TRAINING

Intro to the FIWARE Lab

Fernando López FIWARE Lab

FIWARE

Open APIs for Open Minds

Setting up your virtual infrastructure using FIWARE Lab Cloud

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@flopezaguilar

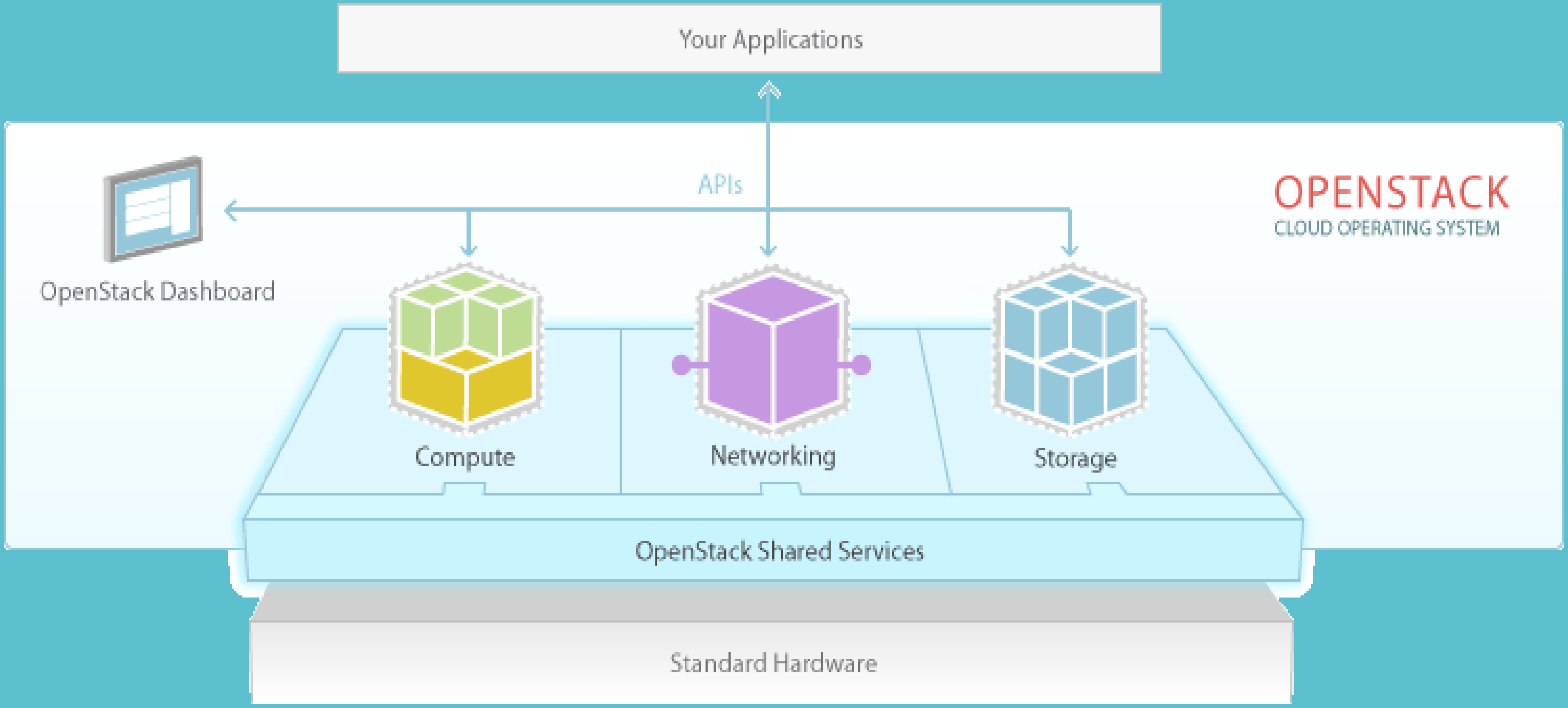
FIWARE

Content

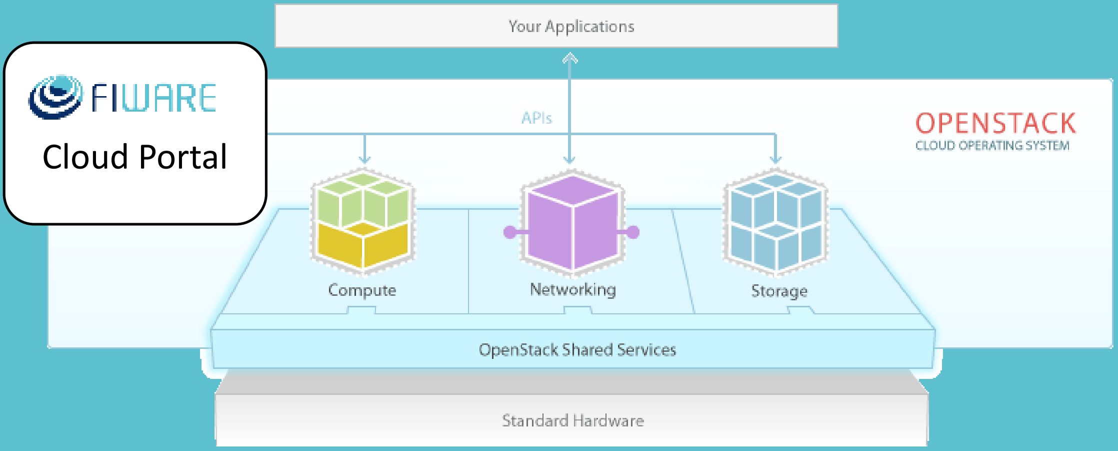
- FIWARE Lab Cloud Hosting: Overview and Architecture
- FIWARE Lab: Basic functionalities
  - FIWARE Identity Services
  - FIWARE Compute Services
  - FIWARE Storage Services
- FIWARE Lab: Extended functionalities
  - FIWARE Network Services
- FIWARE Lab: PaaS, working with Blueprints
- Reference Information

FIWARE Lab Cloud Hosting: Overview and Architecture

FIWARE Lab Cloud Hosting


Your Applications
APIs
OPENSTACK
CLOUD OPERATING SYSTEM
OpenStack Dashboard
Compute
Networking
Storage
OpenStack Shared Services
Standard Hardware

FIWARE Lab Cloud Hosting


Your Applications
APIs
OPENSTACK
CLOUD OPERATING SYSTEM
Compute
Networking
Storage
OpenStack Shared Services
Standard Hardware

FIWARE Cloud Portal

FIWARE PaaS

FIWARE Account

FIWARE SDC

FIWARE Monitoring

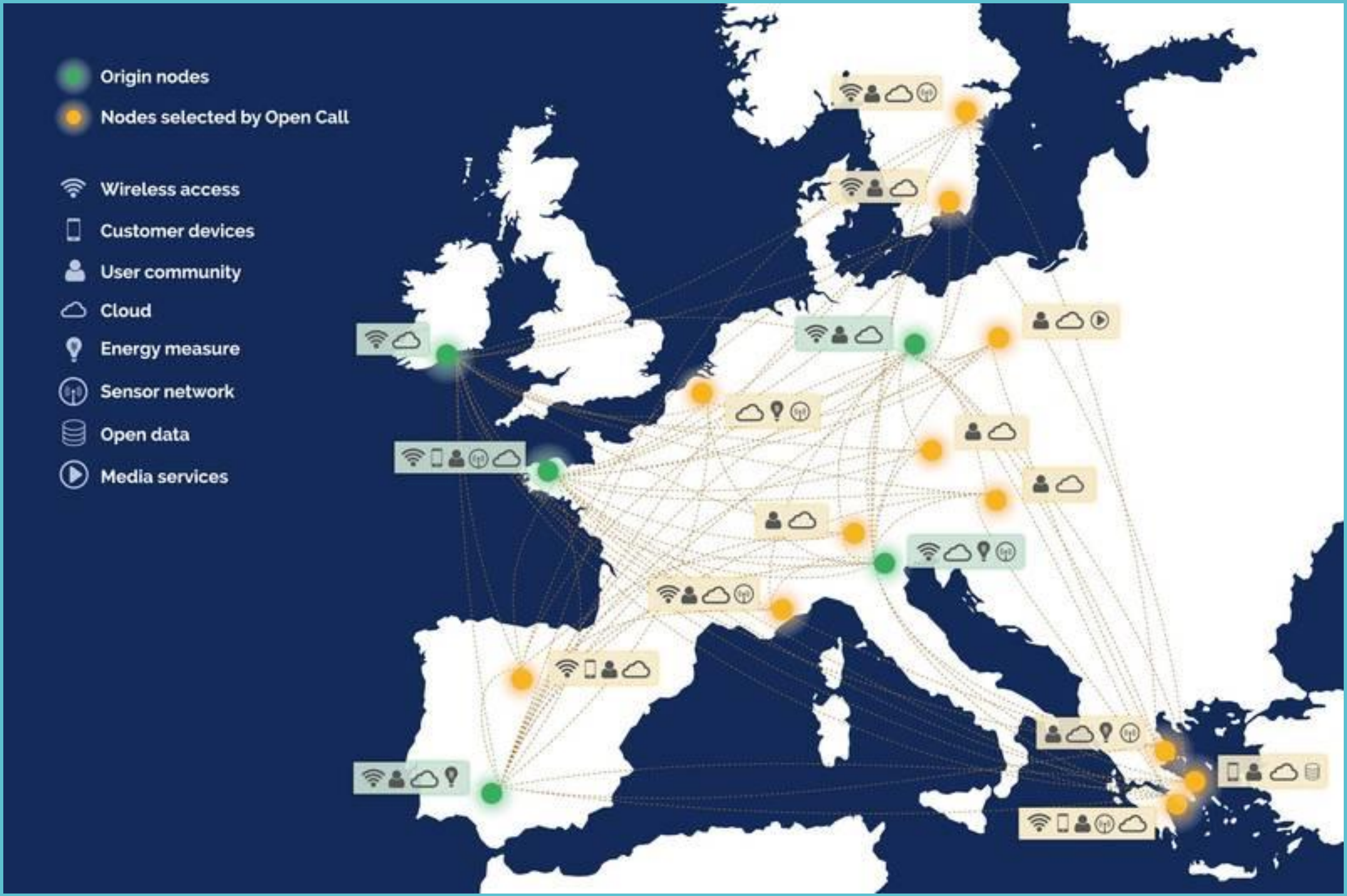
Summary

- **Account**: Manages identity and organizations; provides authentication and authorization for other services (OpenStack Keystone).
- **Compute**: Manages the lifecycle of compute instances. Responsibilities include spawning, scheduling and decommissioning of VMs (OpenStack Nova).
- **Network**: Enable Network-Connectivity-as-a-Service for other services, e.g. Compute, (OpenStack Neutron).
- **Storage**:
  - Persistent block storage for running compute instances (OpenStack Cinder).
  - Stores and retrieves arbitrary unstructured data object and provide storage for other services, e.g. Image, (OpenStack Swift).

Summary

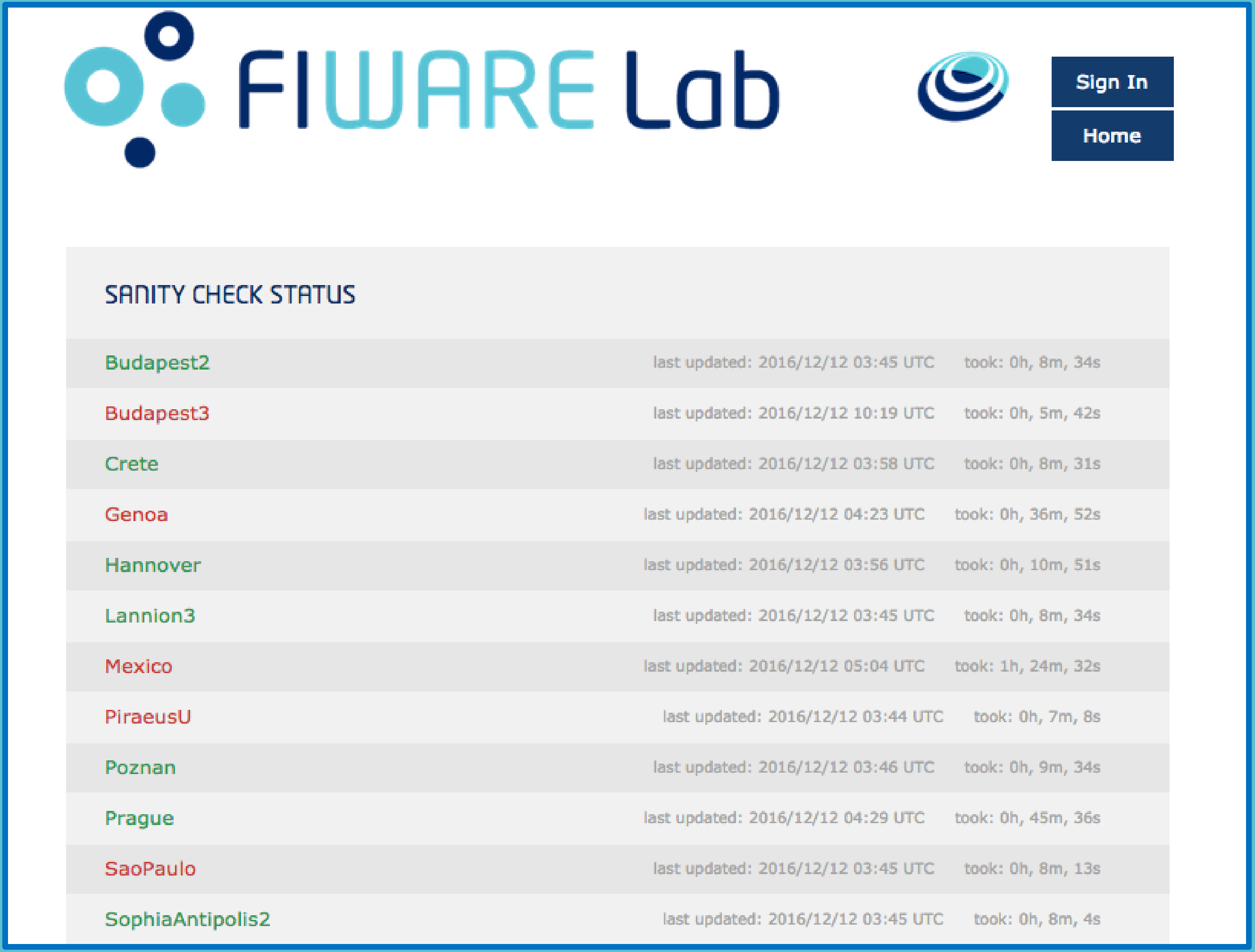
- **Image**: Stores and retrieves VM disk images used by compute (OpenStack Glance).
- **Monitoring**: Monitoring information about VMs
- **SDC**: Deploying Software in VMs
- **PaaS Manager**
  - Working with regions
  - Creating Tiers and deploying Blueprints

FIWARE Lab Cloud – Multiregion


Origin nodes
Nodes selected by Open Call
Wireless access
Customer devices
User community
Cloud
Energy measure
Sensor network
Open data
Media services

FIWARE Lab Cloud – Multiregion

http://fi-health.lab.fiware.org/



SANITY CHECK STATUS

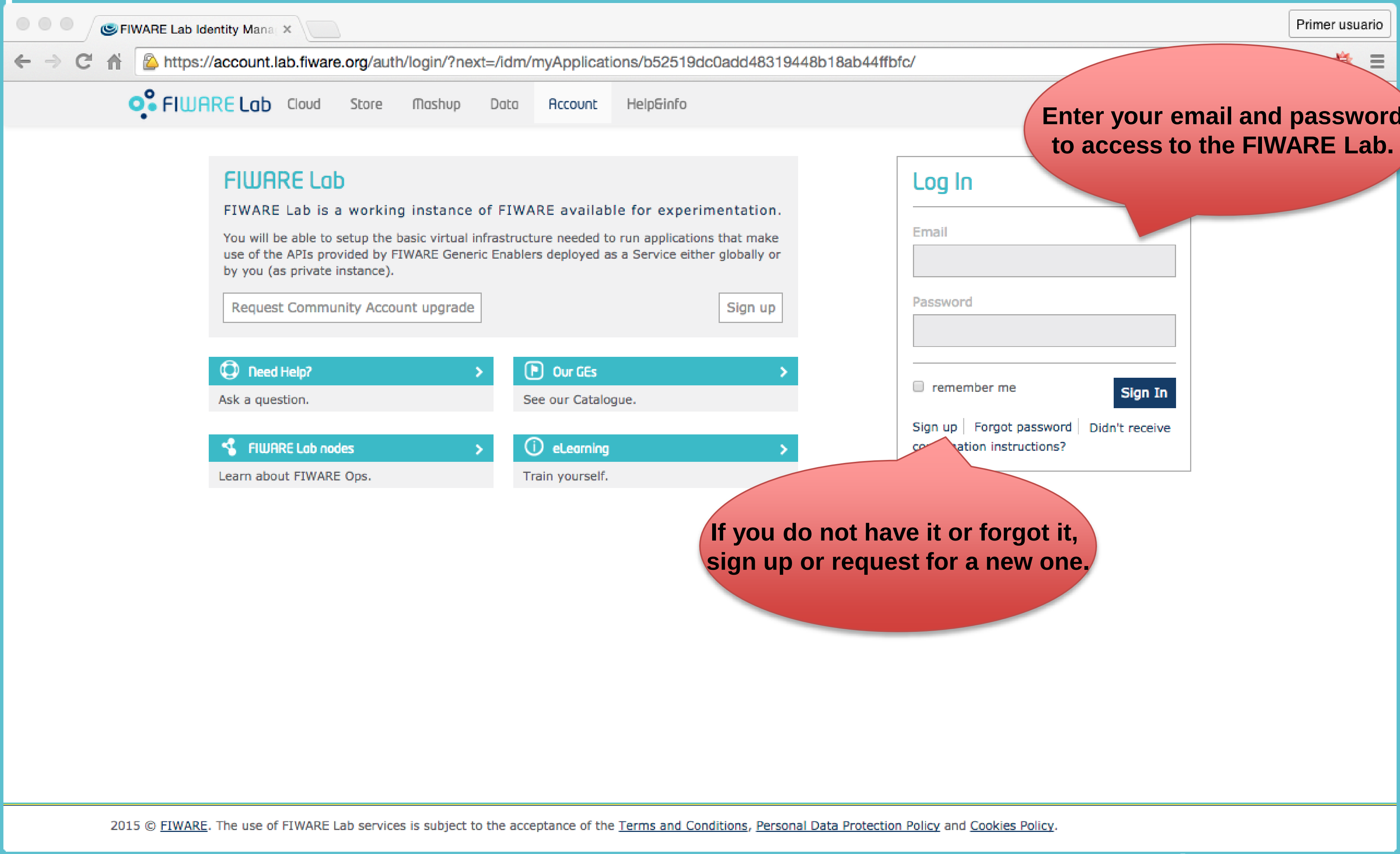
Budapest2	last updated: 2016/12/12 03:45 UTC	took: 0h, 8m, 34s
Budapest3	last updated: 2016/12/12 10:19 UTC	took: 0h, 5m, 42s
Crete	last updated: 2016/12/12 03:58 UTC	took: 0h, 8m, 31s
Genoa	last updated: 2016/12/12 04:23 UTC	took: 0h, 36m, 52s
Hannover	last updated: 2016/12/12 03:56 UTC	took: 0h, 10m, 51s
Lannion3	last updated: 2016/12/12 03:45 UTC	took: 0h, 8m, 34s
Mexico	last updated: 2016/12/12 05:04 UTC	took: 1h, 24m, 32s
PiraeusU	last updated: 2016/12/12 03:44 UTC	took: 0h, 7m, 8s
Poznan	last updated: 2016/12/12 03:46 UTC	took: 0h, 9m, 34s
Prague	last updated: 2016/12/12 04:29 UTC	took: 0h, 45m, 36s
SaoPaulo	last updated: 2016/12/12 03:45 UTC	took: 0h, 8m, 13s
SophiaAntipolis2	last updated: 2016/12/12 03:45 UTC	took: 0h, 8m, 4s

Basic functionalities: Identity Services

Identity Services

- Creating an account
  - https://account.lab.fiware.org
- Understanding account categories
- Understanding organizations
  - Mapped to OS tenants
- Signing in in Cloud Portal
  - https://cloud.lab.fi-ware.org
  - SSO

Add new user


FIWARE Lab Identity Mana ×
Primer usuario
https://account.lab.fiware.org/auth/login/?next=/idm/myApplications/b52519dc0add48319448b18ab44ffbfc/
FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info

FIWARE Lab

FIWARE Lab is a working instance of FIWARE available for experimentation.

