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AGENT ORIENTED TECHNOLOGY TO SUPERVISE NODE IN VIRTUALIZED CLOUD

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Abstract— Now a day's internet plays major role in information communication technology world. Agent oriented technology is rapidly growing over past years and lot off organization is started to use concept of agent technology further they can be integrated to internet system. Software agent is an entity which acts on behalf of others in autonomous manner and performs its actions up to some level of reactivity. Agents are integrated in virtualized cloud consists of multiple virtual machines at single host. In this paper we describe how agent oriented technology incorporated in virtualized cloud to effectively utilize the performance of available resources.

***Keywords*— VMs,VPN,cloud**

I. INTRODUCTION

Over past few years interest towards cloud computing is rapidly drawing attention towards not only information technology industry but as well as other industry .Because of the relative loads of resources and low cost of resource outsourcing, clouds are highly attractive for compute-intensive applications. Virtualization cloud technology gives a lot off success to industry those providing cloud environment to end users. Virtual machines (VMs) provide flexibility and mobility through easy migration and dynamic mapping of VMs to available resources. Virtual machines provide better performance and security that enable to attain the maximum utilization of shared resources. Virtualization become a very important technology in cloud computing application such as parallel computing ,multiuser ,web applications are encapsulated within different virtual machines .

The virtualization include virtual machine (VM) placement. Cloud consumers request for resources. The resources may be software, operating system and applications which are integrated as virtual machine. The cloud providers provide the resources according to the VM requirement. They are responsible for checking the quality of service. Cloud computing requires a provisioning method for allocating resources to cloud consumers. Cloud computing consists of two provisioning plan for allocating resources in cloud. They are Reservation plan and On-demand plan[1]. Reservation plan is long term plan and On-demand plan is a short term plan. In On-demand plan the consumers can access resources at the time when they need. In Reservation plan the resources could be reserved earlier. Hence the cloud providers could charge the resources before consumers could use it. For on-demand pricing is done as pay-per-use basis but in reservation plan pricing is charged by one-time fee. With Reservation plan consumers could utilize the computing resources in a much cheaper amount than on-demand plan.

The rest of the paper is organized as follows. Section 2 describes the types of cloud computing . In Section 3 cloud computing with agents is discussed. Section 4 explain the virtualization of cloud computing.

II. CLOUD COMPUTING

The term **"**cloud" in Cloud Computing was probably derived from the diagrams of clouds used to represent the Internet in Textbooks. The telecommunication companies derived the concept in 1990 when they made a shift from poin t to- point data circuits to Virtual Private Network (VPN) services in 1990 with a better quality services at a comparable lower cost. The idea was to utilize the overall networkbandwidth by switching traffic to balance utilization. The first time the term used in the current context was in 1997, lecture delivered by Ramnath Chellappa where he gave the definition as a "computing paradigm where the boundaries of computing will be determined by economic rationale rather than technical limits alone." The term cloud computing has beensummarized as the acronym of cloud by Joe Weinman's as **C**ommon, **L**ocation-independent, **O**nline **U**tility provisioned on-**D**emand.

Salesforce.com was among the first movers in Cloud Computing in 1999 with the delivery of enterprise application through a simple website, followed by

- Amazon in 2002, introduced Amazon Web Services
- Google Docs in 2006 which actually brought Cloud Services in front of public conscious.
- Amazon again in 2006 with the introduction of Elastic Compute Cloud (EC2) as commercial web service that allowed the consumers to rent services to run their applications.
- Industry wide collaboration in 2007 between Google, IBM and Universities in USA.
- Eucalyptus in 2008 with first open source to deploy private clouds.
- Microsoft with the Launch of Azure in 2009
- And many more today.

Cloud Computing has been adopted widely by the IT Industry and many research have been done till date on the issues of Cloud Computing which include architecture, interoperability issues, load balancing issues, storage mechanism, security issues etc and these issues have been automated for self managing the computing system, which means the system monitors itself and takes measures to prevent or repair problems. Automated Service Provisioning Environment (ASPEN) for data centers has been developed that handles allocation of computing resources, storage, network connectivity and security. Also automation has been done to balance load across the data centers by enabling virtual machine migration.

These services are broadly divided into three categories as shown in below figure.

