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Dispensation from Vendor Lock-In To Neoteric Meta Cloud

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ABSTRACT

In the recent years, we are experiencing a new technology called Cloud Computing. This technology achieved so many objectives and successes which made it adopted by many companies. This technology is called Cloud Computing. The reason for the success of Cloud computing is largely due to customers ability to use services on demand with a pay and make customers feel comfortable in a lot of respects, like low cost, services etc. Provided with high performance and high availability. On the other hand, some companies are wary of moving into the cloud because of problems related to the availability of the service, or data lock-in. For one thing, even though public cloud availability is generally high, outages still occur, so all works, resources/ services are locked, because a cloud is mainly parked until the cloud is back online. Also cloud providers do not guarantee Service Level Agreements (SLAs).For this, the business will be trapped in the cloud, which is not guaranteed because it may not continue with the same quality of service (QoS), and there is another thing which is the cloud provider terms. Let the provider unilaterally change pricing at any time, so the heart or core for all these problems can be identified what the customer needs to control/monitor the cloud that they are using, and make them able to change or migrate the cloud and go to another one, at the conditions if any problem happen with the current cloud. Also, the customers can migrate from the current cloud to new cloud when they found any cloud that provides better services than the current cloud in future.

Key words: Meta cloud, Cloud Computing, Business, Service Level Agreements, Migrating cloud, License Agreement

1. INTRODUCTION

Whenever you can save your programs/photos or any things else in another place online, not in your home pc, or you can use Facebook, Gmail, etc social networking sites then you're using "cloud computing" services. First of all we must know the meaning of Cloud: The word "cloud" often refers to the Internet and more precisely to some datacenter full of servers that is connected to the Internet. A cloud can be a wide area network (WAN) like the public Internet or a private, national or global network. The term can also refer to a local area network (LAN) within an organization. After knowing what the cloud is, we discuss about cloud computing.[1]

Cloud Computing: Cloud computing in short definition it's sharing the resources (services) that are provided by some companies or organizations by the costumers after connected these resources (services) with internet."Cloud computing" refers to the services that have enabled the Internet cloud to become so prominent in everyday life, or Hardware and software services from a provider on the Internet (the "cloud") .The previous generation or we can say the pre concept for cloud computing are: grid computing, ISP (internet service provider), each of these concept share some of the common properties, structure and architecture, and they different in some of the means that deliver the services. Cloud computing refers to the delivery of computing resources over the Internet. Instead of keeping data on your own hard drive or updating applications for your needs, you use a service over the Internet, at another location, to store your information or use its applications. Doing so may give rise to certain privacy implications. Cloud computing is the delivery of computing services over the Internet. Cloud services allow individuals and businesses to use software and hardware that are managed by third parties at remote locations. Examples of cloud services include online file storage, social networking sites, webmail, and online business, the cloud computing model allows access to information and computer resources from anywhere that a network connection is available. Cloud computing provides a shared pool of resources, including data storage space, networks, computer processing power, and specialized corporate and user applications.**[2]**

Characteristics of Cloud Computing:

The characteristics of cloud computing includes:

A) On-demand self service: On-demand self service means that customers (usually organizations) can request and manage their own computing resources.
B) Broad network access: Broad network access allows services to be offered over the Internet or private networks.
C) Resource pooling: Pooled resources means that customers draw from a pool of computing resources, usually remote data centers.
D) Rapid elasticity and measured service: Services can be scaled larger or smaller; and use of a service is measured and customers are billed accordingly.
E) Multi-tenancy : Means that multiple customers can share the same infrastructure services in the cloud computing
F) Service level agreement (SLA) Driven: A contract between cloud service provider and a customer that specifies, in terms what's the services that cloud service provider will furnish.
G) Virtualized: The cloud computing environment is a fully virtualized environment, because that any resources that need are in different places or unknown places.
H) Flexible: Cloud computing flexible mean it can be serve as many as workloads**.** [3]

2. LITERATURE SURVEY

Literature survey is the very important in the procedure of building the software. Before the development of the tools it is necessary to specify the time factor and the economic factor. Once satisfied with these things, then the next steps to select the operating system and language can be used to develop the tool. Once the programmers start building programmers tool you need a lot of external support. It can get this support from the senior programmers, from a book or from the sites. Before the construction of the system considered above are taken into account for the development of the proposed system.[4]

Meta Cloud and License Agreement:

Meta Cloud: Let's come back to the any application. A meta-cloud-compliant variant of this application accesses cloud services using the meta cloudAPI and doesn't directly talk to the cloud-provider-specific service APIs.For our particular case, this means the application doesn't depend on providers service APIs, but rather on the meta cloud's compute, message queue, and relational database service APIs. For initial deployment, the developer submits the application's resource template to the Meta cloud. It specifies not only the three types of cloud services needed to run the sports application, but also their necessary properties and how they depend on each other. For compute resources, for instance, the developer can specify CPU, RAM, and disk space according to terminology defined by the Meta cloud resource template DSL. Each resource can be named in the template, which allows for referencing during deployment, runtime, and migration[3]

License agreement: A licensing agreement is a legal contract between two parties, known as the licensor and the licensee. In a typical licensing agreement, the licensor grants the licensee the right to produce and sell goods, apply a brand name or trademark, or use patented technology owned by the licensor. In exchange, the licensee usually submits to a series of conditions regarding the use of the licensor's property and agrees to make payments known as royalties.

