OpenNebula.org

OpenNebula 4.6 Quickstart CentOS 6 and KVM

Release 4.6

OpenNebula Project

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The purpose of this guide is to provide users with step by step guide to install OpenNebula using CentOS 6 as the operating system and KVM as the hypervisor.

After following this guide, users will have a working OpenNebula with graphical interface (Sunstone), at least one hypervisor (host) and a running virtual machines. This is useful at the time of setting up pilot clouds, to quickly test new features and as base deployment to build a large infrastructure.

Throughout the installation there are two separate roles: **Frontend** and **Nodes**. The Frontend server will execute the OpenNebula services, and the Nodes will be used to execute virtual machines. Please not that **it is possible** to follow this guide with just one host combining both the Frontend and Nodes roles in a single server. However it is recommended execute virtual machines in hosts with virtualization extensions. To test if your host supports virtualization extensions, please run:

```
grep -E 'svm|vmx' /proc/cpuinfo
```

If you don't get any output you probably don't have virtualization extensions supported/enabled in your server.

CHAPTER

ONE

PACKAGE LAYOUT

- opennebula-server: OpenNebula Daemons
- opennebula: OpenNebula CLI commands
- opennebula-sunstone: OpenNebula's web GUI
- opennebula-java: OpenNebula Java API
- opennebula-node-kvm: Installs dependencies required by OpenNebula in the nodes
- opennebula-gate: Send information from Virtual Machines to OpenNebula
- opennebula-flow: Manage OpenNebula Services
- opennebula-context: Package for OpenNebula Guests

Additionally `opennebula-common` and `opennebula-ruby` exist but they're intended to be used as dependencies. `opennebula-occi`, which is RESTful service to manage the cloud, is included in the `opennebula-sunstone` package.

Warning: In order to avoid problems, we recommend to disable SELinux in all the nodes, **Frontend** and **Nodes**:

```
# vi /etc/sysconfig/selinux
...
SELINUX=disabled
...

# setenforce 0
# getenforce
Permissive
```

CHAPTER

TWO

STEP 1. INSTALLATION IN THE FRONTEND

Warning: Commands prefixed by `#` are meant to be run as `root`. Commands prefixed by `$` must be run as `oneadmin`.

2.1 1.1. Install the repo

Enable the EPEL repo:

```
# yum install http://dl.fedoraproject.org/pub/epel/6/i386/epel-release-6-8.noarch.rpm
```

Add the OpenNebula repository:

```
# cat << EOT > /etc/yum.repos.d/opennebula.repo
[opennebula]
name=opennebula
baseurl=http://downloads.opennebula.org/repo/CentOS/6/stable/x86_64
enabled=1
gpgcheck=0
EOT
```

2.2 1.2. Install the required packages

A complete install of OpenNebula will have at least both `opennebula-server` and `opennebula-sunstone` package:

```
# yum install opennebula-server opennebula-sunstone
```

2.3 1.3. Configure and Start the services

There are two main processes that must be started, the main OpenNebula daemon: `oned`, and the graphical user interface: `sunstone`.

`Sunstone` listens only in the loopback interface by default for security reasons. To change it edit `/etc/one/sunstone-server.conf` and change `:host: 127.0.0.1` to `:host: 0.0.0.0`.

Now we can start the services:

```
# service opennebula start
# service opennebula-sunstone start
```

2.4 1.4. Configure NFS

Warning: Skip this section if you are using a single server for both the frontend and worker node roles.

Export `/var/lib/one/` from the frontend to the worker nodes. To do so add the following to the `/etc/exports` file in the frontend:

```
/var/lib/one/ *(rw,sync,no_subtree_check,root_squash)
```

Refresh the NFS exports by doing:

```
# service rpcbind restart
# service nfs restart
```

2.5 1.5. Configure SSH Public Key

OpenNebula will need to SSH passwordlessly from any node (including the frontend) to any other node.

