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Implementation and Analysis of Open Source Computing on Cloud-Based ERP Method

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Abstract: Cloud computing is an emerging computing paradigm that is real and becoming gradually more common. While there are advantages and similarly challenges to implementing the cloudcomputing concept, the key attention provided in this paper can be used as a preliminaryfact. Businesses are largest in capitalist economies, where most of them are privately owned and administered to earn profit to increase the wealth of their owners. ERP also leads to global decision optimization, a clearoverview of enterprise functioning and quicker performance. ERP enables companies to have greater control over marketing, production and inventory. This reduces costs as well as reliance on help desk support. Using a cloud based solution negates the need to purchase hardware, software licences and annual hardware and software maintenance support contracts for company owned assets. Eliminate worries regarding aging hardware and asset replacement.. Avoid the costs associated with environmental controls in server rooms. Reduction in bandwidth and communication service requirements to local servers if multiple sites require access. Traffic is redirected to the Web. As business vendors are targeting SMEs but many projects fail due to poor planning, lack of resources, organization immaturity and failure to understand the complexities of integrating such applications with existing business systems.

Keywords: Include at least 4 keywords or phrases

I. INTRODUCTION

Cloud computing is a universal term for the delivery of hosted services over the Internet. To satisfy the new markets being created by the cloud, small- and medium-size companies will leverage the cloud and get a bigger slice of the action.

Cloud computing enables companies to consume compute resources as a utility -- just like electricity -- rather than having to build and maintain computing infrastructures in-house. Cloud computing promises several attractive benefits for businesses and end users. Three of the main benefits of cloud computing include:

• Self-service provisioning:

End users can spin up computing resources for almost any typeofworkload on-demand.

• Elasticity:

Companies can scale up as computing needs increase and then scale down again as demands decrease.

• Pay per use:

Computing resources are measured at a granular level, allowing users to pay only for the resources and workloads they use.

Cloud computing services can be private, public or hybrid.

Private cloud services are delivered from a business' data center to internal users[9]. This model offers versatility and convenience, while preserving management, control and security. Internal customers may or may not be billed for services through IT chargeback. In the public cloud model, a third-party provider delivers the cloud service over the Internet. Public cloud services are sold on-demand, typically by the minute or the hour. Customers only pay for the CPU cycles, storage or bandwidth they consume. Leading public cloud providers include Amazon Web Services (AWS), Microsoft Azure, IBM/Soft Layer and Google Compute Engine.

Hybrid cloud is a combination of public cloud services and on-premises private cloud – with orchestration and automation between the two. Companies can run mission-critical workloads or sensitive applications on the private cloud while using the public cloud for bursty workloads that must scale on-demand [8]. The goal of hybrid cloud is to create a unified, automated, scalable environment which takes advantage of all that a public cloud infrastructure can provide, while still maintaining control over mission-

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critical data.Although cloud computing has changed over time, it has always been divided into three broad service categories: infrastructure as a service (IaaS), platform as a service (PaaS) and software as service (SaaS).

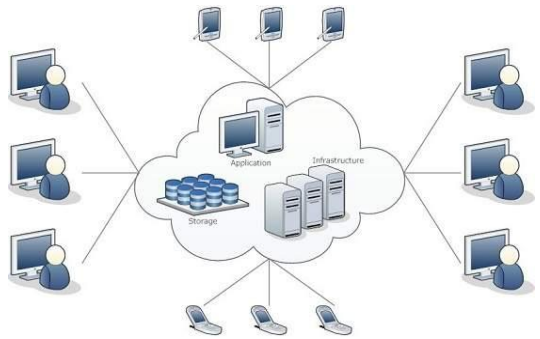
IaaS providers such as AWS supply a virtual server instance and storage, as well as application program interfaces (APIs) that let users migrate workloads to a virtual machine (VM). Users have an allocated storage capacity and start, stop, access and configure the VM and storage as desired. IaaS providers offer small, medium, large, extra-large, and memory- or compute-optimized instances, in addition to customized instances, for various workload needs.

In the PaaS model, providers host development tools on their infrastructures. Users access those tools over the Internet using APIs, Web portals or gateway software. PaaS is used for general software development and many PaaS providers will host the software after it's developed. Common PaaS providers include Salesforce.com'sForce.com, Amazon Elastic Beanstalk and Google App Engine[11].

SaaS is a distribution model that delivers software applications over the Internet; these are often called Web services. Microsoft Office 365 is a SaaS offering for productivity software and email services. Users can access SaaS applications and services from any location using a computer or mobile device that has Internet access [11].

II. RELATED WORK

Cloud Computing refers to manipulating, configuring, and accessing the hardware and software resources remotely. It offers online data storage, infrastructure, and application. Applications such as e-mail, web conferencing, customer relationship management (CRM) execute on cloud.



