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OpenNebula

The Opensource Solution for
Datacenter Virtualization

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Aims

What is OpenNebula?

Features to build your cloud?

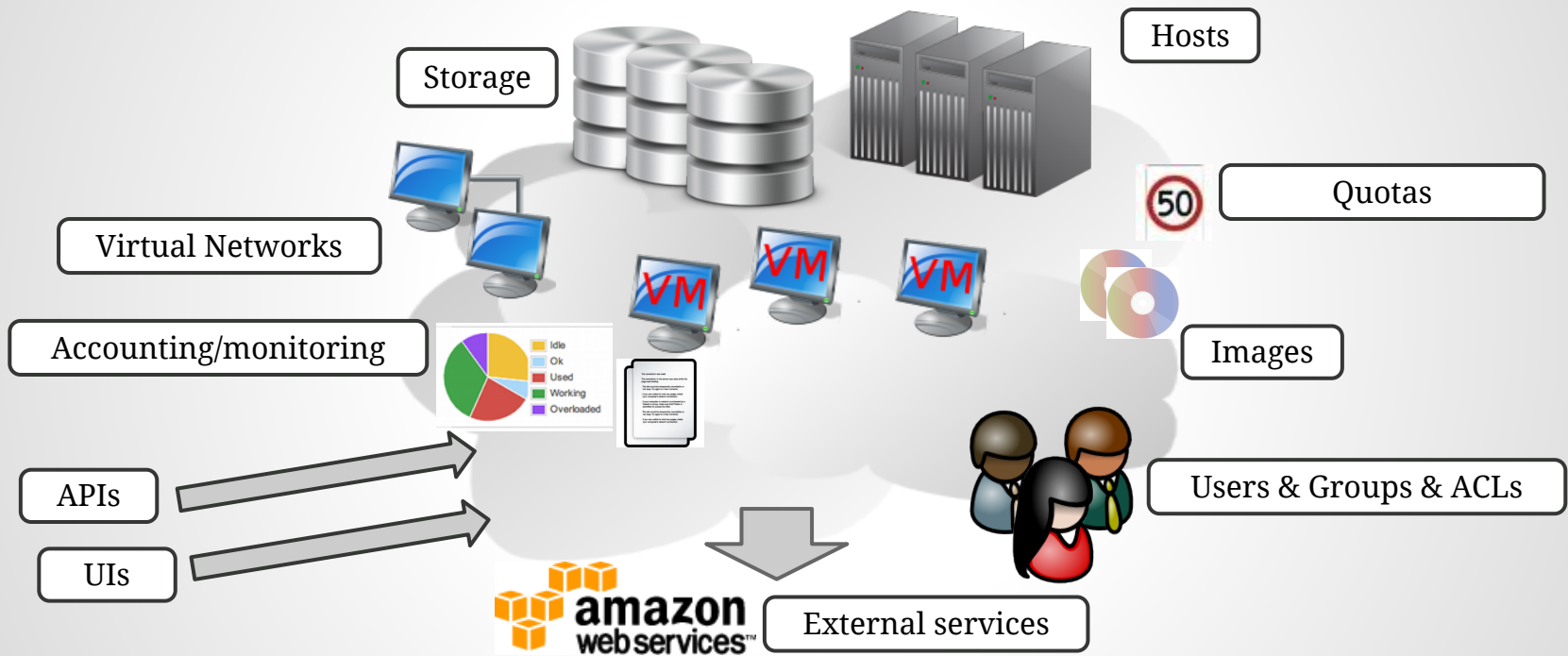
Features to operate your cloud?

Features to integrate your cloud?

What is OpenNebula?

Full cloud infrastructure solution

What is OpenNebula?



Make all this work together
[in a reliable, efficient, scalable way]

OpenNebula principles

Fully open-source

Apache 2 License (not open core)

