First PoliCloud Workshop

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Architecture: Hardware

1x switch (cisco...)

7x Dell PowerEdge 1950 (Dual Xeon L5335)

16–24GB RAM

250–500GB system disk

7x HP Proliant G6 (Dual Xeon E5530)

8–70GB RAM

250–500GB system disk

6x HP Proliant G5 (Dual Xeon L5420)
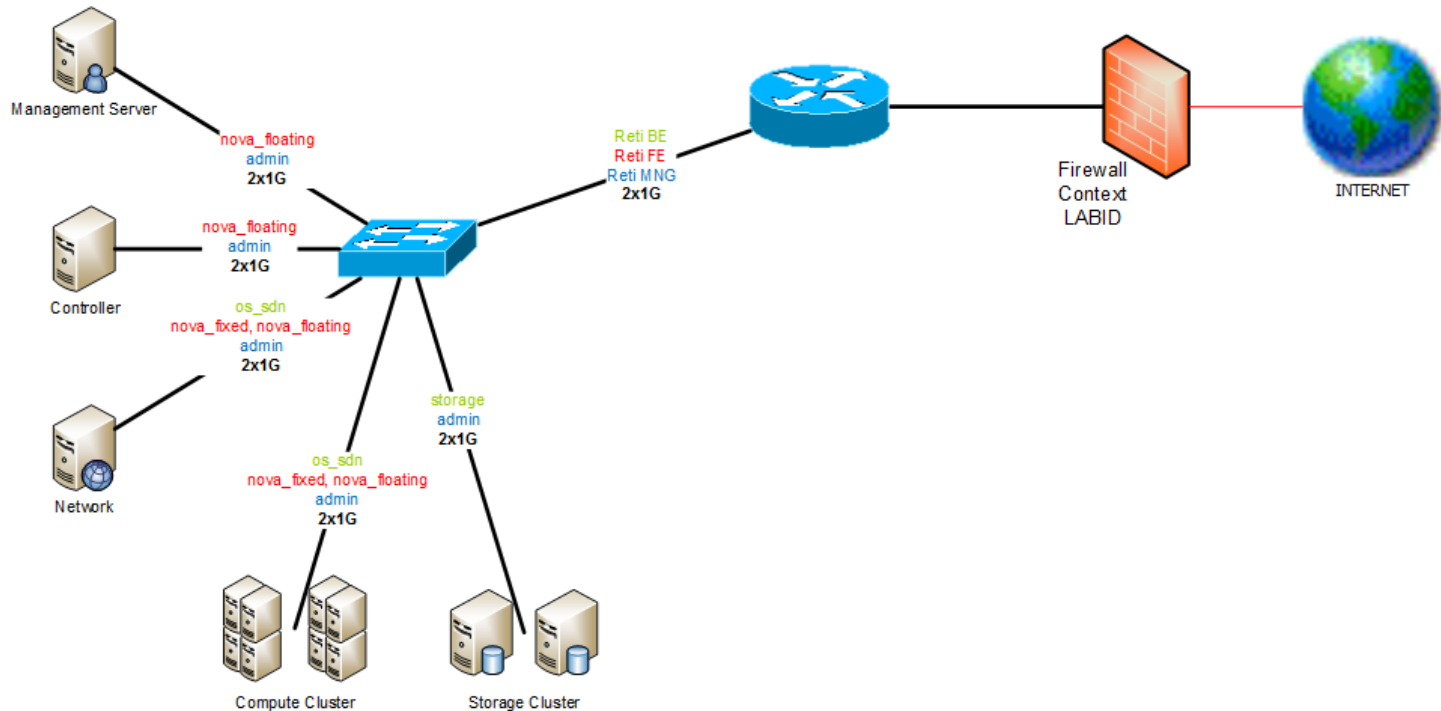
8–24GB RAM

