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Research paper

A Study of Recent Trends and Tehnologies on Openstack Cloud Computing

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Abstract:

Cloud computing is internet based access resources with low cost computing. On demand resources, elasticity, resources pooling are key characteristics of cloud computing. In this paper mainly discussing various trends of cloud computing and technologies, service providers, services. Cloud basic core methodology, service providers with recent technologies are analyzes. Cloud core and concurrent development cloud services and their characteristics are described. Recent tools for applications development for cloud implement technologies. Basics of cloud computing, deployment models, service models, service provider techniques are analyzed.

Keywords: Cloud computing, cloud basics , cloud services ,deployment models, openstack, virtualizing,

1. Introduction

It's a amazing technology in computing trends. Virtualizing it's the core of cloud. Easy access of every computing elements, services are possible via the cloud.NIST standard definition cloud computing is a model for enabling ubiquitous,convenient,on demand network access to a shared pool of configurable computing resources such as network services,storage,applications that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing takes vital role in real current world computing technology. This cloud evolved from Grid computing, utility computing, SOA and complex task at the same time, Grid computing enables parallel computing, its utility is best for large enterprising organization.

function, for example billing for payment is common for all economic system [2]" S. Lee, J. Song, and I. Kim "[3]" R. Colomo-Palacios, V. Stantchev, and A. Rodrıguez-Gonzalez". So these services are avail as architecture approach, so wherever the applications needs they can use it as SOA.No need to create, we can use updated service product from SOA.

1.1. Basic Cloud Service Models

It's the service provisioning model in which service provider makes computing resources affordable for user. User gets satisfaction about resources by the utility computing provider. Its tangible, like Godness, can't touch, but feel. The objectives of virtualization are Centralize management, Optimize resources by over subscription and making efficient utility of computing resources. Service oriented architecture, for example some of core services are common for all organization. Services refer set of specific virtualization. Basic of Grid computing is distributed computing which enables the resources of numerous heterogeneous computers in a network to work on single

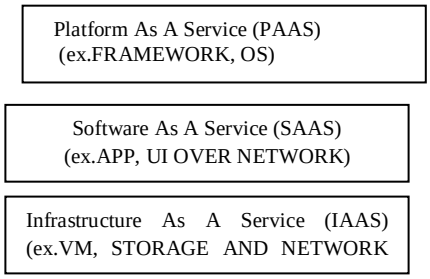

Fig 1: Cloud Service Models

IAAS –Provision of computing and storage resources,PAAS-Users can deploy and develop their own APP,SAAS-Provision of thin interface so that user can hosted on their APP on cloud as fig1 shows

1.3. Cloud Service Models and Functions

Table 1: Cloud models and functions

Service	Functions	Benefits	Ex.Service Provider
IAAS	Multitenancy	Pay per use	RACKSPACE
	Disaster Recovery	Secure Access	JOYENT
	Virtualize Hardware	Guarantee perform	OPSOURCE
PAAS	Multitenancy	Improve scalability	GITHUB
	Open Integration Protocol	Secured Access	APPSCALE
	Analysis	Seamless Integration	OPENSTACK
SAAS	Social network integration	Easy data recovery	ZOHO
	On demand software	Automated backup	TALEO
	Multitenancy	Pay per use	FACEBOOK

Table 1 shows the service models of cloud, benefits, and service providers. As well the deployment models are followings

Cloud Deployment Model

Fig 2: Cloud Deployment Model

Public cloud mainly who looks for develop and testing of applications and host APP in cloud to serve large workloads, without upfront investments in IT infrastructure. Private cloud, can be setup on premise or off premise and may managed by internally or third party, where security is very important [6]" P. V. Gorp, M. Comuzzi, A. Fialho, and U. Kaymak, "[1]" Sung-Hyun Lee, Joon Hyun Song, and Il Kon Kim". Hybrid cloud, combines the services of multi clouds. This mainly for secure applications and cost savings by host sharing applications data in public cloud. Community clouds are best suited for organization wants to access the same APP and data shared by larger group as fig 2 shows.

2. Core Infrastructure for Cloud

Classic Data Center CDC is a facility that enables IT resources to process data. The core elements of CDC are compute, storage, network, application, DBMS.CDC as isolated resource manager. Virtualized Data Center VDC abstracts of physical layer and creation of logical layer over physical resource. Through this virtualization all the compute, storage, network processing easily and effectively [5]" Sabapathi muniyappan danu senthil "HL7 Implementation Guide for CDA Release "[4]" Sabapathi.V, M. Muniyappan". Main advantages are running multiple OS concurrently on a system, effective utilization of resources, reduce the deployment time, increases flexible, multitenancy.

