

DEPLOYING A PRIVATE CLOUD? GO THROUGH THE ERRORS FIRST

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Abstract

Deploying cloud for research purpose is quiet time consuming when different errors have to be eliminated. This paper lists out common problems and errors encountered while deploying private cloud and the possible solutions to these problems and errors. It will help beginners to minimize the time to setup the cloud and make deployment easier. Open source operating system Ubuntu-12.04 long time support and Open nebula cloud computing framework are used for deployment of this private cloud.

Keywords: Cloud, deployment, hypervisor, Open nebula, open source

1. Introduction

Cloud Computing attracts many researchers and students nowadays. A lot of research is going on in this area. The first step towards the cloud computing is to deploy a private cloud and then verify the applications on it. The private cloud can be created using Ubuntu-12.04 long time support (LTS) operating system (O.S) and Open nebula cloud computing framework. These are open source utilities. Small organizations, that cannot afford to invest in building cloud computing framework, normally opt for open source cloud computing platforms. Without worrying about the deployment cost, one can opt the open source frameworks for building the cloud.

The various documentation blogs, available on the internet, provides guidelines to setup a cloud environment. Still one has to overcome a lot of issues while deploying a cloud. These issues are due to

incorrect configurations and improper syntax of the specified arguments.

The common errors that encounter while building the cloud and the solution towards them are discussed in this paper. This effort provides a readily available solution for the different issues arrived while deploying a practical private cloud. Section 2 discusses the pre requisites for setup process of the cloud. The cloud set up is discussed in section 3. Section 4 elaborates the different errors during the setup and the possible solutions to overcome it while conclusions are given in section 5.

2. Prerequisites for Cloud Setup

The cloud can be established on either a single computer or with multiple computers. The first step towards building the cloud begins with a go through the available of documentation for single machine installation. The documentation provided by cloud lab is

quiet useful¹. But when a cloud has to be deployed by separating the frontend and the cluster machines, a lot of issues arise.

New user can start with available guidelines for the cloud setup². But following the steps given in Ref.2 can also result in various errors at the time of practical deployment. As per authors' knowledge, the available documentation can definitely guide for cloud setup but none has given the practical solutions to the various errors that encountered during the deployment of a private cloud.

New users who are unaware about open source operating system framework also find difficult to do installation on it. Ubuntu-12.04 LTS is selected for installation of the cloud due to ease of use and long time support provided with it.

A single machine or multiple machines architecture can be developed with Open nebula. A cloud using multiple machines has deployed. Figure 1 shows the private cloud setup with two machines.

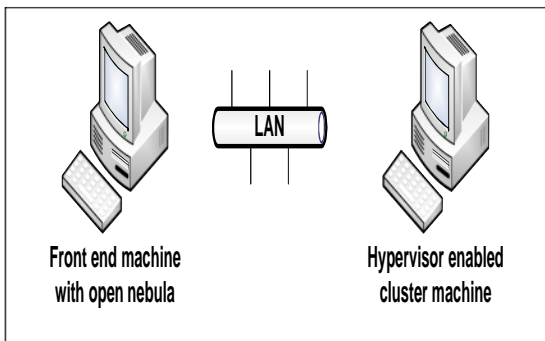


Fig.1. Cloud Setup with two machines

The reason behind selection of multiple PC architecture is high degree of scalability and ease in visualization of setup. An attempt had been done to install open nebula on single machine. But due to lack of visualization of the system and scalability, the multiple PC architecture has been opted.

The two machines involved, a frontend and a cluster machine, are connected to each other with LAN. Frontend is the machine, on which open nebula is installed, executes open nebula services. Cluster machine is the machine on which hypervisor is installed.

More than one cluster nodes can be added depending on the infrastructure availability.

3. Cloud

The private cloud is deployed by using the open nebula O.S. Figure 2 shows a cloud architecture involving multiple computers. The Frontend and cluster machine configuration is as follows:

- Frontend- Ubuntu-12.04 Desktop LTS with opennebula-3.6.0
- Cluster node- Ubuntu-12.04 Desktop LTS with kernel virtual machine (KVM) hypervisor installed.

The Installation steps are as follows:

- Preparing the two machines with Ubuntu operating system, and
- Creating user accounts.

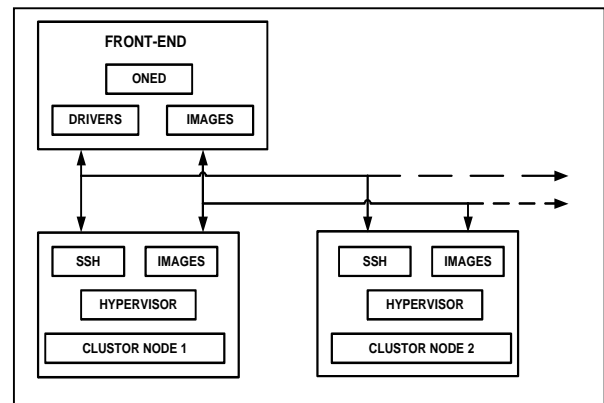


Fig.2. Open nebula cloud system²

The network file sharing (NFS) indicates a proper connection between the frontend and clusters. Ubuntu Community documentation³ provides information about the network file sharing. The frontend act as NFS server and cluster acts as a client.