250–500GB system disk

2 x 2–4TB storage disk

Architecture: Network

Rete Laboratorio Policloud

Reti Backend:
        storage: VID 1904 – net 10.75.4.0/24 - gw 10.75.4.254
        os_sdn: VID 1905 – net 10.75.5.0/24 - gw 10.75.5.254
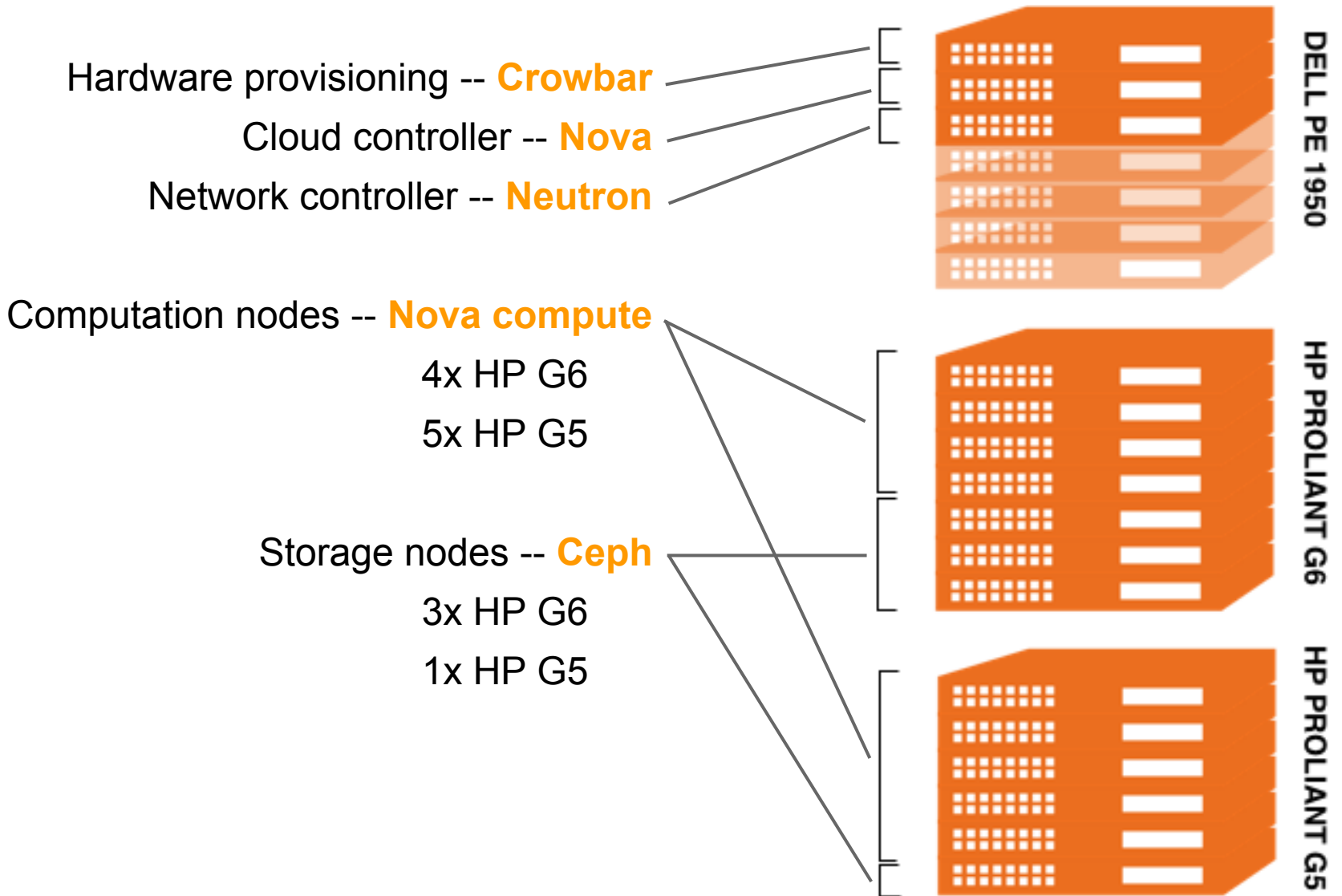Reti Frontend:
        nova_fixed: VID 1906 - net 10.75.130.0/24 - gw 10.75.130.254 (dynamic NAT on 131.175.56.197)
        nova_floating: VID 1907 - net 10.75.131.0/24 - gw 10.75.131.254 (static NAT on 131.175.56.224/27)
Reti Management
        admin: VID 1908 - net 10.75.194.0/24 - gw 10.75.194.254

Architecture: Software Stack

Hardware provisioning -- **Crowbar**

Cloud controller -- **Nova**

Network controller -- **Neutron**

Computation nodes -- **Nova compute**

4x HP G6

5x HP G5

Storage nodes -- **Ceph**

3x HP G6

1x HP G5

DELL PE 1950

HP PROLIANT G6

HP PROLIANT G5

Architecture: Resource Inventory

9   computation nodes

4   storage nodes

26   floating IPs 10.75.131.224/27

104   vCPU

259GB   RAM

12TB   distributed mirrored storage (2 copies -- 24TB)

5   images

              Fedora 18, 19

              Ubuntu 12.04, 14.04

              CentOS 6.5

5   VM flavors (Amazon EC2 style)

Dashboard & Tutorial

Spawning virtual machines

- From image (easy)

- From existing volume (intermediate)

- From snapshot (advanced)

Tutorial: Spawning From Image

- Volume is ephemeral (nothing is persistent)
- (at the moment) Volume does not grow to root disk size
- Fast creation

DEMO

Tutorial: Spawning From Volume

- Volume is persistent
- Disk size can be chosen upon creation
- Optimized for live migration

DEMO

Tutorial: Spawning From Snapshot

- Volume is "ephemerally" persistent
  - State is frozen when snapshot is created
- VM state can be saved and multiple instances can be spawned from the same snapshot
- It's possible to create a "model" and spawn instances from that.

