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A New Software Development based on OpenStack System for Monitoring Purposes on Cloud Computing

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***Abstract*—OpenStack is a cloud operating system that controls large groups of computational, storage, and networking resources across a datacenter, and all aspects of this system are managed through a dashboard. Historically, Raskspace Hosting and NASA mutually launched this OpenStack, an initiative open-source cloud-software project around July 2010. This project aims to help organizations in offering cloud-computing services running on standard hardware. OpenStack allows users to use virtual machines which can handle different tasks to manage the environment. It is easier because of its horizontal scaling, which means that the tasks can easily serve users quickly by turning more instances.**

***Keywords*: openstack system, cloud computing, monitoring**

I. INTRODUCTION

OpenStack allows the users to use virtual machines which can handle different tasks in order to manage the environment. It has horizontal scaling, which means that the tasks can easily serve more or less users quickly by turning more instances.

For instance, a mobile application that needs to communicate with a remote server may be able to separate work to communicate with each user across different conditions, all communicating with each other but with the fast scaling and easy scaling as the application gains more users.

II. THEORY

A. History

Raskspace Hosting and NASA have mutually launched an initiative open-source cloud-software around July 2010, and it was known as OpenStack. Its project aims to help organizations in offering cloud-computing services running on standard hardware.

Metaphor, which come from word cloud was used for the Internet as it indicates a network on telephony schematics, and also refers to platforms for distributed computing.

B. Enhancement of the Management Openstack

The development of cloud software services has been presented for the patient-specific computational analysis of blood flows through aortic valve, and a modeling software based on ANSYS Floent was developed as a software services (SaaS) for numerical analysis. The user-friendly management tools have been introduced by using Apache jclouds API to enhance the OpenStack cloud infrastructure management [8].

VisLT cloud visualization service [12] has been developed for visualizing the results that was computed and stored in the private cloud infrastructure. In order to enhance the management of cloud infrastructure, Apache jclouds API has been proposed as it can improve the access of the visualization service.

In [7], it shows the design and implementation of management plane forensic toolkit of OpenStack Cloud platform. It is known as Forensic OpenStack Tools (FROST). It works at cloud management plane rather than interacts with operating system inside virtual machines.

C. Reduction of execution cost

Based on Figure 1 below, Elastic Cloud Computing Cluster (EC3) has been developed to reduce the total cost and to ease the automatic fault tolerance. Besides, EC3 can organize and handle the hybrid clusters across on-premises and public cloud resources [3].

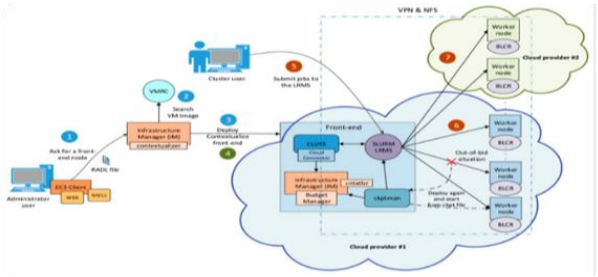

Figure 1. Main architecture of EC3

In paper [14], it states that input costs of system are too high as the demand for computing resources is increasing. So, to solve this problem, the enterprise private cloud platform architecture has been proposed based on open source system. The main stream of open source project was analyzed and the basis for choosing OpenStack has been given.

According to [6], Virtual Machines (VMs) has been utilized as it was efficiently used in the available resources. For example, VMs was used to combine a minimum number of physical servers. A cloud management platform was

proposed to optimize VM consolidation into the dimensions, which are networking, host resources and power consumption.

D. Monitoring and performance of OpenStack

A completely distributed architecture known as Distributed Architecture for Resource Management and Monitoring in Clouds (DARGOS) has been proposed. It has been used as an open-source tool based on OpenStack Cloud platform and is available to the public Cloud [13].

According to [9], Docker allow hosting of micro-services on cloud infrastructures. It is easier for the deployment and subsequent utilization by enabling the bundling of applications. The OpenStack-based Australia-wide National eResearch Collaboration Tools and Resources (NeCTAR) Research Cloud has been used for this purpose.

Based on [4], the design of efficient architectures was used to monitor the resources (Figure 2). The architectures have been implemented in daily life based on OpenStack. The implementation of all the monitoring architectures was released to the community of public open source project of OpenStack and was known as MonPaaS.