You will be able to setup the basic virtual infrastructure needed to run applications that make use of the APIs provided by FIWARE Generic Enablers deployed as a Service either globally or by you (as private instance).

Request Community Account upgrade
Sign up

Need Help? ›
Ask a question.

Our GEs ›
See our Catalogue.

FIWARE Lab nodes ›
Learn about FIWARE Ops.

eLearning ›
Train yourself.

Log In

Email

Password

☐ remember me

Sign In
Sign up | Forgot password | Didn't receive co ation instructions?

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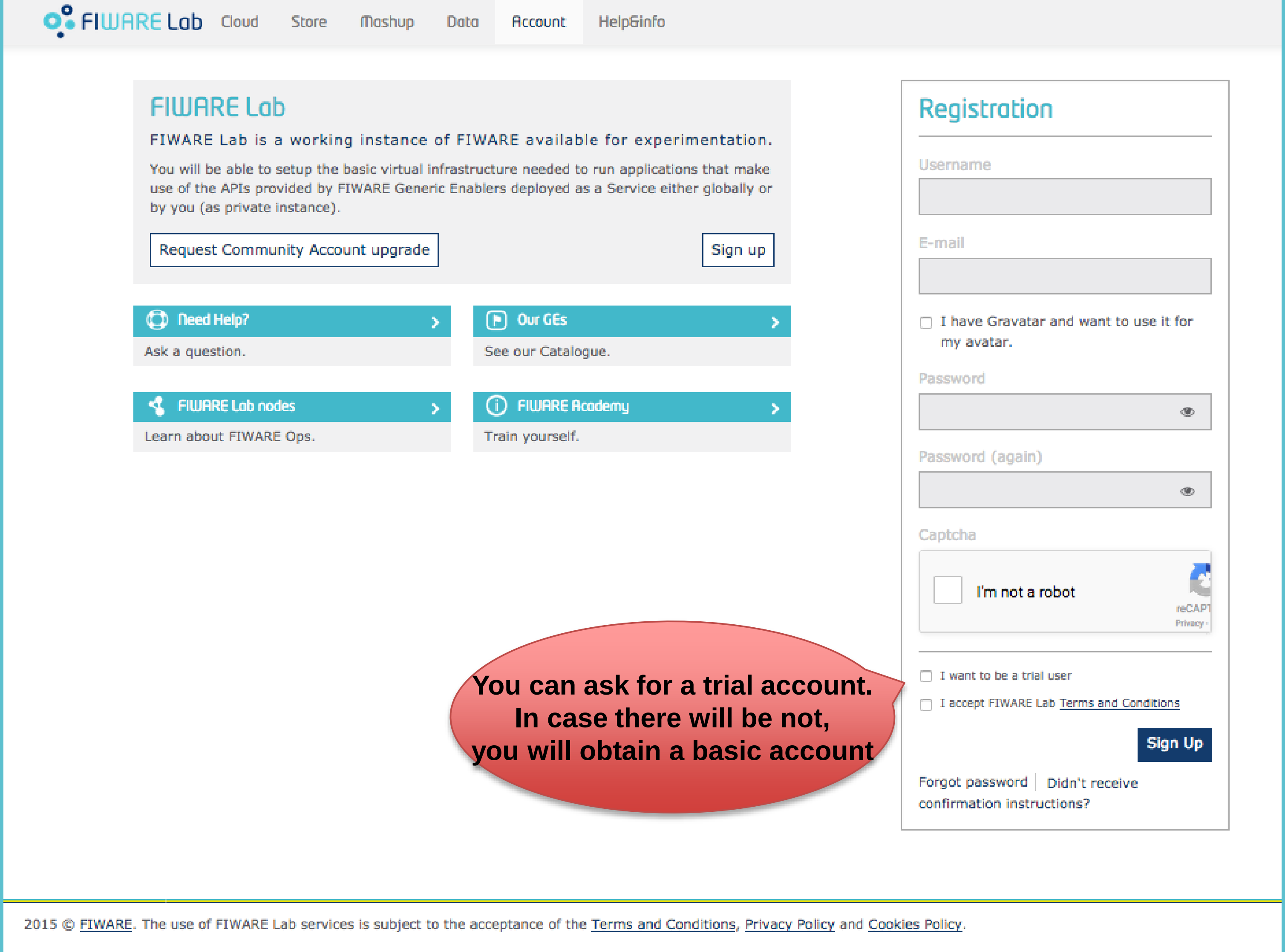
Enter your email and password to access to the FIWARE Lab.

If you do not have it or forgot it, sign up or request for a new one.

Create new account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See our Catalogue.

FIWARE Lab nodes
Learn about FIWARE Ops.

FIWARE Academy
Train yourself.

Registration

Username

E-mail

☐ I have Gravatar and want to use it for my avatar.

Password

Password (again)

Captcha

☐ I'm not a robot

☐ I want to be a trial user

☐ I accept FIWARE Lab Terms and Conditions

Forgot password | Didn't receive confirmation instructions?

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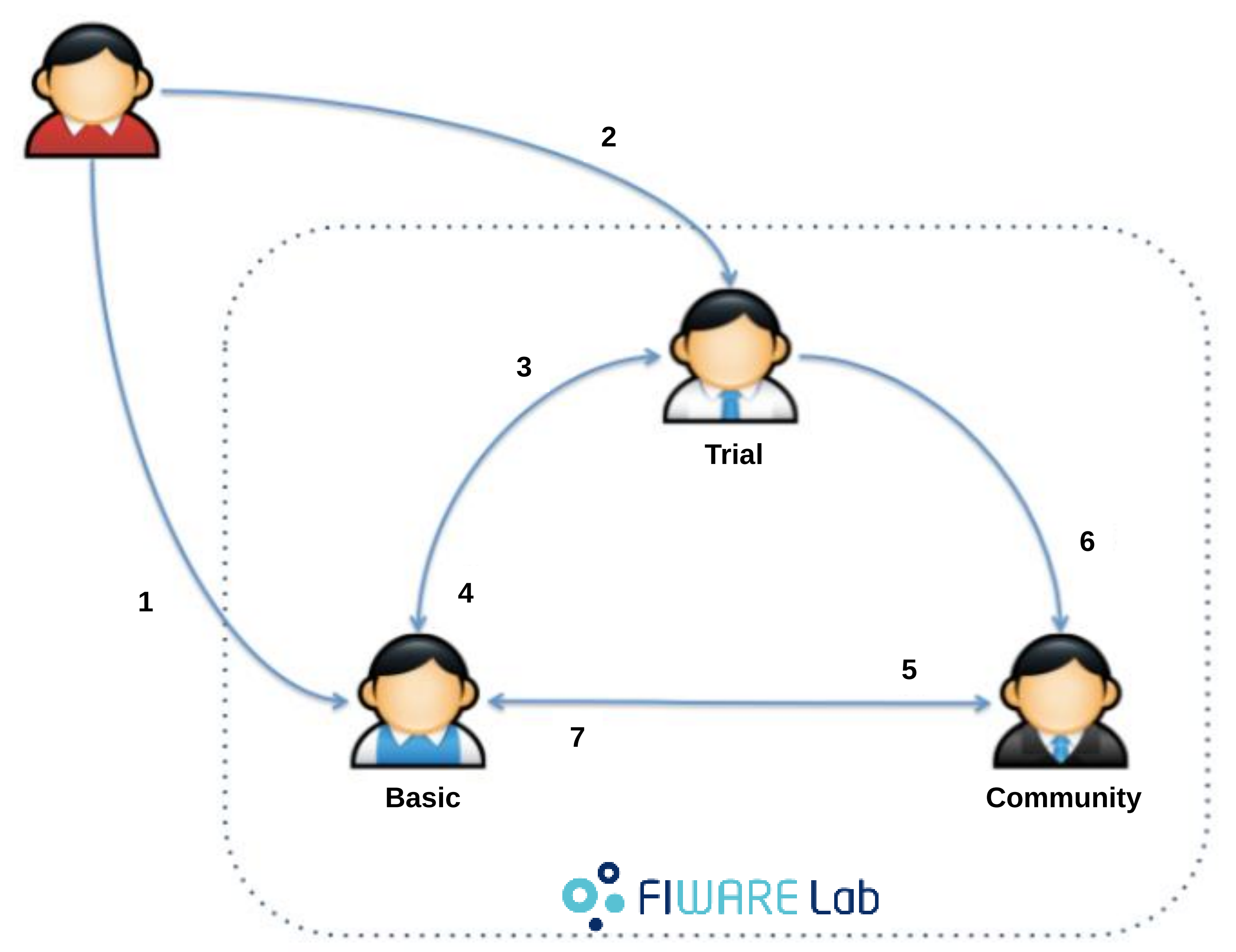
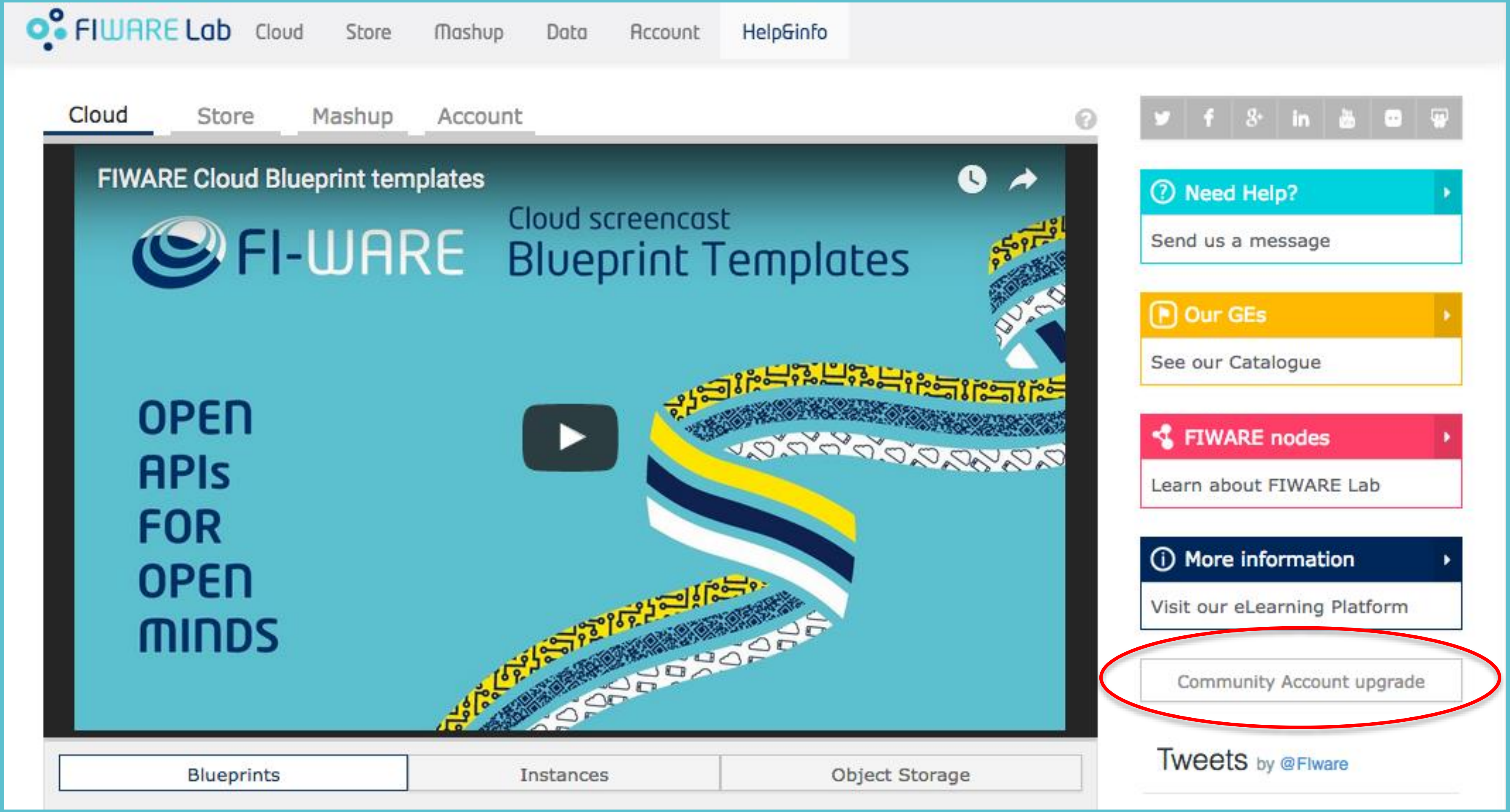
You can ask for a trial account.
In case there will be not,
you will obtain a basic account

FIWARE Lab Account Categories


2
3
Trial
6
1
4
5
7
Basic
Community
FIWARE Lab

Asking for a community account upgrade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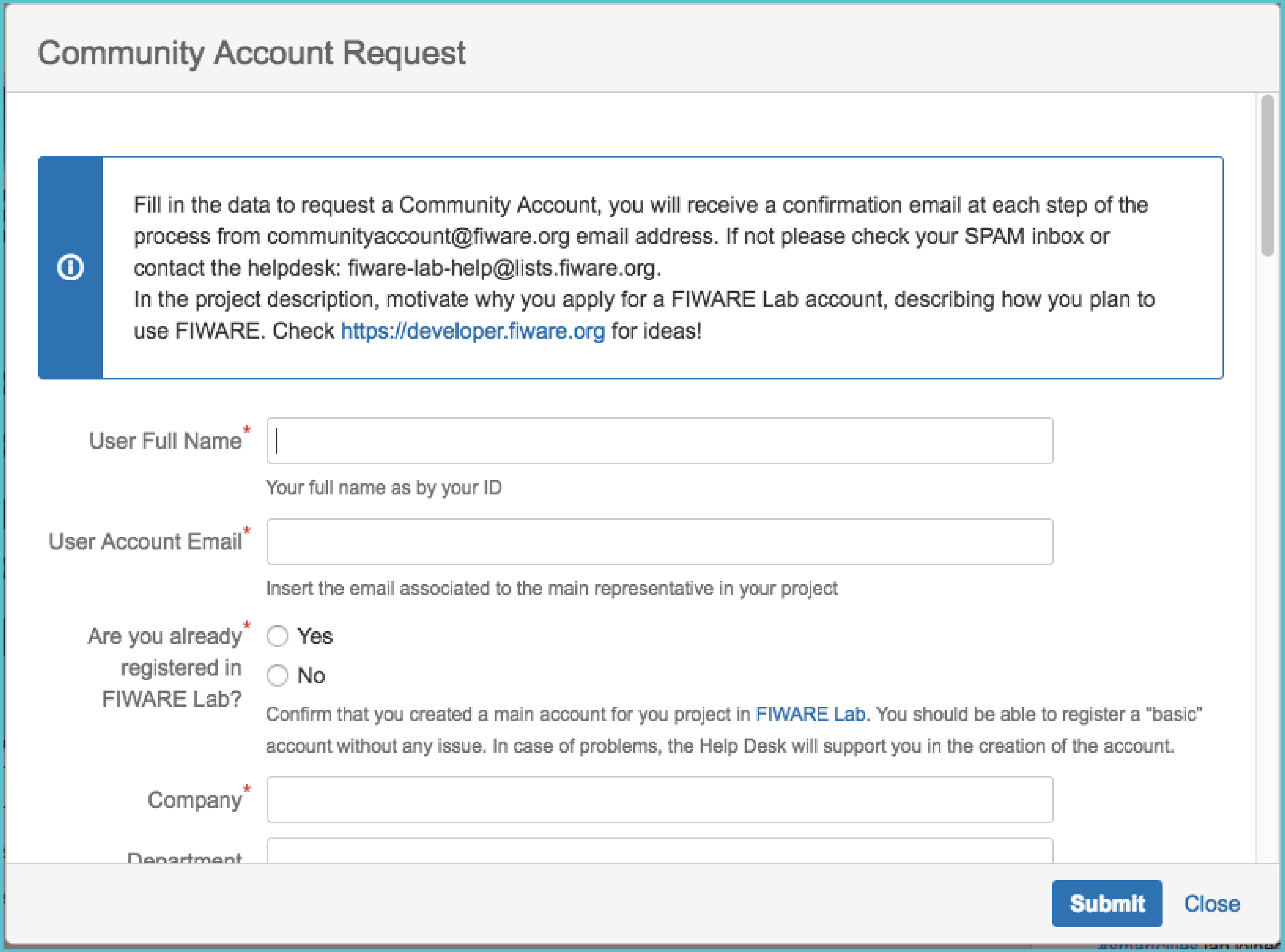
Store
Mashup
Data
Account
Help&info
Cloud
Store
Mashup
Account
FIWARE Cloud Blueprint templates
FI-WARE
Cloud screencast
Blueprint Templates
OPEN
APIs
FOR
OPEN
MINDS
Need Help?
Send us a message
Our GEs
See our Catalogue
FIWARE nodes
Learn about FIWARE Lab
More information
Visit our eLearning Platform
Community Account upgrade
Tweets by @FIware
Blueprints
Instances
Object Storage

Asking for a community account upgrade



Community Account Request

Fill in the data to request a Community Account, you will receive a confirmation email at each step of the process from communityaccount@fiware.org email address. If not please check your SPAM inbox or contact the helpdesk: fiware-lab-help@lists.fiware.org.
In the project description, motivate why you apply for a FIWARE Lab account, describing how you plan to use FIWARE. Check https://developer.fiware.org for ideas!

User Full Name*

Your full name as by your ID

User Account Email*

Insert the email associated to the main representative in your project

Are you already registered in FIWARE Lab?*
○ Yes
○ No

Confirm that you created a main account for you project in FIWARE Lab. You should be able to register a "basic" account without any issue. In case of problems, the Help Desk will support you in the creation of the account.