DEMO

Login – OpenStack Dashbo ×

131.175.56.226/auth/login/

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Log In

User Name

Password

Sign In

Administration: quotas

Quotas can be defined per project:

- **51GB**   RAM
- **10**   Instances
- **20**   VCPUs
- **1TB**   Storage (total)
- **10**   Snapshots
- **10**   Volumes

Current Limitations

Internet access & VPN

Outbound traffic is limited to **SSH**, **HTTP** and **HTTPS** services

Inbound traffic is limited to **SSH**, **HTTP** and **HTTPS** only from within PoliMi network. **VPN** tunnel is required to access VMs.

VM access

VMs can be accessed only if they have an associated floating IP. The listening address is composed by appending the last floating octet to the IP 131.175.56.X.

Disk size mismatch

When spawning a VM from an image, root disk is not correctly resized (OpenStack bug, soon to be solved).

Spawning from volume is always advised.

Future Work

Access

Policy for external access (ASICT)

Performance

Increase Ceph performance

Add SSDs for caching/journaling

Test NIC bonding

Administration

Per-project network customization

Availability

Failure and migration tests

High availability configuration

131.175.56.226/project/

Overview

policloud BETA

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AndroTotal

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Limit Summary

Instances Used 0 of 10	**VCPUs** Used 0 of 20	**RAM** Used 0 of 50.0 GB	**Floating IPs** Used 0 of 50	**Security Groups** Used 1 of 10

Select a period of time to query its usage:

From: 2014-05-01   To: 2014-05-14   Submit   The date should be in YYYY-mm-dd format.

Active Instances: - **Active RAM:** - **This Period's VCPU-Hours:** 0.00 **This Period's GB-Hours:** 0.00

Usage Summary

⬇ Download CSV Summary

Instance Name	VCPUs	Disk	RAM	Uptime
No items to display.				

Displaying 0 items

131.175.56.226/project/instances/

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Instances

Instanc   ter   **+ Launch Instance**

| | Instan | | | | | **Uptime** | **Actions** |

Project   Admin

Displaying 0 ite

Launch Instance   ×

| Details * | Access & Security * | Networking * | Post-Creation |

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Availability Zone

nova

Specify the details for launching an instance.

The chart below shows the resources used by this project

Flavor Details

Name	m1.medium
VCPUs	2
Root Disk	40 GB
Ephemeral Disk	0 GB
	40 GB

✓ --- Select source ---

Boot from image

Boot from snapshot

Boot from volume

Boot from image (creates a new volume).

Boot from volume snapshot (creates a new volume).

--- Select source ---

Project Limits

Number of Instances   0 of 10 Used

Number of VCPUs   0 of 20 Used

Total RAM   0 of 51,200 MB Used

Cancel   **Launch**

Instances

Logged in as: phretor   Settings   Help   Sign Out

Instanc   ter   + Launch Instance

Launch Instance   ×

Details *   Access & Security *   Networking *   Post-Creation

Keypair

No keypairs available.   ▲▼   +

Admin Pass

Confirm Admin Pass

Security Groups *
☑ default

Control access to your instance via keypairs, security groups, and other mechanisms.

Cancel   **Launch**

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Instances

Displaying 0 ite

Launch Instance   ×

Details *   **Access & Security ***   Networking *   Post-Creation

Keypair

workshop1   +

Admin Pass

Confirm Admin Pass

Security Groups *
☑ default

Control access to your instance via keypairs, security groups, and other mechanisms.