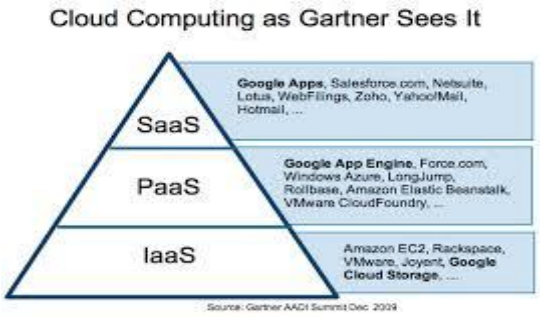

Figure 1:- Classification of cloud services

Platform as a Service(PaaS)

Platform as a service:- In the cloud PaaS is a collection of software and development tools hosted on the provider's infrastructure. Developers build and deploy their applications on the provider's platform.The customer may use API"s and software installed on a PaaS provider. The aim is to design and deploy the application in a quick and efficient manner.

Infrastructure as a service (IaaS)

It is a preliminary point for anyone looking to receive a IaaS cloud services. The IaaS market, has proven to be one of the most exciting ones in the cloud space, and there have been several important factors, such as changes in pricing strategies, Pricing information, Compatibility operating Systems and languages, supporting services and many other have to be considered in order to choose particular service provider [2].

Software as a Service (SaaS)

This is where cloud service providers enable their clients to get access of infrastructure, software"s etc. From productivity applications and CRM app„s suites to software programs which manage cloud applications and deployments and even enable the creation of hybrid clouds, software as a service is exceptionally broad and runs the scope. Here we consider cloud software and application providers that are performing in different way, something new or something predominantly well [3].

III. CLOUD COMPUTING USING AGENTS

Cloud computing is a novel technology that has been designed and implemented in the past few years, mainly due to industry that was looking to a large-scale scalable computing infrastructure for implementing and selling service-oriented commercial solutions. Whereas much of the effort are devoted for the production of the Cloud infrastructures, technologies for supporting virtualization and data centers. Now little attention has been devoted to introduce innovative methods for users and developers to discover, request, assemble and use Cloud computing resources. Autonomous and flexible agents and MASs are suitable tools for negotiating user access, automating the resource and service discovery, and composition, trading, and harnessing of cloud resources. A new discipline, called *agent-based Cloud computing* must be set for providing agent-based solutions founded on the design and development of software agents for improving Cloud resources and service management and discovery, SLA negotiation, and service composition[4].

Autonomous agents can make Clouds smarter in the interaction with users and more efficient in allocating processing and storage to applications. In large-scale data centers, agents can search, filter, query and update the massive volumes of data that are stored.cloud agents working on our operating system will provide intelligent data access services, monitoring services processor-to-application assignment strategies, and energy-efficient use of Cloud computing infrastructures. In Clouds, there also is the need to design and implement techniques and methodologies that adapt to the dynamic behaviors of Cloud computing environments. Autonomic techniques may help providers and users to reach this goal.

Multi-agent systems that are able to handle with changing configurations, heterogeneity, and volatility, can provide a promising approach for addressing this requirement. Security and trust are two very critical issues in Cloud computing as data and software are stored, accessed and run on machines that are not owned or directly managed by owners of data and software. Services provided by the cloud computing system can be improved by the use of MAS.

Agent-based models and algorithms for trust and security in Cloud infrastructures also could be very useful. If agent-based solutions will be introduced in the software infrastructure of Clouds we will have an Intelligent and flexible Cloud services which enhances its usage

IV. IMPLEMENTATION

Virtualization is an abstraction layer that decouples the physical hardware from the operating system to deliver greater IT resource utilization and flexibility. Virtualization allows multiple virtual machines, with heterogeneous operating systems (e.g., Windows 2003 Server and Linux) and applications to run in isolation, side-by-side on the same physical machine. A virtual machine is the representation of a physical machine by software. It has its own set of virtual hardware (e.g., RAM, CPU, NIC, hard disks, etc.) upon which an operating system and applications are loaded. The operating system sees a consistent, normalized set of hardware regardless of the actual physical hardware components. VMware virtual machines contain advanced hardware features suchas 64-bit computing and virtual symmetric multiprocessing.