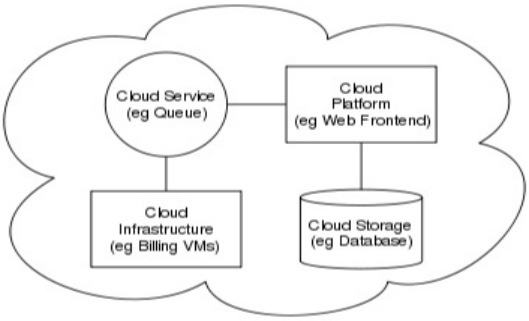
Licensing agreements cover a wide range of well-known situations. For example, a retailer might reach agreement with a professional sports team to develop, produce, and sell merchandise bearing the sports team's logo. Or a small manufacturer might license a proprietary production technology from a larger firm to gain a competitive edge rather than expending the time and money trying to develop its own technology. Or a greeting card company might reach agreement with a movie distributor to produce a line of greeting cards bearing the image of a popular animated character.[5]

3. EXISTING SYSTEM

As we know day by day the computer technology have developed so many principles that can used for serve the human beings and provide their daily needs, customers as always looking for the services that have more reliable, acceptable cost, high performance, and high availability. During the past years, many of the concepts have emerged in the world of information technology, these concepts were based on research and extensive studies by the researchers, and by relying on these studies has developed many of the techniques and applications that provide services to customers that facilitate their work in everyday life, and how to make satisfied users these services. One of these techniques is cloud computing, cloud computing a new modern concept introduced during the past few years, based on the delivery of services to customers with different types or classes (such as companies or ordinary users). Also cloud computing concept is the result of previous concepts (such as network, Web 2.0, Internet service provider), cloud computing is based on the idea of connecting services to network after that the users will able to used it through internet, with another meaning users will have the ability to obtain these services via the Internet, there are different types of services produced by cloud which depend on the cloud provider and the nature work of cloud. Things started to cloud service is payable on demand, also offers high performance and speed services, But also there are some problems and challenges faced by cloud computing, singled and one of the common problems in the field of cloud computing is the vendor lock in, So do not go away in the problem of

vendor lock-in Should initially remind and explain the architecture of cloud computing, what kinds of existing cloud computing? , With the number of services provided. [6]

Cloud architecture: Any work in an organization needs to be structured, coordinated and determined accurately, and also present a set of fundamentals in order to help make it a success, collected up to reach a high degree of perfection administrative this called Architectural administration, The same for cloud computing architecture there a set of components that cooperate with each other in the completion of work, In general cloud architecture can be summarized that all services provided by the cloud can be obtained by customers or business users via the Internet using browsers applications, The cloud components shown in Figure (2.1)



Figure(1) Cloud Architecture

Component of cloud architecture:

Cloud service

Any resources that provided over internet, it called cloud service.

Cloud platform

It's a place where software applications may be run in an environment composed of utility cloud services in a logically abstract environment.

Cloud storage

Its service model where data are maintained backed up remotely, made available for the users.

Cloud infrastructure

It's hardware and software components, such as server, storages…etc.

Cloud types:

Public cloud

One of the types of cloud, where the service provider offers services to the public via the Internet directly.

Private cloud

One of the types of cloud, where the private cloud only certain organization only and are not available to all, or the public.

Hybrid cloud

One of the cloud types, this type of cloud integrates two types of private and public clouds.

Cloud services:

Software as a Service (SaaS)

This type of cloud services, the service provider has the applications needed by the customer.

Platform as a Service (PaaS)

This type of service allows users or customers of rental services, operating systems, as well as storage, through the internet, and also customers can rent a server for testing applications or develop new applications.