Add the following snippet to `~/.ssh/config` as `oneadmin` so it doesn't prompt to add the keys to the `known_hosts` file:

```
# su - oneadmin
$ cat << EOT > ~/.ssh/config
Host *
    StrictHostKeyChecking no
    UserKnownHostsFile /dev/null
EOT
$ chmod 600 ~/.ssh/config
```

CHAPTER

THREE

STEP 2. INSTALLATION IN THE NODES

3.1 2.1. Install the repo

Add the OpenNebula repository:

```
# cat << EOT > /etc/yum.repos.d/opennebula.repo
[opennebula]
name=opennebula
baseurl=http://downloads.opennebula.org/repo/CentOS/6/stable/x86_64
enabled=1
gpgcheck=0
EOT
```

3.2 2.2. Install the required packages

```
# yum install opennebula-node-kvm
```

Start the required services:

```
# service messagebus start
# service libvirtd start
```

3.3 2.3. Configure the Network

Warning: Backup all the files that are modified in this section before making changes to them.

You will need to have your main interface, typically `eth0`, connected to a bridge. The name of the bridge should be the same in all nodes.

To do so, substitute `/etc/sysconfig/network-scripts/ifcfg-eth0` with:

```
DEVICE=eth0
BOOTPROTO=none
NM_CONTROLLED=no
ONBOOT=yes
TYPE=Ethernet
BRIDGE=br0
```

And add a new `/etc/sysconfig/network-scripts/ifcfg-br0` file.

If you were using DHCP for your `eth0` interface, use this template:

```
DEVICE=br0
TYPE=Bridge
ONBOOT=yes
BOOTPROTO=dhcp
NM_CONTROLLED=no
```

If you were using a static IP address use this other template:

```
DEVICE=br0
TYPE=Bridge
IPADDR=<YOUR_IPADDRESS>
NETMASK=<YOUR_NETMASK>
ONBOOT=yes
BOOTPROTO=static
NM_CONTROLLED=no
```

After these changes, restart the network:

```
# service network restart
```

3.4 2.4. Configure NFS

Warning: Skip this section if you are using a single server for both the frontend and worker node roles.

Mount the datastores export. Add the following to your `/etc/fstab`:

```
192.168.1.1:/var/lib/one/  /var/lib/one/  nfs   soft,intr,rsize=8192,wsize=8192,noauto
```

Warning: Replace `192.168.1.1` with the IP of the frontend.

Mount the NFS share:

```
# mount /var/lib/one/
```

If the above command fails or hangs, it could be a firewall issue.

