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MARKET ORIENTATION OF DATA CENTRES IN CLOUD

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ABSTRACT

Datacenters are the building blocks of the computing infrastructure that backs the services offered by a cloud computing vendor, no matter its specific category (IaaS, PaaS, or SaaS)[2]. In this paper, we present these systems by taking into account the elements that are fundamental for realizing computing infrastructures that support Market Oriented cloud computing (MOCC). These criteria govern the logical organization of these systems rather than their physical layout and hardware characteristics. They provide guidance for designing architectures that are market oriented.

Key words: ***Data center, Market, Resource, Allocation.***

1. INTRODUCTION

Cloud computing is all about selling on demand IT services to customers. So wherever sale purchase terms come that approach becomes market oriented. Similarly whenever some customers wants to purchase services from cloud we need to handle all aspects that are related to market e.g. brokers, pricing of resources, resource allocation etc. .These all things when done with cloud computing it becomes Market oriented cloud computing. This paper focuses on arrangement required at the data centre of cloud to support MOCC.

2. FEATURES OF MARKET ORIENTED DATA ENTERS

As we know these data centers also take care of marketing aspects of cloud [7]. SO it has some unique features which make it different from normal datacenters. Following are some of them:

- Pricing of services : charging users as per usage, gernating bill
- Maintaining account: for each and every user. How many services are allocated to each user a how much it paying for it.
- Monitoring: Status of resources is monitored i.e. are they available or not whenever a new request arrives.

3. ARCHITECTURE

We describe reference architecture for Market oriented data centers [9]. This architecture provides an overall view of the components that can support a cloud computing provider in making available its services on a market-oriented basis [7]. More specifically, the model applies to PaaS and IaaS providers that explicitly leverage virtualization technologies to serve customers' needs. Following are the major components of the datacentre at cloud.

3.1 Users and brokers

They originate the workload that is managed in the cloud datacenter. Users either require [4] [5] virtual machine instances to which to deploy their systems (IaaS scenario) or deploy applications in the virtual environment available to them by the provider (PaaS scenario). These service requests are issued by service brokers that act on behalf of users and look for the best deal for them.

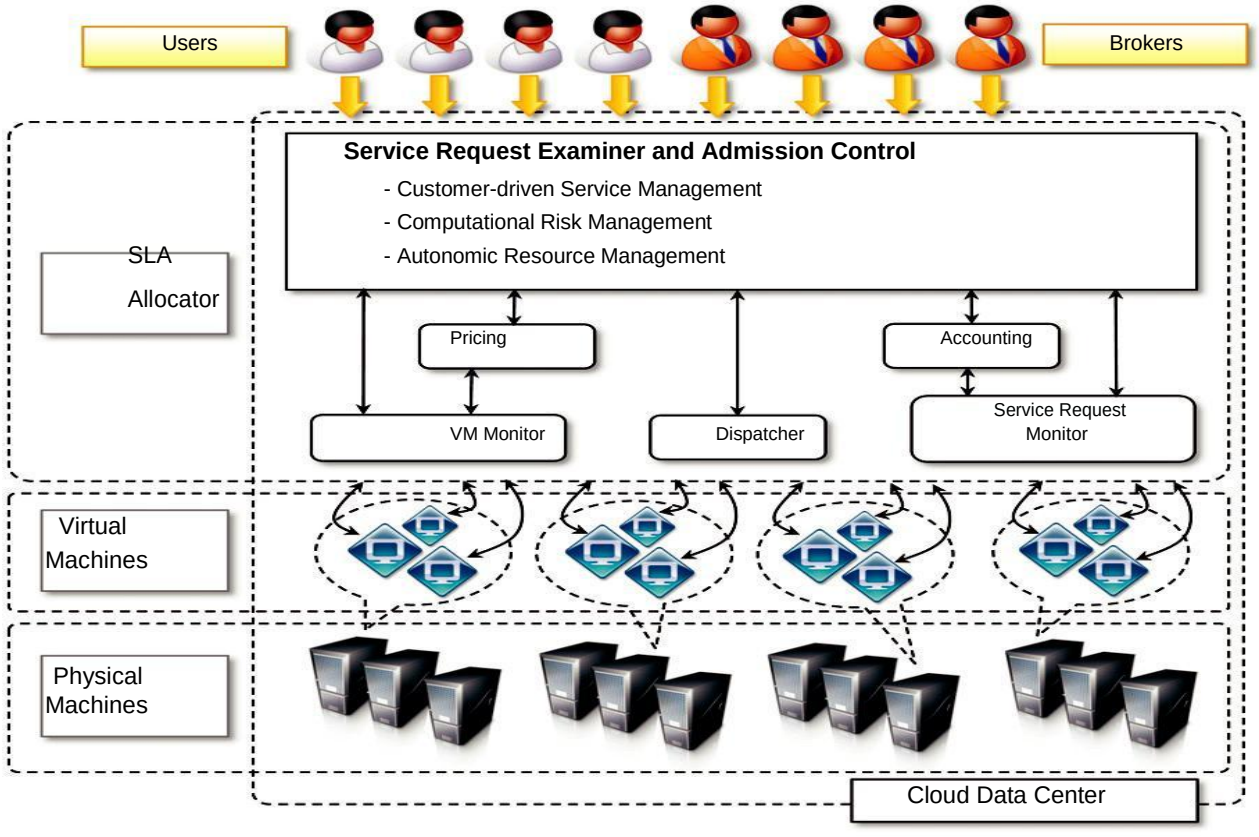

Fig 1.Reference architecture for a cloud datacenter.