Company*

Basic functionalities: Compute Services

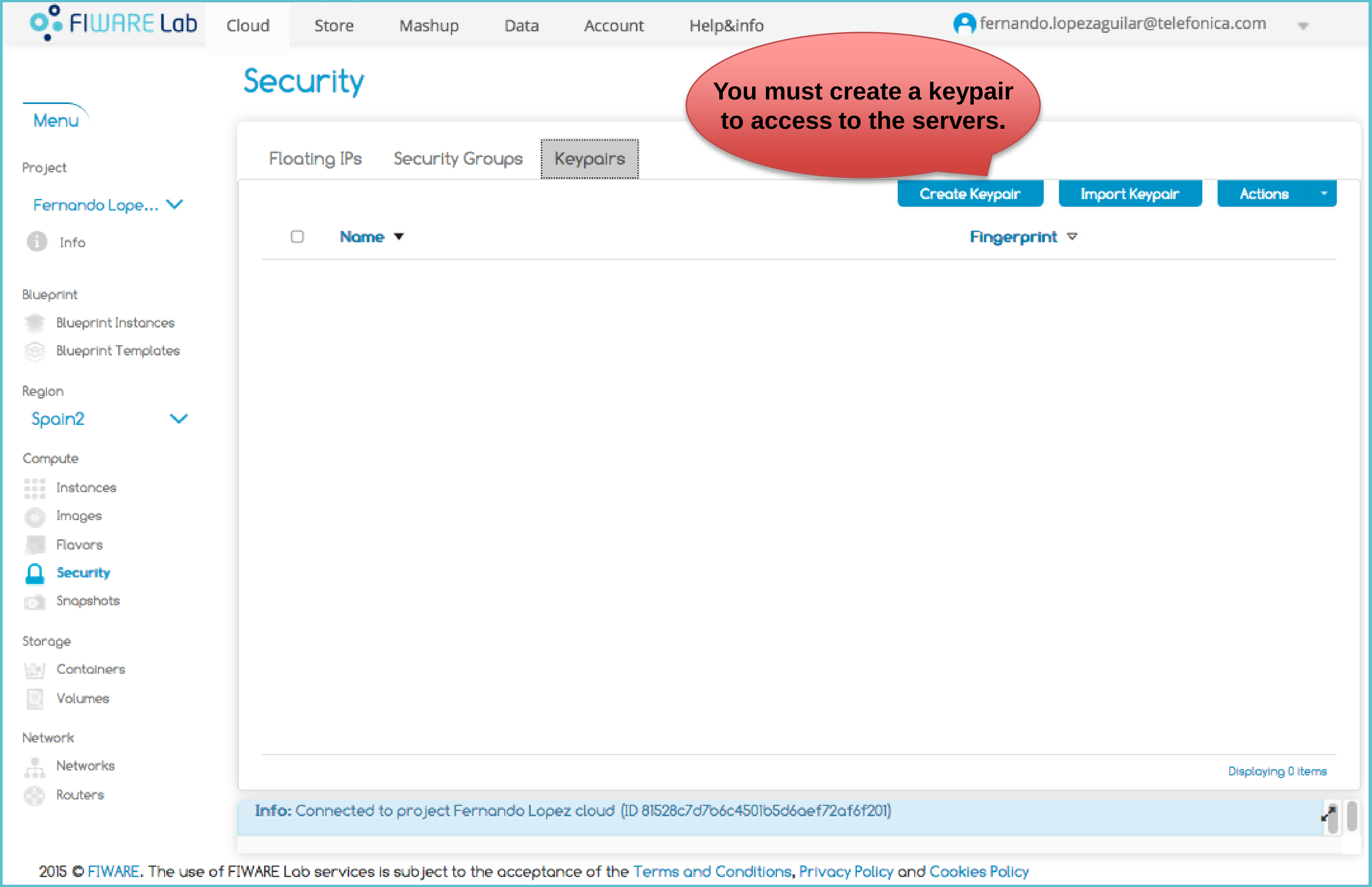
FIWARE Lab Cloud Hosting: basic functionalities

- Create your keypair (private key)
- Create security group (incoming ports to VM, e.g. 22 for ssh)
- Deploy your instance
  - choice from a library of predefined images, e.g. Centros, Ubuntu, etc.
  - choice flavor of resource configuration.
  - choice security group.
  - choice keypair to ssh into VM.
  - specify configuration scripts (optional).

FIWARE Lab Cloud Hosting: basic functionalities

- Associate public IP with the instance.

Create keypair



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Volumes
Network
Networks
Routers
Floating IPs
Security Groups
Keypairs
Create Keypair
Import Keypair
Actions
☐ Name
Fingerprint
Displaying 0 items

You must create a keypair to access to the servers.

Info: Connected to project Fernando Lopez cloud (ID 81528c7d7b6c4501b5d6aef72af6f201)

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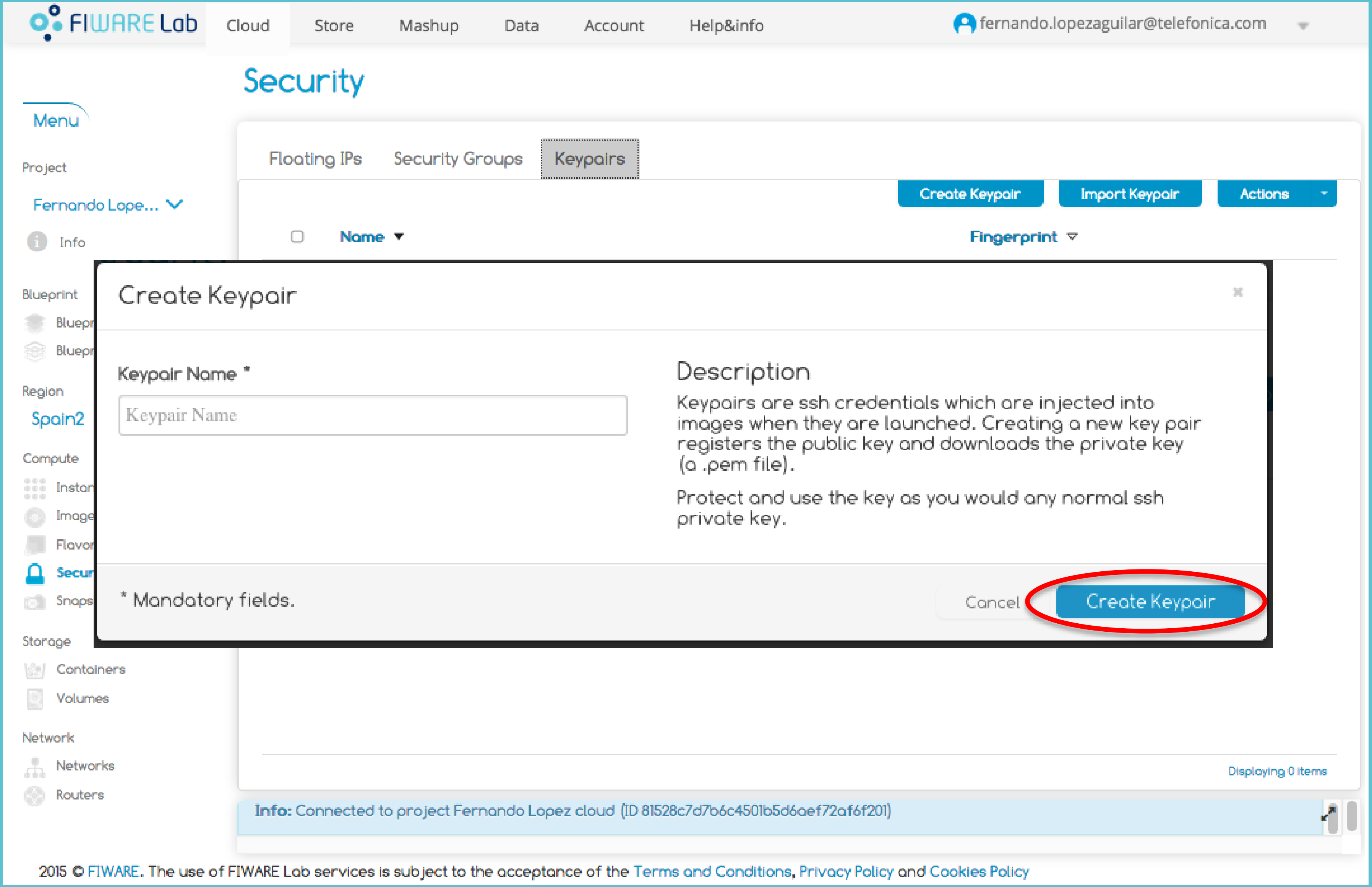
Create keypair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Create Keypair
Import Keypair
Actions
Name
Fingerprint
Displaying 0 items

Create Keypair

Keypair Name *

Keypair Name

Description

Keypairs are ssh credentials which are injected into images when they are launched. Creating a new key pair registers the public key and downloads the private key (a .pem file).

Protect and use the key as you would any normal ssh private key.

* Mandatory fields.

Cancel
Create Keypair

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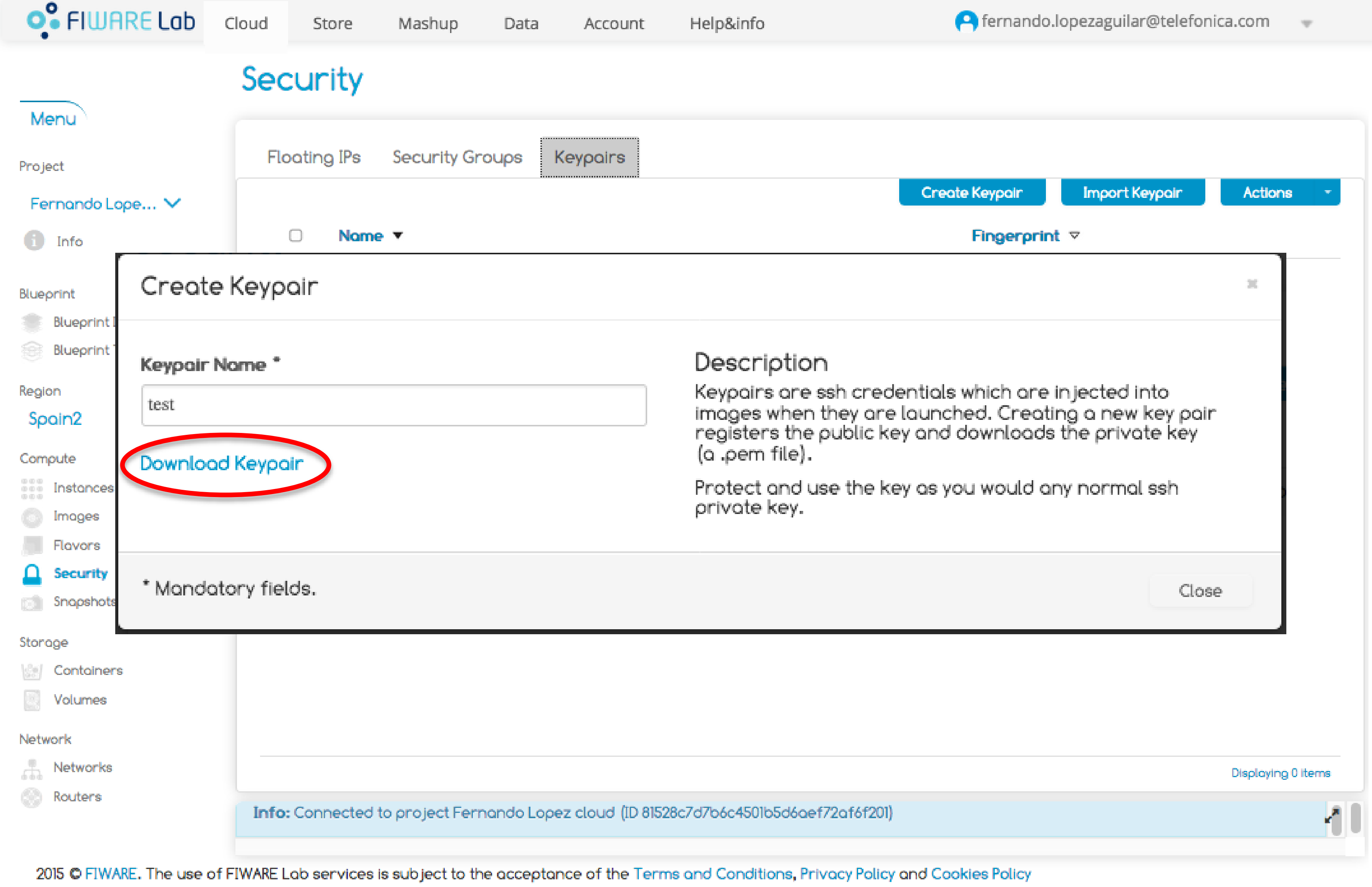
Create keypair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Floating IPs
Security Groups
Keypairs
Create Keypair
Import Keypair
Actions
Name
Fingerprint
Download Keypair
Close
Displaying 0 items

Security

Create Keypair

Keypair Name *

test

Description

Keypairs are ssh credentials which are injected into images when they are launched. Creating a new key pair registers the public key and downloads the private key (a .pem file).

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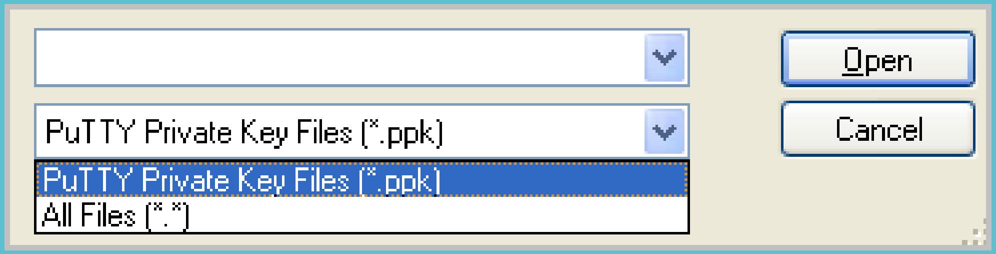
How to connect from Windows (I)

- Install PuTTY and PuTTYgen from http://www.putty.org/
- Convert your Keypair to PPK
  - Start PuTTYgen (e.g. From the Start menu, click All Programs > PuTTY > PuTTYgen)
  - Click Load and select the Keypair file (e.g. my_cert.pem). You'll need to display All Files (*.*) to see your Keypair.



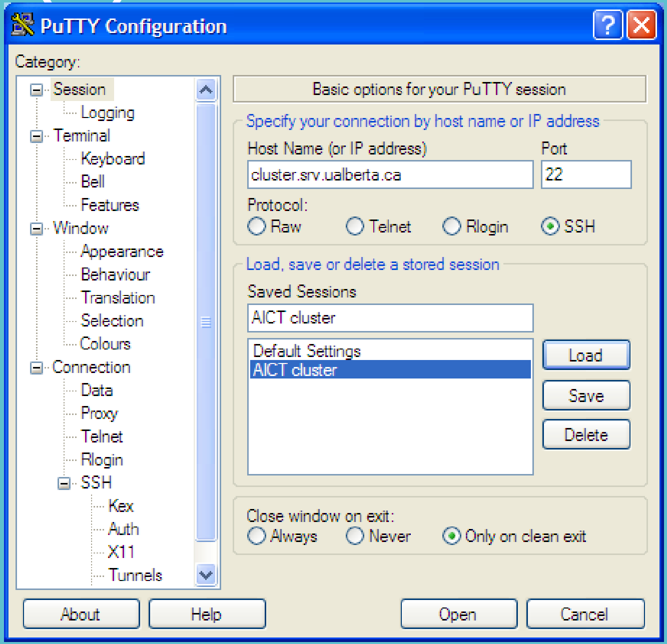
PuTTY Private Key Files (*.ppk)

PuTTY Private Key Files (*.ppk)
All Files (*.*)

  - Click Open. And select the destination path and name of your PPK file.

How to connect from Windows (II)

- Connect to your instance
  - Start PuTTY.
  - Put the public IP of your instance (default SSH port is 22).
- Configure it to use your Keypair
  - Open the Auth submenu (Connection > SSH > Auth)
  - Select the recently generated Private key file (PPK file).


PuTTY Configuration
Category:
Session
Logging
Terminal
Keyboard
Bell
Features
Window
Appearance
Behaviour
Translation
Selection
Colours
Connection
Data
Proxy
Telnet
Rlogin
SSH
Kex
Auth
X11
Tunnels
Load
Save
Delete
About
Help
Open
Cancel

Basic options for your PuTTY session

Specify your connection by host name or IP address

Host Name (or IP address): cluster.srv.ualberta.ca

Port: 22

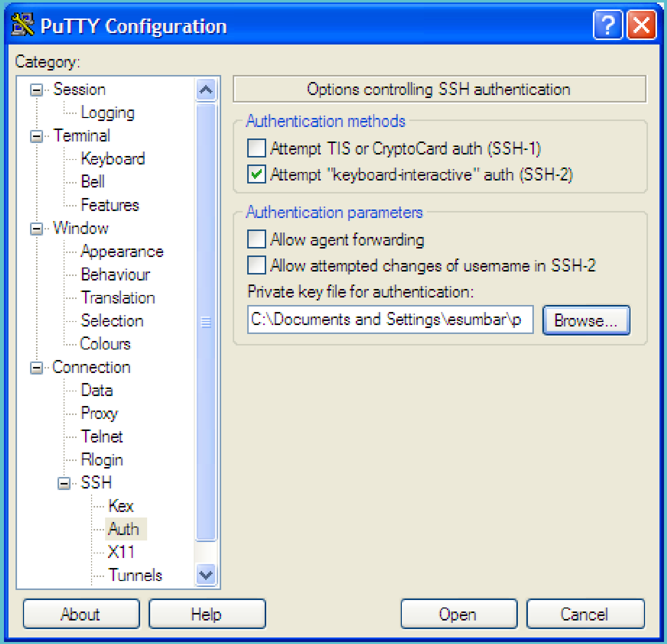
Protocol: ○ Raw ○ Telnet ○ Rlogin ● SSH

Load, save or delete a stored session

Saved Sessions: AICT cluster

Default Settings
AICT cluster

Close window on exit: ○ Always ○ Never ● Only on clean exit


PuTTY Configuration
Category:
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Translation
Selection
Colours
Connection
Data
Proxy
Telnet
Rlogin
SSH
Kex
Auth
X11
Tunnels
Browse...
About
Help
Open
Cancel

Options controlling SSH authentication

Authentication methods

☐ Attempt TIS or CryptoCard auth (SSH-1)

☑ Attempt "keyboard-interactive" auth (SSH-2)

