

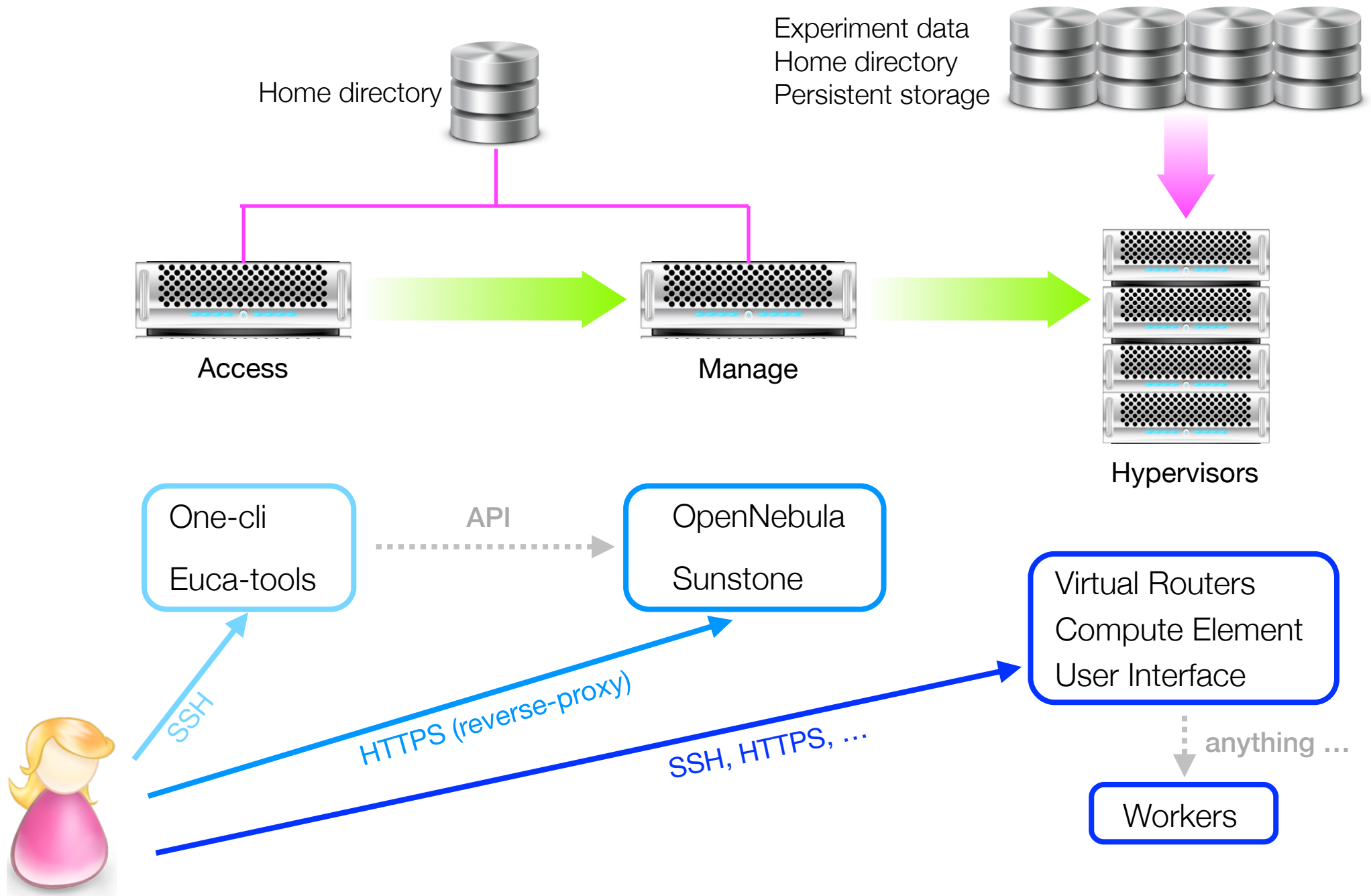
How to use the INFN Torino Cloud

Torino Cloud Users Mini-workshop, May 26 2016

Speaker: Sara Vallero

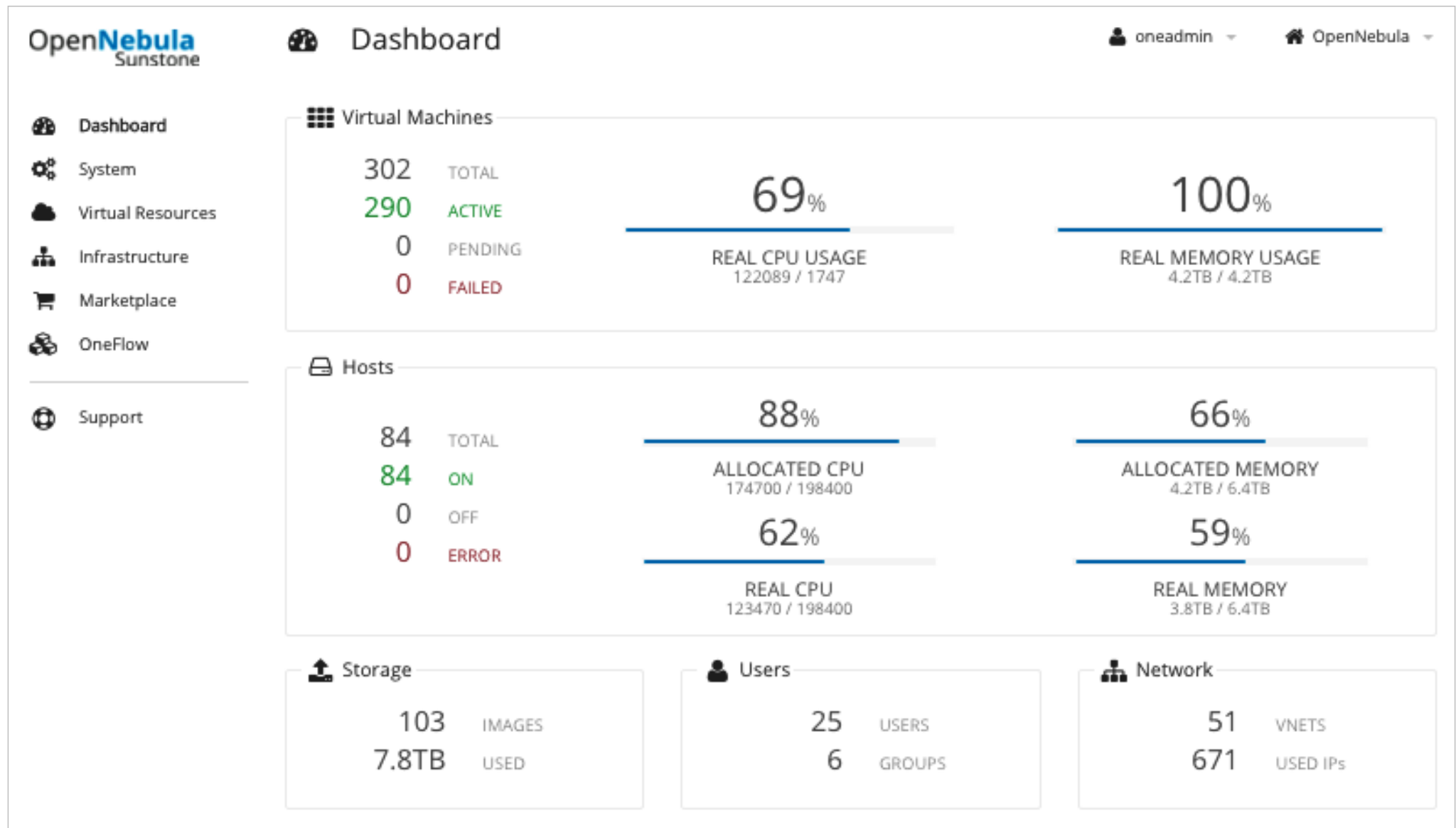


Rationale



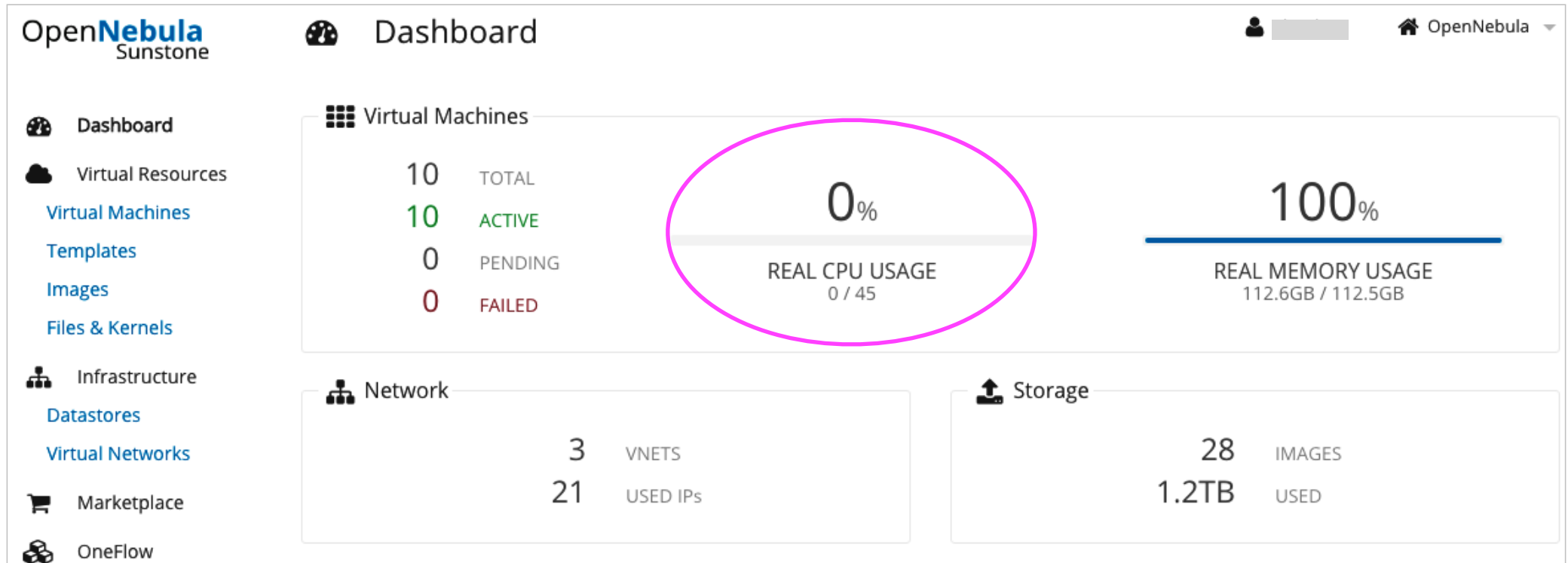
The Sunstone Graphic User Interface

Administrator dashboard



The Sunstone Graphic User Interface