Infrastructure as a service (IaaS)

This type of service allows users or customers of access to the tools they need to complete their work in a matter of minutes.[5]

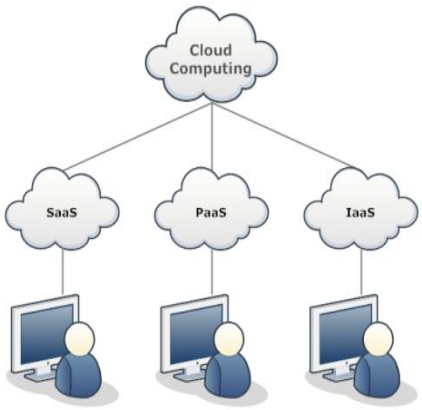


Figure (2) Cloud services

Challenges of cloud computing

Cloud computing have no. of challenges that must be solve and avoid the problems, these challenges are:

Security

It must provide security for the customer.

Availability

It should be work for 24 h/7 days in week.

Performance

The performance of the services must keep same even if the workload is increased.

Vender lock-in

The cloud provider should not lock-in services, resources of customers. If they figure out better services in another cloud or any issues in current cloud, the user can easily migrate to a different cloud. The existing system has been discussing the problem of challenge of vendor lock-in. The solution to this problem is through the concept of Meta cloud. The problem of vendors lock-in means make the customers rely only on a single service provider, which means the monopoly of ownership, so it does not allow customers to migrate to another cloud, unless they pay a high cost. Migration of customers to another cloud back for several reasons may be poor service. Meta cloud is the proposed solution which incorporates design time and runtime components. This Meta cloud would abstract

away from existing offerings, technical incompatibilities, thus mitigating vendor lock-in. It helps users find the right set of cloud services for a particular use case and supports an application's initial deployment and runtime migration.[7]

Meta cloud architecture

As noted above, the proposed Meta cloud to solve the problem of vendors lock, it helps customers to choose the required cloud at design time, and gathering information for all the required components that are present at the service provider at the time of implementation. In this way we can minimize or avoid vendors lock. The components of Meta cloud are shown in below figure.

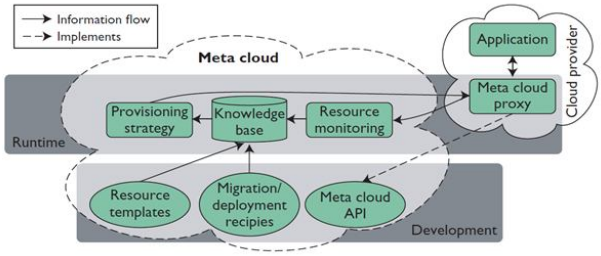


Figure (3) Meta Cloud Architecture

Inside the Meta Cloud: To some extent, we can realize the Meta cloud based on a combination of existing tools and concepts, part of which we just examined. Figure 1 depicts the Meta cloud's main components. We can categorize these components based on whether they're important mainly for cloud software engineers during development time or whether they perform tasks during runtime. We illustrate their interplay using the sports betting portal example.

Meta Cloud API: The Meta cloud API provides a unified programming interface to abstract from the differences among provider API implementations. For customers, using this API prevents their application from being hard-wired to a specific cloud service offering. The Meta cloud API can build on available cloud provider abstraction APIs, as previously mentioned. Although these deal mostly with key- value stores and compute services, in principle, all services can be covered that are abstract enough for more than one provider to offer and who's specific APIs don't differ too much, conceptually.

Resource Templates: Developers describe the cloud services necessary to run an application using resource templates. They can specify service types with additional properties, and a graph model expresses the interrelation and functional dependencies between services. Developers create the Meta cloud resource templates using a simple domain-specific language (DSL), letting them concisely specify required resources. Resource definitions are based on a hierarchical composition model; thus developers can create configurable and reusable template components, which enable them and their teams to share and reuse common resource templates in different projects. Using the DSL, developers model their application components and their basic runtime requirements, such as (provider- independently normalized) CPU, memory, and I/O capacities, as well as dependencies and weighted communication relations between these components. The provisioning strategy uses the weighted component relations to determine the application's optimal deployment configuration. Moreover, resource templates allow developers to define constraints based on costs, component proximity, and geographical distribution. [8]

Migration and Deployment Recipes: Deployment recipes are an important ingredient for automation in the Meta cloud infrastructure. Such recipes allow for controlled deployment of the application, including installing packages, starting required services, managing package and application parameters, and establishing links between related components. Automation tools such as Opscode Chef provide an extensive set of functionalities that are directly integrated into the Meta cloud environment. Migration recipes go one step further and describe how to migrate an application during runtime — for example, migrate storage functionality from one service provider to another. Recipes only describe initial deployment and migration; the provisioning strategy and the Meta cloud proxy execute the actual process using the aforementioned automation tools.[1]