OpenNebula principles

Flexible & adaptable

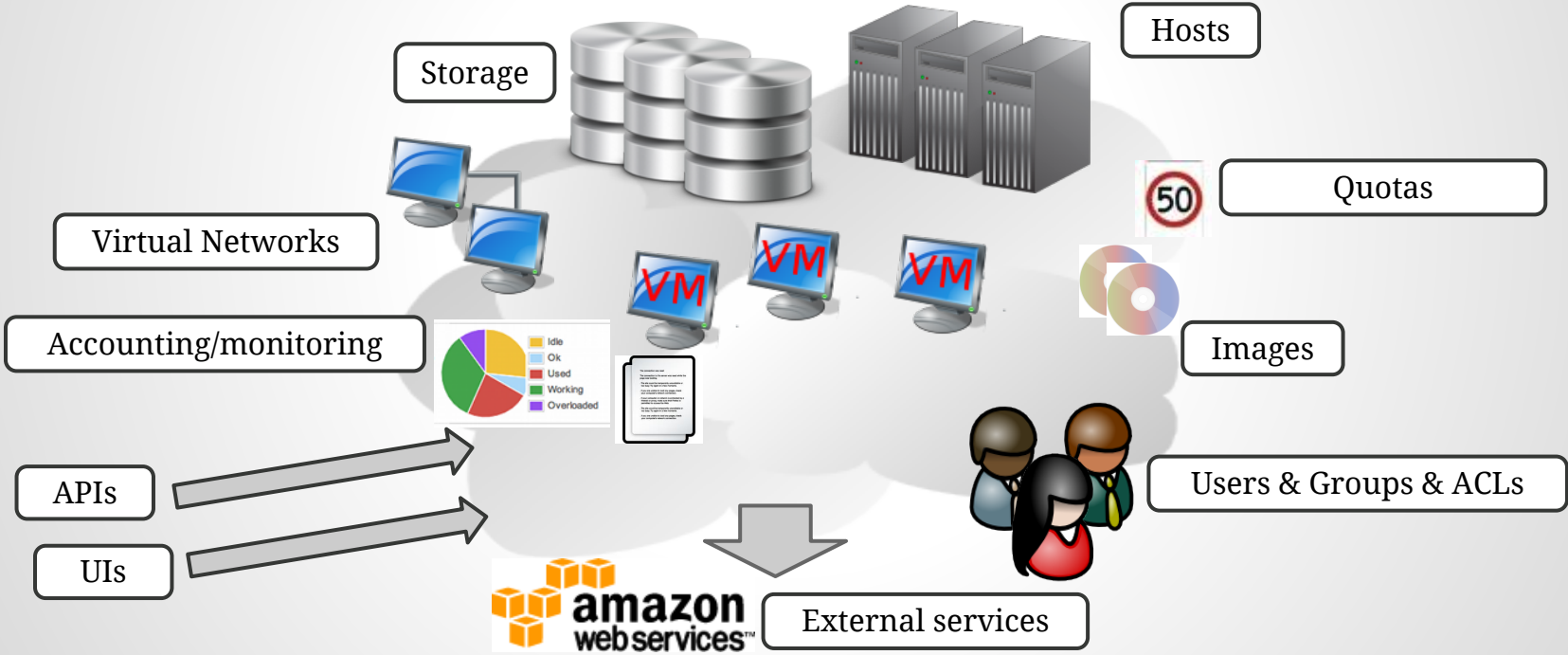
Modular design
Custom plugins

OpenNebula principles

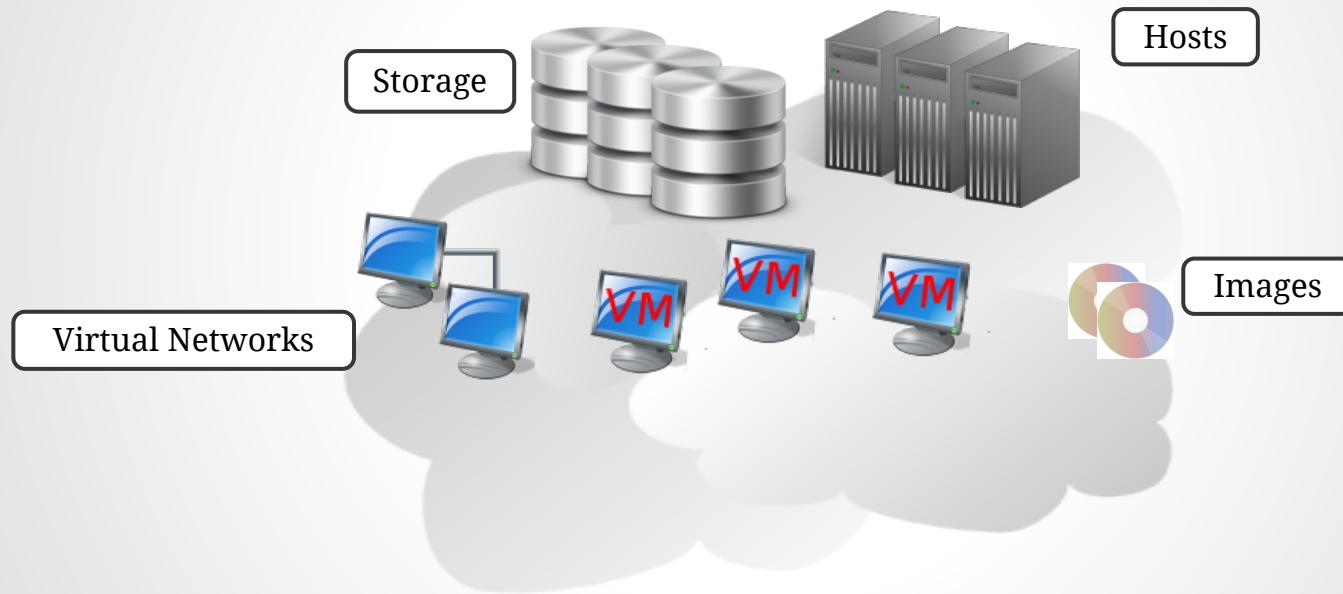
Interoperable / No lock-in

Infraestructure agnostic
Multiple Hypervisors (VMware, XEN, KVM)
Several APIs (AWS, OCCl)

Getting it sorted out



Setting up the infrastructure



Physical hosts - Hypervisors

VMware

KVM

Xen

EC2 -> Deploy VMs to
Amazon host

Hyper-V (Ecosystem)

OpenVZ (Ecosystem)