Cancel   **Launch**

📄 workshop1.pem   ▾

⬇ Show All   ×

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Overview **Log** Console

Instance Console Log

Log Length 35 Go View Full Log

```
|         ..o +.  |
|       .   E.   |
|      . .. +    |
|       ...o.o   |
+-----------------+
Skipping profile in /etc/apparmor.d/disable: usr.sbin.rsyslogd
 * Starting AppArmor profiles      [80G [74G[ OK ]
landscape-client is not configured, please run landscape-config.
 * Stopping System V initialisation compatibility[74G[ OK ]
 * Starting System V runlevel compatibility[74G[ OK ]
 * Starting automatic crash report generation[74G[ OK ]
 * Starting ACPI daemon[74G[ OK ]
 * Starting save kernel messages[74G[ OK ]
 * Starting regular background program processing daemon[74G[ OK ]
 * Starting deferred execution scheduler[74G[ OK ]
 * Stopping save kernel messages[74G[ OK ]
 * Starting CPU interrupts balancing daemon[74G[ OK ]
 * Stopping System V runlevel compatibility[74G[ OK ]
Generating locales...
  en_US.UTF-8... done
Generation complete.
ec2:
ec2: ################################################################
ec2: -----BEGIN SSH HOST KEY FINGERPRINTS-----
ec2: 1024 99:20:2b:31:1d:78:0f:72:b1:26:fd:af:99:87:fc:1d  root@workshop1 (DSA)
ec2: 256 ad:de:f6:63:53:81:a3:94:04:29:f5:e9:dc:a7:90:b7  root@workshop1 (ECDSA)
ec2: 2048 9d:cd:8f:4a:20:cb:93:b0:92:54:ea:4b:ae:2a:a1:b7  root@workshop1 (RSA)
ec2: -----END SSH HOST KEY FINGERPRINTS-----
ec2: ################################################################
-----BEGIN SSH HOST KEY KEYS-----
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBBT3JKMrB62Z2wW2XXU9VrKLIhqK9AgDz07r/GibuSZej533i0/P0ywj4M
lRk9GU55oeVXf+arFhnpf8QI6GYX4= root@workshop1
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQC33N8ip+B+H9qhs5yWeJS/D3ih/Rta6qZPkuZS95Fq3fLawIYqrdTQ60Hbou2ia4zCEuZymMVQroMTJXVATFvJj+TegM
vcrcBKitg0mezyPqQXQlbcTbTmaIO/LRFGMyck73DZ5bL6a6UiHZaxSkqKQVPk75XrA5HUQ94c4e6Xrp2mfOfkLfnooFu4Khyhjj2K0bMbs3dmkuEXwWTtIFGxwJQhpLjb
R2S7WG3y/bhElAL+x2Xwqtd7cLoCGjFPnHfiqgROzGkFOu5/Q6xXMaFfGd8gq3xsOoc7KCg6ucK+Mkj5RJUO6X/pSJAcTUDJlWnOcR1kfhUcmOq4oiClQ3Ff root@work
shop1
-----END SSH HOST KEY KEYS-----
cloud-init boot finished at Wed, 14 May 2014 09:08:58 +0000. Up 11.25 seconds
```

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Limit Summary

Instances
Used 1 of 10

VCPUs
Used 2 of 20

RAM
Used 4.0 GB of 50.0 GB

Floating IPs
Used 0 of 50

Security Groups
Used 1 of 10

Select a period of time to query its usage:

From: 2014-05-01   To: 2014-05-14   Submit   The date should be in YYYY-mm-dd format.

Active Instances: 1 **Active RAM:** 4GB **This Period's VCPU-Hours:** 0.00 **This Period's GB-Hours:** 0.10

Usage Summary

⬇ Download CSV Summary

Instance Name	VCPUs	Disk	RAM	Uptime
workshop1	2	40	4GB	0 minutes
Displaying 1 item				

131.175.56.226/project/instances/

Instances

Instances

	Instance Name	Image Name	IP Address	Size	Keypair	Status	Task	Power State	Uptime	Actions
☐	workshop1	Ubuntu Server 12.04 LTS	10.75.130.54	m1.medium | 4GB RAM | 2 VCPU | 40.0GB Disk	-	Active	None	Running	1 minute	Create Snapshot More ▾

Displaying 1 item

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[Filter] Filter   + Launch Instance   Soft Reboot Instances   🗑 Terminate Instances

Associate Floating IP
Disassociate Floating IP
Edit Instance
Edit Security Groups
Console
View Log
Pause Instance
Suspend Instance
Resize Instance
Soft Reboot Instance
Hard Reboot Instance
Shut Off Instance
Rebuild Instance
Terminate Instance

131.175.56.226/project/access_and_security/floating_ips/associate/?instance_id=31105c90-1e93-4df3-ad3c-adf43678df05&next=%2Fproject%2Finstances%2F

131.175.56.226/project/instances/

Instances

Success: Allocated Floating IP 10.75.131.229. ✕

Instanc

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Manage Floating IP Associations ✕

Terminate Instances

IP Address *

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IP Address *

10.75.131.229   ⇕   +

Port to be associated *

workshop1: 10.75.130.54   ⇕

Select the IP address you wish to associate with the selected instance.