Meta Cloud Proxy: The Meta cloud provides proxy objects, which are deployed with the application and run on the provisioned cloud resources. They serve as mediators between the application and the cloud provider. These proxies expose the Meta cloud API to the application, transform application requests into cloud-provider-specific requests, and forward them to the respective cloud services. Proxies provide a way to execute deployment and migration recipes triggered by the Meta cloud's provisioning strategy. Moreover, proxy objects send QoS statistics to the resource monitoring component running within the Meta cloud. The Meta cloud obtains the data by intercepting the application's calls to the underlying cloud services and measuring their processing time, or by executing short benchmark programs. Applications can also define and monitor custom QoS metrics that the proxy objects send to the resource monitoring component to enable advanced, application-specific management strategies. To avoid high load and computational bottlenecks, communication between proxies and the Meta cloud is kept at a minimum. Proxies don't run inside the Meta cloud, and

regular service calls from the application to the proxy aren't routed through the Meta cloud, either.[4]

Resource Monitoring: On an application's request, the resource monitoring component receives data collected by Meta cloud proxies about the resources they're using. The component filters and processes these data and then stores them on the knowledge base for further processing. This helps generate comprehensive QoS information about cloud service providers and the particular services they provide, including response time, availability, and more service-specific quality statements.[7]

Provisioning Strategy: The provisioning strategy component primarily matches an application's cloud service requirements to actual cloud service providers. It finds and ranks cloud services based on data in the knowledge base. The initial deployment decision is based on the resource templates, specifying the resource requirements of an application, together with QoS and pricing information about service providers. The result is a list of possible cloud service combinations ranked according to expected QoS and costs. At runtime, the component can reason about whether migrating a resource to another resource provider is beneficial based on new insights into the application's behavior and updated cloud provider QoS or pricing data. Reasoning about migrating also involves calculating migration costs. Decisions about the provisioning strategy result in the component executing customer-defined deployment or migration scripts.

Knowledge Base: The knowledge base stores data about cloud provider services, their pricing and QoS, and information necessary to estimate migration costs. It also stores customer-provided resource templates and migration or deployment recipes. The knowledge base indicates which cloud providers are eligible for a certain customer. These usually comprise all providers the customer has an account with and providers that offer possibilities for creating (sub) accounts on the fly. Several information sources contribute to the knowledge base: Meta cloud proxies regularly send data about application behavior and cloud service QoS. Users can add cloud service providers' pricing and capabilities manually or use crawling techniques that can get this information automatically.[5]

Advantages of Meta cloud

- The concept of a Meta cloud that incorporates design time and runtime components.
- This Meta cloud would abstract away from existing offerings' technical incompatibilities, thus mitigating vendor lock-in.[5]

Disadvantages of Meta cloud

- It not guarantee that problem of vendor lock-in will not occur in future.
- The migration from one cloud service provider to another will be occurring only at the design time (when the customer decided to select the cloud service provider) not after select.[6]

The Meta cloud as a general concept to solve the problem of vendors lock itself is something worth trying, but in some respects needs tinkering, and also fill some of the gaps necessary to minimize the problem and give some kind of legitimacy for each consequent it later, after the purchase from the cloud service provider. In this paper, we will review the other side of the problem of vendors lock, and we must know that we will not eliminate this problem completely, because part of the reason is not always the technology, but the problem is related to the nature of trends suppliers also[8]

4. PROPOSED SYSTEM

As we have noted potential problems in the meta cloud, it is necessary to avoid such gaps that may lead to a problem of vendor locking-in, and to avoid these gaps, it is appropriate to provide a solution which explains the nature of the software applications that are open source, which gives the permissions to users or customers in the modification and control for applications that deal with it, while most open source applications are dependent on license agreement. These agreements allow customers to freely use the product in the manner set forth in this agreement. Through what we have stated previously, the license agreement is the solution to the problem of vendor lock-in, this solution ensures that the two parties of the contract will save their rights, without manipulation or unfairness among the parties.[4]

Modification of Meta Cloud with License Agreement**:**

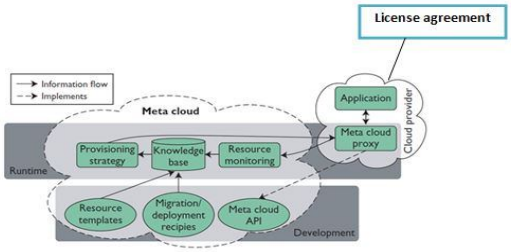


Figure (4) Meta Cloud Architecture with License Agreement

Advantages of proposed system:

1) The concept of license agreement is promoting the Meta cloud in run time.

2) It will help to reduce the problem of vendor lock-in.[3]

5. CONCLUSIONS & FUTURE WORK

The enhancement of Meta cloud with license agreement could solve the problem of vendor lock-in but there are so many impedes that are required to be adjusted between the different cloud providers. Along with the services that the cloud provider supplies, it is also recommended to give the customer the insurance that the services are sufficient for his need. The future work is to solve all these impedes and also provide more security and flexibility in moving from one cloud to another specially in private cloud and public cloud.[9]

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