Authentication parameters

☐ Allow agent forwarding

☐ Allow attempted changes of username in SSH-2

Private key file for authentication: C:\Documents and Settings\esumbar\p

How to obtain your public key from pem file

- Secure to have the proper permissions:

```
$ chmod 600 private.pem
```

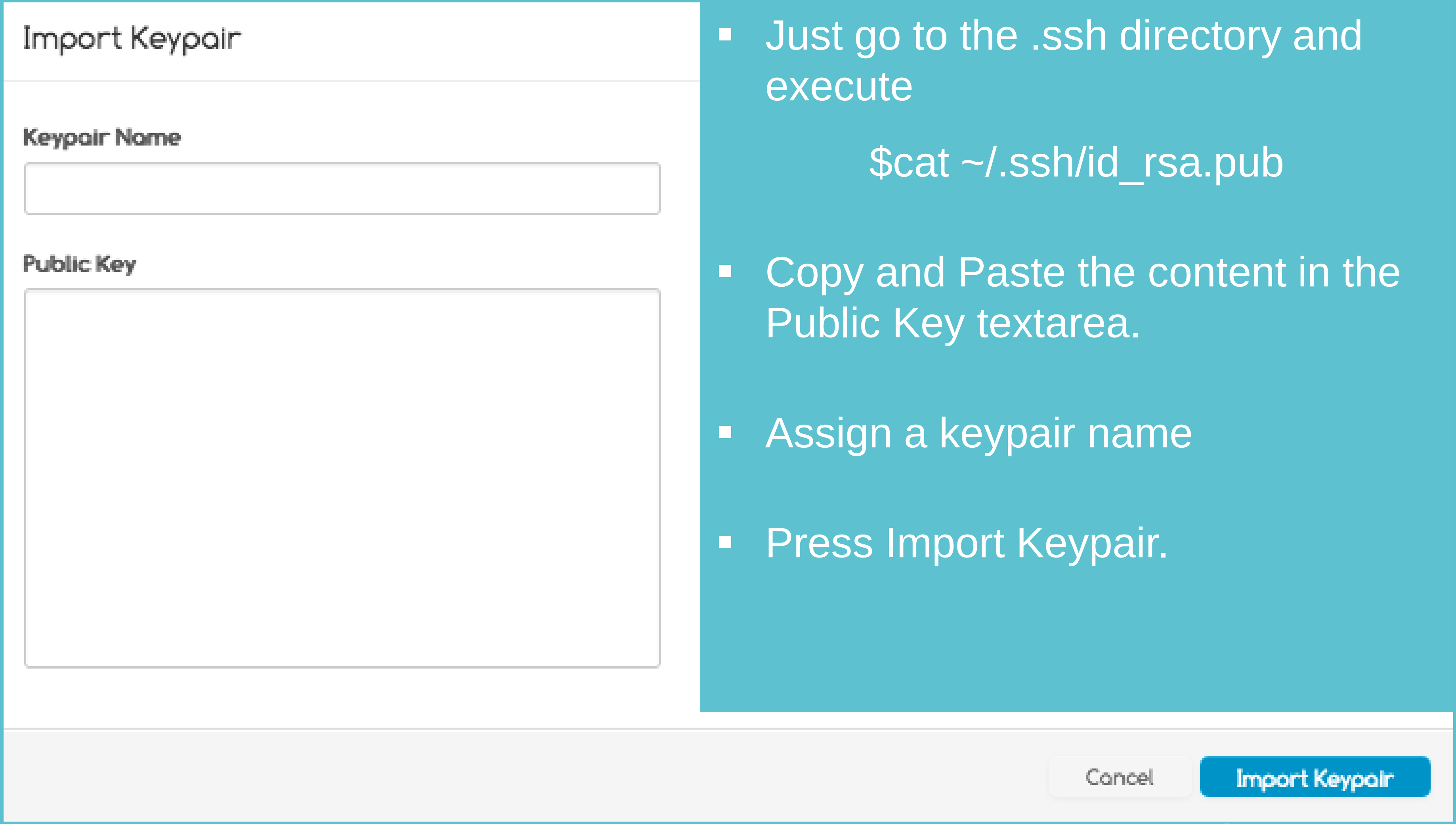
- Create the public key:

```
$ ssh-keygen –y –f private.pem >> publickey.pub
```

- Add the public key to your system

```
$ cat publickey.pub >> ~/.ssh/id_rsa.pub
```

How to import your public key into OpenStack

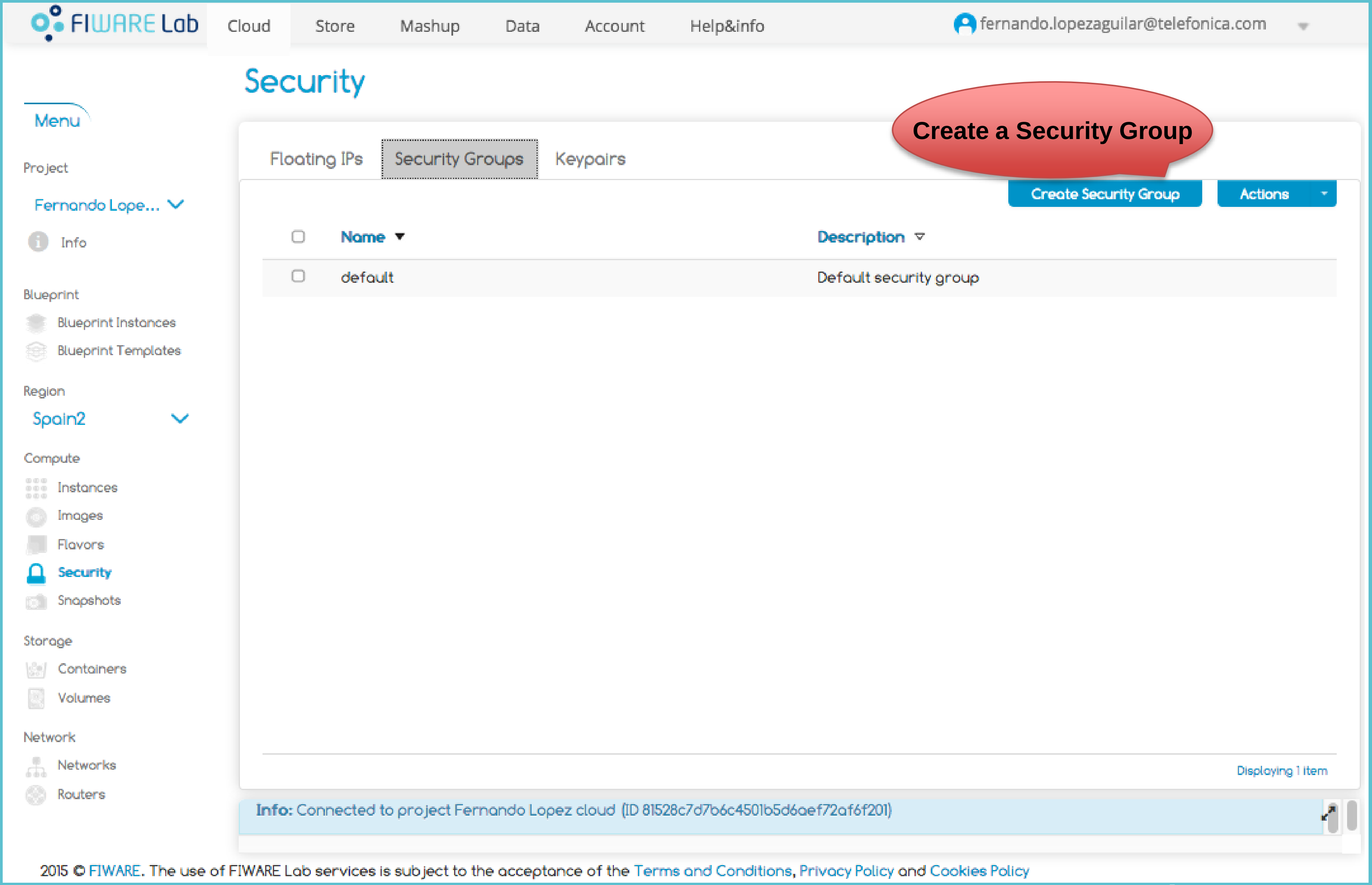

Import Keypair
Keypair Name
Public Key
Cancel
Import Keypair

- Just go to the .ssh directory and execute

  $cat ~/.ssh/id_rsa.pub

- Copy and Paste the content in the Public Key textarea.
- Assign a keypair name
- Press Import Keypair.

Security groups



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Networks
Routers
Floating IPs
Security Groups
Keypairs
Create Security Group
Actions

Security

Create a Security Group

☐	Name ▼	Description ▽
☐	default	Default security group

Displaying 1 item

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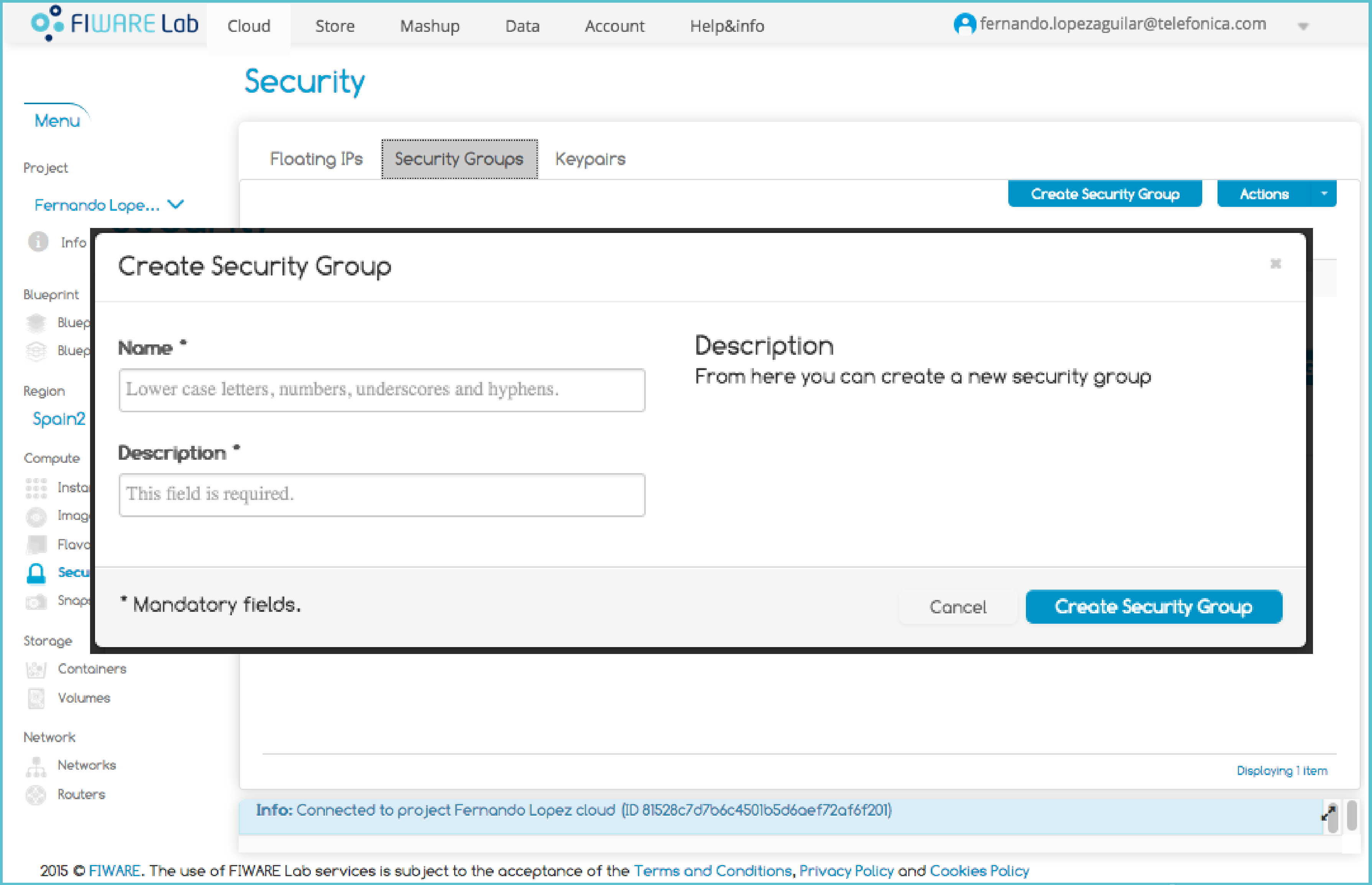
Security groups



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Create Security Group
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Displaying 1 item

Create Security Group

Name *

Lower case letters, numbers, underscores and hyphens.

Description *

This field is required.

Description

From here you can create a new security group

* Mandatory fields.

Cancel
Create Security Group

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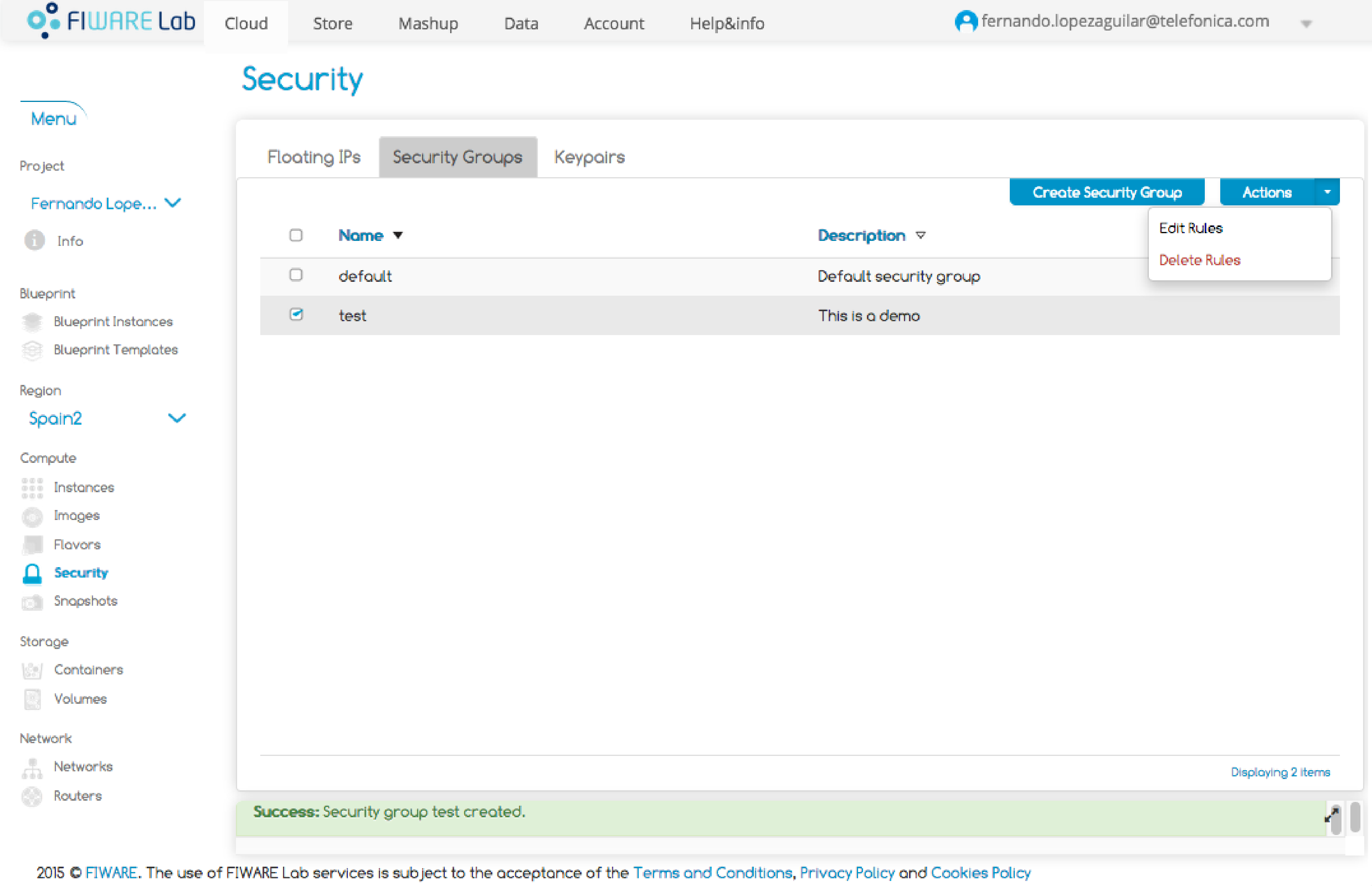
Create and edit Security Group rules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Routers
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Security Groups
Keypairs
Create Security Group
Actions
Edit Rules
Delete Rules
Displaying 2 items

☐	Name ▼	Description ▽
☐	default	Default security group
☑	test	This is a demo

Success: Security group test created.

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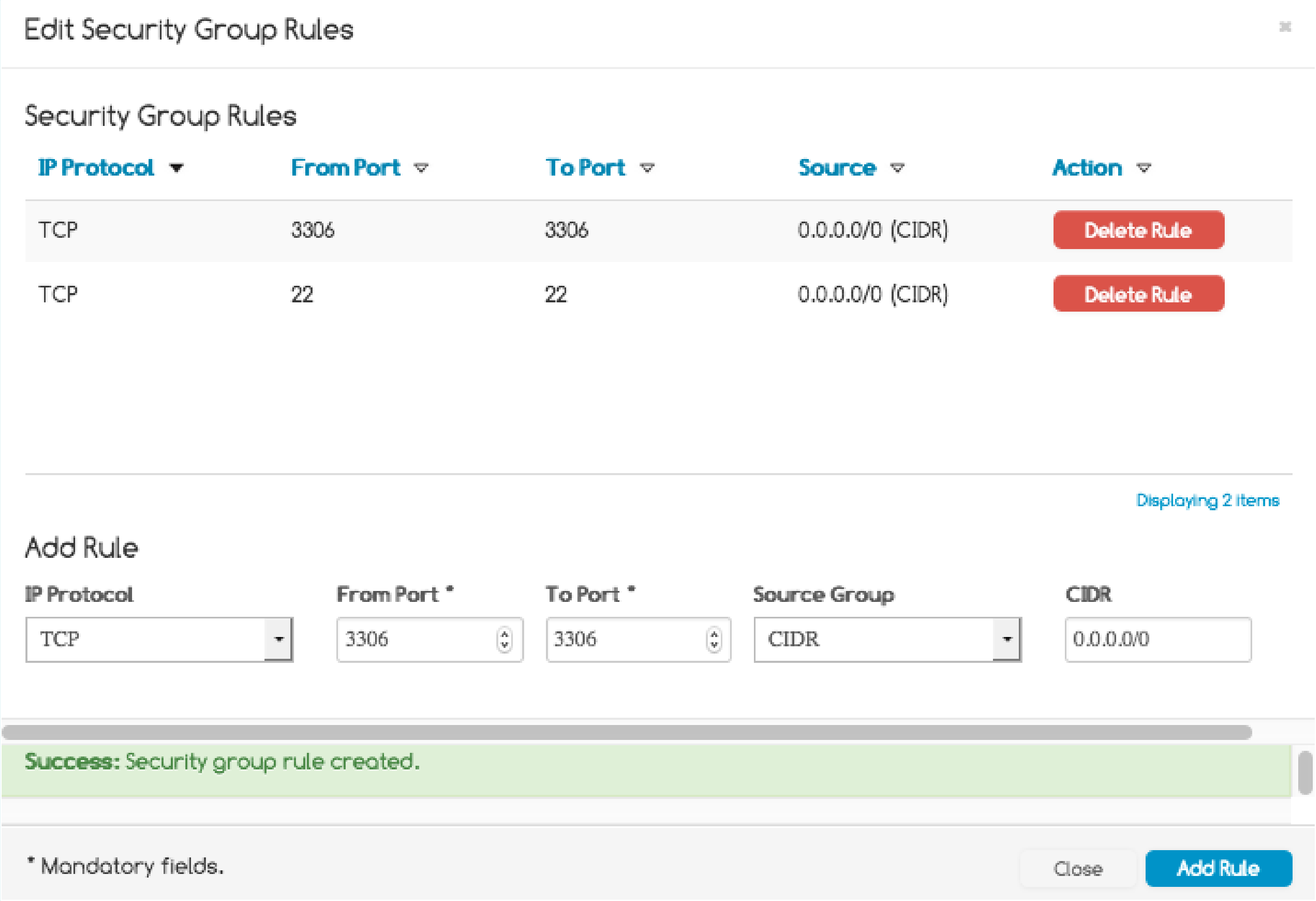
Create and edit Security Group rules