Snapshot   More ▾

Displaying 1 ite

Cancel   Associate

131.175.56.226/project/access_and_security/

Access & Security

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Security Groups   Keypairs   Floating IPs   API Access

Security Groups

+ Create Security Group   **🗑 Delete Security Groups**

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☐	Name	Description	Actions
☐	default	default	Edit Rules

Displaying 1 item

Edit Security Group Rules: default

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Security Group Rules

+ Add Rule   **🗑 Delete Rules**

	Direction	Ether Type	IP Protocol	Port Range	Remote	Actions
☐	Egress	IPv4	Any	-	0.0.0.0/0 (CIDR)	Delete Rule
☐	Ingress	IPv4	Any	-	default	Delete Rule
☐	Egress	IPv6	Any	-	::/0 (CIDR)	Delete Rule
☐	Ingress	IPv6	Any	-	default	Delete Rule

Displaying 4 items

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131.175.56.226/project/access_and_security/security_groups/854fcad1-afd1-44c3-85af-5f6142695591/

Edit Security Group Rules: default

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Security

Direct

Egres

Ingres

Egres

Ingres

Displaying 4 ite

Add Rule

Delete Rules

Add Rule   ×

Rule *

SSH

Remote *

CIDR

CIDR

0.0.0.0/0

Description:

✓ **Custom TCP Rule**
Custom UDP Rule
Custom ICMP Rule
Other Protocol
ALL ICMP
ALL TCP
ALL UDP
DNS
HTTP
HTTPS
IMAP
IMAPS
LDAP
MS SQL
MYSQL
POP3
POP3S
RDP
SMTP
SMTPS
SSH

Cancel   Add

131.175.56.226/project/access_and_security/security_groups/854fcad1-afd1-44c3-85af-5f6142695591/

Edit Security Group Rules: default

Logged in as: pbretor   Settings   Help   Sign Out

Success: Successfully added rule: ALLOW IPv4 22/tcp from 0.0.0.0/0   ×

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Security Group Rules

+ Add Rule   🗑 Delete Rules

☐	Direction	Ether Type	IP Protocol	Port Range	Remote	Actions
☐	Ingress	IPv4	TCP	22 (SSH)	0.0.0.0/0 (CIDR)	Delete Rule
☐	Egress	IPv4	Any	-	0.0.0.0/0 (CIDR)	Delete Rule
☐	Ingress	IPv4	Any	-	default	Delete Rule
☐	Egress	IPv6	Any	-	::/0 (CIDR)	Delete Rule
☐	Ingress	IPv6	Any	-	default	Delete Rule

Displaying 5 items

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131.175.56.226/project/access_and_security/

Access & Security

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Security Groups   **Keypairs**   Floating IPs   API Access

Keypairs

+ Create Keypair   **↑ Import Keypair**

	Keypair Name	Fingerprint	Actions
	No items to display.		

Displaying 0 items

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131.175.56.226/project/access_and_security/keypairs/workshop1/download/

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BETA

Go to the folder:

~/.ssh/

Cancel   Go

Project   Admin

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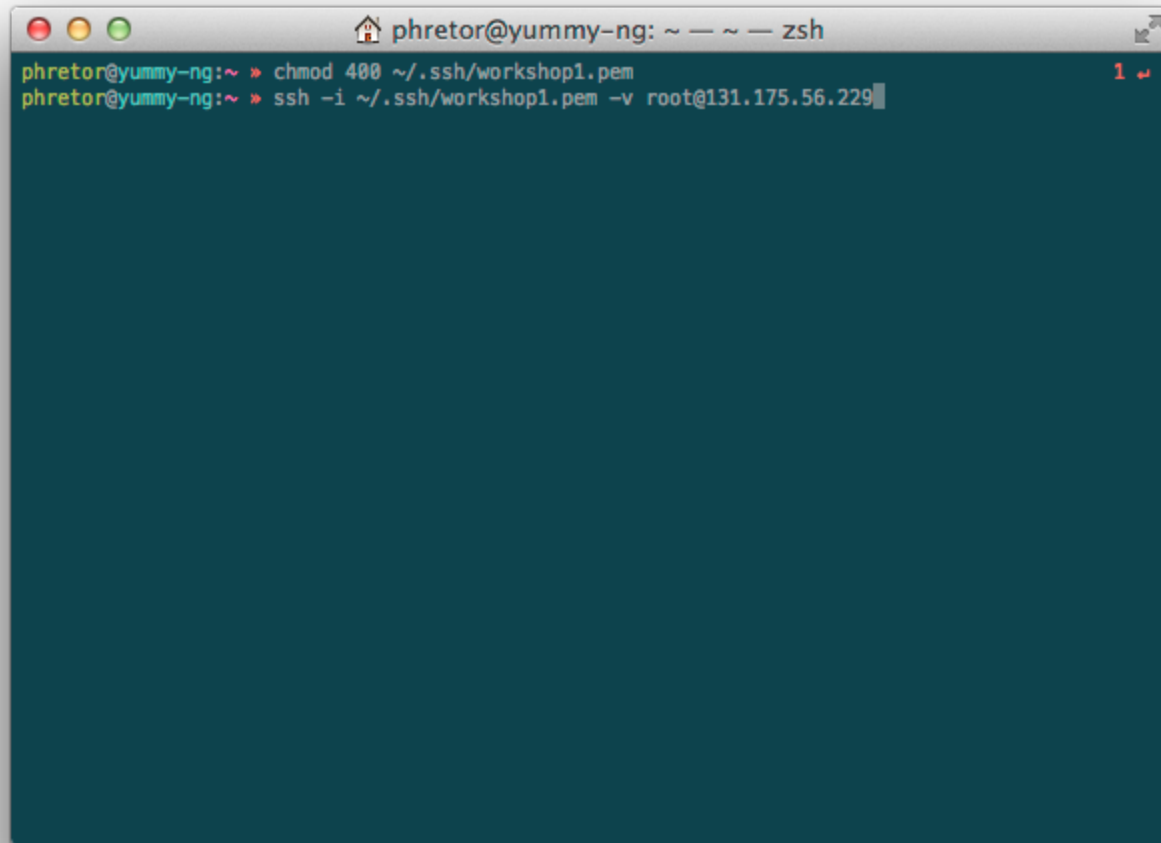
FAVORITES