VirtualBox (Ecosystem)



Physical hosts - Monitoring

Monitoring drivers for the different hypervisors

Ganglia

Physical hosts - Networking

Defined per host:

802.1Q

eatables

Open vSwitch

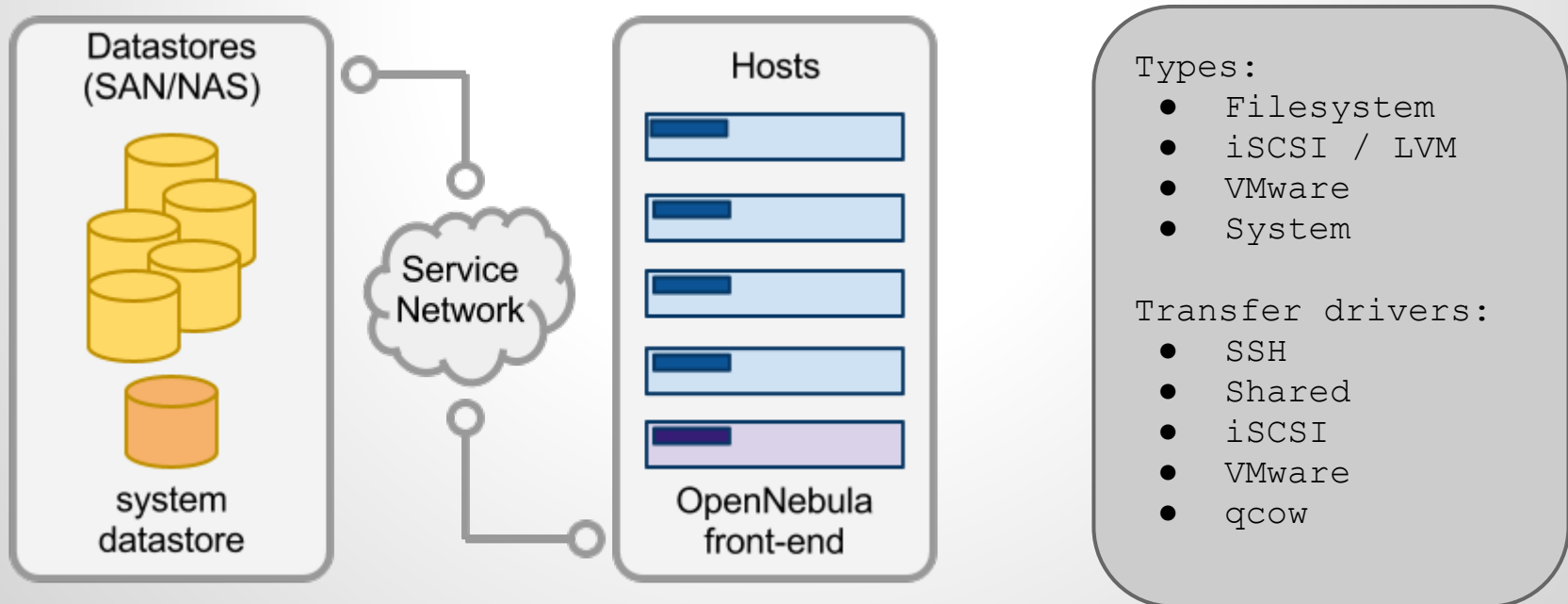
VMware - native networks

Firewall - rules via iptables - no isolation

Dummy

Storage - Datastores

"A Datastore is any storage medium used to store disk images for VMs. Typically, a datastore will be backed by SAN/NAS servers"