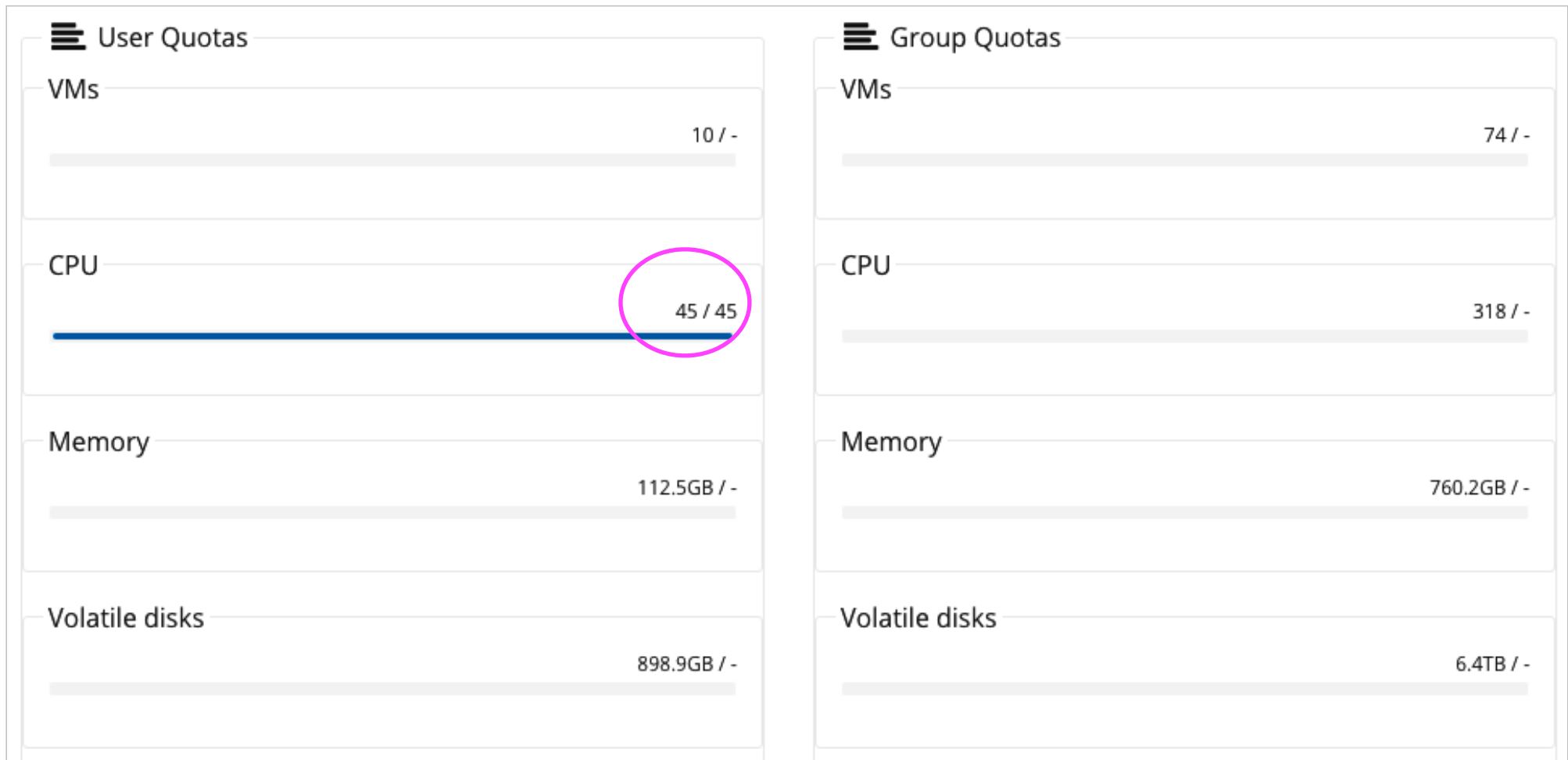
User dashboard...



- we should think about the real CPU usage... (later)
- real memory usage is not meaningful
- not all the resources you see (network, images) you can actually use... we will do some clean-up

The Sunstone Graphic User Interface

... continued



- blue line means: quota enforced

The Sunstone Graphic User Interface

OpenNebula Sunstone Virtual Machines sfarm OpenNebula

Dashboard Virtual Resources Virtual Machines Templates Images Files & Kernels Infrastructure Datastores Virtual Networks Marketplace OneFlow

Showing 1 to 6 of 6 entries

ID	Owner	Group	Name	Status	Host	IPs	VNC
24344	sfarm	ec2	ec2-m1-large	RUNNING	one-kvm-34	172.16.215.16	
24303	sfarm	ec2	ec2-m1-large	RUNNING	one-kvm-59	172.16.215.14	
24302	sfarm	ec2	ec2-m1-large	RUNNING	one-kvm-66	172.16.215.13	
24301	sfarm	ec2	ec2-m1-large	RUNNING	one-kvm-60	172.16.215.12	
24298	sfarm	ec2	ec2-m1-large	RUNNING	one-kvm-31	172.16.215.11	
23767	sfarm	ec2	SFARM-HEAD	RUNNING	one-kvm-06	172.16.215.4	

