers that are monitored and maintained around the clock by content providers. Cloud computing is an extension of this paradigm wherein the capabilities of business applications are exposed as sophisticated services that can be accessed over a network. Cloud service providers are incentivized by the profits to be made by charging consumers for accessing these services. Consumers, such as enterprises, are attracted by the opportunity for reducing or eliminating costs associated with “in-house” provision of these services. However, since cloud applications may be crucial to the core business operations of the consumers, it is essential that the consumers have guarantees from providers on service delivery. Typically, these are provided through Service Level Agreements (SLAs) brokered between the providers and consumers. Providers such as Amazon, Google, Salesforce, IBM, Microsoft, and Sun Microsystems have begun to establish new data centers for hosting Cloud computing applications in various locations around the world to provide redundancy and ensure reliability in case of site failures. Since user requirements for cloud services are varied, service providers have to ensure that they can be flexible in their service delivery while keeping the users isolated from the underlying infrastructure. Recent advances in microprocessor technology and software have led to the increasing ability of commodity hardware to run applications within Virtual Machines (VMs) efficiently. VMs allow both the isolation of applications from the underlying hardware and other VMs, and the customization of the platform to suit the needs of the end-user. Providers can expose applications running within VMs, or provide access to VMs themselves as a service (e.g. Amazon Elastic Compute Cloud) thereby allowing consumers to install their own applications. While convenient, the use of VMs gives rise to further challenges such as the intelligent allocation of physical resources for managing competing resource demands of the users.

3. PROPOSED SYSTEM

In this paper, we present the design and implementation of an automated resource management system that achieves a good balance between the two goals. Two goals are overload avoidance and green computing.

Overload avoidance: The capacity of a PM should be sufficient to satisfy the resource needs of all VMs running on it. Otherwise, the PM is overloaded and can lead to degraded performance of its VMs.

Green computing: The number of PMs used should be minimized as long as they can still satisfy the needs of all VMs. Idle PMs can be turned off to save energy.

Advantages: We make the following contributions:

- We develop a resource allocation system that can avoid overload in the system effectively while minimizing the number of servers used.
- We introduce the concept of “skewness” to measure the uneven utilization of a server. By minimizing skewness, we can improve the overall utilization of servers in the face of multidimensional resource constraints.
- We design a load prediction algorithm that can capture the future resource usages of applications accurately without looking inside the VMs. The algorithm can capture the rising trend of resource usage patterns and help reduce the placement churn significantly.

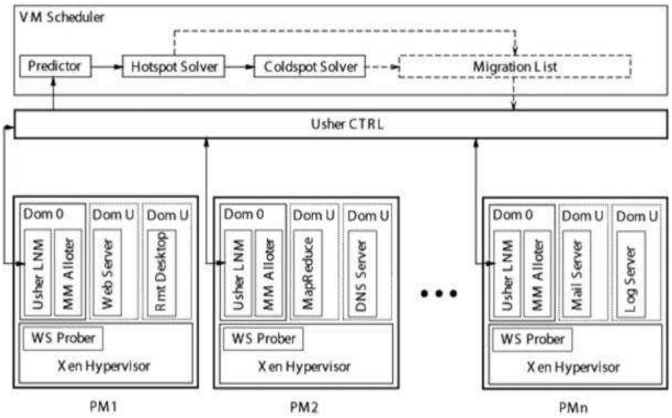

Fig.1. System Architecture

4. MODULE S

After careful analysis the system has been identified to have the following modules:

- Cloud Computing Module.
- Resource Management Module.
- Virtualization Module.

Cloud Computing Module: Cloud computing refers to applications and services offered over the Internet. These services are offered from data centers all over the world, which collectively are referred to as the "cloud." Cloud computing is a movement away from applications needing to be installed on an individual's computer towards the applications being hosted online. Cloud resources are usually not only shared by multiple users but as well as dynamically re-allocated as per demand. This can work for allocating resources to users in different time zones.

Resource Management Module: Dynamic resource management has become an active area of research in the Cloud Computing paradigm. Cost of resources varies significantly depending on configuration for using them. Hence efficient management of resources is of prime interest to both Cloud Providers and Cloud Users. The success of any cloud management software critically de-pends on the flexibility; scale and efficiency with which it can utilize the underlying hardware resources while pro-viding necessary performance isolation. Successful resource management solution for cloud environments needs to provide a rich set of resource controls for better isolation, while doing initial placement and load balancing for efficient utilization of underlying resources.