Storage - Images

- Placed in a datastore
- Type:
 - OS
 - CDROM (read-only)
 - Datablock
- Path
 - Filesystem
 - Download
 - Upload (via UI, OCCI)
 -
- Persistent / Non-persistent

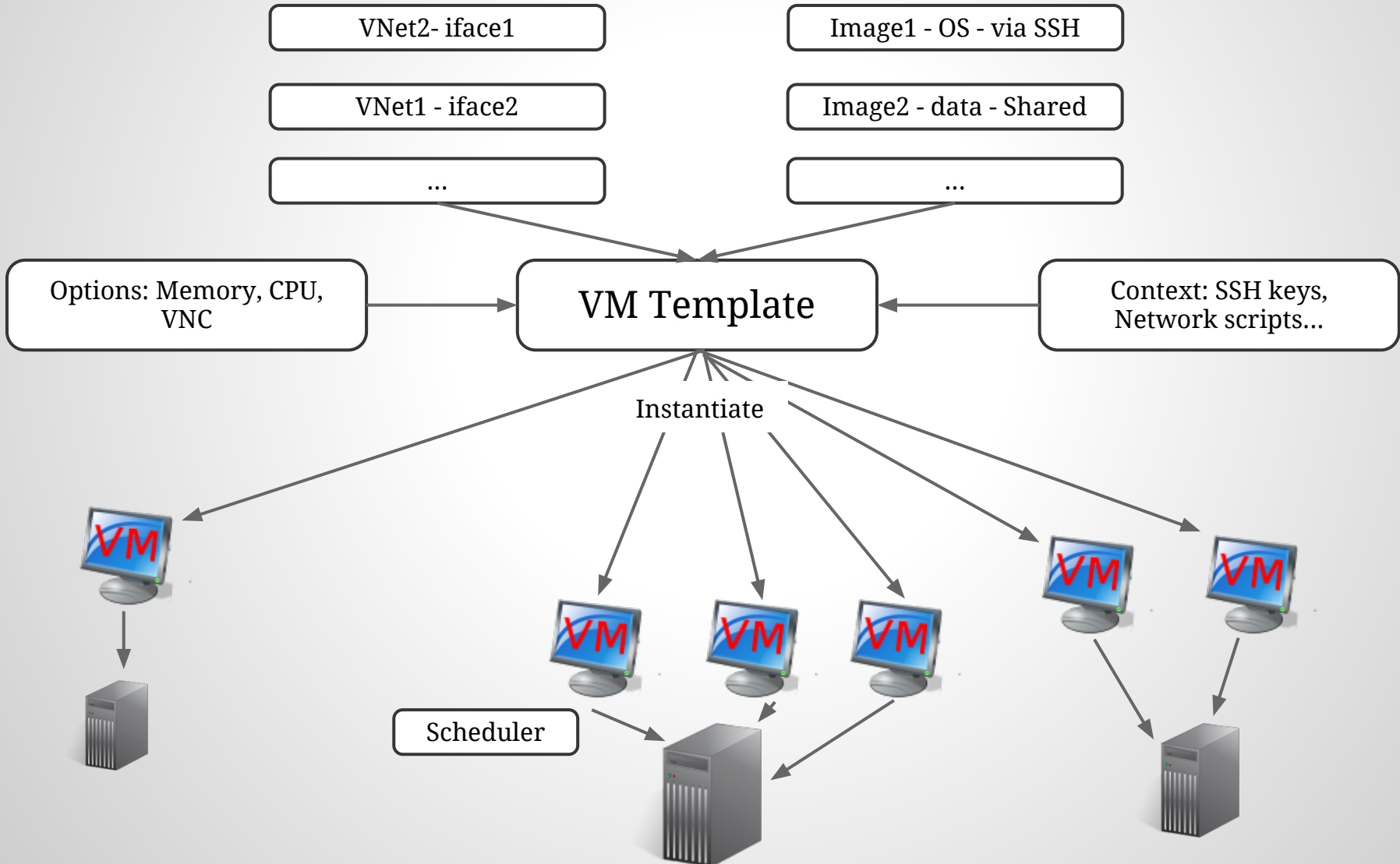


Networking - Virtual Networks

- Set of leases (IP:MAC) - defined via ranged, fixed
- Deploy: MAC is assigned to network iface with the IP



Virtual Machines



Virtual Machines - operations

Deploy
hold/release
suspend/stop/resume
restart/reboot/reset
resubmit
cancel
shutdown

Migrate
Live-migrate

New: Disk hotplugging

Operating the cloud



Groups



Set of users

Quota-enabled: Group usage limits for VMs,
Storage...

