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**Project Report Approval**

This project report entitled **“Private Cloud using Eucalyptus and Xen to provide IaaS”**

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**Declaration**

We declare that this written submission for B.E project entitled “Private Cloud using Eucalyptus and Xen to provide IaaS” represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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**Abstract**

Cloud Computing has emerged as a popular computing model to support processing large volumetric data using clusters of commodity computers. As per NIST “Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”. Cloud computing has become an extremely attractive area of research and practice over the last few years. An increasing number of public and private sector organizations have either adopted cloud computing based solutions or are seriously considering a move to cloud computing. The foundation of cloud computing is the broader concept of converged infrastructure and shared services. The cloud also focuses on maximizing the effectiveness of the shared resources. Cloud resources are usually not only shared by multiple users but are also dynamically reallocated per demand. This can work for allocating resources to users. There are various methods to set up cloud computing infrastructures in today’s market but it has to be taken into account that the infrastructure is reliable, secure and less expensive to deploy the various applications. From the point of deployment, cloud computing platform include three kinds i.e. public cloud, private cloud and hybrid cloud. Where private cloud means the cloud infrastructure is owned or leased by only one organization and management of the infrastructure is also done by the same organization. Public cloud means that the cloud infrastructure is owned by a cloud service sales organization who tries to sell cloud computing services to the public or industry circle. Hybrid cloud means that the cloud infrastructure consists of more than two kind of cloud say private cloud and public cloud in which each kind of cloud is independent, however they are combined with some standards or special techniques. Even though public cloud is most preferred in current time, there are many concerns about adopting and using public cloud solutions such as shared technology vulnerabilities, abuse of cloud services, malicious insiders, account hijacking and service traffic hijacking, data loss, data breaches, etc. Hence, in order to overcome such problems private cloud solutions are becoming an attractive alternative to a large number of companies. Also, due to availability of open source platforms which are available free of cost and help to achieve our goal to setup private cloud with minimum cost which can be used for setting up complex and highly time taking processes We quantitatively analyzed leading open source hypervisors, Xen and KVM & cloud computing software CloudStack, OpenStack and Eucalyptus. From the results we have obtained from this analysis, we intended to build up a private cloud using the Eucalyptus and Xen to provide IaaS (Infrastructure as a Service) for an academic, research or IT infrastructure. Eucalyptus is an open source cloud computing framework that gives users the ability to create, run and manage virtual machine instances across physical machines. Xen is the hypervisor upon which the virtual machines run on the host computer.

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**Abbreviation Notation and Nomenclature**

AJAX: Asynchronous JavaScript And XML

AoE: ATA over Ethernet

API: Application Programming Interface

ATA: Advanced Technology Attachment

AWS: Amazon Web Service

CC: Cluster Controller

CLC: Cloud Controller

CLI: Command Line Interface

CPD: Component Diagrams

CPU: Central Processing Unit

CSS: Cascading Style Sheet

DFD: Data Flow Diagrams

DLL: Dynamically Linked Libraries

DOM: Document Object Model

DOS: Denial Of Service

EBS: Elastic Block Store

EC2: Elastic Compute 2

ELB: Elastic Load Balancing

EKI: Eucalyptus Kernel Image

EMI: Eucalyptus Machine Images

ERI: Eucalyptus Ramdisk Image

GB: GigaByte

GHz: GigaHertz

GPL: General Public License

GUI: Graphical User Interface

HPC: High Performance Computing Systems

HTML: Hypertext Markup Language

HTTP: Hypertext Transport Protocol

IA-64: Intel Itanium architecture

IaaS: Infrastructure as a Service

IAM: Identity and Access Management

IO: Input Output

IP: Internet Protocol

iSCSI: Internet Small Computer System Interface

IT: Information Technology

LAN: Local Area Network

LEAD: Linked Environment for Atmospheric Discovery

MB: MegaByte

MIT: Massachusetts Institute of Technology

NC: Node Controller

NIST: National Institute of Standards and Technology

OMG: Object Management Group

OS: Operating System

PaaS: Platform as a service

PHP: Pre Hypertext Processor

SaaS: Software as a service

SC: Storage Controller

RAM: Random Access Memory

REST: Representational State Transfer

S3: Simple Storage Service

SSH: Secure Shell

SSL: Secure Sockets Layer

TB: TeraByte

UI: User Interface

UML: Unified Modeling Language

VG: Virtual Grid

vgDL: Grid Description Language

vgFAB: Virtual Grid Finding And Binding resources

vgES: Virtual Grid Execution System

vgLaunch: Virtual Grid Launch

VGrADS: The Virtual Grid Application Development Software Project

VLAN: Virtual Lan

VM: Virtual Machine

VT: Virtualization Technology

WS: Web Service

WSDL: Web Service Description Language