Desktop
Google Drive
Downloads
TODO
Dropbox
research
phretor
Documents
shopping
Applications
Movies
Pictures
Sites
Music
maggicc
081369
31337

.ssh
android-sdks
Applications
bin
Books
Desktop
dev
Documents
dotfiles
Downloads
Dropbox
etc
go
Google Drive
local
Mail
Malware
mbox
Movies
Music

ami-ireland.pem
authorized_keys2
config
config~
id_dsa
id_dsa.pub
id_rsa
id_rsa_osx1
id_rsa.pub
id_test
known_hosts
known_hosts~
machobox.pem
maggi.cc@clizia
maggi.cc@clizia.pub
noelani-hg
noelani-hg.pub
phretor.pem
vagrant
vagrant.pub

New Folder

Cancel

```
phretor@yummy-ng:~ » chmod 400 ~/.ssh/workshop1.pem                              1 ↵
phretor@yummy-ng:~ » ssh -i ~/.ssh/workshop1.pem -v root@131.175.56.229
```

```
debug1: Sending env LANG = en_US.UTF-8
Welcome to Ubuntu 12.04.4 LTS (GNU/Linux 3.2.0-61-virtual x86_64)

 * Documentation:  https://help.ubuntu.com/

  System information as of Wed May 14 09:10:30 UTC 2014

  System load:  0.02               Processes:           69
  Usage of /:   36.0% of 2.16GB    Users logged in:     0
  Memory usage: 2%                 IP address for eth0: 10.75.130.54
  Swap usage:   0%

  Graph this data and manage this system at:
    https://landscape.canonical.com/

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@workshop1:~# █
```

```
    Graph this data and manage this system at:
      https://landscape.canonical.com/

    Get cloud support with Ubuntu Advantage Cloud Guest:
      http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.


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applicable law.

root@workshop1:~# df -H
Filesystem      Size  Used Avail Use% Mounted on
/dev/vda1       2.4G  837M  1.4G  38% /
udev            2.1G  8.2k  2.1G   1% /dev
tmpfs           415M  218k  415M   1% /run
none            5.3M     0  5.3M   0% /run/lock
none            2.1G     0  2.1G   0% /run/shm
root@workshop1:~# lsblk
NAME   MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
vda    253:0    0   2.2G  0 disk
└─vda1 253:1    0   2.2G  0 part /
root@workshop1:~#
```

```
root@workshop1:~# dd if=/dev/zero of=t bs=4K
dd: writing `t': No space left on device
361890+0 records in
361889+0 records out
1482297344 bytes (1.5 GB) copied, 11.2728 s, 131 MB/s
root@workshop1:~# ^C
root@workshop1:~# dd if=t of=/dev/null bs=4K
361889+0 records in
361889+0 records out
1482297344 bytes (1.5 GB) copied, 0.33314 s, 4.4 GB/s
root@workshop1:~#
```

```
root@workshop1:~# aptitude update
Get: 1 http://security.ubuntu.com precise-security Release.gpg [198 B]
Hit http://nova.clouds.archive.ubuntu.com precise Release.gpg
Get: 2 http://security.ubuntu.com precise-security Release [49.6 kB]
Get: 3 http://nova.clouds.archive.ubuntu.com precise-updates Release.gpg [198 B]
Hit http://nova.clouds.archive.ubuntu.com precise Release
Get: 4 http://nova.clouds.archive.ubuntu.com precise-updates Release [49.6 kB]
Get: 5 http://nova.clouds.archive.ubuntu.com precise/main Sources [934 kB]
Get: 6 http://security.ubuntu.com precise-security/main Sources [103 kB]
Get: 7 http://security.ubuntu.com precise-security/universe Sources [30.9 kB]
Get: 8 http://security.ubuntu.com precise-security/main amd64 Packages [384 kB]
Get: 9 http://security.ubuntu.com precise-security/universe amd64 Packages [91.8 kB]
Get: 10 http://security.ubuntu.com precise-security/main i386 Packages [412 kB]
Get: 11 http://nova.clouds.archive.ubuntu.com precise/universe Sources [5,019 kB]
Get: 12 http://security.ubuntu.com precise-security/universe i386 Packages [96.6 kB]
Get: 13 http://security.ubuntu.com precise-security/main TranslationIndex [74 B]
Get: 14 http://security.ubuntu.com precise-security/universe TranslationIndex [73 B]
Hit http://security.ubuntu.com precise-security/main Translation-en
Hit http://security.ubuntu.com precise-security/universe Translation-en
51% [11 Sources 1,478 kB/5,019 kB 29%]                          94.4 kB/s 37
```