Accounting: Group resource usage is monitored
and stored

Users



Quota-enabled: Usage limits for VMs, Storage...

Accounting: resource usage is monitored and stored

Authentication: Core, SSH, LDAP, x509... custom

Permissions & ACLs

Permissions:

Resources (Images, Networks, VMs, Templates)
have owner/group and Unix-like permissions:

`user/group/other : use/manage/admin`

ACLs:

Rules in the style:

`"Group testers can use templates from group developers"`

`"User Bob can administrate all Virtual Networks"`

Command line interface

Set of command line utilities

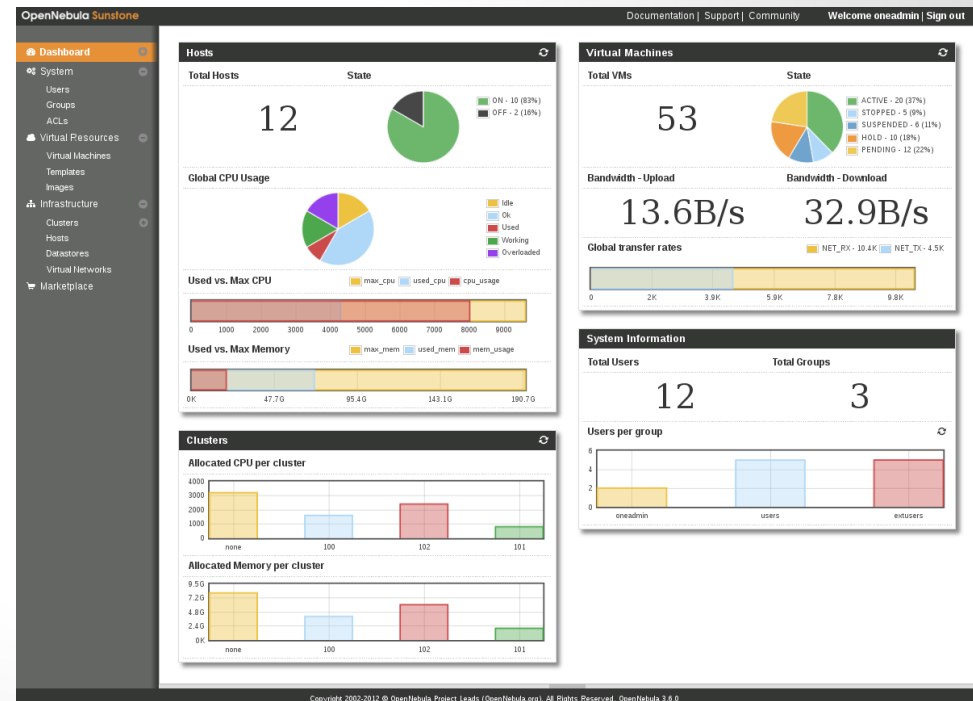
```
onevm          [list|create|delete]...
onehost        [list|create|delete]...
onetemplate   [list|create|delete]...
onevnet        [list|create|delete]...
oneimage       [list|create|delete]...
onedatastore  [list|create|delete]...
```

...

(options to produce raw XML output)

OpenNebula Sunstone

- Fully featured administration interface
- Integrated web VNC console
- Monitoring, accounting, usage plots
- VM creation wizards, i18n...
- Custom plugins



OpenNebula Self-Service

- End-user oriented interface, simple, multi-language
- Manage virtual resources: Nets, VMs, Images
- Easily brandable, customizable
- Built on OCCI API

OpenNebula Self-Service

Welcome oneadmin | Sign out

Dashboard

- Compute
- Storage
- Networks
- Configuration

Welcome to OpenNebula Self-Service

OpenNebula Self-Service OpenNebula Self-Service is a simplified user interface to manage OpenNebula compute, storage and network resources. It is focused on easiness and usability and features a limited set of operations directed towards end-users.

Additionally, OpenNebula Self-Service allows easy customization of the interface (e.g. this text) and brings multi-language support.

Have a cloudy experience!

Current resources

Compute	2
Storage	4
Network	2

Useful links

- Documentation
- Support
- Community

Compute

Compute resources are Virtual Machines attached to storage and network resources. OpenNebula Self-Service allows you to easily create, remove and manage them, including the possibility of pausing a Virtual Machine or taking a snapshot of one of their disks.

[Create new compute resource](#)

[See more](#)

Storage

Storage pool is formed by several images. These images can contain from full operating systems to be used as base for compute resources, to simple data. OpenNebula Self-Service offers you the possibility to create or upload your own images.

[Create new storage resource](#)

[See more](#)

Network

Your compute resources connectivity is performed using pre-defined virtual networks. You can create and manage these networks using OpenNebula Self-Service.