Virtualization Module: Virtualization, in computing, is the creation of a virtual (rather than actual) Version of something, such as a hardware platform, operating system, and a storage device or network resources.VM live migration is a widely used technique for dynamic resource allocation in a virtualized environment. The process of running two or more logical computer system so on one set of physical hardware. Dynamic placement of virtual servers to minimize SLA violations.

5. DATABASE DESIGN

Data Dictionary: A data dictionary is a centralized repository of information about data such as meaning, relationship to other data, origin, usage, and format. Database users and application developers can benefit from an authoritative data dictionary document that catalogs the organization, contents and conventions of one or more databases. This typically includes the names and descriptions of various tables and fields in each database, plus additional details like the type and length if each data element. A data dictionary document also may include further information describing how data elements are encoded. One of the advantages of well-designed data dictionary documentation is that it helps to establish consistency throughout a complex database or across a large collection of federated database. In relational database and flat file databases, a table is a set of data elements (values) that are organized using a model of vertical columns (which are identified by their name) and horizontal rows. A table has a specified number of columns, but can have any number of rows. Each row is identified by the values appearing in a particular column subset which has been identified as a candidate key.

Data Script: A data script refers to SQL (Structured Query Language), is a database computer language designed for the retrieval and management of data in relational database management system(RDBMS), database schema creation and modification, and database object access control management. SQL is a programming language for querying and modifying data and managing databases. SQL allows the retrieval, insertion, updating and deletion of data.

6. OUTPUT SCREENS

Fig.2. SS 2: Cloud User Registration Page

Fig.3.Domain Registration Page

Fig.4. SS 9: Creating the Site

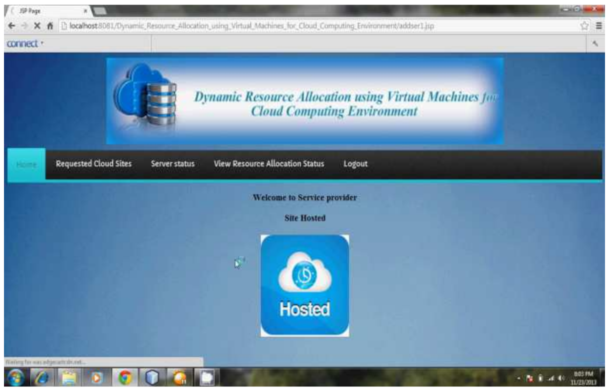

Fig.5. SS 14: Hosted Site

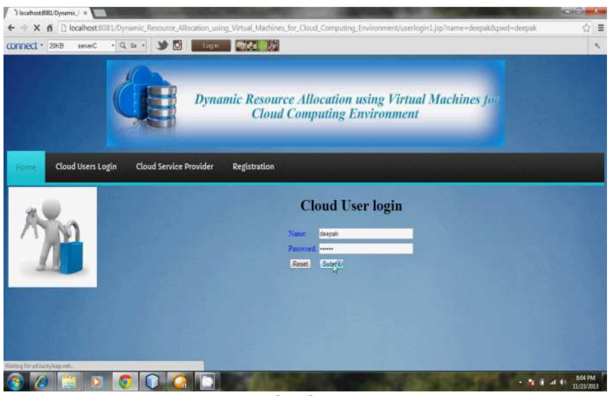

Fig.6. SS 16: Cloud User Login Page

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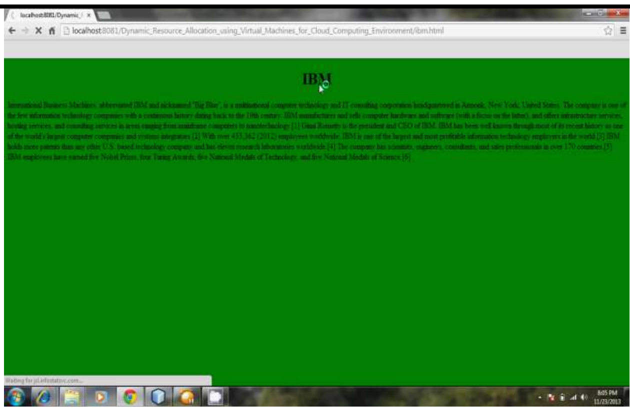

Fig.7. SS 18: User's Hosted Site

7. CONCLUSION

We have presented the design, implementation, and evaluation of a resource management system for cloud computing services. Our system multiplexes virtual to physical resources adaptively based on the changing demand. We use the skewness metric to combine VMs with different resource characteristics appropriately so that the capacities of servers are well utilized. Our algorithm achieves both overload avoidance and green computing for systems with multi-resource constraints.

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