3. Cloud Basic Concepts

For enabling technologies of cloud, following fundamentals concepts are takes vital role. Virtualization, portioning the physical resources such as memory, computing resources into virtual resources. So multiple OS can run on single OS and multitenant as well as effective resource managed by virtualization [6]. HOST OS-The main OS of the system, GUEST OS-This OS in the VM.This Guest OS different from Host OS, HYPERVISOR OR VMM*VIRTUAL MACHINE monitor it presents in the virtual OS to a guest OS.TYPE 1-HYPERVISOR-The hypervisor directly run on the hardware, which is called type 1 hypervisor, ex: CitrixXen server, Oracle Vm Server. TYPE 2"HYPERVISORThe hypervisor directly run the host OS then it will run or control on the hardware, which is called type2 hypervisor ex: Virtual box, Vmware workstation.

3.1. Load Balancing

"Scalability" it's the important future of Cloud. Scalability evolves from the load balancing. Efficient use of server or resources can be done by load balancing. Fault tolerant, distributes workloads across multiple server to meet the application workloads [7]" P. V. Gorp and M. Comuzzi". These load balancing main advantages are maximum utilization resource, minimizing response time, maximizing throughput,scalability,elasticity.Ex;Nginx software,HAProxy software load balancer,Baracuda hardware,F5 NETWORKS BIG-IP LTM hardware load balancer

Cloud Referece Model

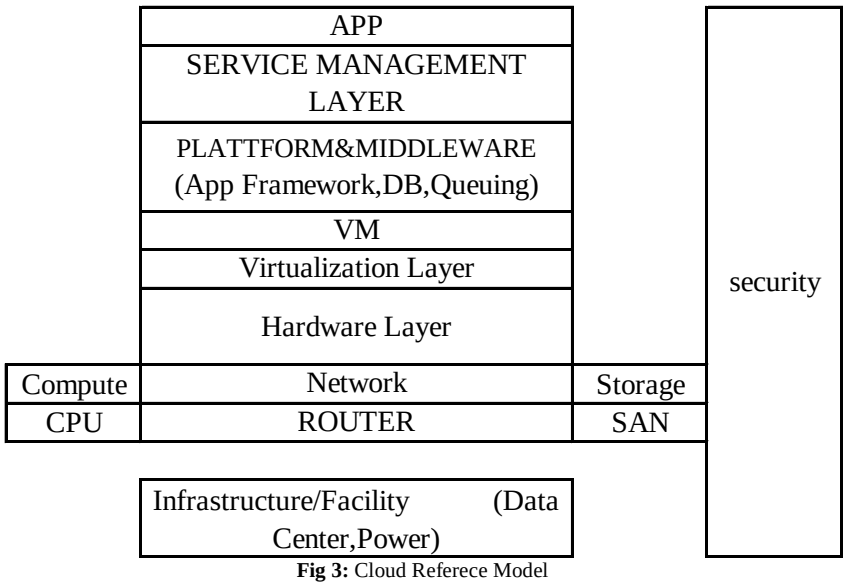

Fig 3: Cloud Referece Model

IAAS provides dynamically scalable resources using virtualized infrastructutre.PAAS provide simplification APP and deployment and development tools, SAAS provide multitenant applications hosted in the cloud.

The bottommost layer is the infrastructure and facilities layer that includes the physical resources such as datacenter resources, electrical etc.Then top infrastructure layer is hardware layer that include physical compute, network and storage hardware. On top of that virtualization layer partitions the physical hardware into multi virtual resources. Then platform and middleware layer builds upon IAAS layers and standardized stacks of service such as DB service,Queuing,etc.The service management layer provides API's for requesting, managing and monitoring cloud resources[7]. The topmost layer is than applications layer such as, Email, productivity applications, management portals. Fig 3 shows and table 2,refers some of recent trends of cloud and applications

Recent Cloud Services

Table 2: Recent Cloud Services

Services	Service Providers
Public Computing Cloud	Amazon Elastic Cloud
	Google Compute Engine, Windows Azure Vm
Storage	Google Cloud Storage
	Windows Azure Storage
Cloud –Relational Db	Amazon Relational Data Store
	Google Cloudsql
	Windows Azuresql
Cloud-Non Relational Db	Amazon Dynamodb
	Google Cloud Data Store
	Windows Azure Table Services
Cloud Base App	Google App Engine
	Windows Azure Websites
Cloud Based Queuing Service	Amazon Simple Queue Service
	Google Task Queue Service
	Windows Azure Queue Service
Cloud Based Email Service	Amazon Simple Email Service
	Google Email Service
Cloud Based Notification	Amazon Simple Notification Service
	Google Cloud Messaging
	Windows Azure Notification Hubs
Cloud Based Media Services	Amazon Elastic Transcoder
	Google Image Manipulation Service
	Windows Azure Media Services
Cloud Based Content Delivery Networks	Amazon Cloudfront
	Windows Azure Cdn
Cloud Based Media Analytics	Windows Azure Hdinsight
	Amazon Elastic Map Reduce
	Google Mapreduce