Cloud computing offers platform independency, as the software is not required to be installed locally on the PC. Hence, the Cloud Computing is making our business applications mobile and collaborative. Various Cloud Computing platforms are available today. The following are the popular Cloud Computing platforms.

Salesforce.com
This is a Force.com development platform. This provides a simple user interface and lets users log in, build an app, and push it in the cloud.

Appistry
The Appistry's Cloud IQ platform is efficient in delivering a runtime application. This platform is very useful to create scalable and service oriented applications.

App Scale
The AppScale is an open source platform for App Engine of Google applications.

AT&T
The AT&T allows access to virtual servers and manages the virtualization infrastructure. This virtualization infrastructure includes network, server and storage.

Engine Yard
The Engine Yard is a rails application on cloud computing platform.

Enomaly
Enomaly provides the Infrastructure-as-a-Service platform.

Flexi Scale
The Flexi Scale offers a cloud computing platform that allows flexible, scalable and automated cloud infrastructure.

GCloud3
The GCloud3 offers private cloud solution in its platform.

Gizmox
The Gizmox Visual Web GUI platform is best suited for developing new web apps and modernizes the legacy apps based on ASP.net, DHTML, etc.

Go Grid
The Go Grid platform allows the users to deploy web and database cloud services.

Google
The Google's App Engine lets the users build, run and maintains their applications on Google infrastructure.

Long Jump
The Long Jump offers a business application platform, a Platform-as-a-Service (PaaS).

Microsoft
The Microsoft Windows Azure is a cloud computing platform offering an environment to create cloud apps and services.

Orange Scape
Orange Scape offers a Platform-as-a-Service (Paas) for non-programmers. Building an app is as easy as spreadsheet.

Rack Space
The Rack Space provides servers-on-demand via a cloud-driven platform of virtualized servers.

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Amazon EC2
The Amazon EC2 (Elastic Compute Cloud) lets the users configure and control computing resources while running them on Amazon environment s.

The concept of Cloud Computing came into existence in the year 1950 with implementation of mainframe computers, accessible via thin/static clients. Since then, cloud computing has been evolved from static clients to dynamic ones and from software to services.

III.HISTORY OF CLOUD COMPUTING

Manufacturers need to understand their control and complexity requirements before deciding how to integrate ERP cloud computing with on-premises systems, analysts say. Cloud Computing has numerous advantages. Few of them are listed below [3].

- One can access applications as utilities, over the Internet.
- One can manipulate and configure the applications online at any time.
- It does not require to install a software to access or manipulate cloud application.
- Cloud Computing offers online development and deployment tools, programming runtime environment through PaaS model.
- Cloud resources are available over the network in a manner that provide platform independent access to any type of clients.
- Cloud Computing offers on-demand self-service. The resources can be used without interaction with cloud service provider.
- Cloud Computing is highly cost effective because it operates at high efficiency with optimum utilization. It just requires an Internet connection
- Cloud Computing offers load balancing that makes it more reliable.

Although Cloud Computing is a promising innovation with various benefits in the world of computing, it comes with risks. Some of them are discussed below:

- Security and Privacy

It is the biggest concern about cloud computing. Since data management and infrastructure management in cloud is provided by third-party, it is always a risk to handover the sensitive information to cloud service providers. Although the cloud computing vendors ensure highly secured password protected accounts, any sign of security breach may result in loss of customers and businesses. Although the cloud computing vendors ensure highly secured password protected accounts, any sign of security breach may result in loss of customers and businesses.

- Lock In

It is very difficult for the customers to switch from one Cloud Service Provider (CSP) to another. It results in dependency on a particular CSP for service.

- Isolation Failure

This risk involves the failure of isolation mechanism that separates storage, memory, and routing between the different tenants.

- Management Interface Compromise

In case of public cloud provider, the customer management interfaces are accessible through the Internet.

- Insecure or Incomplete Data Deletion

It is possible that the data requested for deletion may not get deleted. It happens because either of the following reasons

- Extra copies of data are stored but are not available at the time of deletion.

- Disk that stores data of multiple tenants is destroyed.

IV. OPEN SOURCE COMPUTE CLOUDS

A. Eucalyptus

Though currently only available on Cent OS and Red Hat Enterprise Linux, Eucalyptus is already getting notice as a complete IaaS solution. Comprised of a Cloud Controller (CLC), Walrus (persistent data storage), Cluster Controller (CC), Storage Controller (SC), Node Controller (NC), and an optional VMware Broker (VB), Eucalyptus is a full-featured product. Each component is a stand-alone web service (excluding VB), with the aim of allowing Eucalyptus to provide an API for each service (language-agnostic). This Linux-based system allows users to implement private and hybrid clouds within existing infrastructure with an industry-standard, modular framework[4]. In particular, Eucalyptus provides a virtual network overlay isolating various traffic, allowing multiple clusters to be transparent on the same Local Area Network (LAN) while maintaining data integrity. Additionally, Eucalyptus is API compatible with Amazon's EC2, S3, IAM, ELB, Auto Scaling, and Cloud Watch services, ideal for hybrid cloud implementation options.