[Create new network resource](#)

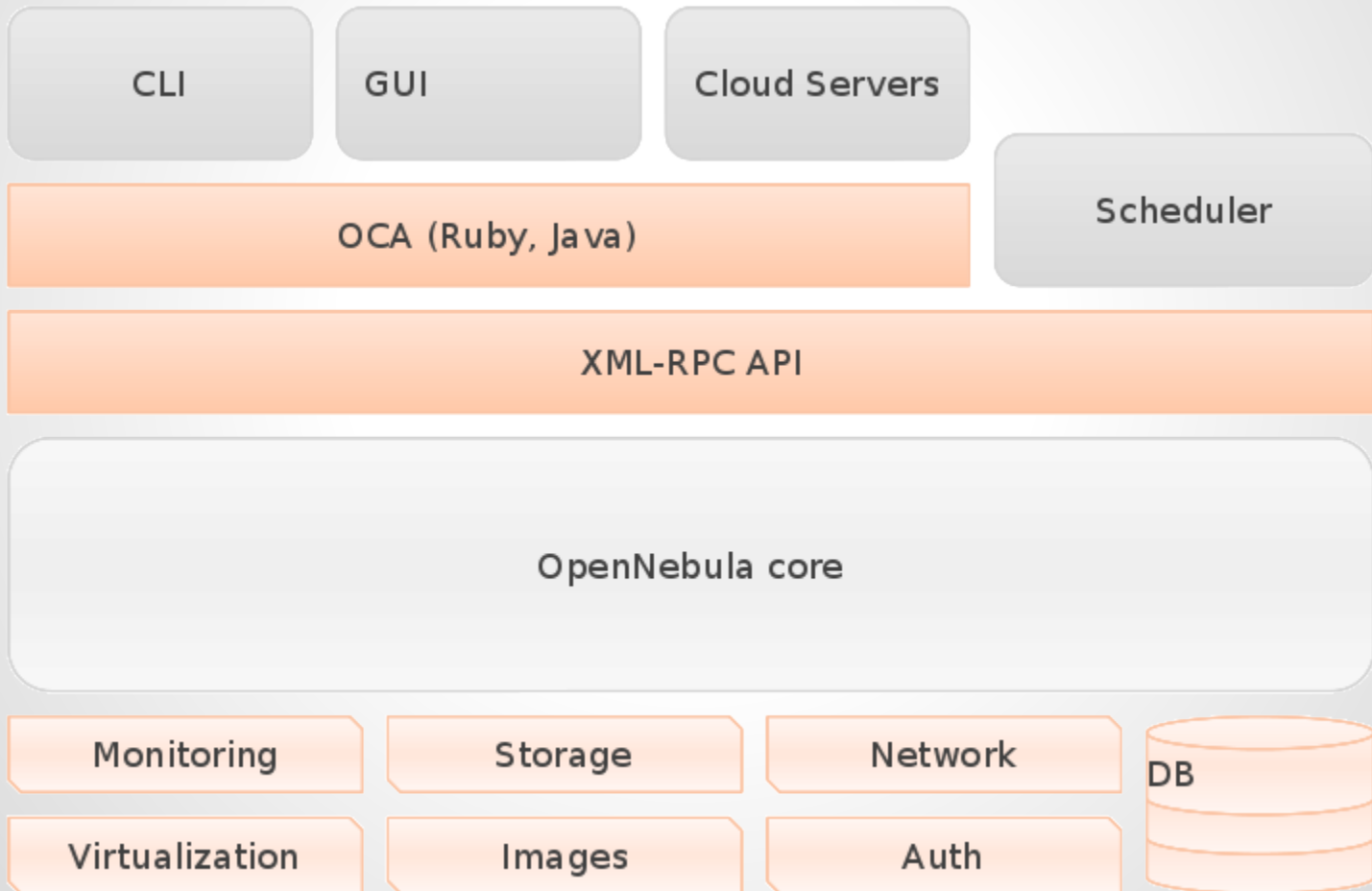
[See more](#)

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APIs



Integrating the cloud



System interfaces - OCA

Ruby OCA

Java OCA

Python OCA (Ecosystem)

XML-RPC API

Drivers & Plugins

Small scripts performing defined operations

Monitoring, virtualization, storage, network, auth...

Easy to write, easy to tweak

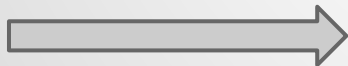
There's more...