	Google Bigquery
Deployment &Management Service	Amazon Elastic Beanstalk
	Amazon Cloud Formation
Identity &Access Management(Idam)	Amazon Idam

4. Private Cloud Softwares

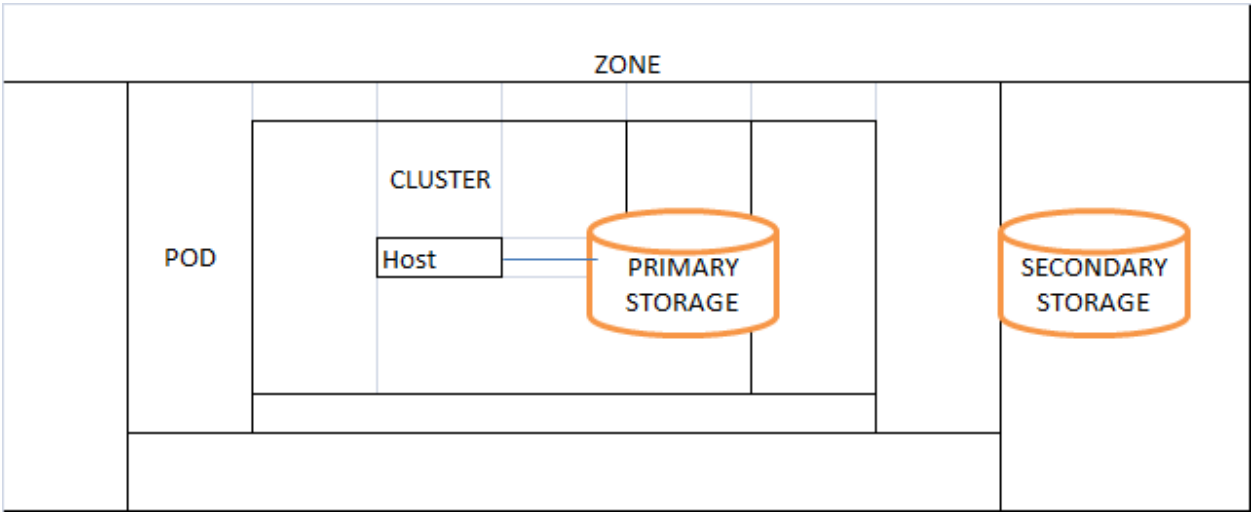

Fig 4: CloudStack Architecture

Apache Cloudstack is an open source, cloud offering software. Hence Zone is typically datacenter. A pod is a rack of hardware comprising of switch and one or more clusters. A host is a compute node that runs guest VM with primary storage as fig 4 shows. A cluster has handle host with primary storage.

4.1. Openstack

Openstack it's a cloud operating system, which is consolidated and facilitates all type of cloud services such as computing, storage and networking resources. The Openstack nova takes over the computing services and manages networks of VM, providing virtual servers on demands. The cinder manages storage volumes for virtual machines. The object storage swift allows users to store and retrieve files. Keystone provides identity services and glance for image registry as fig 5 shows. The Openstack scheduler maps nova – API calls to appropriate Openstack components. Rabbit – Mq for messaging service. Orchestration for compute API calls. The dashboard provides web interface for managing Openstack services called as horizon.

OpenStack		
PRESENTATION(DASHBOARD-HORIZON)		
LOGIC		
SCHEDULING	ORCHESTRATION	IMAGE REGISTRY
(NOVA-SHEDULE)	(NOVA-API)	(GLANCE-REGISTRY)
OBJECT STORAGE	IDENTITY	MESSAGING
SWIFT	KEYSTONE	RABBIT-MQ
RESOURCES		
COMPUTE	VOLUME	NETWORK
NOVA COMPUTE	CINDER	NOVA NETWORK

Fig 5: Openstack Architecture

5. Conclusion

Cloud basic services, deployment tools, and recent trends of public and private cloud offering softwares are analyzed. This paper provides overview towards cloud computing system with updating techniques is analyzed. In future cloud security threats with safer framework will be analyzing with proven will provide

efficient use of cloud computing and its applications will be discuss.

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