

# Implementing Secure Cloud Storage System using OpenNebula VOneCloud

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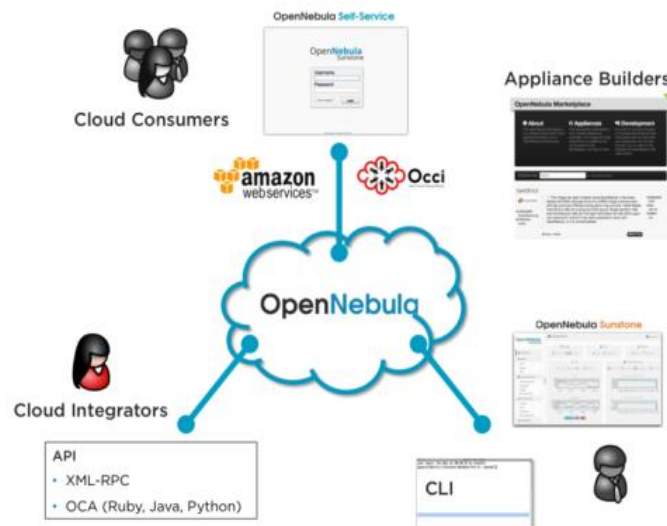
**Abstract** - OpenNebula Means Openness, Excellence, Cooperation and Innovation resource pooling, and dynamic provisioning. Using this Develop a simplest, powerful, highly-scalable and adaptable solution for building and managing virtualized data centers and enterprise clouds. Provide cloud builders and integrators with a modular system that can implement a variety of cloud architectures and can interface with any datacenter service. Its Provide cloud developers and users with choice of cloud and system interfaces, from open cloud to de-facto standards, to support the creation of a rich ecosystem of higher level components. OpenNebula is the open-source industry standard for data center virtualization, offering a simple but feature rich and flexible solution to build and manage enterprise clouds and virtualized data centers. OpenNebula is designed to be simple. Simple to install, update and operate by the admins, and simple to use by end users. Being focused on simplicity, we integrate with existing technologies whenever possible.

**Keywords** – Cloud, OpenNebula VOneCloud, highly-scalable, Virtual Machine, Virtualization.

## I. INTRODUCTION

OpenNebula provides many different interfaces that can be used to interact with the functionality offered to manage physical and virtual resources. There are four main different perspectives to interact with OpenNebula:

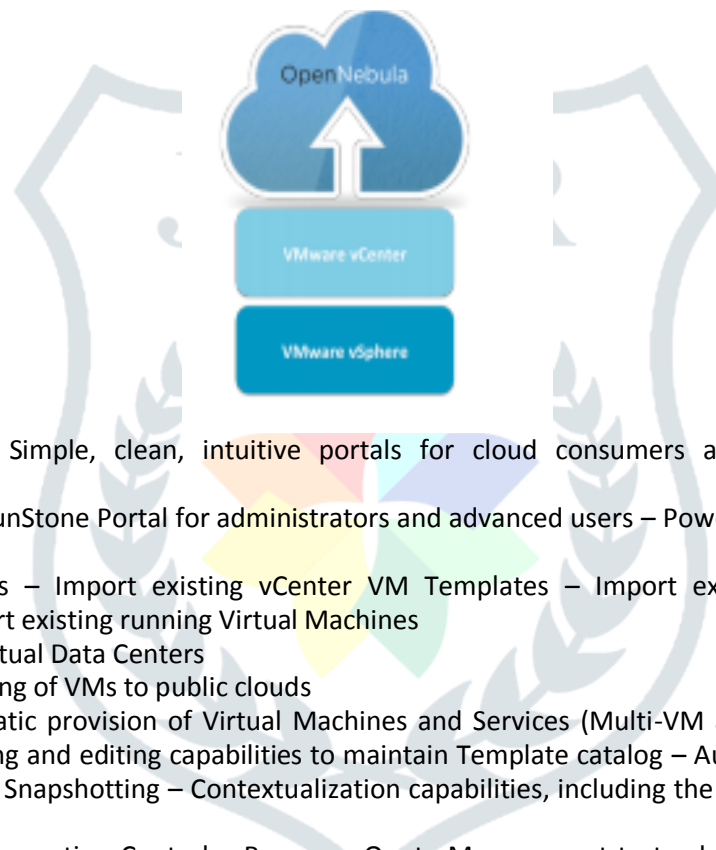
- Cloud interfaces for Cloud Consumers, like the OCCI and EC2 Query and EBS interfaces, and a simple Sunstone cloud user view that can be used as a self-service portal.
- Administration interfaces for Cloud Advanced Users and Operators, like a Unix-like command line interface and the powerful Sunstone GUI.
- Extensible low-level APIs for Cloud Integrators in Ruby, JAVA and XMLRPC API
- A Marketplace for Appliance Builders with a catalog of virtual appliances ready to run in OpenNebula environments



