

# Open Source Virtualization Management Using Ganeti Platform

Rakesh Kumar<sup>1</sup>, Sonu Agarwal<sup>2</sup>, Muskan Bansal<sup>3</sup>, Anurag Mishra<sup>4</sup>

<sup>1,2,3,4</sup>Department of Information Technology & JECRC, Jaipur, India

<sup>1</sup>rakeshkumar.it14@jecrc.ac.in, <sup>2</sup>sonuagarwal.it16@jecrc.ac.in, <sup>3</sup>bansalmuskan17@gmail.com,

<sup>4</sup>anuragmishra.it17@jecrc.ac.in

**Abstract** — Ganeti is an open source virtualization management software used in small as well as growing businesses that can help users to manage networks, storage and virtual machines (VMs). Software is built on top of popular virtualization technologies such as KVM, Xen and other open source solutions. This paper contains introduction to Virtualization, introduction to Ganeti that is a cluster virtual server management software tool, its background with features of Ganeti. Further this paper includes components of Ganeti as well as Pros and Cons of Ganeti. The aim of this paper is to show importance of Ganeti that is a cluster virtual server management software tool built on top of existing virtualization technologies.

**Index Terms** – Google, Ganeti, KVM, Virtualization, Xen

## I. INTRODUCTION

Virtualization is a building block in today's computer infrastructures. Virtualization is the creation of a virtual version of something, like an operating system, a server, a storage device or network resources. Ganeti is an important cluster virtualization system developed by Google and also used by many organizations worldwide. Ganeti is very lightweight, simple to install as well as manage, and it does not demand any special storage hardware.

## II. GANETI

Ganeti is a cluster virtual server management software tool developed by Google. Solution stack uses either KVM or Xen as the virtualization platform, and LVM uses for disk management, as well as optionally DRBD for disk replication across physical hosts. Ganeti is essentially a wrapper around existing hypervisors that makes it convenient for system administrators to set up a cluster. Ganeti is mainly used by Google for its Internal Computing Infrastructure as well as used by the former Open Source Development Labs for hosting open source projects. Ganeti also requires pre-installed virtualization software on servers in order to function, and once installed, the tool assumes management of the virtual instances (Xen DomU). Ganeti is a very important cluster virtual server management software tool that is designed to facilitate cluster management of virtual servers as well as to provide fast, simple recovery after physical failures using commodity hardware.

Cluster virtual server management software tool (Ganeti) mainly controls such as:

- 1) *Operating system installation for instances*
- 2) *Disk creation management*
- 3) *Startup, Shutdown, as well as Failover between physical systems*

## III. BACKGROUND

Google, company behind Ganeti, was founded in September 1998, is headquartered in Mountain View, California. Google originally started Ganeti that is a cluster virtualization management system based on KVM or Xen in 2005-2006 as a VMware alternative for managing virtual machines, storage as well as networks; not used as a cloud platform. Because some missing features, like cloud-based storage, elastic-style computing as well as object APIs that come with the bigger open cloud projects. Ganeti is developed and also released as free, open source software, since August 2007. Ganeti primarily used for back office servers for Google.

## IV. GANETI FEATURES

Ganeti provides some important features for managed instances:

- 1) *Support for KVM virtualization:* It support for live migration, fully virtualized instances and VNC as well as emulated devices.
- 2) *Support for Xen virtualization:* It support for HVM, PVM instances and live migration as well as emulated devices.
- 3) *Disk management:* It supports Plain LVM volumes, Files and across the network RAID1 for quick recovery in physical system failure.
- 4) *Automated instance migration across clusters and Cluster size of 1 to150 physical nodes*
- 5) *Export and import mechanism for backup purposes*
- 6) *Instance disk partitioning*

## V. GANETI COMPONENTS

Ganeti contains different types of components such as:

- A. *Master daemon*: Master daemon controls overall cluster coordination.
- B. *Node daemon*: Node daemon controls node functions like storage, VMs, etc.
- C. *Conf daemon*: Conf daemon provide a fast way to query configuration.
- D. *API daemon*: API daemon provide a remote API.
- E. *Htools*: Htools is auto-allocation and rebalancing tools.

## VI. PROS AND CONS OF GANETI

Ganeti is a virtual machine cluster management tool. Here we are discussing some pros and cons of Ganeti:

### A. Pros of Ganeti

- 1) *To quickly as well as easily spin up virtual machines (VMs) for the open source projects housed at OSU's Open Source Lab*
- 2) *Ganeti cloud can perform faster than other cloud environments as well as at a lower hardware cost*
- 3) *Expand a Ganeti cluster with built-in utilities which can easily add a node with minimal downtime as well as even automatically re-balance the cluster*
- 4) *Ganeti is simple to set up as well as maintain*
- 5) *Support lightweight architecture and Better performance*
- 6) *Start with a single node and can be scaled out later*
- 7) *Designed to be used with local as well as cheap storage*
- 8) *Great for standard Linux as well as windows workloads*
- 9) *User friendly as well as easy to use for a standard Linux sysadmin*
- 10) *Fault-tolerance built-in and local storage*
- 11) *Customizable and simple to manage*
- 12) *Less complex and Ideal for smaller clusters*

### B. Cons of Ganeti

- 1) *Ganeti does not automatically shift resources when a node fails and No EC2 compatibility*
- 2) *Its command line driven so there is no good Web interface for users to interact easily with system*
- 3) *Ganeti has own API, and it is not compatible with Amazon API as well as any other API*
- 4) *Does not have official vendor support and only solves the compute problem*
- 5) *More skills than VMware and less than OpenStack*
- 6) *HA of master need to be triggered from monitoring platform*
- 7) *Admin centric, VM Deployment, No AWS integration and Lack of some features like storage vmotion*

## VII. CONCLUSIONS

Virtualization is an important building block in today's computer infrastructures, and Ganeti do not need to configure a huge system and it is used when need to build a small infrastructure and also, at same time, retaining the option to scale easily to thousands of nodes. Ganeti allows managing a collection of physical machines (nodes) to host virtualized machines (instances).

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