Edit Security Group Rules

Security Group Rules

IP Protocol	From Port	To Port	Source	Action
TCP	3306	3306	0.0.0.0/0 (CIDR)	Delete Rule
TCP	22	22	0.0.0.0/0 (CIDR)	Delete Rule

Displaying 2 items

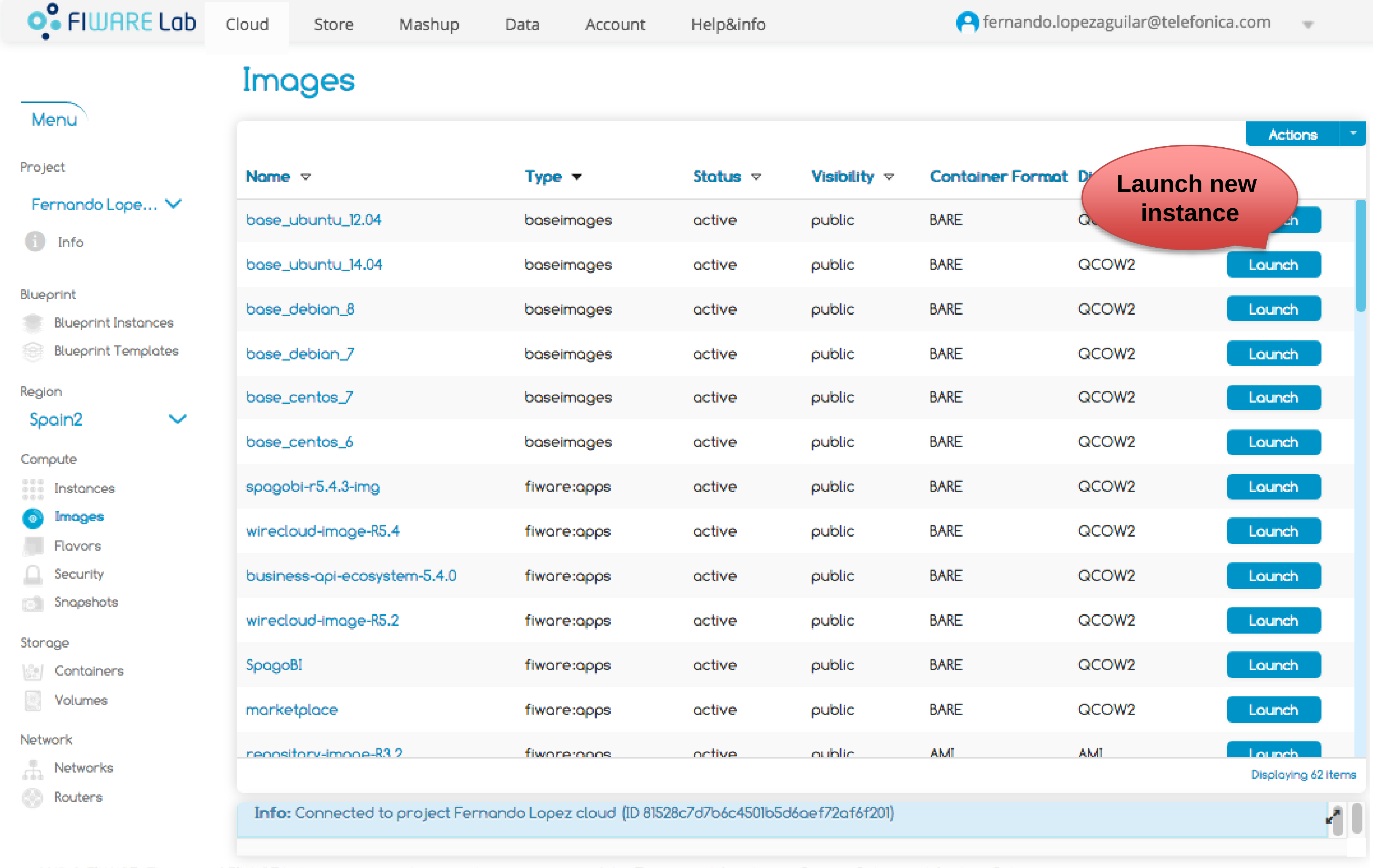
Add Rule

IP Protocol	From Port *	To Port *	Source Group	CIDR
TCP	3306	3306	CIDR	0.0.0.0/0

Success: Security group rule created.

* Mandatory fields.

Launch Instances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Storage
Containers
Volumes
Network
Networks
Routers
Actions
Launch new instance

Images

Name	Type	Status	Visibility	Container Format	Di	
base_ubuntu_12.04	baseimages	active	public	BARE	Q	ch
base_ubuntu_14.04	baseimages	active	public	BARE	QCOW2	Launch
base_debian_8	baseimages	active	public	BARE	QCOW2	Launch
base_debian_7	baseimages	active	public	BARE	QCOW2	Launch
base_centos_7	baseimages	active	public	BARE	QCOW2	Launch
base_centos_6	baseimages	active	public	BARE	QCOW2	Launch
spagobi-r5.4.3-img	fiware:apps	active	public	BARE	QCOW2	Launch
wirecloud-image-R5.4	fiware:apps	active	public	BARE	QCOW2	Launch
business-api-ecosystem-5.4.0	fiware:apps	active	public	BARE	QCOW2	Launch
wirecloud-image-R5.2	fiware:apps	active	public	BARE	QCOW2	Launch
SpagoBI	fiware:apps	active	public	BARE	QCOW2	Launch
marketplace	fiware:apps	active	public	BARE	QCOW2	Launch
repository-image-R3.2	fiware:apps	active	public	AMI	AMI	Launch

Displaying 62 items

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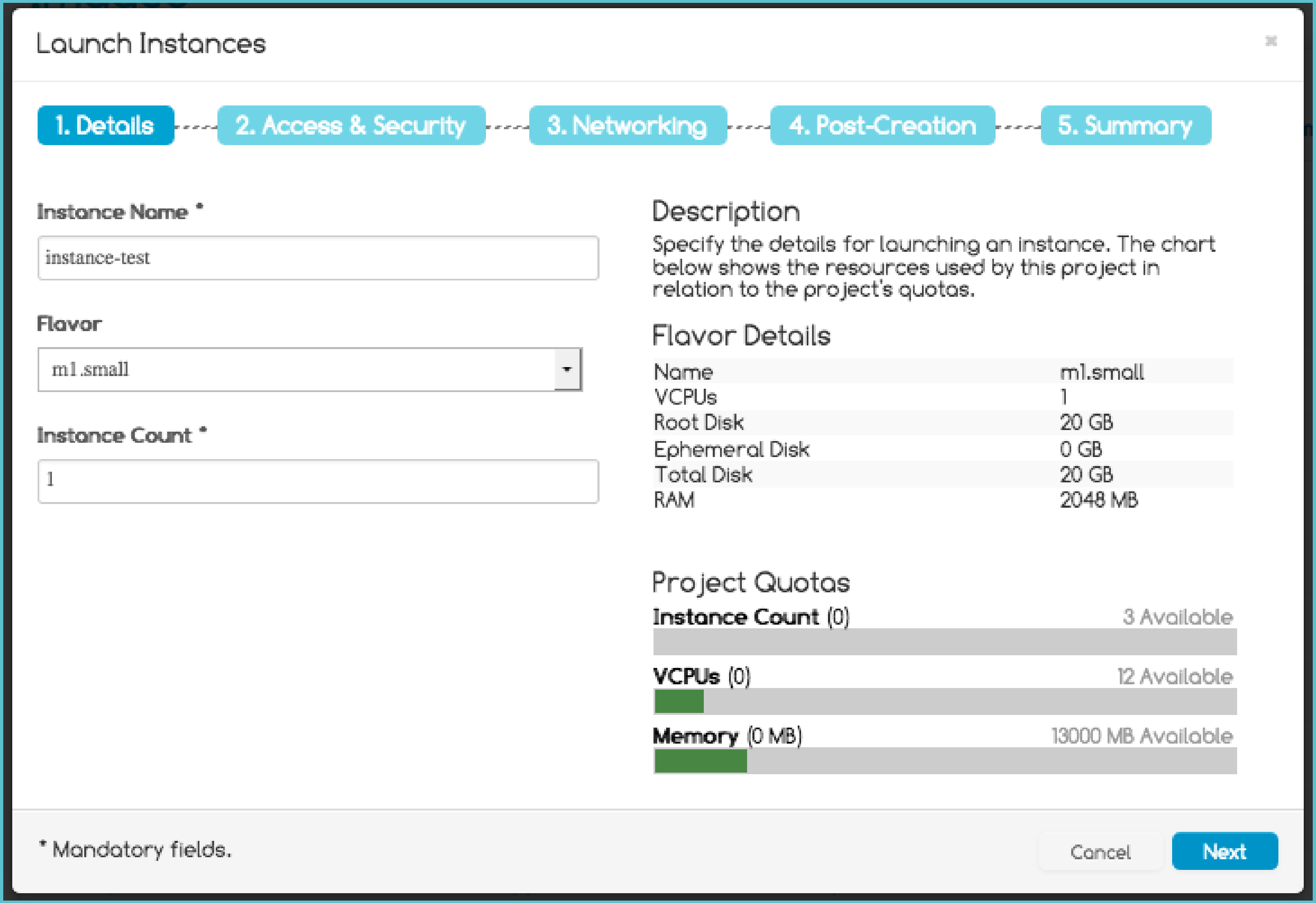
Launch Instances



Launch Instances
1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Instance Name *

instance-test

Flavor

m1.small

Instance Count *

1

Description

Specify the details for launching an instance. The chart below shows the resources used by this project in relation to the project's quotas.

Flavor Details

Name	m1.small
VCPUs	1
Root Disk	20 GB
Ephemeral Disk	0 GB
Total Disk	20 GB
RAM	2048 MB

Project Quotas

Instance Count (0) 3 Available

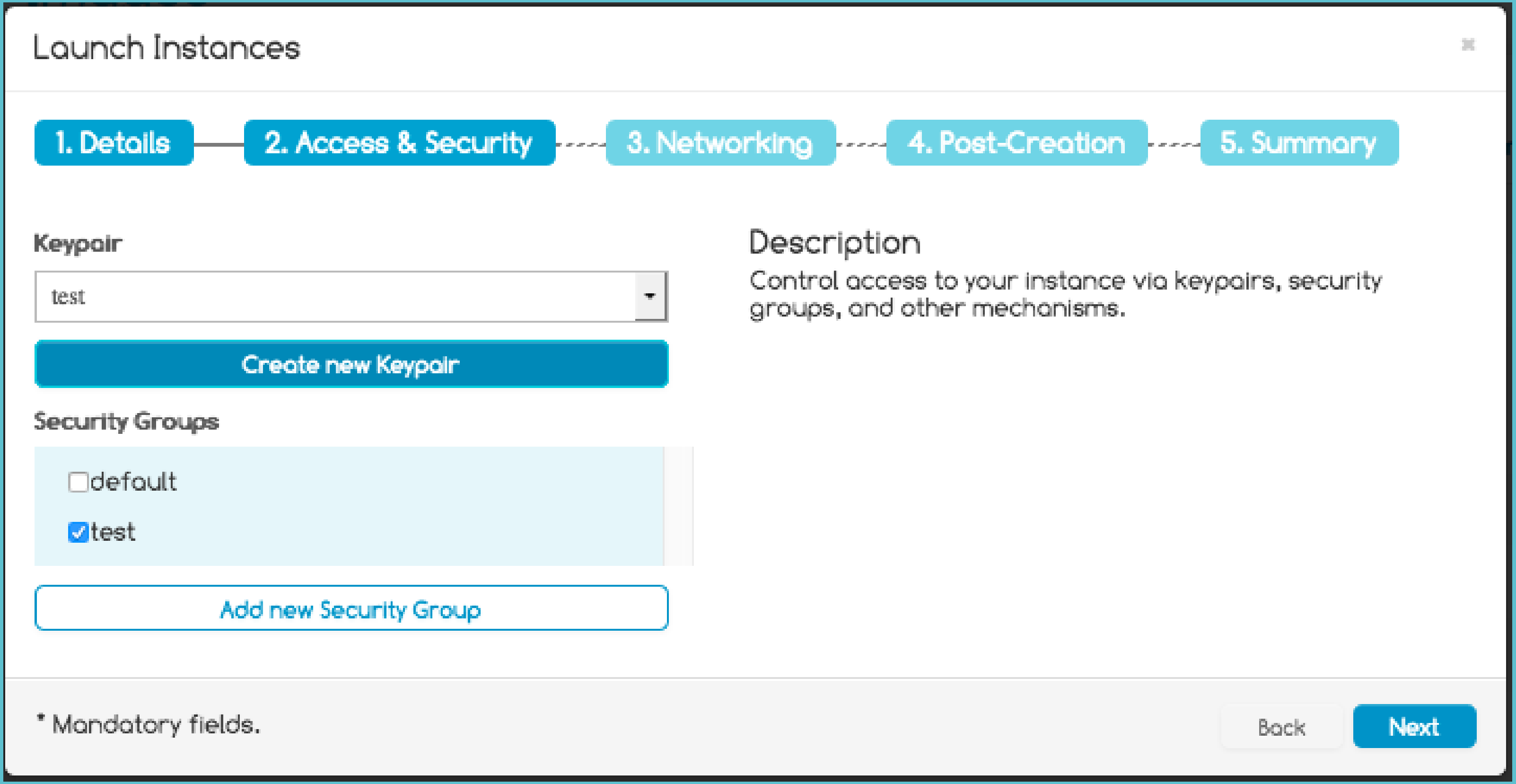
VCPUs (0) 12 Available

Memory (0 MB) 13000 MB Available

* Mandatory fields.

Cancel
Next

Launch Instances



Launch Instances

1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Keypair

test

Create new Keypair

Security Groups

☐ default

☑ test

Add new Security Group

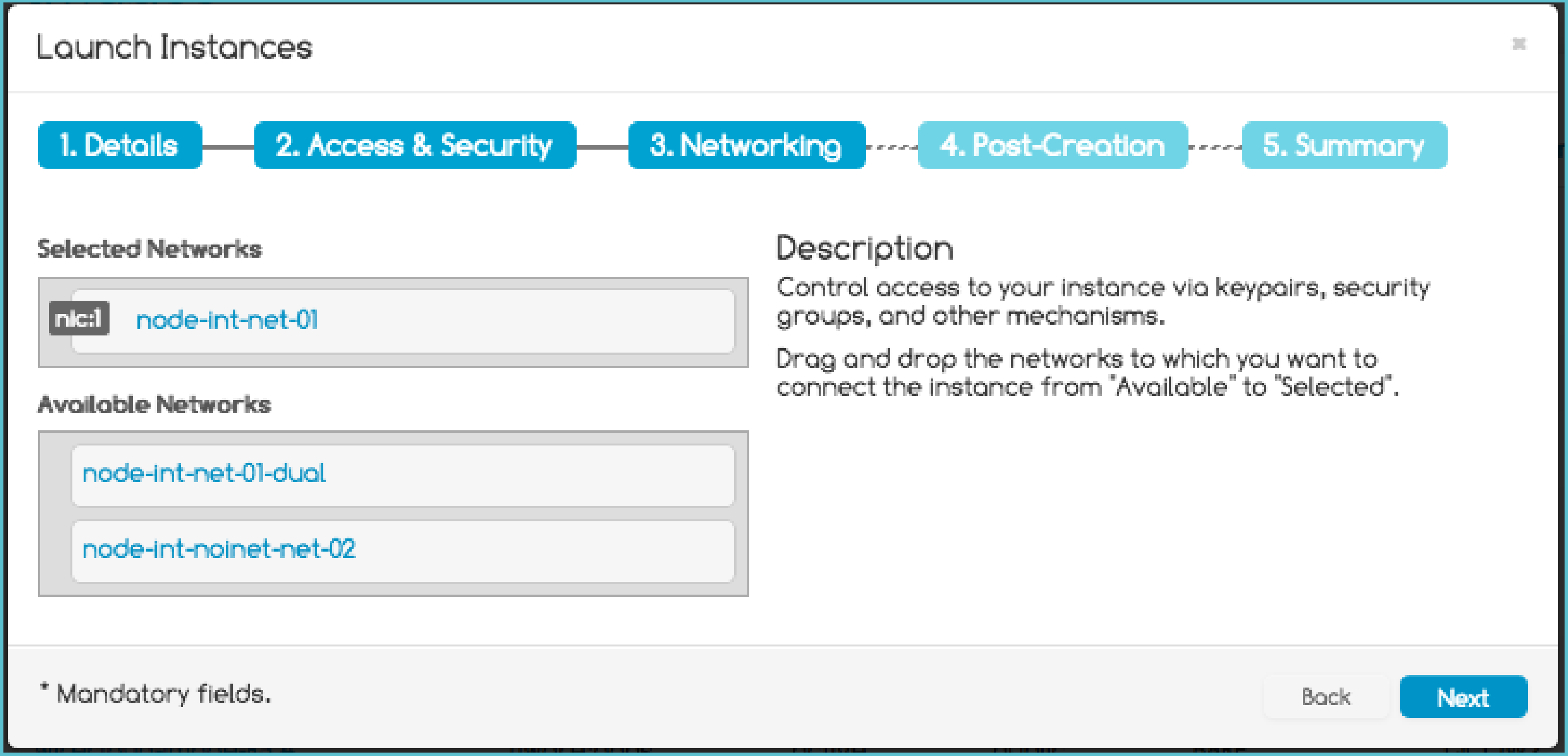
Description

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

* Mandatory fields.