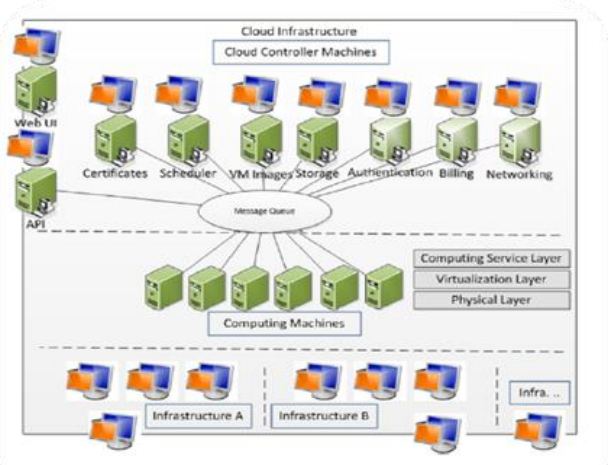

Figure 2. Architectural overview of a cloud computing infrastructure

Cloud monitoring survey was prepared by analyzing the initial motivations for Cloud monitoring [1]. Cloud monitoring is an important task for both providers and users (Figure 3). In addition, it was also a main tool for controlling the hardware and software infrastructures and provides information and Key Performance Indicators (KPIs) for both applications and platforms.

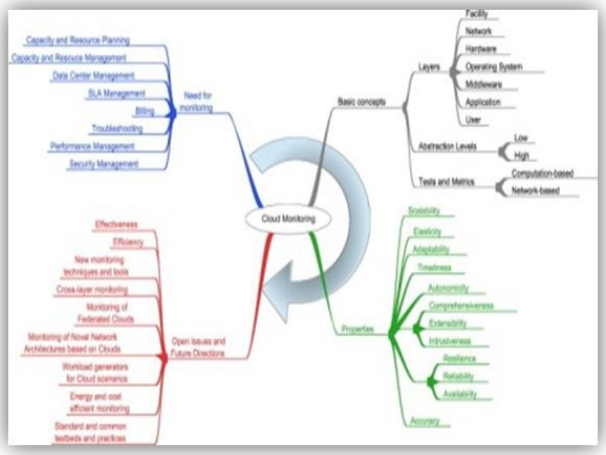

Figure 3. Model of Cloud Monitoring

In [11], SLA supervision shows most vital uses in monitoring system in cloud environment. Mostly commercial service level agreements of cloud infrastructures determine the connection between client and CSP. Besides, all aspects of cloud monitoring have been covered by applying GMoNe (general-purpose cloud monitoring tool) as they specifically address the needs of modern cloud infrastructures.

In [2], an adaptive distributed monitoring architecture is implemented under "MonPaaS", open source software for integrating Nagios and Google apps Engine and also to evaluate the performance and scalability in cloud computing infrastructure for cloud provider and the cloud consumers (Figure 4). It determines the resources or services that are to be monitored.

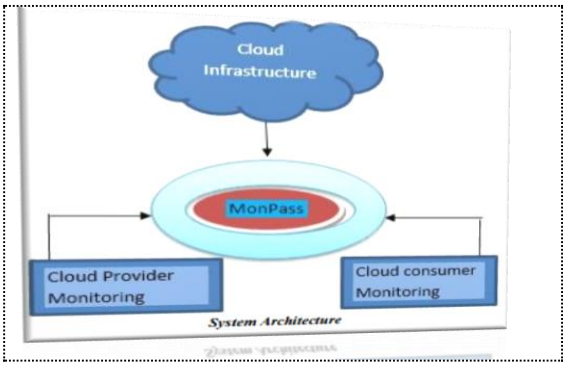

Figure 4. Monitoring Information and Control Flow on Paas of Cloud Computing

E. Training Application for Openstack

According to [5], Moodle technology has been used as e-learning applications which has been installed on Cloud. It is a package of software for training purpose-web. Besides, it can also create learning environments completely and efficiently.

F. Optimize Engineering for Cloud Platform

Generic cloud platform has been proposed to optimize the engineering by making use of compute resources. This system was tested, and the result showed potentially engineering optimization problems [10,15-17].

III. Conclusion

OpenStack is a cloud operating system that controls large groups of computational, storage, and networking resources across datacenter infrastructure. Infrastructure monitoring component plays an significant role in providing support for efficient management of cloud resources. The OpenStack is an early project, but it is completely open source and based on open cloud standards. However, being a proprietary product, it renders some difficulties for large parts of the project to be an open cloud product.

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