Cool things that come with
OpenNebula

Core tuning - Hooks

Scripts triggered on certain events

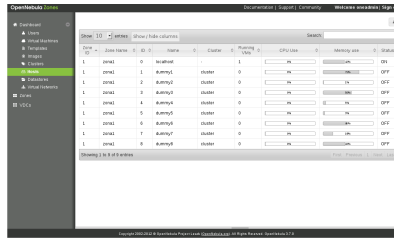
- Local or remote
- Hooks for Hosts:
 - Triggered on CREATE, ERROR, DISABLE
- Hooks for VMs:
 - Triggered on CREATE, RUNNING, SHUTDOWN, STOP, FAILED, DONE...



Fault tolerance

OpenNebula Zones

Multi-tier deployments with oZones



UI + CLI + Ruby API

OpenNebula



ZONE 1

OpenNebula

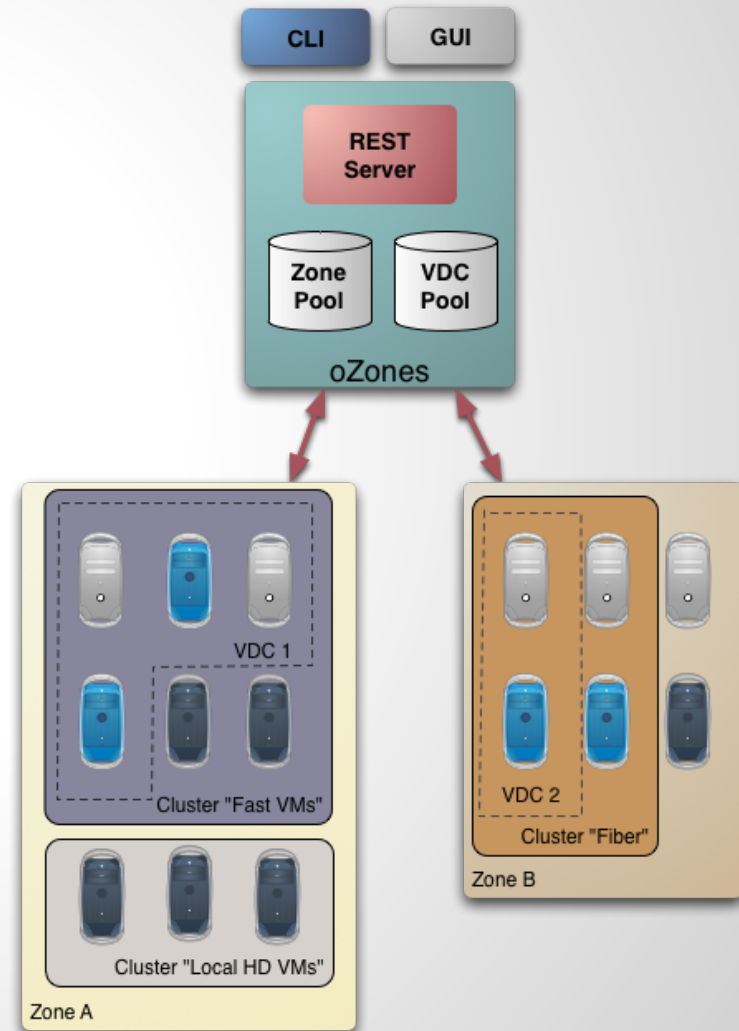


ZONE 2

OpenNebula Zones


Virtual Data Center (VDC)

- Group of
 - Hosts
 - Datastores
 - Virtual Networks
- Managed by (ACL rules)
 - VDC Admin user
 - VDC group
- ONE / UIs accessible from oZones frontend
 - http://ozones:6121/sunstone_vdc1



OpenNebula Marketplace

Hosted by C12G labs | Integrated in Sunstone

 **OpenNebula Marketplace**
BETA

📘 About

The OpenNebula Marketplace is an online catalog where individuals and organizations can quickly distribute and deploy appliances ready-to-run on OpenNebula clouds.


[Learn more](#)

🛠️ Post your Appliance

You can create and distribute your software as an OpenNebula Virtual Appliance. The OpenNebula Marketplace is available at no charge to any community developer.

[Learn more](#)


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Ubuntu Server 12.04 (Precise Pangolin) - kvm



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community

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73

[More Info](#)

— This image has been created with OpenNebula 3.4. It has been tested with KVM, although since it's a RAW image it should work with Xen and even VMware (using qemu-img convert).