6 TOTAL 6 ACTIVE 0 OFF 0 PENDING 0 FAILED

Virtual Machine 24344 sfarm OpenNebula

Info Capacity Storage Network Snapshots Actions

CPU VCPU MEMORY

6 6 15GB

REAL CPU

REAL MEMO

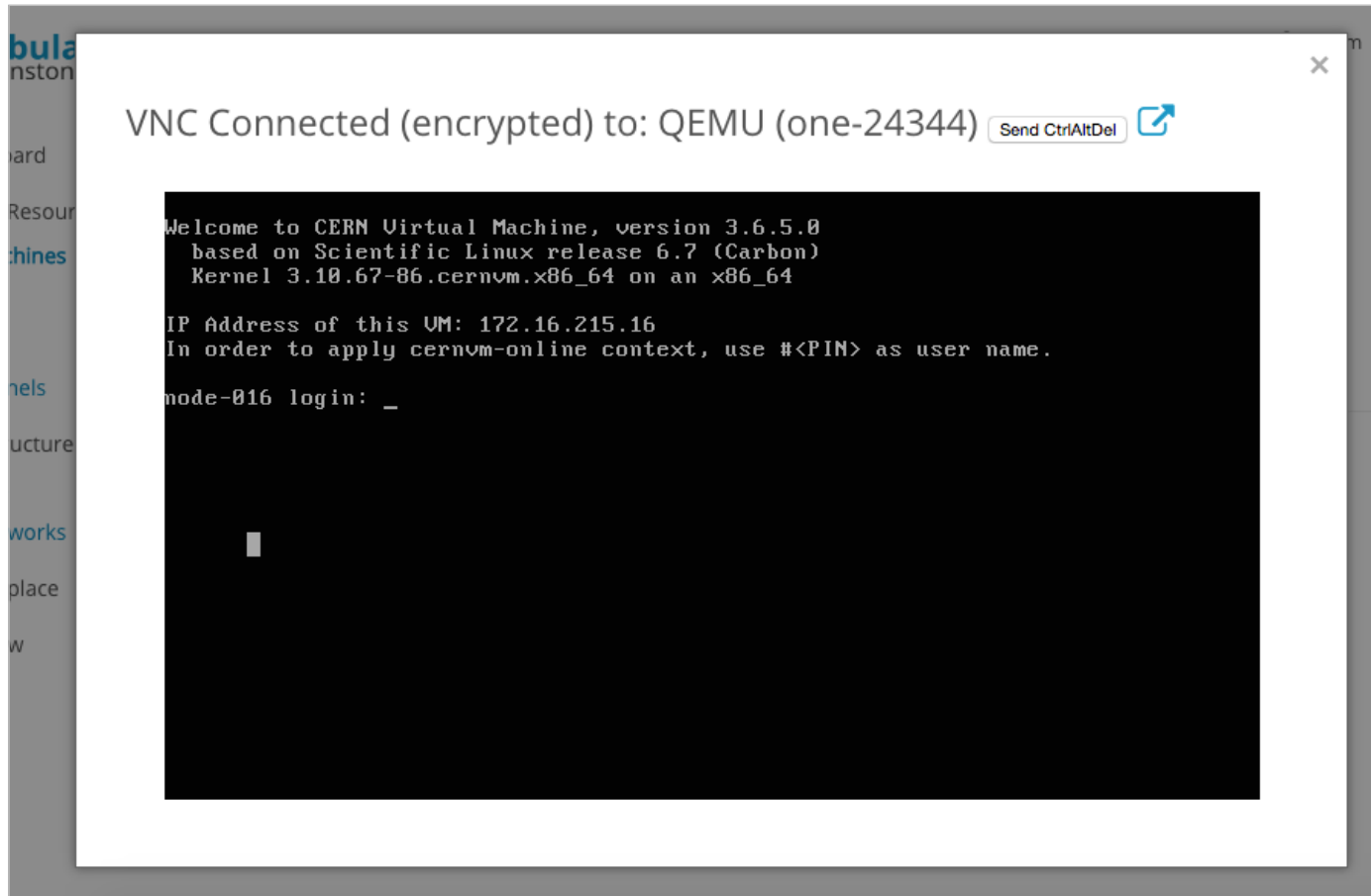
Virtual Machine 24344 sfarm OpenNebula

Info Capacity Storage Network Snapshots Actions

ID	Target	Image / Format-Size	Persistent	Save as	Actions
0	vda	ucvm-1.18-14	NO	-	Snapshot Detach
1	vdb	117.2GB - raw	NO	-	Detach