Back
Next

Launch Instances



Launch Instances

×
1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Selected Networks

nic:1 node-int-net-01

Available Networks

node-int-net-01-dual

node-int-noinet-net-02

Description

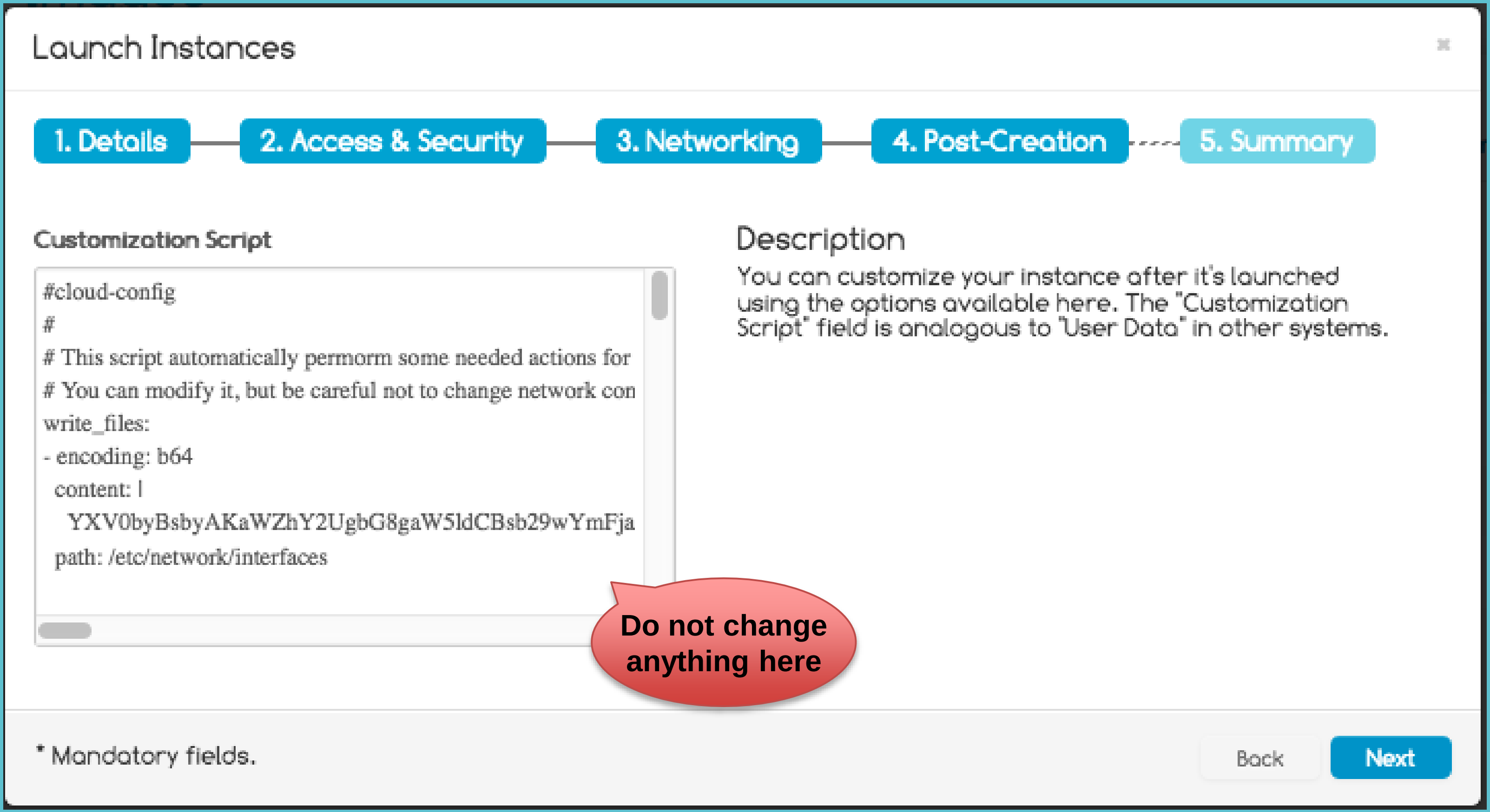
Control access to your instance via keypairs, security groups, and other mechanisms.

Drag and drop the networks to which you want to connect the instance from "Available" to "Selected".

* Mandatory fields.

Back
Next

Launch Instances



Launch Instances
1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Customization Script

```
#cloud-config
#
# This script automatically permorm some needed actions for
# You can modify it, but be careful not to change network con
write_files:
- encoding: b64
  content: |
    YXV0byBsbyAKaWZhY2UgbG8gaW5ldCBsb29wYmFja
  path: /etc/network/interfaces
```

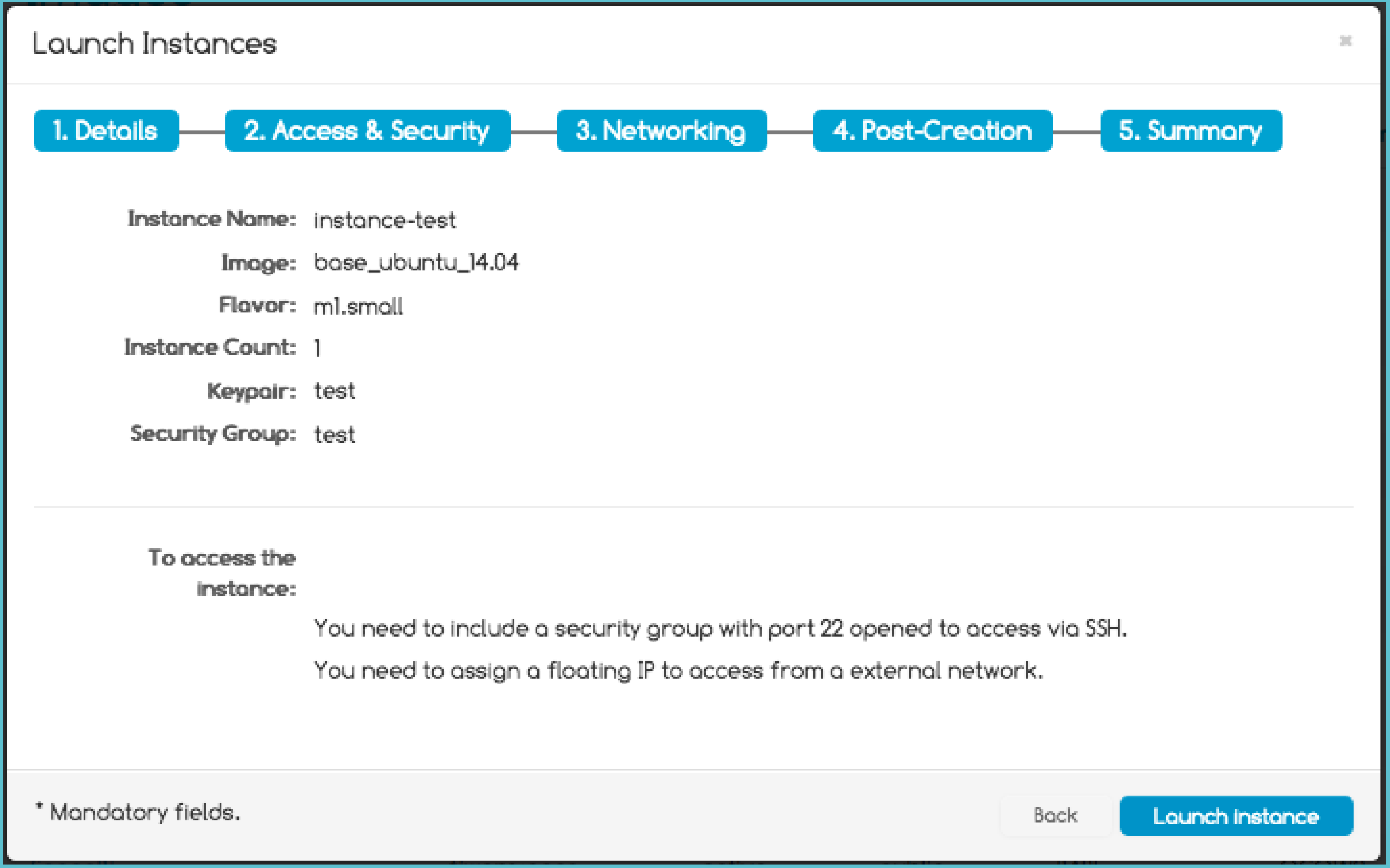
Description

You can customize your instance after it's launched using the options available here. The "Customization Script" field is analogous to "User Data" in other systems.

* Mandatory fields.

Do not change anything here

Launch Instances



Launch Instances

×
1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Instance Name: instance-test
Image: base_ubuntu_14.04
Flavor: m1.small
Instance Count: 1
Keypair: test
Security Group: test

To access the instance:

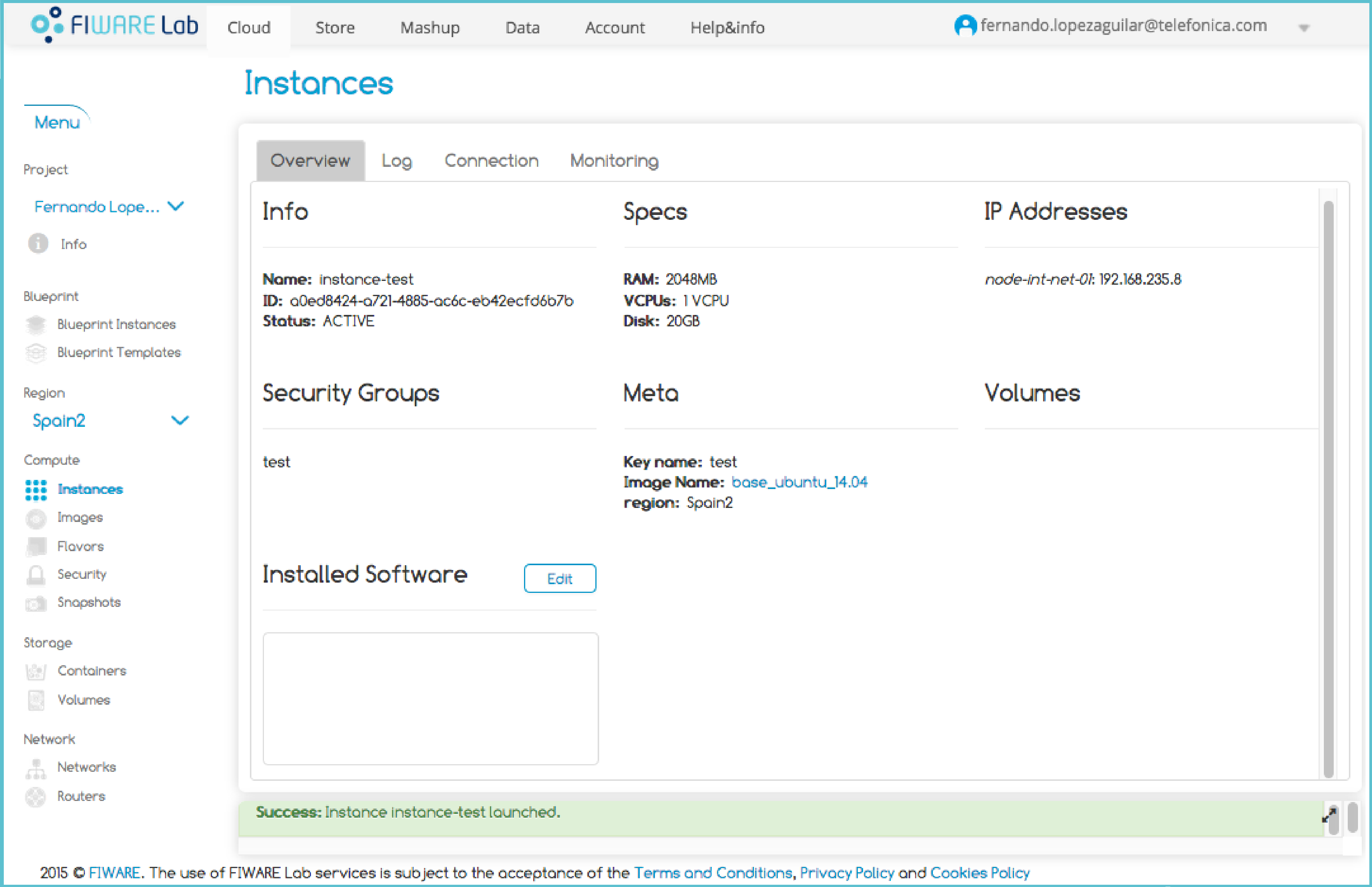
You need to include a security group with port 22 opened to access via SSH.

You need to assign a floating IP to access from a external network.

* Mandatory fields.

Back
Launch Instance

Instances Overview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Overview
Log
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Monitoring
Edit

Instances

Info

Name: instance-test
ID: a0ed8424-a721-4885-ac6c-eb42ecfd6b7b
Status: ACTIVE

Specs

RAM: 2048MB
VCPUs: 1 VCPU
Disk: 20GB

IP Addresses

node-int-net-01: 192.168.235.8

Security Groups

test

Meta

Key name: test
Image Name: base_ubuntu_14.04
region: Spain2

Volumes

Installed Software

Success: Instance instance-test launched.

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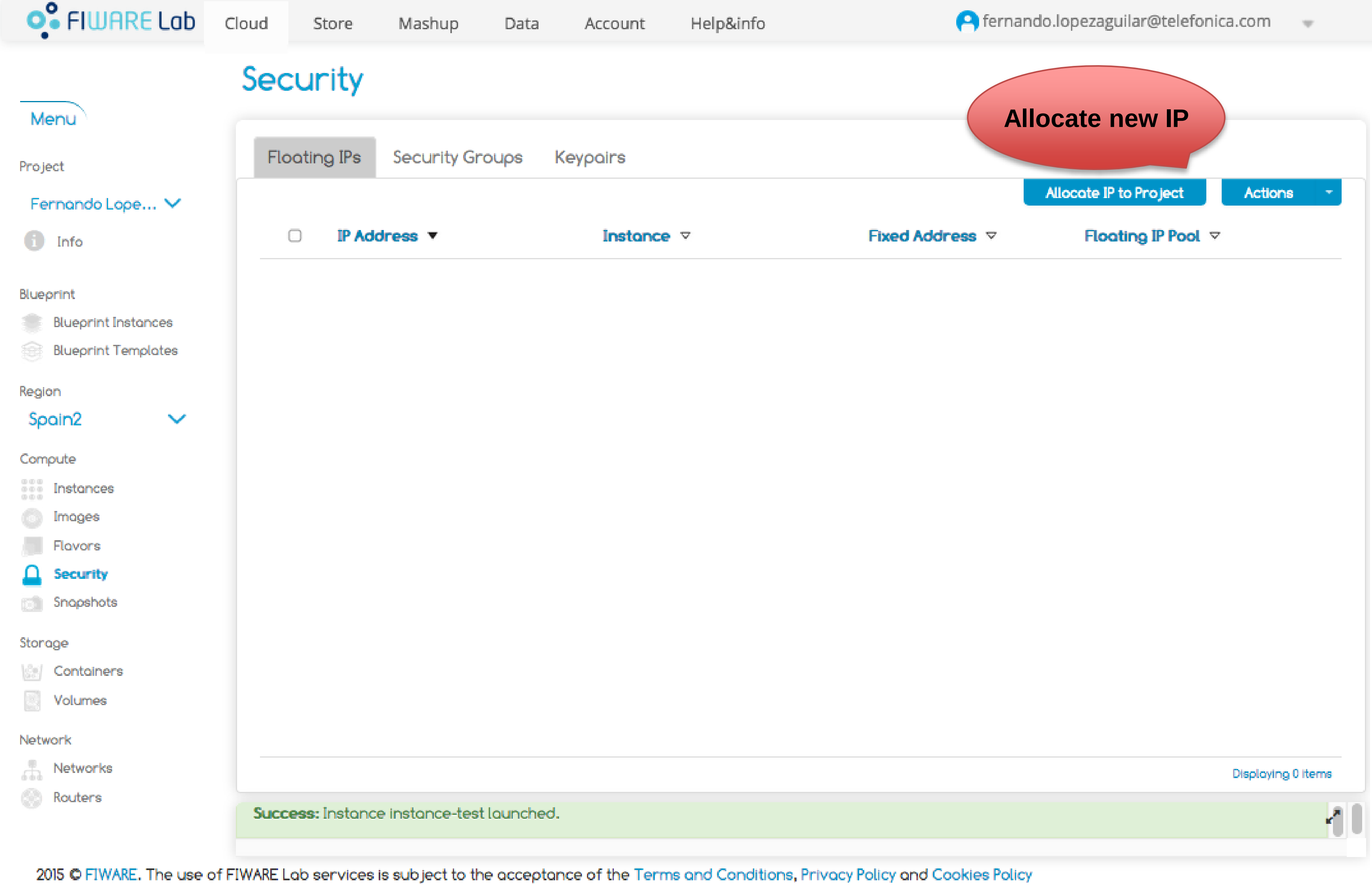
Allocate IP to Project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Routers
Floating IPs
Security Groups
Keypairs
Allocate IP to Project
Actions
☐
IP Address
Instance
Fixed Address
Floating IP Pool
Displaying 0 items

Allocate new IP

Success: Instance instance-test launched.

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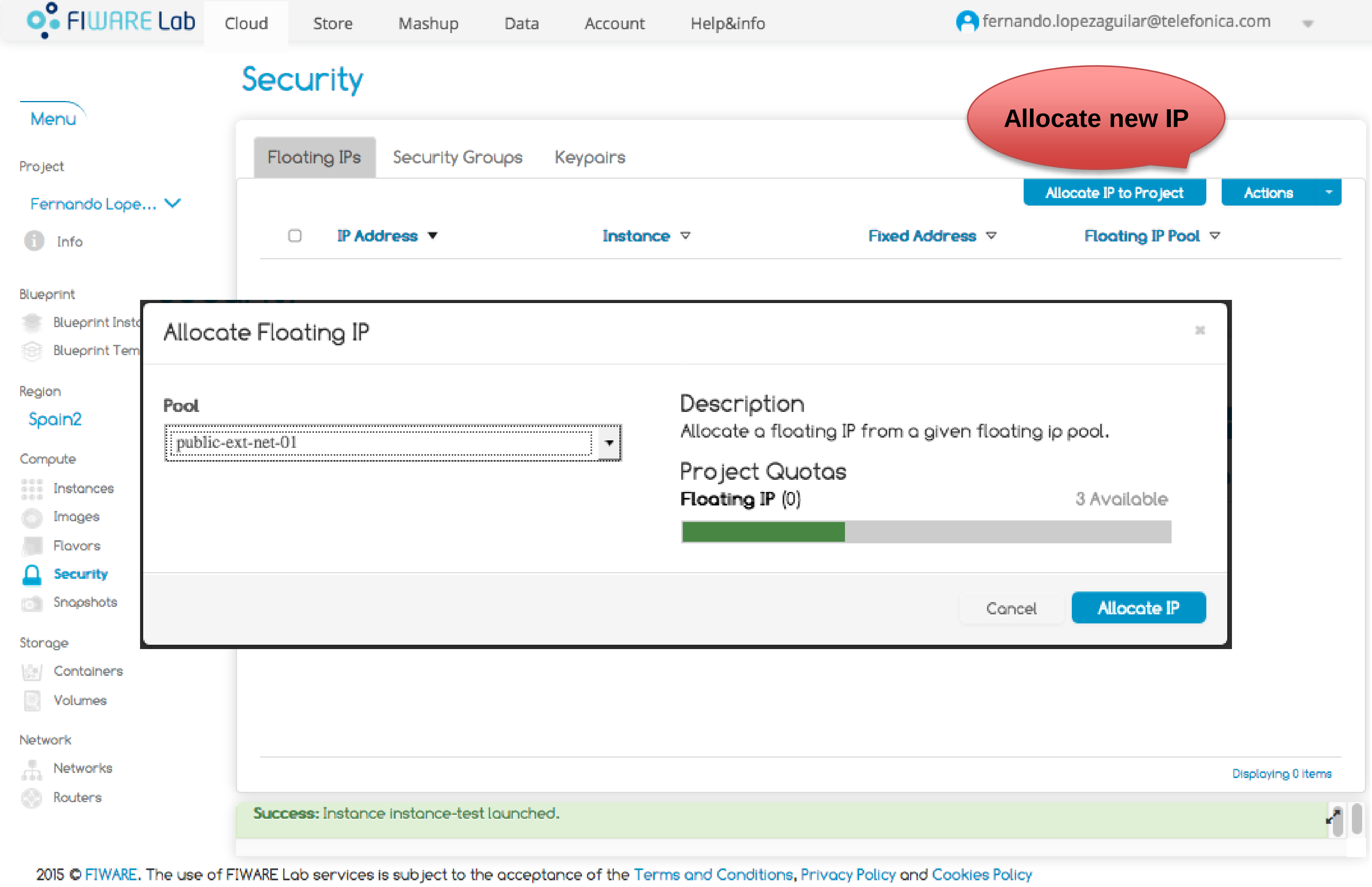
Allocate IP to Project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Allocate IP to Project
Actions
IP Address
Instance
Fixed Address
Floating IP Pool
Cancel
Allocate IP
Displaying 0 items

Security

Allocate Floating IP

Pool

public-ext-net-01

Description

Allocate a floating IP from a given floating ip pool.