3.2 SLA resource allocator

The allocator represents the interface between the datacenter and the cloud service provider and the external world. Its main responsibility is ensuring that service requests are satisfied according to the SLA (service level agreement) agreed to with the user. Several components coordinate allocator activities in order to realize this goal:

3.2.1 Service Request Examiner and Admission Control Module

This module operates in the front-end and filters user and broker requests in order to accept those that are feasible given the current status of the system and the workload that is already processing. Accepted requests are allocated and scheduled for execution. IaaS service providers allocate one or more virtual machine instances and make them available to users. PaaS providers identify a suitable collection of computing nodes to which to deploy the users' applications.

3.2.2 Pricing Module

This module is responsible for charging users according to the SLA they signed. Different parameters can be considered in charging users; for instance, the most common case for IaaS providers is to charge according to the characteristics of the virtual machines requested in terms of memory, disk size, computing capacity, and the time they are used. It is very common to calculate the usage in time blocks of one hour, but several other pricing schemes exist. PaaS providers can charge users based on the number of requests served by their application or the usage of internal services made available by the development platform to the application while running.

3.2.3 Accounting Module

This module maintains the actual information on usage of resources and stores the billing information for each user. These data are made available to the Service Request Examiner and Admission Control module when assessing users' requests. In addition, they constitute a rich source of information that can be mined to identify usage trends and improve the vendor's service offering.

3.2.4 Dispatcher

This component is responsible for the low-level operations that are required to realize admitted service requests. In an IaaS scenario, this module instructs the infrastructure to deploy as many virtual machines as are needed to satisfy a user's request. In a PaaS scenario, this module activates and deploys the user's application on a selected set of nodes; deployment can happen either within a virtual machine instance or within an appropriate sandboxed environment.

3.2.5 Resource Monitor

This component monitors the status of the computing resources, either physical or virtual. IaaS providers mostly focus on keeping track of the availability of VMs and their resource entitlements. PaaS providers monitor the status of the distributed middleware, enabling the elastic execution of applications and loading of each node.

3.2.6 Service Request Monitor

This component keeps track of the execution progress of service requests. The information collected through the Service Request Monitor is helpful for analysing system performance and for providing quality feedback about the provider's capability to satisfy requests. For instance, elements of interest are the number of requests satisfied versus the number of incoming requests, the average processing time of a request, or its time to execution. These data are important sources of information for tuning the system.

The SLA allocator executes the main logic that governs the operations of a single datacenter or a collection of datacenters. Features such as failure management are most likely to be addressed by other software modules, which can either be a separate layer or can be integrated within the SLA resource allocator.

3.3 Virtual machines (VMs)

Virtual machines constitute the basic building blocks of a cloud computing infrastructure, especially for IaaS providers. VMs [1] represent the unit of deployment for addressing users' requests. Infrastructure management software is in charge of keeping operational the computing infrastructure backing the provider's commercial service offering. As we discussed, VMs play a fundamental role in providing an appropriate hosting environment for users' applications and, at the same time, isolate application execution from the infrastructure, thus preventing

applications from harming the hosting environment. Moreover, VMs are among the most important components influencing the QoS with which a user request is served. VMs can be tuned in terms of their emulated hardware characteristics so that the amount of computing resource of the physical hardware allocated to a user can be finely controlled. PaaS providers do not directly expose VMs to the final user, but they may internally leverage virtualization technology in order to fully and securely utilize their own infrastructure. As previously discussed, PaaS providers often leverage given middleware for executing user applications and might use different QoS parameters to charge application execution rather than the emulated hardware profile.

3.4 Physical Machines

At the lowest level of the reference architecture resides the physical infrastructure [6] that can comprise one or more datacenters. This is the layer that provides the resources to meet service demands. This architecture provides cloud services vendors with a reference model suitable to enabling their infrastructure for MOCC. As mentioned, these observations mostly apply to PaaS and IaaS providers, whereas SaaS vendors operate at a higher abstraction level. Still, it is possible to identify some of the elements of the SLA resource allocator, which will be modified to deal with the services offered by the provider. For instance, rather than linking user requests to virtual machine instances and platform nodes, the allocator will be mostly concerned with scheduling the execution of requests within the provider's SaaS framework, and lower layers in the technology stack will be in charge of controlling the computing infrastructure. Accounting, pricing, and service request monitoring will still perform their roles.

4. CONCLUSION

We conclude that MOCC datacenters contains lots of additional features then normal datacenters. As they cover all the aspects that deal with sale of services too. So, these datacenters not only gernate services but do all necessary things for revenue collection from customers.

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