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Volumes

Volume

Name

Filter   ✚ Create Volume

Displaying 0 ite

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Create Volume   ✕

Volume Name *

workshop1-extra-volume

Description

Additional information here...

Type

Size (GB) *

10

Volume Source

No source, empty volume.

Description:
Volumes are block devices that can be attached to instances.

Volume Limits

Total Gigabytes (0 GB)   1,000 GB Available

Number of Volumes (0)   10 Available

Cancel   **Create Volume**

Actions

131.175.56.226/project/volumes/

Volumes

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Volume

Delete Volumes

Manage Volume Attachments   ×

Name

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works

Attachments

Instance	Device	Actions
No items to display.		

Displaying 0 items

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Attach To Instance

Attach to Instance *

workshop1 (7638e91a-16a0-4f6e-989f-ac01780 ⬍

Device Name *

/dev/vdc

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Cancel   **Attach Volume**

Displaying 1 ite

tachments   More ▾

```
)
[  527.823130] pci 0000:00:00.0: no hotplug settings from platform
[  527.823133] pci 0000:00:00.0: using default PCI settings
[  527.823181] pci 0000:00:01.0: no hotplug settings from platform
[  527.823184] pci 0000:00:01.0: using default PCI settings
[  527.823227] ata_piix 0000:00:01.1: no hotplug settings from platform
[  527.823230] ata_piix 0000:00:01.1: using default PCI settings
[  527.823274] uhci_hcd 0000:00:01.2: no hotplug settings from platform
[  527.823277] uhci_hcd 0000:00:01.2: using default PCI settings
[  527.823319] pci 0000:00:01.3: no hotplug settings from platform
[  527.823322] pci 0000:00:01.3: using default PCI settings
[  527.823365] pci 0000:00:02.0: no hotplug settings from platform
[  527.823368] pci 0000:00:02.0: using default PCI settings
[  527.823411] virtio-pci 0000:00:03.0: no hotplug settings from platform
[  527.823414] virtio-pci 0000:00:03.0: using default PCI settings
[  527.823457] virtio-pci 0000:00:04.0: no hotplug settings from platform
[  527.823459] virtio-pci 0000:00:04.0: using default PCI settings
[  527.823502] virtio-pci 0000:00:05.0: no hotplug settings from platform
[  527.823505] virtio-pci 0000:00:05.0: using default PCI settings
[  527.823548] pci 0000:00:06.0: no hotplug settings from platform
[  527.823551] pci 0000:00:06.0: using default PCI settings
[  527.824762] virtio-pci 0000:00:06.0: enabling device (0000 -> 0003)
[  527.827737] ACPI: PCI Interrupt Link [LNKB] enabled at IRQ 11
[  527.827742] virtio-pci 0000:00:06.0: PCI INT A -> Link[LNKB] -> GSI 11 (level, high) -> IRQ
11
[  527.829416] virtio-pci 0000:00:06.0: setting latency timer to 64
[  527.830241] virtio-pci 0000:00:06.0: irq 45 for MSI/MSI-X
[  527.830259] virtio-pci 0000:00:06.0: irq 46 for MSI/MSI-X
[  527.835291]  vdb: unknown partition table
root@workshop1:~#
```

```
[  527.827737] ACPI: PCI Interrupt Link [LNKB] enabled at IRQ 11
[  527.827742] virtio-pci 0000:00:06.0: PCI INT A -> Link[LNKB] -> GSI 11 (level, high) -> IRQ
11
[  527.829416] virtio-pci 0000:00:06.0: setting latency timer to 64
[  527.830241] virtio-pci 0000:00:06.0: irq 45 for MSI/MSI-X
[  527.830259] virtio-pci 0000:00:06.0: irq 46 for MSI/MSI-X
[  527.835291]   vdb: unknown partition table
root@workshop1:~# mkfs.ext4 /dev/vdb