Project Quotas

Floating IP (0) 3 Available

Success: Instance instance-test launched.

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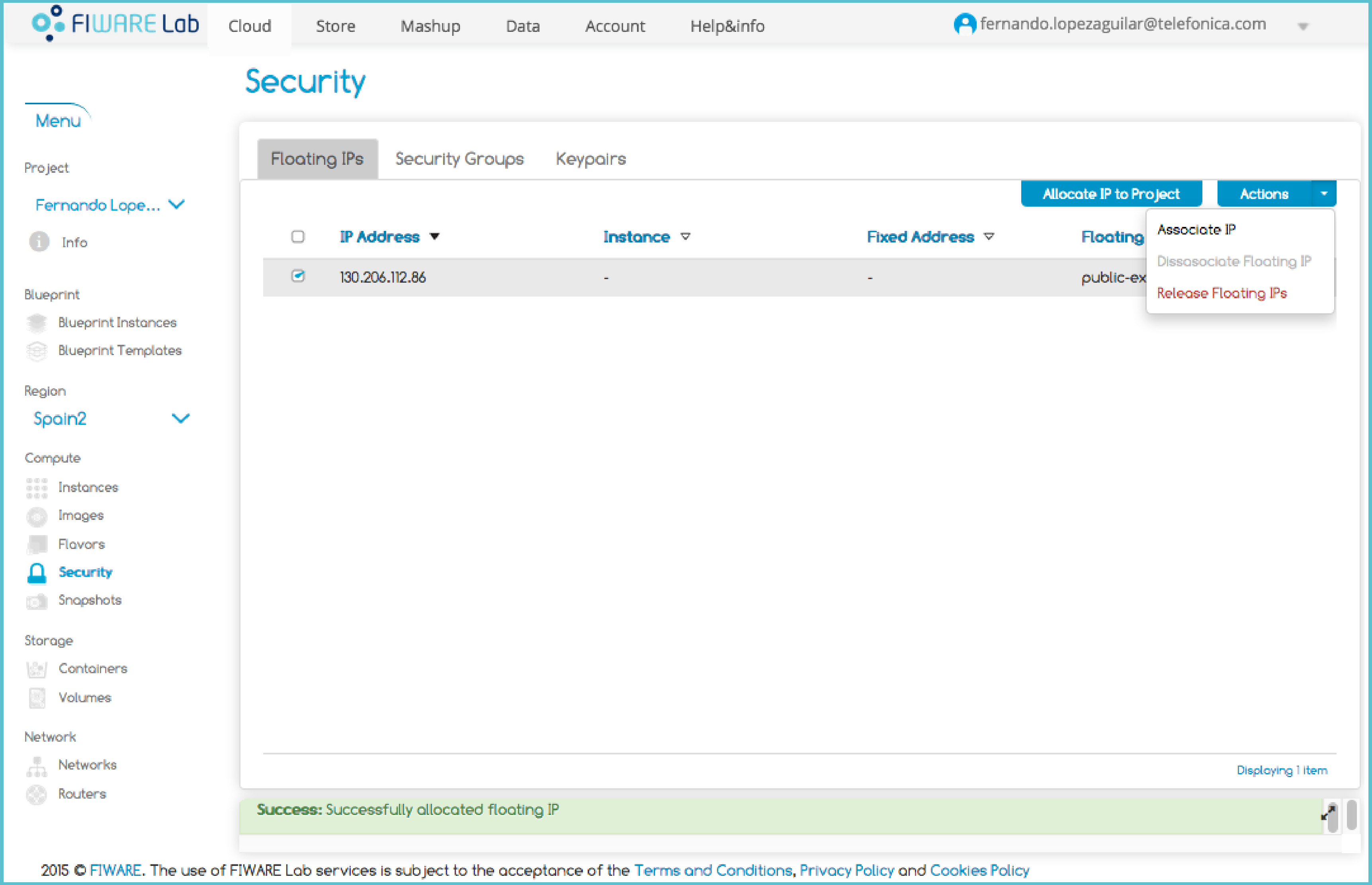
Allocate new IP

Allocate IP to Project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Floating IPs
Security Groups
Keypairs
Allocate IP to Project
Actions
Associate IP
Dissasociate Floating IP
Release Floating IPs

Security

☐	IP Address ▼	Instance ▽	Fixed Address ▽	Floating
☑	130.206.112.86	-	-	public-ex

Displaying 1 item

Success: Successfully allocated floating IP

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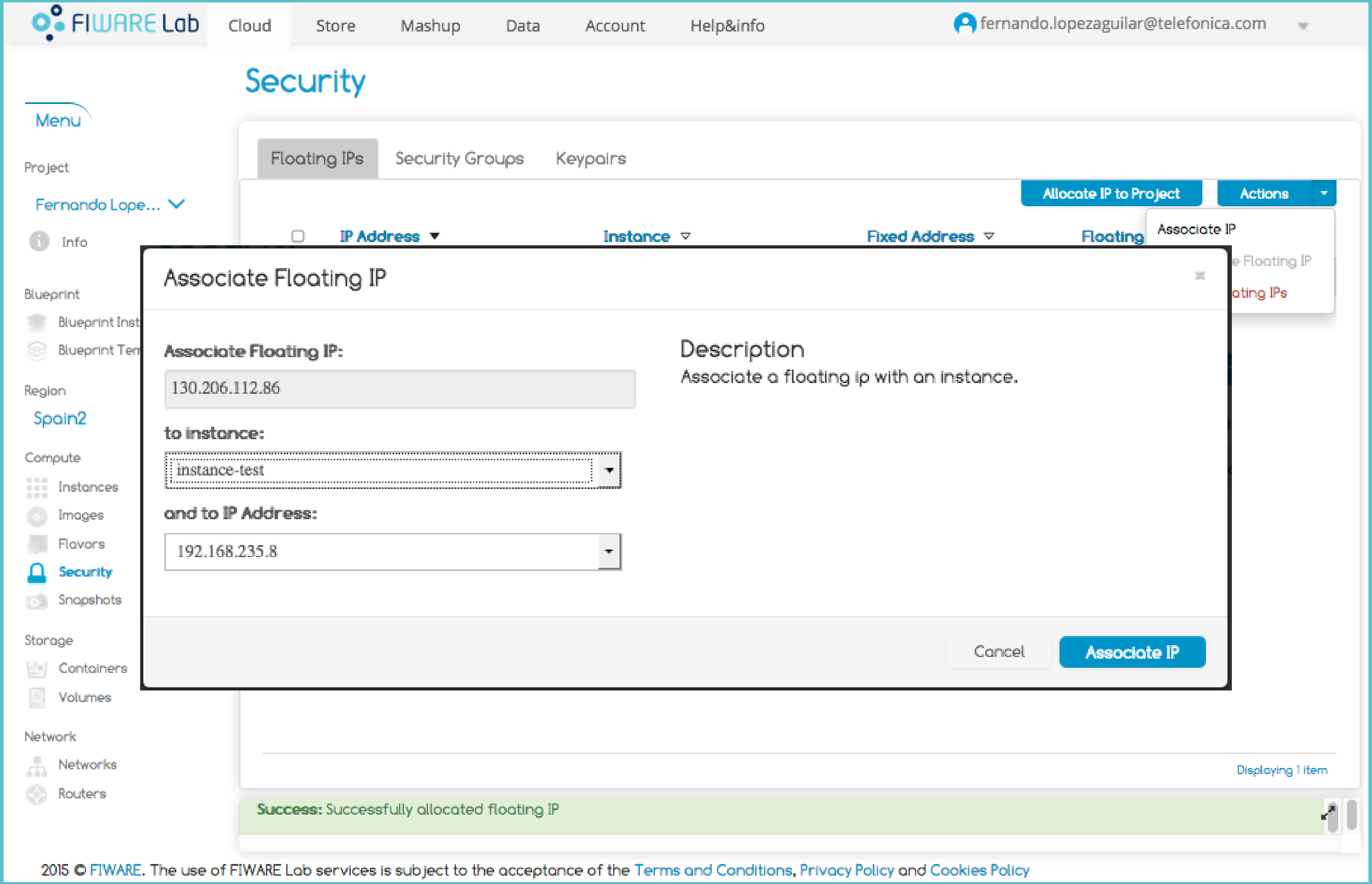
Allocate IP to Project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Allocate IP to Project
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Associate IP
e Floating IP
ating IPs
IP Address
Instance
Fixed Address
Floating
Displaying 1 item
Cancel
Associate IP

Associate Floating IP

Associate Floating IP: 130.206.112.86

to instance: instance-test

and to IP Address: 192.168.235.8

Description

Associate a floating ip with an instance.

Success: Successfully allocated floating IP

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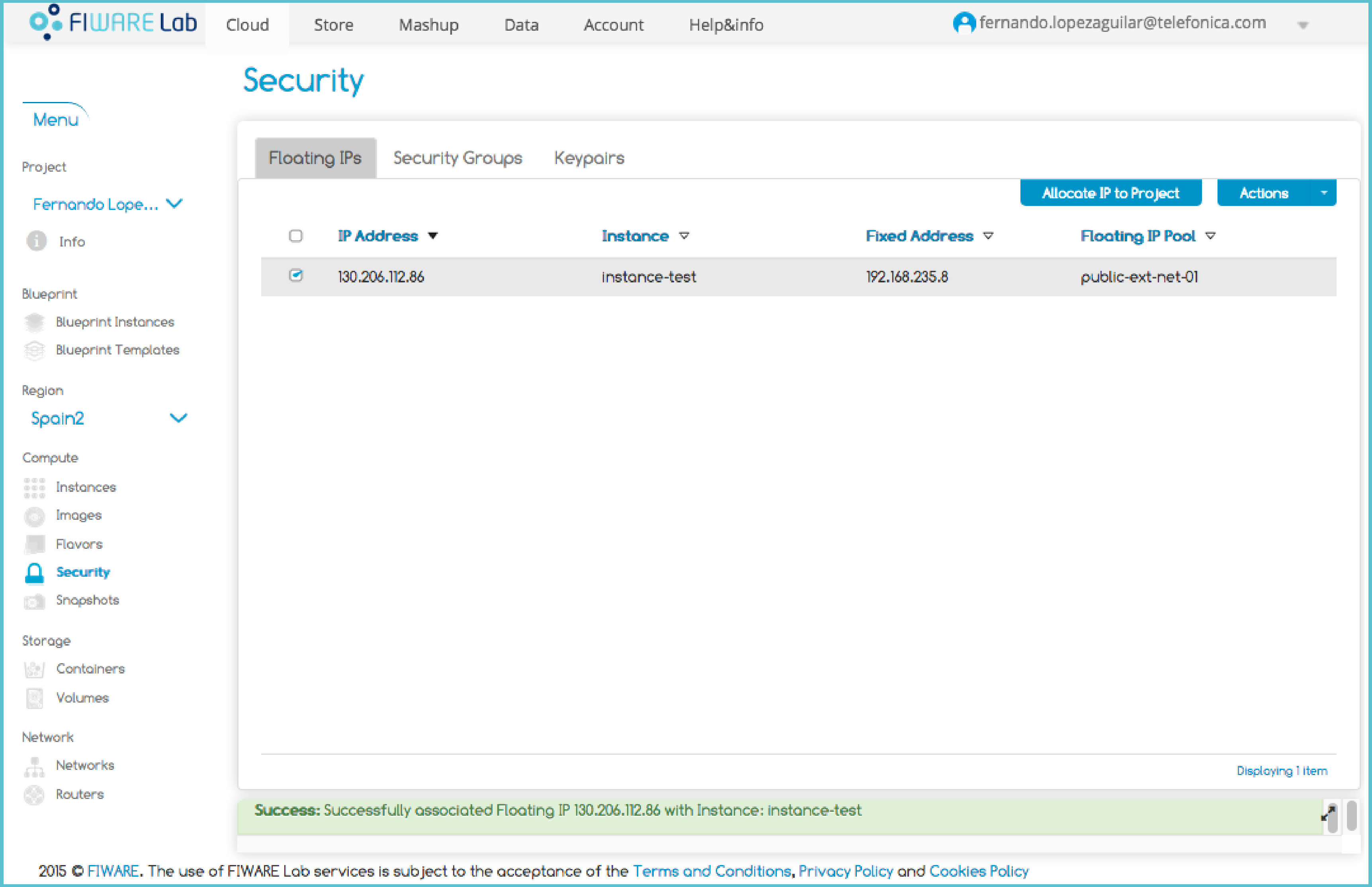
Allocate IP to Project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Routers
Floating IPs
Security Groups
Keypairs
Allocate IP to Project
Actions
Displaying 1 item

☐	IP Address	Instance	Fixed Address	Floating IP Pool
☑	130.206.112.86	instance-test	192.168.235.8	public-ext-net-01

Success: Successfully associated Floating IP 130.206.112.86 with Instance: instance-test

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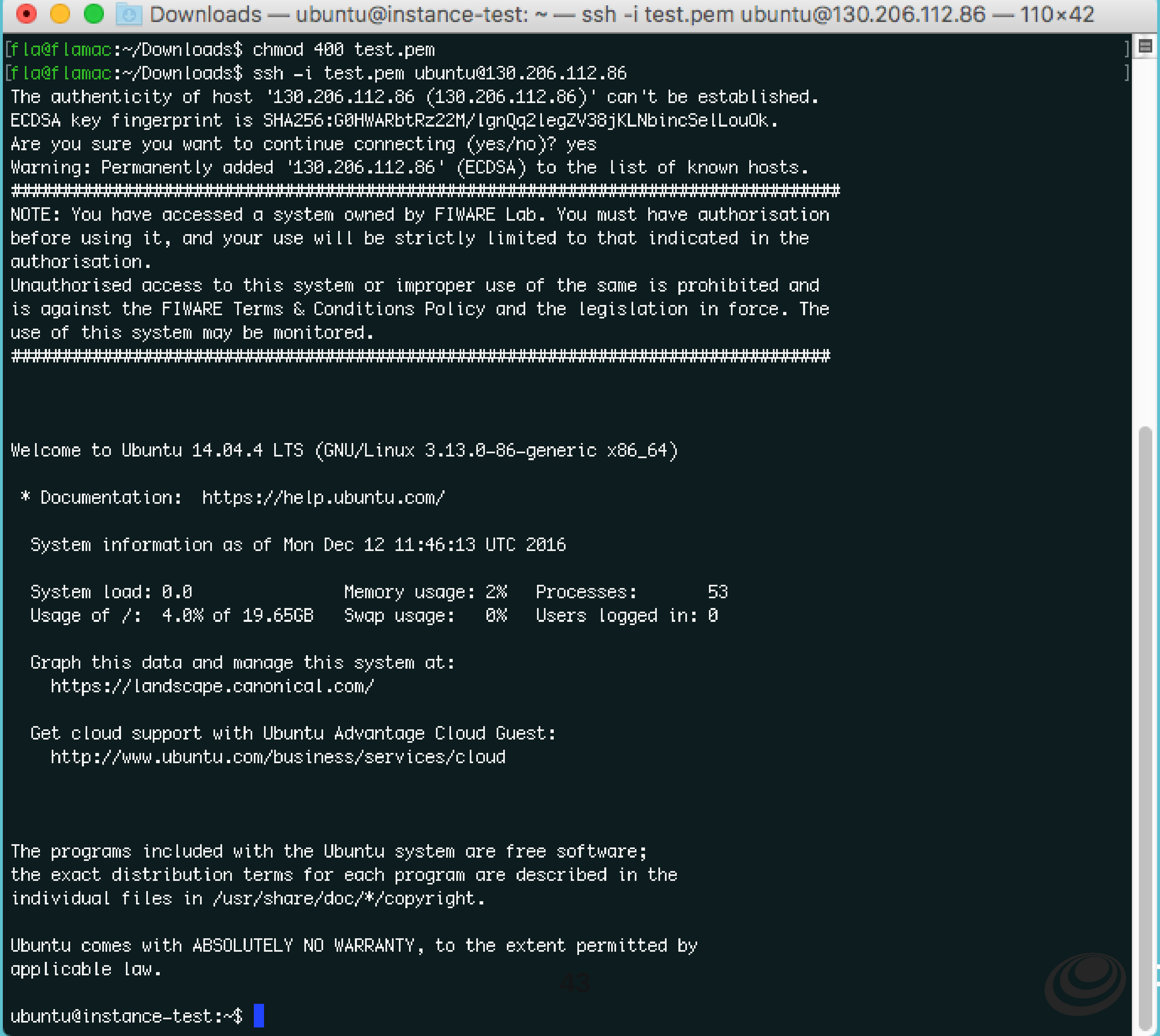
Access to the instance



Downloads — ubuntu@instance-test: ~ — ssh -i test.pem ubuntu@130.206.112.86 — 110×42