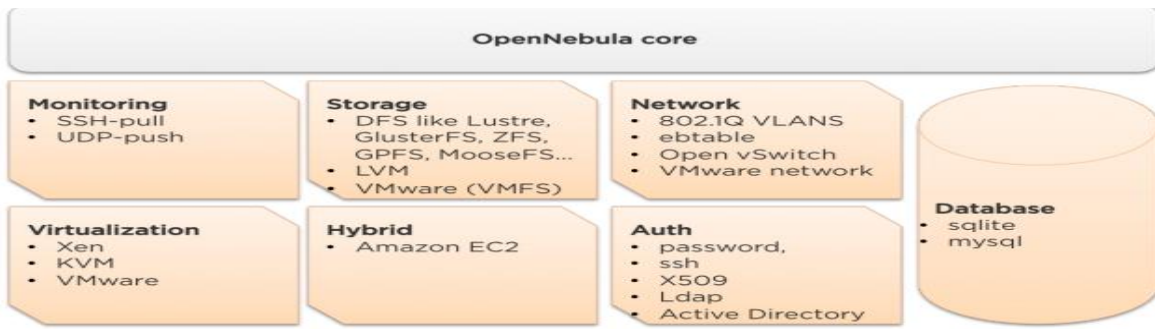
## II. What Is vOneCloud ?

vOneCloud is an OpenNebula distribution optimized to work on existing VMware vCenter deployments. It deploys an enterprise-ready OpenNebula cloud just in a few minutes where the infrastructure is managed by already familiar VMware tools, such as vSphere and vCenter Operations Manager, and the provisioning, elasticity, multi-tenancy, elasticity and multi-vm cloud features are offered by OpenNebula. It inherits all the benefits from the open source cloud management platform, adding an easy to deploy, easy to use aspect due to pre configuration of the OpenNebula install contained within the appliance.

vOneCloud is distributed as a virtual appliance in OVA format for vSphere. It contains all required OpenNebula services within a single CentOS Linux appliance. All components are fully open-source and have been certified to work in enterprise environments, vOneCloud includes:



- Cloud User Interfaces – Simple, clean, intuitive portals for cloud consumers and Virtual Datacenter (VDC) administrators.
- Cloud Admin Interfaces – SunStone Portal for administrators and advanced users – Powerful CLI that resembles typical UNIX commands applications
  - Import Existing Resources – Import existing vCenter VM Templates – Import existing vCenter Networks and Distributed vSwitches – Import existing running Virtual Machines
- On-demand Provision of Virtual Data Centers
- Hybrid Cloud – Cloud-bursting of VMs to public clouds
- Fast Provisioning – Automatic provision of Virtual Machines and Services (Multi-VM applications) from a Template catalog – VM Template cloning and editing capabilities to maintain Template catalog – Automatic execution and scaling of multi-tiered applications – Snapshotting – Contextualization capabilities, including the ability to run any script at VM boot time
- Security and Resource Consumption Control – Resource Quota Management to track and limit computing resource utilization – Fine-grained accounting and monitoring – Complete isolated VDCs and organizations – Fine-grained ACLs and user quotas – VM capacity resizing (CPU and Memory) – Powerful user, group and role management – vCenter Network and Distributed vSwitch support – Attach/detach network interfaces functionality – Capacity (CPU and MEMORY) resizing – Showback functionality to report resource usage cost – VNC connection to VMs, including the ability to set keymap
- Enterprise Datacenter Component Integration Capabilities – Integration with user management services like Active Directory and LDAP. – HTTP Proxy support
- Reliability, Efficiency and Massive Scalability – Profit from years of testing and production use – Be sure that your Cloud Management Platform will be up to the task vOneCloud additionally brings new configuration and upgrade tools:
  - Appliance and Services Configuration – Control Console for vOneCloud appliance configuration – Control Panel (Web UI) for vOneCloud services configuration and debugging
  - Smooth Upgrade Process