mke2fs 1.42 (29-Nov-2011)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
655360 inodes, 2621440 blocks
131072 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2684354560
80 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

root@workshop1:~#
```

```
root@workshop1:~# mkfs.ext4 /dev/vdb
mke2fs 1.42 (29-Nov-2011)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
655360 inodes, 2621440 blocks
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Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done


root@workshop1:~# mkdir /mnt/data
root@workshop1:~# ls -la /dev/disk/by-uuid/
total 0
drwxr-xr-x 2 root root  80 May 14 09:18 .
drwxr-xr-x 6 root root 120 May 14 09:17 ..
lrwxrwxrwx 1 root root  10 May 14 09:08 c87bb14e-67d7-4aba-a0e2-71334787bf56 -> ../../vda1
lrwxrwxrwx 1 root root   9 May 14 09:18 d7862f9f-c6db-4c4c-bbf9-4628b4c8fa6b -> ../../vdb
root@workshop1:~# mount /dev/disk/by-uuid/d7862f9f-c6db-4c4c-bbf9-4628b4c8fa6b /mnt/data
```

```
First data block=0
Maximum filesystem blocks=2684354560
80 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

root@workshop1:~# mkdir /mnt/data
root@workshop1:~# ls -la /dev/disk/by-uuid/
total 0
drwxr-xr-x 2 root root  80 May 14 09:18 .
drwxr-xr-x 6 root root 120 May 14 09:17 ..
lrwxrwxrwx 1 root root  10 May 14 09:08 c87bb14e-67d7-4aba-a0e2-71334787bf56 -> ../../vda1
lrwxrwxrwx 1 root root   9 May 14 09:18 d7862f9f-c6db-4c4c-bbf9-4628b4c8fa6b -> ../../vdb
root@workshop1:~# mount /dev/disk/by-uuid/d7862f9f-c6db-4c4c-bbf9-4628b4c8fa6b /mnt/data
root@workshop1:~# df -H
Filesystem      Size  Used Avail Use% Mounted on
/dev/vda1       2.4G  878M  1.4G  40% /
udev            2.1G  8.2k  2.1G   1% /dev
tmpfs           415M  222k  415M   1% /run
none            5.3M     0  5.3M   0% /run/lock
none            2.1G     0  2.1G   0% /run/shm
/dev/vdb         11G  158M  9.9G   2% /mnt/data
root@workshop1:~#
```

policloud
BETA

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	Name	Description	Project ID	Enabled	Actions
☐	service	-	71b167876bc340d1adcb4e28cd3fa399	True	Modify Users More ▾
☐	openstack	-	83f58bec7178408bb342a3966cb68eda	True	Modify Users More ▾
☐	PoliCloud Test	PoliCloud test environment	865e19f8ddd1422584b564130c43cfe5	True	Modify Users More ▾
☐	AndroTotal		ddacdf93a1a8437a8012fbbb0b86cbcb	True	Modify Users More ▾
☐	admin	-	e0dc862962f446daa8d3c823af27b41e	True	Modify Users More ▾

Displaying 5 items

Filter   Filter   ✚ Create Project   🗑 Delete Projects

131.175.56.226/admin/projects/

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crowbar	+
glance	+
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davide.quarta	+
nova	+

Project Members	Filter 🔍
danilo.ardagna	Member, _member_ ▾	−
roberto.pagano	Member, _member_ ▾	−
kirves	admin, Member, ... ▾	−
massimo.quadrana	−
	Member, _member_ ▾
paolo.cremonesi	Member, _member_ ▾	−
marco.scavuzzo	Member, _member_ ▾	−
mirjana.mazuran	Member, _member_ ▾	−
emanuele.panigati	−
	Member, _member_ ▾
phretor	admin, Member, ... ▾	−
alessandro.campi	−
	Member, _member_ ▾
mario.marchente	Member, _member_ ▾	−
salvatore.distefano	−

Logged in as: phretor   Settings   Help   Sign Out

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Project Info *   Project Members   **Quota** *

Metadata Items *   From here you can set quotas (max limits) for the project.

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Users   More ▾
Users   More ▾
Users   More ▾
Users   More ▾

Displaying 5 ite