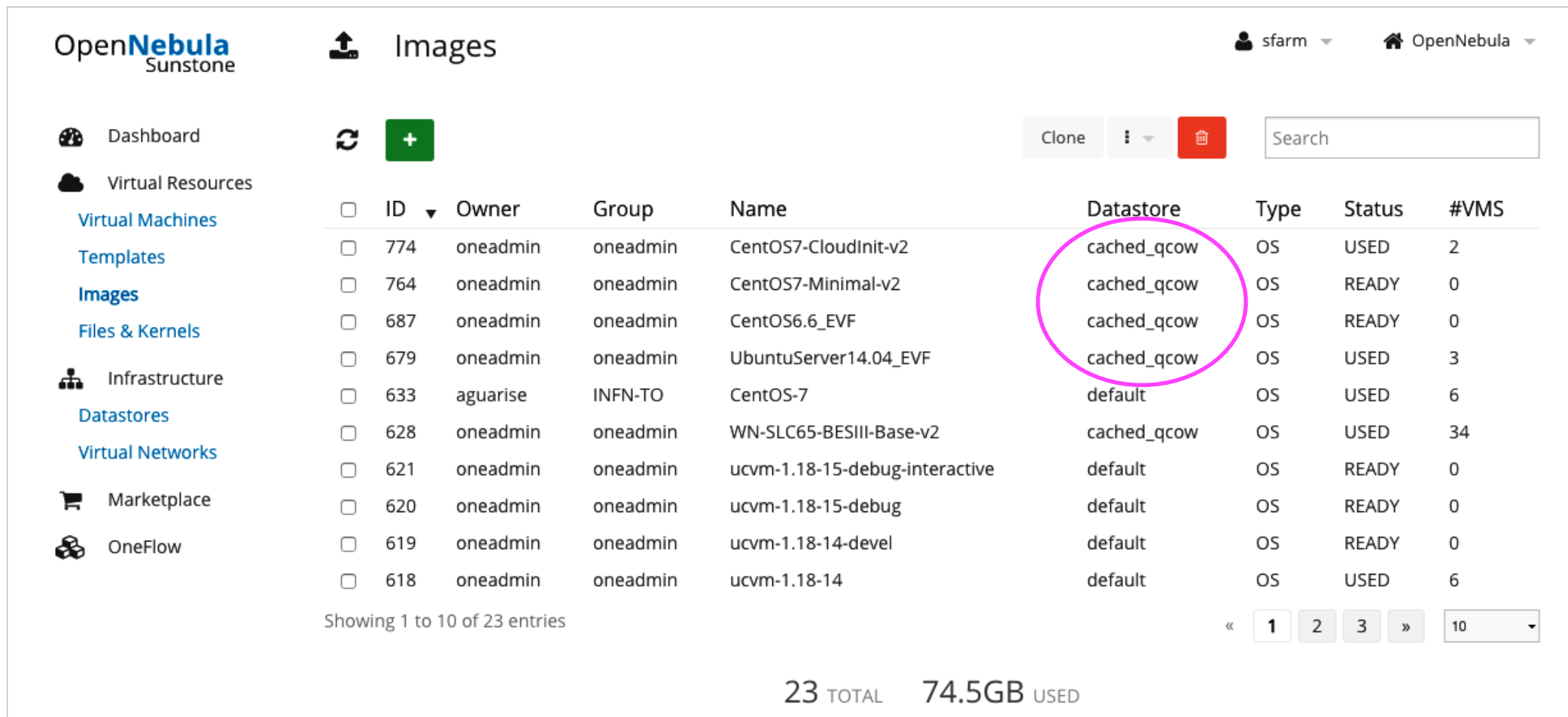
Attach disk

The Sunstone Graphic User Interface



- very useful to troubleshoot if you cannot ssh to the VM
- add security exception to your browser if asked
- Sunstone supports Internet Explorer (≥ 9), Firefox (> 3.5) and Chrome browsers

The Sunstone Graphic User Interface



OpenNebula Sunstone

Images

sfarm OpenNebula

Dashboard Virtual Resources

Virtual Machines Templates Images Files & Kernels Infrastructure Datastores Virtual Networks Marketplace OneFlow