B. Apache CloudStack

Despite rumours to the contrary, Java continues to prove central to many major cloud applications. At the heart of Apache CloudStack is a host of functions written in Java including user management, multi-tenancy and account separation, network, compute and storage resource accounting, web-based management console, native API and Amazon S3/EC2 compatible API, and primary/secondary storage support. Apache CloudStack works with hosts on Xen Server/XCP, KVM, Hyper-V and VMware. Used to deploy and manage large networks of virtual systems, Apache CloudStack has been chosen by many providers deploying private, public, and hybrid cloud solutions to customers. Additional features include high availability, a scalable infrastructure as a service cloud computing platform, and a significant community of

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users and developers who keep the technology and feature improvements moving forward [10].

C. Sheep Dog

Another distributed object storage solution, Sheepdog stands by its small codebase, simplicity and ease of use. Primarily for volume and container services, Sheepdog intelligently manages disks and nodes to which it can scale out to by the thousands. Sheepdog can attach to QEMU VMs and Linux SCSI targets, also supporting snapshot, cloning and thin provisioning.

It can also attach to other VMs and OS that run on bare metal hardware (iSCSI must be supported, however). Sheepdog has support for libvirt and OpenStack, can interface with HTTP Simple Storage, and has backend storage features like discard support, journaling, multi-disk on single node support, and erasure code support. With OpenStack Swift and Amazon S3 compatibility via web interface, Sheepdog can store and retrieve vast amounts of data.

A. Open Stack

Among the many architectural features of OpenStack, storage is one of the foundational cloud architecture necessities [6]. Providing scalable, redundant object storage, OpenStack uses clusters of servers and can store petabytes of data. Through this distributed storage system, OpenStack adds to its feature list another area of scalability, redundancy and durability. Written to multiple disks across the data center, data replication is managed and replication ensured.
For those that are mindful of budgets, the Open Stakc storage solution can write across older, smaller drives as well as newer, faster ones. Not satisfied with OpenStack storage? OpenStack is compatible with other storage solutions like Ceph, NetApp, Nexenta, Solid Fire and Zadara.

Additional features include snapshots (can be restored or used to create a new storage block), scaling (add new servers to scale and replicate data across), support for block storage, self-healing, a variety of powerful management tools for usage, performance, and general reporting, including auditing [12].

V. CLOUD BENEFITS AND RISKS

It is obvious that implementing a new data system comes with serious risks to consider, but it is also clear that the benefits of cloud computing can be factors that help business grow—particularly smaller ones.Cloud computing is letting businesses slash time to market for new products and services and respond quickly to competitors and market shifts.

But to deliver the benefits promised, cloud service providers must assure tenants their workloads are running on trusted platforms and provide the visibility and control they need for business continuity and compliance.to extend Cloud Integrity Technology to storage and networking workloads as well: storage controllers, SDN controllers, and virtual network functions like switches, evolved packet core elements, and security appliances. It's all about giving enterprises the tools they need to capture the full potential of cloud computing. Cloud computing offers what every business wants: the ability to respond instantly to business needs.

It also offers what every business fears: loss of control and, potentially, loss of the data and processes that enable the business to work [5].in order to present a more complete picture of Business problem solutions for the SME, the study included reviews of lesser known Business delivery methods and platforms, in particular Cloud Computing, SaaS and Open Source Business to heighten awareness of the alternatives available to SMEs other than proprietary licensed software.

Benefits	Risks
Software free od Pay for Use	Organizational Support
24 hours access	Intellectual Property
Open for Business and Research	Protect and Secure Sensitive Data
Protect the Environment by using Green Technologies	Maturity of Solutions
Increase Functional Capabilities	Standard Adherence
Support for Teaching and Learning	Data Protection, Security and Accounts Management
Access Application from anywhere	Not all Applications Run in Cloud

VI. CONCLUSION

The Enterprise resource planning is an industry term for the broad set of activities that helps a business manage the important parts of its business such as purchasing and inventory management. ERP applications can also include modules for the finance and human capital management aspects of a business.

To some industry experts, the promise of cloud computing is that it will provide an opportunity for business to completely transform how it uses and pays for information technology[7]. For example, cloudsourcing legacy ERP applications might eliminate the need for a business to purchase the necessary server and storage hardware and maintain it on site which, in turn, has the potential reduce operational expenditures.

Other industry experts, however, point out that the problems associated with ERP software deployments -- such as integration problems between ERP modules and a company's legacy systems -- would simply transfer to the cloud.The hope is that ERP software developed specifically for cloud computing environments will include new feature sets that were simply not possible using old technology. Until then, cloud ERP is seen as being good for start up organizations and new business divisions within an existing company.

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