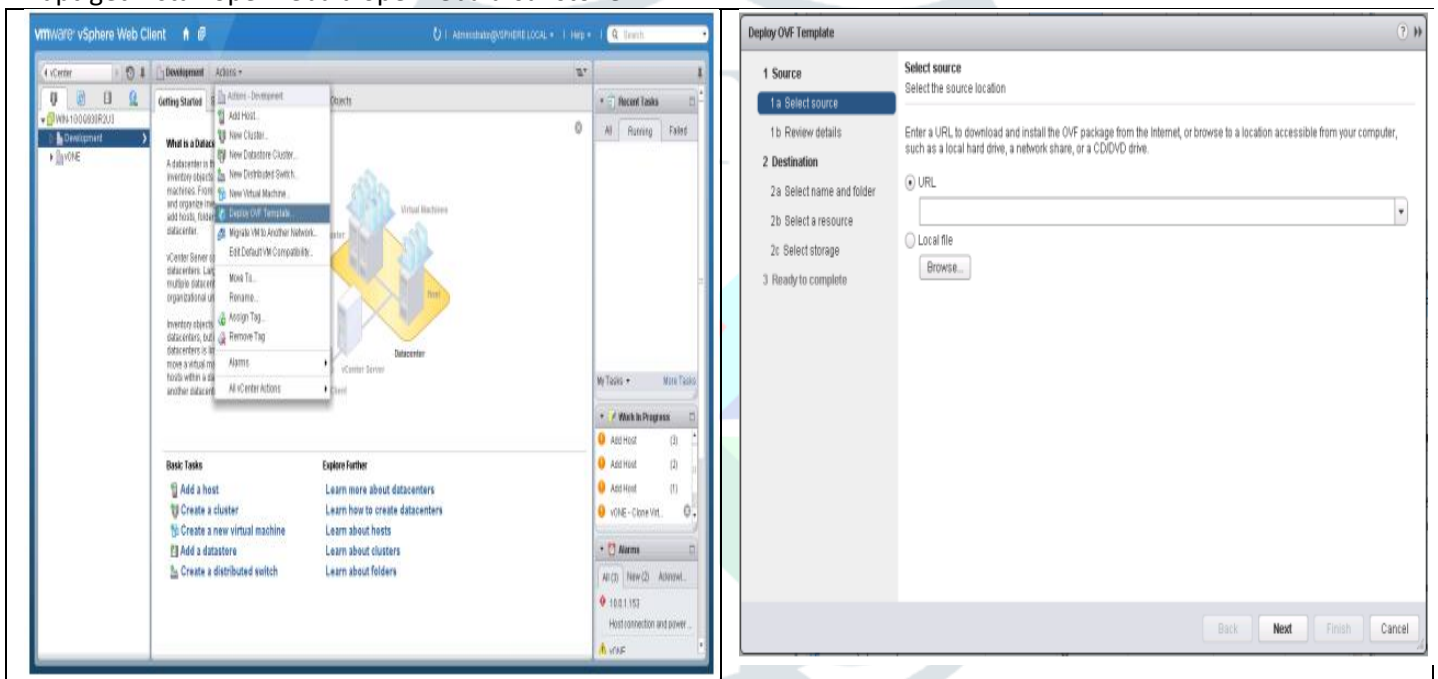


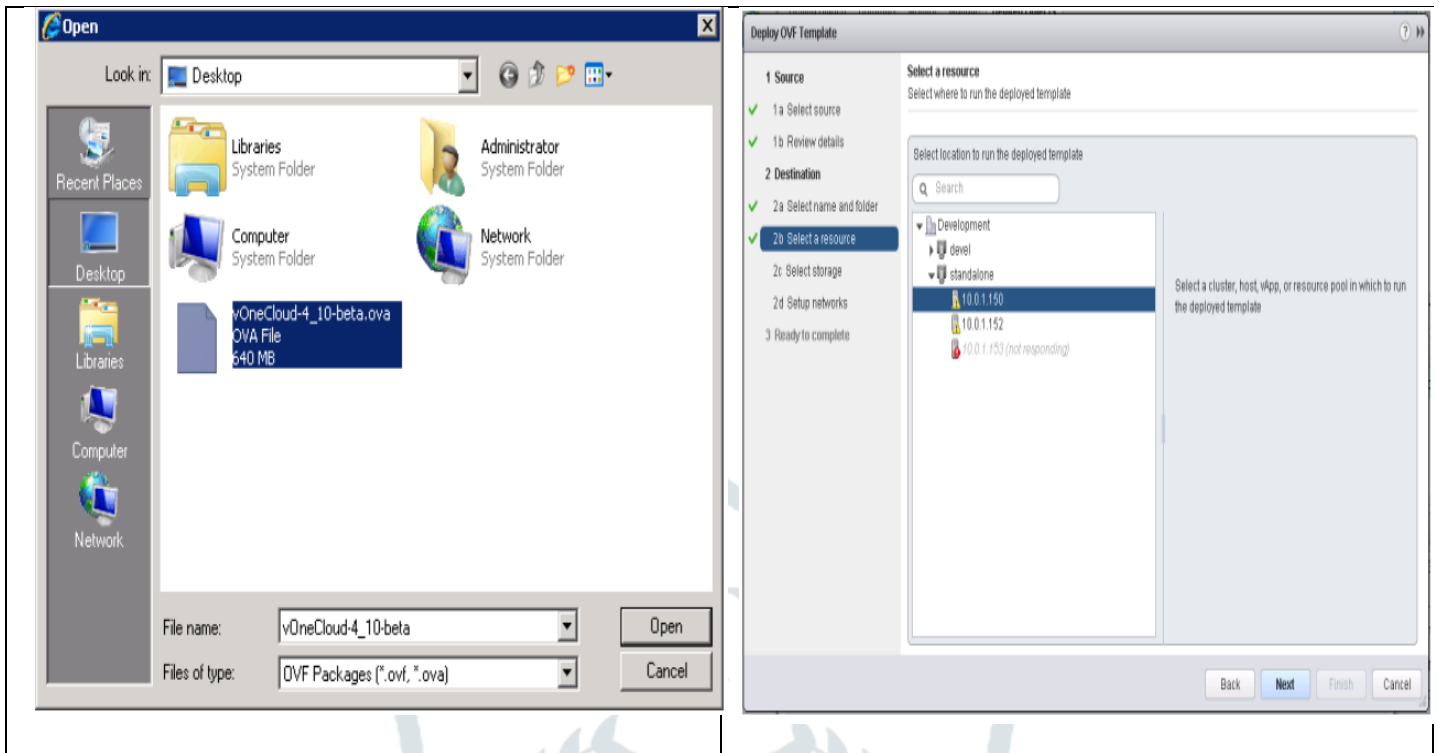
### III. IMPLEMENTATION AND DEPLOY

#### Step 1: Deploying the OVA

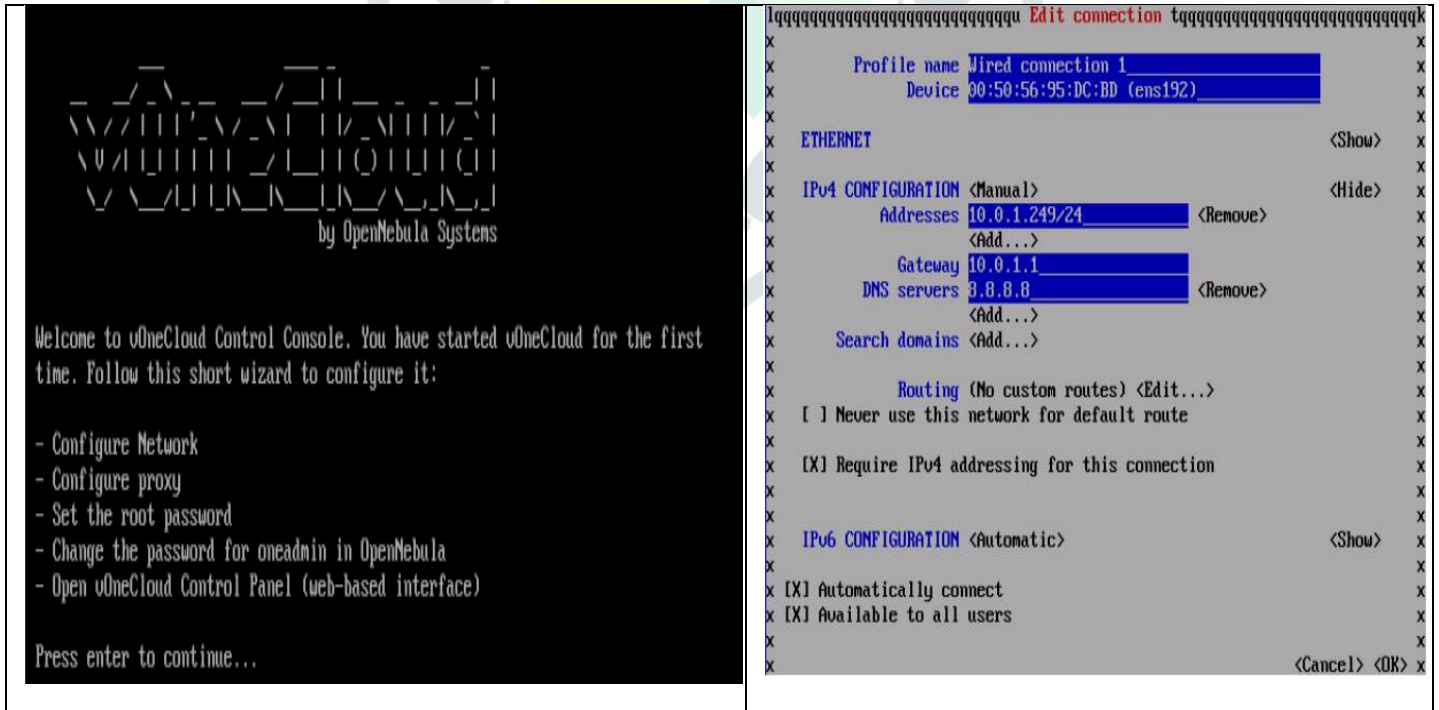
```
# apt-get update
```

```
# apt-get install opennebula opennebula-sunstone
```





### Step 2: vOneCloud Control Console - Initial Configuration



### Step 3: vOneCloud Control Panel - Manage Services

The vOneCloud Control Panel will allow the administrator to:

- Check for new vOneCloud versions and manage upgrades.
  - Configure Active Directory / LDAP integration and hybrid cloud drivers: Amazon EC2, Windows Azure and IBM SoftLayer.
  - Start the OpenNebula services
  - Manage automatic upgrades. Click on the configuration icon if you need to configure one of the supported options.
- Keep in mind that you can run this configuration at any moment. We recommend starting inspecting vOneCloud’s functionality before delving into advanced configuration options like the aforementioned ones.