ID	Owner	Group	Name	Datastore	Type	Status	#VMS
774	oneadmin	oneadmin	CentOS7-CloudInit-v2	cached_qcow	OS	USED	2
764	oneadmin	oneadmin	CentOS7-Minimal-v2	cached_qcow	OS	READY	0
687	oneadmin	oneadmin	CentOS6.6_EVF	cached_qcow	OS	READY	0
679	oneadmin	oneadmin	UbuntuServer14.04_EVF	cached_qcow	OS	USED	3
633	aguarise	INFN-TO	CentOS-7	default	OS	USED	6
628	oneadmin	oneadmin	WN-SLC65-BESIII-Base-v2	cached_qcow	OS	USED	34
621	oneadmin	oneadmin	ucvm-1.18-15-debug-interactive	default	OS	READY	0
620	oneadmin	oneadmin	ucvm-1.18-15-debug	default	OS	READY	0
619	oneadmin	oneadmin	ucvm-1.18-14-devel	default	OS	READY	0
618	oneadmin	oneadmin	ucvm-1.18-14	default	OS	USED	6

Showing 1 to 10 of 23 entries

23 TOTAL 74.5GB USED

- use the images we agreed upon (others are not guarantee to work)
- minimal OS images + **contextualisation** (see later)
- if you need a **snapshot** or custom image ask us (we put it in the right datastore)

The Sunstone Graphic User Interface

OpenNebula Sunstone

OpenNebula Marketplace

sfarm OpenNebula

Dashboard

Virtual Resources

Virtual Machines

Templates

Images

Files & Kernels

Infrastructure

Datastores

Virtual Networks

Marketplace

OneFlow

Name	Publisher	Hypervisor	Arch	Format
☐ ttylinux - kvm	OpenNebula.org	KVM	x86_64	raw
☐ ttylinux - VMware	OpenNebula Systems	VMWARE	i686	vmdk
☐ Carina Environment Manager	Research In Motion	KVM	X86_64	qcow2
☐ Testing gUSE installations (on SL5)	MTA SZTAKI LPDS	KVM	x86_64	raw
☐ gUse v3.5.2	MTA SZTAKI LPDS	KVM	x86_64	raw
☐ Vyatta Core 6.5R1 - kvm	MACTO	KVM	i386	raw
☐ gUSE CloudBroker Wrapper	MTA SZTAKI LPDS	KVM	x86_64	raw
☐ debian-7.1-amd64-kvm	Demo-TIC	KVM	x86_64	raw
☐ Hadoop 1.2 Master	OpenNebula Systems	KVM	x86_64	qcow2
☐ Hadoop 1.2 Slave	OpenNebula Systems	KVM	x86_64	qcow2

Showing 1 to 10 of 46 entries

« 1 2 3 4 5 » 10

- you can download pre-built images from the marketplace and save them in the **default datastore** for testing
- choose **KVM** hypervisor and **x86_64** architecture
- prefer **qcow2** images (expandible)

OpenNebula client

- a set of **command-line tools** to operate and monitor the Cloud
- provide access to infrastructural resources (datastores, hypervisors, network...)
- although unprivileged users have a restricted functionalities
- basically the same informations/functionalities provided by the Sunstone GUI
- create VM through templates (not recommended, see the ON documentation if you really want to)
- `ssh your_user_name@one-access.to.infn.it ...` (*Linux credentials*)
- `... and run cloud-enter` (*Cloud credentials*)

```
[root@one-access ~]# cloud-enter
cloud user: sfarm
password for cloud user "sfarm": ****
authenticating...ok

EC2 commands start with euca-*, OpenNebula commands start with one*
Use [Tab] to complete.
Type exit to return to your normal shell.

cloud@infnto user: sfarm
root@one-access.to.infn.it [~] > onevm list
warning: peer certificate won't be verified in this SSL session
warning: peer certificate won't be verified in this SSL session
```

ID	USER	GROUP	NAME	STAT	UCPU	UMEM	HOST	TIME
23767	sfarm	ec2	SFARM-HEAD	runn	2	15G	one-kvm-06	114d 06h27
24298	sfarm	ec2	ec2-m1-large	runn	0	15G	one-kvm-31	15d 12h30
24301	sfarm	ec2	ec2-m1-large	runn	0	15G	one-kvm-60	14d 08h54
24302	sfarm	ec2	ec2-m1-large	runn	0	15G	one-kvm-66	14d 08h54
24303	sfarm	ec2	ec2-m1-large	runn	0	15G	one-kvm-59	14d 08h54
24344	sfarm	ec2	ec2-m1-large	runn	0	15G	one-kvm-34	1d 07h18

Try out:

- onehost
- onevm
- oneimage
- onedatastore
- oaneacct
- ...

followed by:

- ls
- show <id>
- ...