4. The analysis of different errors and their solutions

4.1. Front end side errors

To install NFS server at front end, '/etc/exports' file must be properly configured. Next part is of Password less entry from one machine to another machine. The frontend provides open nebula services and the cluster is having the host for the virtual machine. The *openSSH* installation is required on both the machines. 'SSH-keygen-t rsa' command will generate public key and then copied to remote host with 'scp' command for passwordless entry for further session. When

passwordless entry is to be carried out, following errors are encountered:

Error: SSH cannot connect to host port 22, connection refused.

Solution:

- Make sure 'sshd' configuration file must have port 22 line uncommented.
- If the port 22 line is uncommented and still this error persists, then try to ping the cluster machine from frontend. If connection exists, then one can use 'netstat' command to check if TCP port 22 is blocked.
- If still the error is not resolved then one has to reinstall the 'openSSH' and make sure to remove previously generated keys to avoid the conflict.

Error: Command prompt asks to enter a password of cluster machine

Solution:

- This error arises if one has reinstalled openSSH and the old keys are not replaced with new keys correctly. The replacement of 'public_keys' with latest 'passphrase' must be ensured while doing reinstallation.
- The hostname and the IP address of the cluster machine can be added in '/etc/hosts file'.
- Another important step is to add cluster to 'known_hosts' when asked at the command prompt.

Without passwordless entry into cluster machine, it is impossible to establish a connection between two machines.

Open nebula Installation on frontend machine and the common errors that can trouble the installation completion are as follows

Error: Improper installation of the gems like 'nokogiri' rake 'xmlparser'.

Solution: Try to install gems separately.

Error: After installation of 'MYSQL' server, Create User or Create Database query fails.

Solution: To check particular MYSQL version installed on machine and issue above commands according to MYSQL version on frontend.

Error: Unable to download open nebula with 'wget' command

Solution:

- Check 'wget' is enabled or not. With Ubuntu normally it is provided.

- The link specified to download open nebula is important.

The open nebula developer's site provides the all software package list which can be found at:

<http://dev.opennebula.org/packages>

If the open nebula is not properly downloaded then a lot of errors can arise in further installation steps.

Error: When tried to 'untar' the downloaded file 'gzip stdin' not in 'gzip' format.

Solution: This error is mainly due to corrupt file download.

Error: 'install' command does not work for open nebula.

Solution: Open opennebula folder which is untared and check if 'install.sh' is present or not. If it is not present, then download opennebula again as the previous download is corrupt or incomplete.

Once the 'one start' command is successful then the half battle is over in cloud deployment.

But 'one start' command can also result in different errors. One can check log for errors. The errors are mainly due to bad configuration files, Corrupt download of open nebula and syntax errors when 'bash profile' file is set.

If these checks are followed correctly then 'one start' can be done with less effort.

4.2. Errors at cluster machine side

There are two common errors encounter while doing NFS installation, *i.e.*-

Error: Bad syntax error in *fstab* or *mtab* file.

Solution: Check the syntax and the spaces in between the arguments. This error is repeated if the slash used for separating the directory to mount is misplaced.

Error: mount.nfs is unable to mount the directory.

Solution: This error is due to the arguments specified with the mount directory. Check the arguments in *fstab* or *mtab* file.

Argument syntax and selection is important aspect to perform successful network file sharing.

Cluster machine is not actively involved till the commands are issued from frontend like 'one host create' etc. For proper execution of open nebula commands following checks has to be taken care-

- Install required packages and utilities for hypervisor.
- Properly configure 'qemu.conf' and 'libvirtd.conf' in case of KVM.

- Check the configuration requirements according to need.

4.3. GUI creation

For GUI creation Sunstone server installation at frontend side is required. Some “gems” are required for sunstone installation. While downloading the gems, sometimes installation remains incomplete. When installing ‘Sudo gen install Sinatra’ gem, an error encountered as-

Error: ‘Rdoc’ not supported or not installed

Solution: Separate installation of ‘Rdoc’ is required.

When all the required gems are installed correctly then further errors can be minimized. Properly configuring the sunstone configuration file with different parameters will reduce errors. Still the errors persist, check for ‘sunstone.log’. If ‘sunstone.log’ file is empty, then check for ‘sunstone.error’. Proper parser must be installed for minimizing the errors.

Lastly it is to be checked if the installation is successful or not. It is accomplished with command ‘Onehost create’. ‘onehost list’ command gives the list of host created. If the ‘stat’ shown is on then installation is successful. Here the ‘stat’ field value must be on.

Error: ‘stat’ field is off, giving ‘err’ message

Solution:

- Check the log file for error.
- Check if connection is lost between two machines

Error: The hostname cannot be resolved

Solution: Check ‘/etc/hosts’ file for list of host names and IP Address.

5. Conclusions

Multi system cloud architecture is used for deploying a private cloud with the help of open nebula and Ubuntu O.S. In depth analysis of the commonly occurring errors during the installation and deployment of the cloud is listed out here. Also the possible practical solutions are discussed. This effort is useful for the beginners for hassle free deployment of the private cloud for research purpose. Also the source for obtaining the proper cloud computing frame work. In future, we are aiming at developing and deploying the mobile cloud for private use.

Acknowledgments

We are thankful to persons engaged in user’s mailing list of open nebula.

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