📌 linux, ubuntu

HYPERVISOR
KVM

ARCH
x86_64

FORMAT
raw

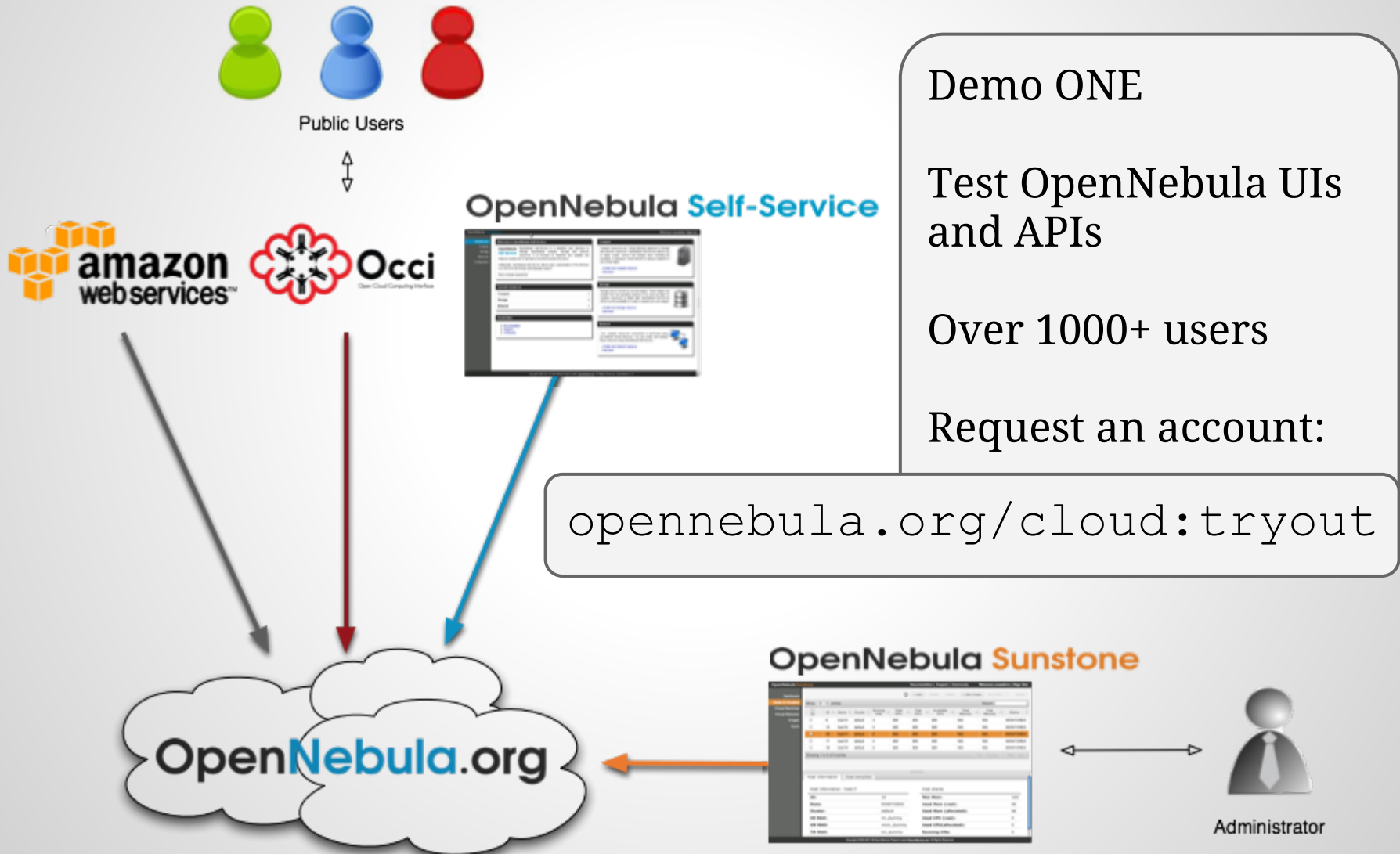
OpenNebula sandboxes

Easiest way to try out OpenNebula

Available: KVM, VMware

[http://openebula.org/cloud:sandbox:\[vmware|kvm\]](http://openebula.org/cloud:sandbox:[vmware|kvm])

OpenNebula public cloud



Ecosystem

Community contributions

Some examples:

Standards



Adapters



Virtualization Drivers



Configuration



Storage



Final keys

- Soon celebrating 5th birthday
- FOSS project:
 - Mailing lists and IRC channel in Freenode
 - Extensive, up-to-date documentation
 - Packages for major Linux distros
 - `blog.opennebula.org` with news, tutorials...
 - **Development site:** `dev.opennebula.org`

Github mirror: `github.com/OpenNebula/one`

- Commercial support via **C12G**.com
LABS
- Fast release cycle every 3 months: Currently v3.6.0

Final keys

Featured users and contributors

Contributors



Users



Projects



OpenNebula.org

Twitter: @opennebula
Freenode: #opennebula

Thanks!

Questions

?