VMware Infrastructure includes the following components

VMware ESX Server – A production-proven virtualization layer run on physical servers that abstract processor, memory,
storage and networking resources to be provisioned to multiple virtual machines

VirtualCenter Management Server – The central point for configuring, provisioning and managing virtualized IT infrastructure

Virtual Infrastructure Client (VI Client) – An interface that allows administrators and users to connect remotely to the VirtualCenter Management Server or individual ESX Server installations from any Windows PC.

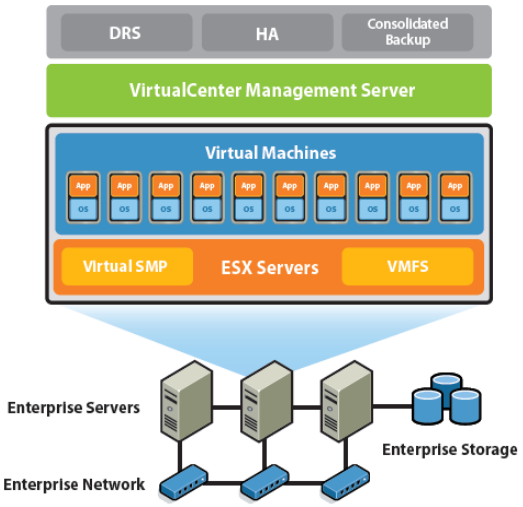

Figure2: VMware Virual Infrastructure

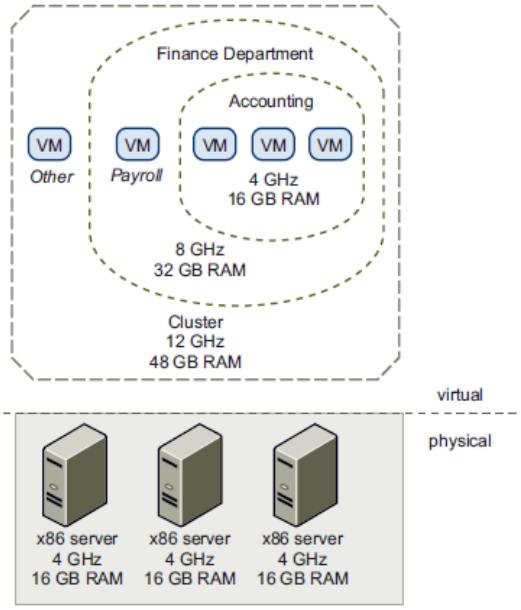

Figure 3: Hosts,clusters,resource pools.

VMware High Availability (HA) – Provides easy-to-use, costeffective high availability for applications running in virtual machines. In the event of server failure, affected virtual
machines are automatically restarted on other production servers that have spare capacity
VMware Distributed Resource Scheduler (DRS) – Intelligently allocates and balances computing capacity dynamically across collections of hardware resources for virtual machines• [5]
VMware Virtual Machine File System (VMFS) – A high-performance cluster file system for virtual machines
VMware Virtual Symmetric Multi-Processing (SMP) – Enables a single virtual machine to use multiple physical processors simultaneously The virtual resource owners do not need to be concerned with the physical composition (number servers, quantity and type of CPUs—Multi-core, Hyperthreading, etc) of the underlying Cluster to provision resources. They simply set up the resourceprovisioning policies based on the aggregate available resource. VMware Infrastructure will automatically assign the appropriate resources dynamically to the virtual machines within the boundaries of those policies.
Resources reserved for a Resource Pool or virtual machine are not taken away immediately. They dynamically respond to the demand. For example, if the 4 GHz of computing resources reserved for the Accounting department are not being used, virtual machine "Payroll" can make use of the remaining processing capacity during its peak time. When Accounting again requires the processing capacity, "Payroll" will dynamically give them back. As a result, even though

resources are reserved for different Resource Pools, they are not being wasted if not used by their owner.

V. CONCLUSIONS

Cloud computing technology is increasingly being used bysmall scale industry to enterprise industry. Cloud service provider must needed an effective resource allocation strategy that will increase the profit earned but also increases the number of users. This paper describe basic steps taken care by VMware cloud service provider for dynamically allocation of VMs .So that how resources such as cpu, memory, processors are how dynamically utilized.

VI. REFERENCES

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