EC2 interface and Euca2ools

- query the Cloud in an Amazon **Elastic Compute Cloud (EC2)** fashion (portability)
- service exposed by the OpenNebula *econe-server*
- use any Amazon Web Services (AWS) compatible tool to query the Cloud:
 - econe-* (default, not recommended)
 - **euca-***
- VMs categorised according to *flavours*: (if you need a custom flavour, ask us)

Flavour	CPUs	RAM	Disk
m1.tiny	1	512 MB	3 GB
m1.small	1	2.6 GB	20 GB
m1.medium	3	7.7 GB	60 GB
m1.large	6	15.4 GB	120 GB

EC2 interface and Euca2ools

Getting ready to use the Cloud:

- create a pair of public/private ssh keys:

```
euca-create-keypair -f privkey.pem your_key_name
```

- allocate the elastic IP (only the first time):

```
euca-allocate-address
```

- list the available images:

```
euca-describe-images
```

```
root@one-access.to infn.it [~] > euca-describe-images
IMAGE ami-00000297 Ubuntu Server 12.10 oneadmin available public i386 machine
IMAGE ami-00000317 WorkerNode-SLC53-BESIII oneadmin available public i386 machine
IMAGE ami-00000344 WN-CentOS6-CloudInit-v2 oneadmin available public i386 machine
IMAGE ami-00000363 WN-CentOS6-CloudInit-services oneadmin available public i386 machine
IMAGE ami-00000370 WN-SLC53-BESIII oneadmin available public i386 machine
IMAGE ami-00000380 ubuntu-server-14.04-v3 oneadmin available public i386 machine
IMAGE ami-00000402 ucvm-1.18-1 oneadmin available public i386 machine
IMAGE ami-00000406 WN-CentOS6-CloudInit-v9 oneadmin available public i386 machine
IMAGE ami-00000547 ubuntu-server-14.10-32bit-v1 oneadmin available public i386 machine
IMAGE ami-00000560 WN-CentOS6-CloudInit-v10 oneadmin available public i386 machine
```

EC2 interface and Euca2ools

- run your first instance:

```
euca-run-instances ami-<id> -k <keyname> \  
-f /path/to/user-data.txt -t m1.<flavour>
```

- check out your elastic IP:

```
euca-describe-address
```

- associate the elastic IP to an instance:

```
euca-associate-address -i i-<instance_id> <elastic_ip>
```

Contextualisation

- start with basic images
- complex configuration at boot time (contextualisation)
- use **CloudInit**
- **user-data.txt** can be in *cloud-config* (.ccfg) format or a simple *bash script* (.sh):

#cloud-config

```
# vim: syntax=yaml
### Contact: stefano.bagnasco@to.infn.it
...
mounts:
  - [ "/dev/vdd", "/home", "xfs", "defaults", "0", "0" ]

groups:
  - users

users:
  - default

# Extra packages
packages:
  - emacs
...
runcmd:
  - [ bash, -c, *custom_config_script ]
```

#!/bin/sh

```
echo "Hello World." | tee /root/output.txt
```

We provide more complete examples!

Best practices

When to use the GUI:

- monitor your instances
- attach/detach disks

When to use the euca-tools:

- create new instances
 - attach the elastic IP
-
- after testing new configurations, add it to your **contextualisation file** (the Cloud is a volatile environment)
 - do not snapshot, save on the **persistent disk** instead

Documentation

- **OpenNebula user guide:** <http://docs.opennebula.org/4.8/user/>
 - OpenNebula Client: <http://docs.opennebula.org/4.8/user/references/cli.html>
- **Euca2ools:** http://personalpages.to.infn.it/~berzano/cloud/user_guide.html#euca2ools-managing-vms-keys-and-ip-addresses
- **CloudInit:** <https://cloudinit.readthedocs.io/en/latest/>

And above all: browse, play around, (do not) break it, ask...
report bugs and requests!