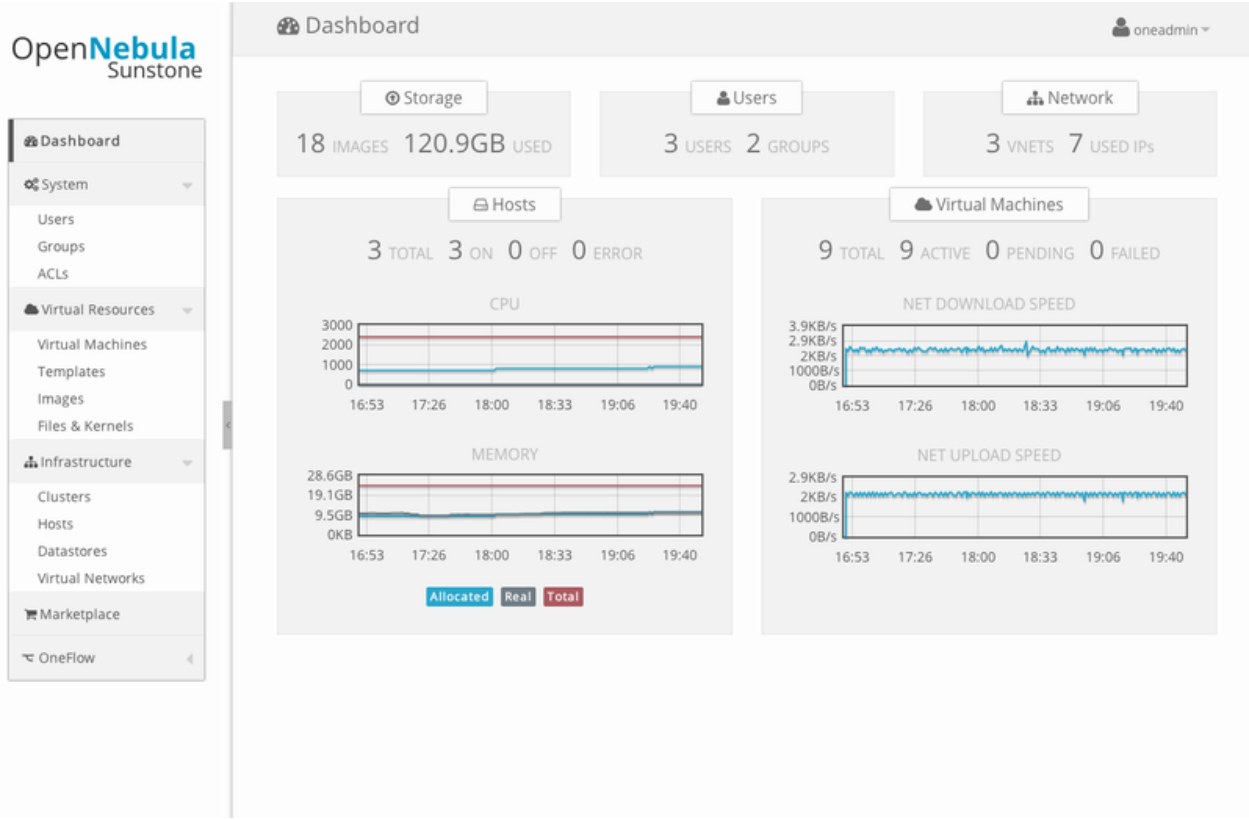
CHAPTER

FOUR

STEP 3. BASIC USAGE

Warning: All the operations in this section can be done using Sunstone instead of the command line. Point your browser to: `http://frontend:9869`.

The default password for the `oneadmin` user can be found in `~/.one/one_auth` which is randomly generated on every installation.



To interact with OpenNebula, you have to do it from the `oneadmin` account in the frontend. We will assume all the following commands are performed from that account. To login as `oneadmin` execute `su - oneadmin`.

4.1 3.1. Adding a Host

To start running VMs, you should first register a worker node for OpenNebula.

Issue this command for each one of your nodes. Replace `localhost` with your node's hostname.

```
$ onehost create localhost -i kvm -v kvm -n dummy
```

Run `onehost list` until it's set to on. If it fails you probably have something wrong in your ssh configuration. Take a look at `/var/log/one/oned.log`.

4.2 3.2. Adding virtual resources

Once it's working you need to create a network, an image and a virtual machine template.

To create networks, we need to create first a network template file `mynetwork.one` that contains:

```
NAME = "private"
TYPE = FIXED

BRIDGE = br0

LEASES = [ IP=192.168.0.100 ]
LEASES = [ IP=192.168.0.101 ]
LEASES = [ IP=192.168.0.102 ]
```

> **Warning:** Replace the leases with free IPs in your host's network. You can add any number of leases.

Now we can move ahead and create the resources in OpenNebula:

```
$ onevnet create mynetwork.one

$ oneimage create --name "CentOS-6.5_x86_64" \
    --path "http://appliances.c12g.com/CentOS-6.5/centos6.5.qcow2.gz" \
    --driver qcow2 \
    --datastore default

$ onetemplate create --name "CentOS-6.5" --cpu 1 --vcpu 1 --memory 512 \
    --arch x86_64 --disk "CentOS-6.5_x86_64" --nic "private" --vnc \
    --ssh
```

You will need to wait until the image is ready to be used. Monitor its state by running `oneimage list`.

In order to dynamically add ssh keys to Virtual Machines we must add our ssh key to the user template, by editing the user template:

```
$ EDITOR=vi oneuser update oneadmin
```

Add a new line like the following to the template:

```
SSH_PUBLIC_KEY="ssh-dss AAAAB3NzaC1kc3MAAACBANBWTQmm4Gt..."
```

Substitute the value above with the output of `cat ~/.ssh/id_dsa.pub`.

4.3 3.3. Running a Virtual Machine

To run a Virtual Machine, you will need to instantiate a template:

```
$ onetemplate instantiate "CentOS-6.5" --name "My Scratch VM"
```

Execute `onevm list` and watch the virtual machine going from PENDING to PROLOG to RUNNING. If the vm fails, check the reason in the log: `/var/log/one/<VM_ID>/vm.log`.

CHAPTER

FIVE

FURTHER INFORMATION

- *Planning the Installation*
- *Installing the Software*
- FAQs. Good for troubleshooting
- *Main Documentation*