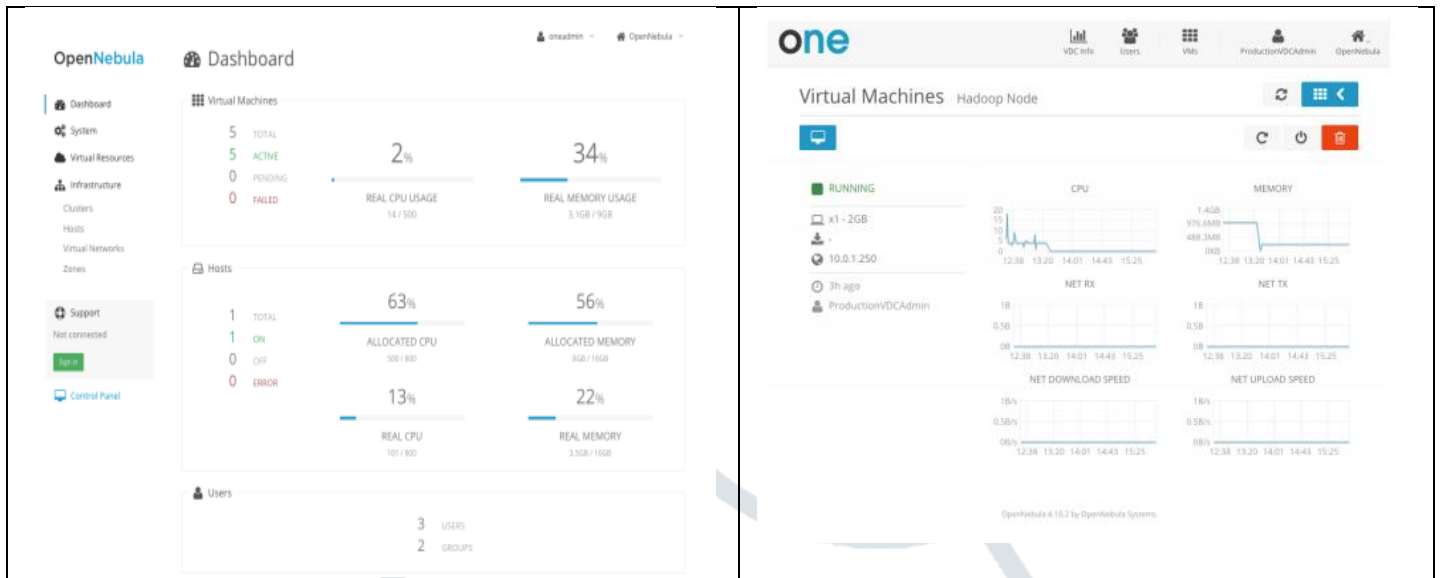
### Editing the vOneCloud Appliance

The image displays the OpenNebula Sunstone interface. The top section shows a dashboard with metrics for Storage (18 IMAGES, 120.9GB USED), Users (3 USERS, 2 GROUPS), Network (3 VNETS, 7 USED IP), Hosts (3 TOTAL, 3 ON, 0 OFF, 0 ERROR), and Virtual Machines (9 TOTAL, 9 ACTIVE, 0 PENDING, 0 FAILED). Below these are line graphs for CPU, MEMORY, NET DOWNLOAD SPEED, and NET UPLOAD SPEED.

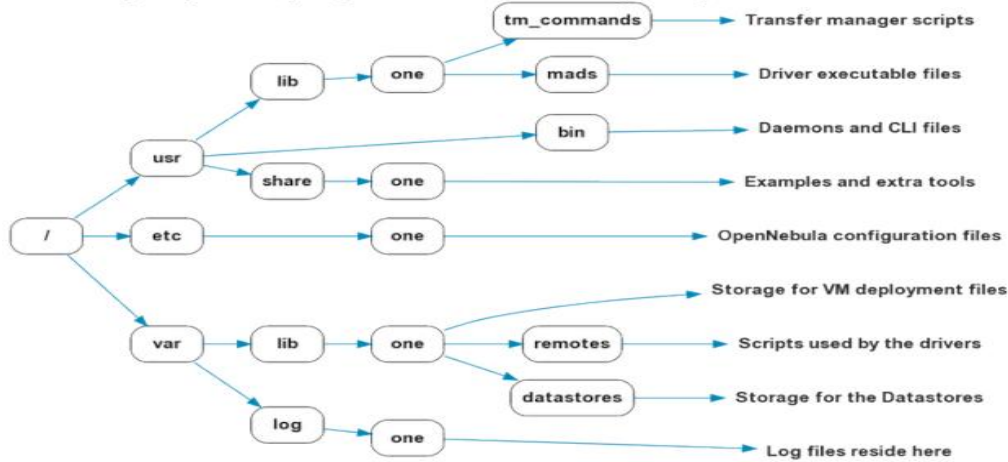
The bottom left shows the 'Virtual Hardware' configuration window with fields for CPU (1), Memory (2048 MB), Hard disk 1 (10 GB), SCSI controller 0 (VMware Paravirtual), Network adapter 1 (VM Network, Connected), Video card, VNCI device, and SATA controller 0. A 'New device' section is at the bottom with a compatibility note: 'Compatibility: ESXi 5.5 and later (VM version 10)'. A note at the bottom states: 'If you want for instance to add a new network interface, select Network from the dropdown in New device (at the bottom of the dialog):'.

The bottom right shows the 'Create Virtual Data Center' screen. It features a sidebar with navigation options like Dashboard, System, Users, Groups, ACLs, Virtual Resources, Virtual Machines, Templates, Infrastructure, and OneFlow. The main area has tabs for General, Groups, and Resources. A table lists resources with columns for ID, Owner, Group, Name, Reservation, Cluster, and Leases. A red arrow points to the 'VM Network' entry in the table.

ID	Owner	Group	Name	Reservation	Cluster	Leases
2	oneadmin	oneadmin	VM Network	No	-	1/1
1	oneadmin	oneadmin	DPortGroup	No	-	1/255
0	oneadmin	oneadmin	DSwitch0.DVUplinks-17	No	-	0/255



After installing the OpenNebula packages in the front-end the following directory structure will be used



#### IV. CONCLUSION

We have gone through and discussed all the steps required to get from bare hardware to a fully operational OpenNebula infrastructure. We have started from notes on installing CentOS on the nodes, continued through setting up a network gateway, distributed replicated storage using GlusterFS, KVM hypervisor, and all the main OpenNebula services. We have concluded with steps to test the OpenNebula installation, suggestions on ways of finding problem sources and resolving them, and a discussion of solutions to a number of problems that may be encountered during the installation process.



**REFERENCE**

1. "OpenNebula Key Features and Functionality". *OpenNebula documentation*. Retrieved 13 October 2011.
2. R. Moreno-Vozmediano, R. S. Montero, and I. M. Llorente. "Multi-Cloud Deployment of Computing Clusters for Loosely-Coupled MTC Applications", *Transactions on Parallel and Distributed Systems. Special Issue on Many Task Computing* (in press, doi:10.1109/TPDS.2010.186)
3. R. S. Montero, R. Moreno-Vozmediano, and I. M. Llorente. "An Elasticity Model for High Throughput Computing Clusters", *J. Parallel and Distributed Computing* (in press, DOI: 10.1016/j.jpdc.2010.05.005)
4. "The Future of Cloud Computing" (PDF). *European Commission Expert Group Report*. 25 January 2010. Retrieved 3 June 2013.
5. B. Sotomayor, R. S. Montero, I. M. Llorente, I. Foster. "Virtual Infrastructure Management in Private and Hybrid Clouds", *IEEE Internet Computing*, vol. 13, no. 5, pp. 14-22, September/October 2009. DOI: 10.1109/MIC.2009.119)
6. "OpenNebula @ GSoC 2010". *Google Summer of Code 2010*. Retrieved 27 December 2010.
7. "Featured Users". *OpenNebula website*. Retrieved 13 October 2011.