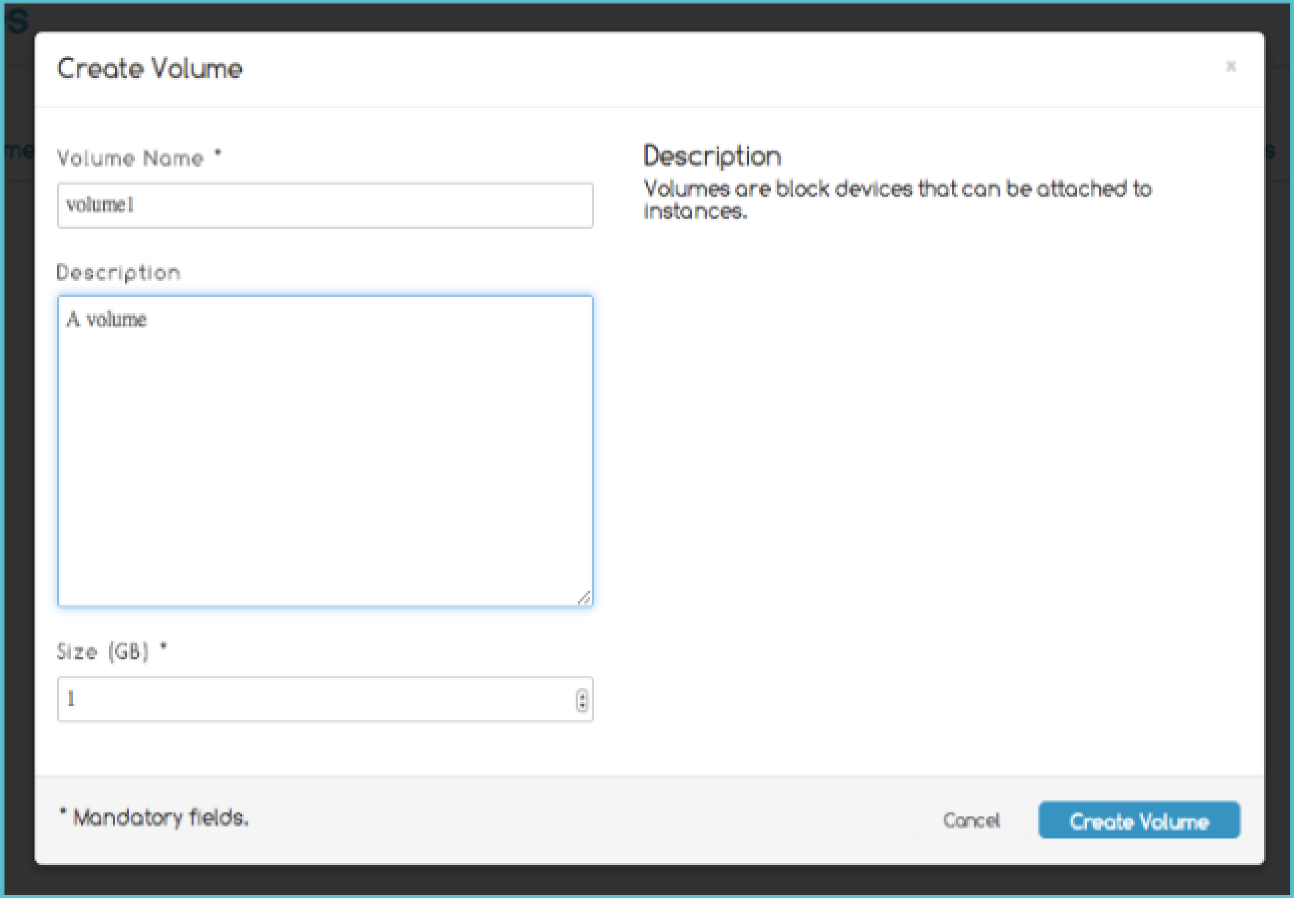
```
[fla@flamac:~/Downloads$ chmod 400 test.pem
[fla@flamac:~/Downloads$ ssh -i test.pem ubuntu@130.206.112.86
The authenticity of host '130.206.112.86 (130.206.112.86)' can't be established.
ECDSA key fingerprint is SHA256:G0HWARbtRz22M/lgnQq2legZV38jKLNbincSelLouOk.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '130.206.112.86' (ECDSA) to the list of known hosts.
###################################################################################
NOTE: You have accessed a system owned by FIWARE Lab. You must have authorisation
before using it, and your use will be strictly limited to that indicated in the
authorisation.
Unauthorised access to this system or improper use of the same is prohibited and
is against the FIWARE Terms & Conditions Policy and the legislation in force. The
use of this system may be monitored.
##################################################################################



Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 3.13.0-86-generic x86_64)

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

  System information as of Mon Dec 12 11:46:13 UTC 2016

  System load: 0.0               Memory usage: 2%   Processes:       53
  Usage of /:  4.0% of 19.65GB   Swap usage:   0%   Users logged in: 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



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.

ubuntu@instance-test:~$ 
```

Basic functionalities: Storage Services

FIWARE Lab Cloud Hosting: storage functionalities

- Create volumes
- Attach volume to servers
- Configure the instance to detect the new volume
- Create containers in the object storage
- Upload objects into your containers
- Object Storage API

Create a volume



Create Volume

Volume Name *

volume1

Description

A volume

Size (GB) *

1

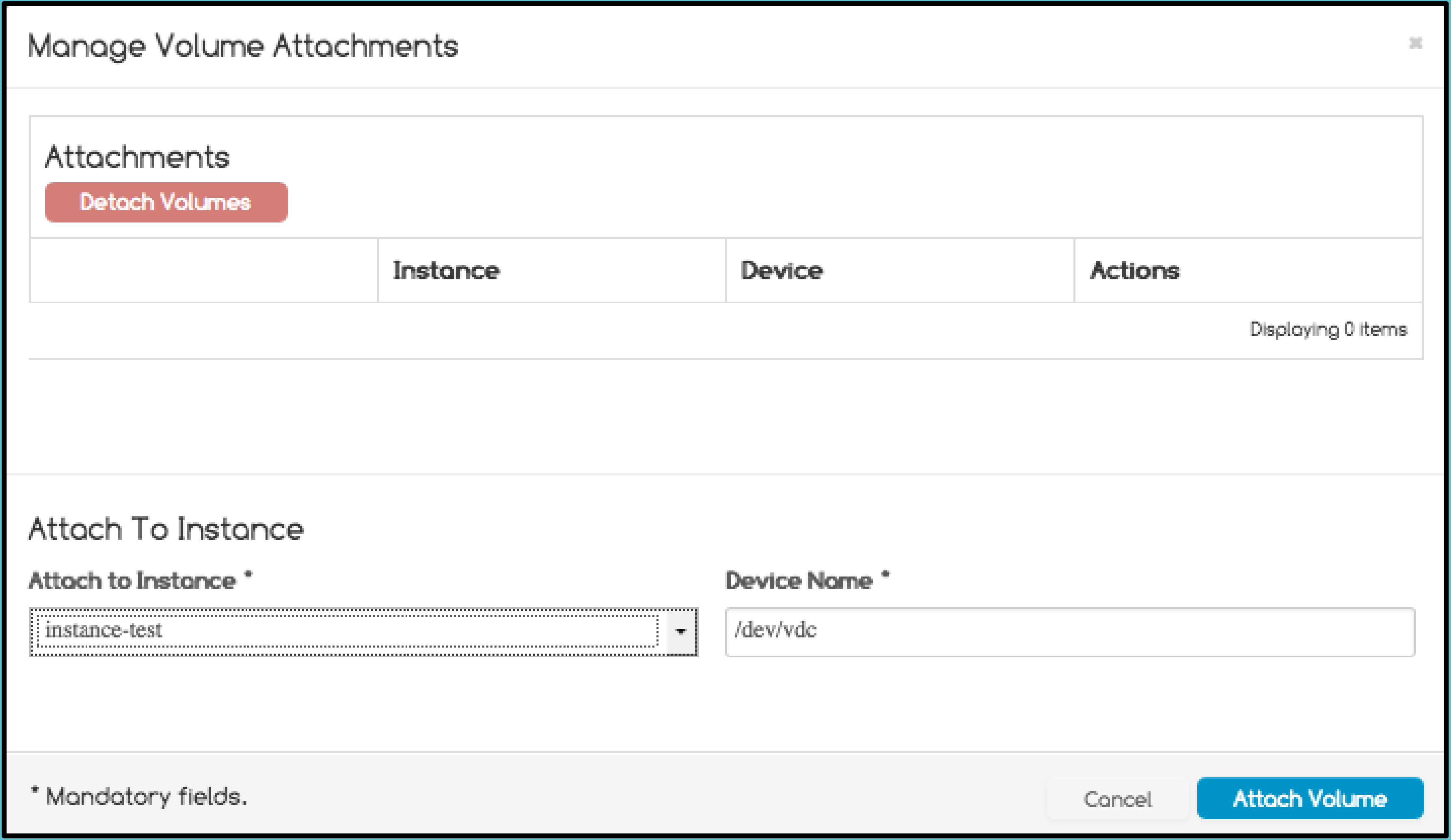
Description

Volumes are block devices that can be attached to instances.

* Mandatory fields.

×
Cancel
Create Volume

Attach a volume to an instance



Manage Volume Attachments

Attachments

Detach Volumes

	Instance	Device	Actions

Displaying 0 items

Attach To Instance

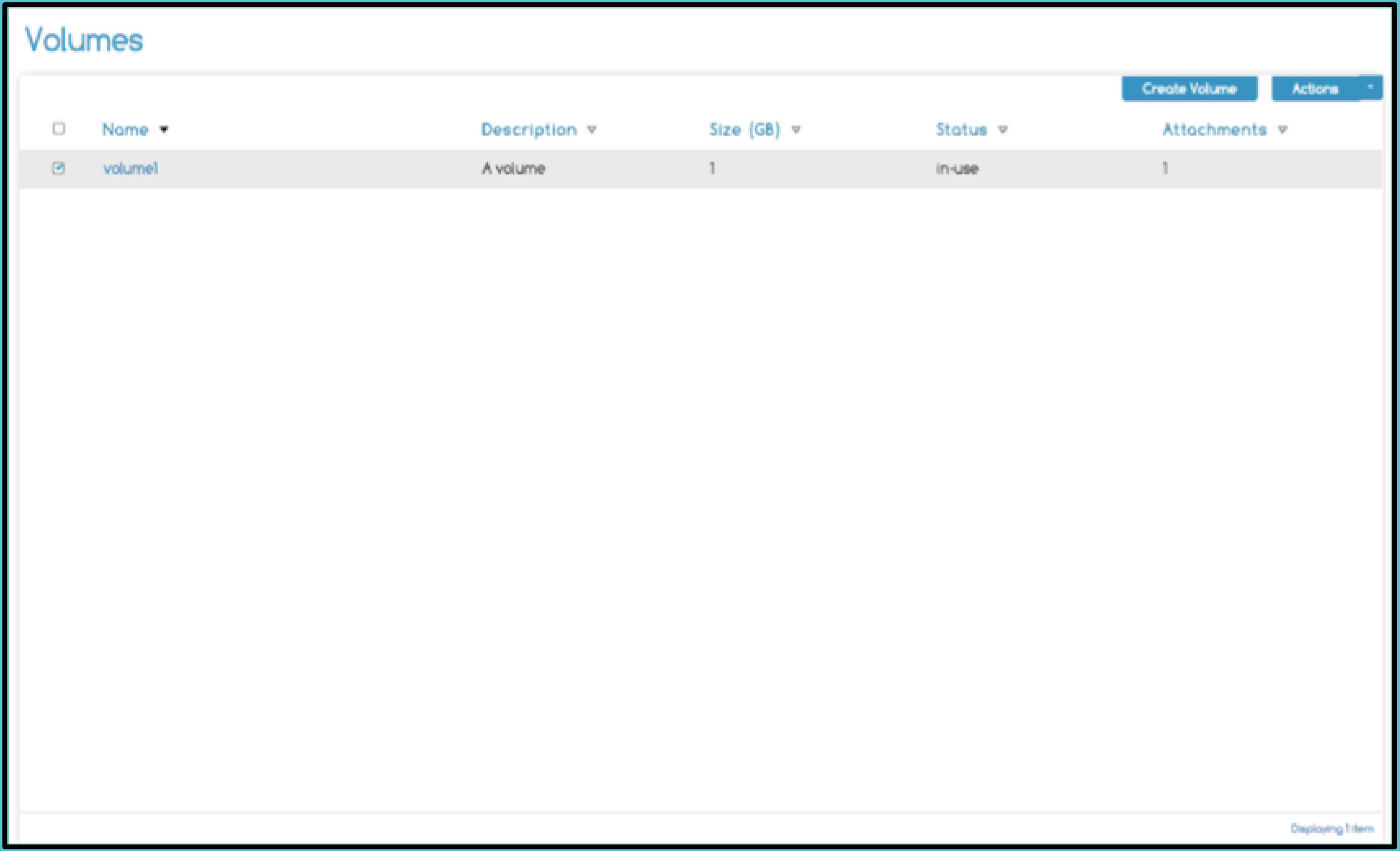
Attach to Instance *: instance-test

Device Name *: /dev/vdc

* Mandatory fields.

Cancel
Attach Volume

Volume attached

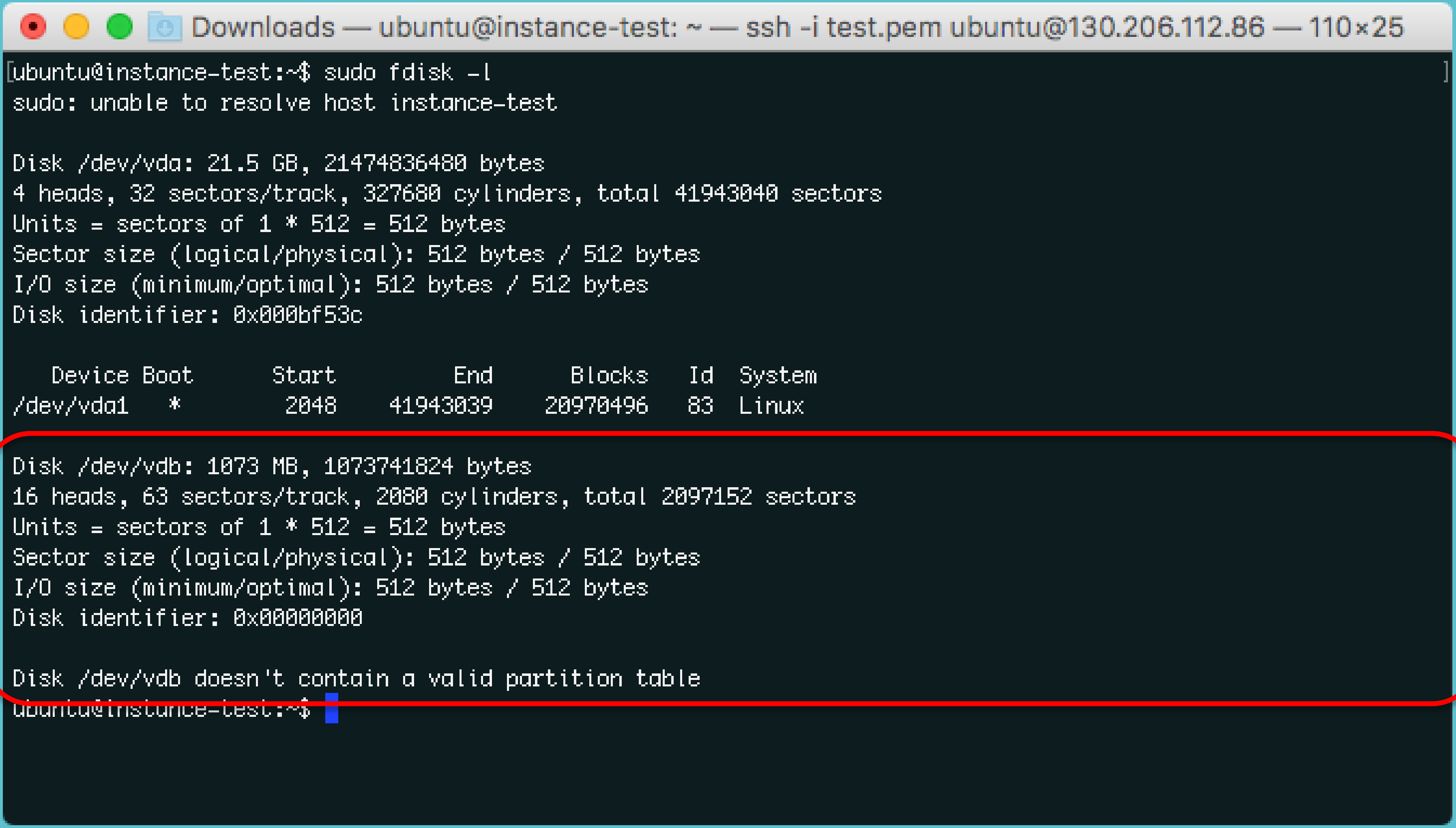


Volumes
Create Volume
Actions

☐	Name	Description	Size (GB)	Status	Attachments
☑	volume1	A volume	1	in-use	1

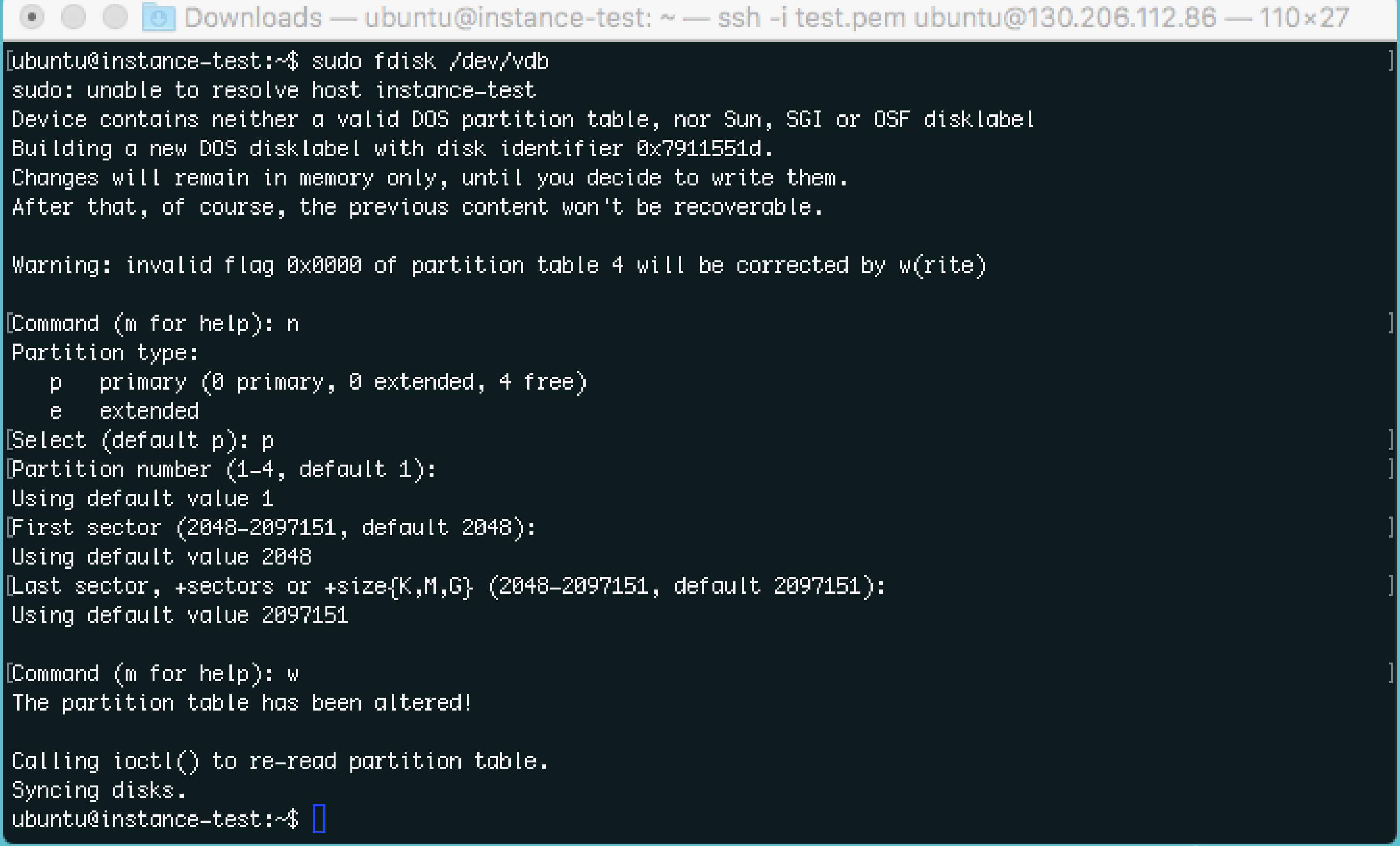
Displaying 1 item

See the new volume with fdisk


Downloads — ubuntu@instance-test: ~ — ssh -i test.pem ubuntu@130.206.112.86 — 110×25

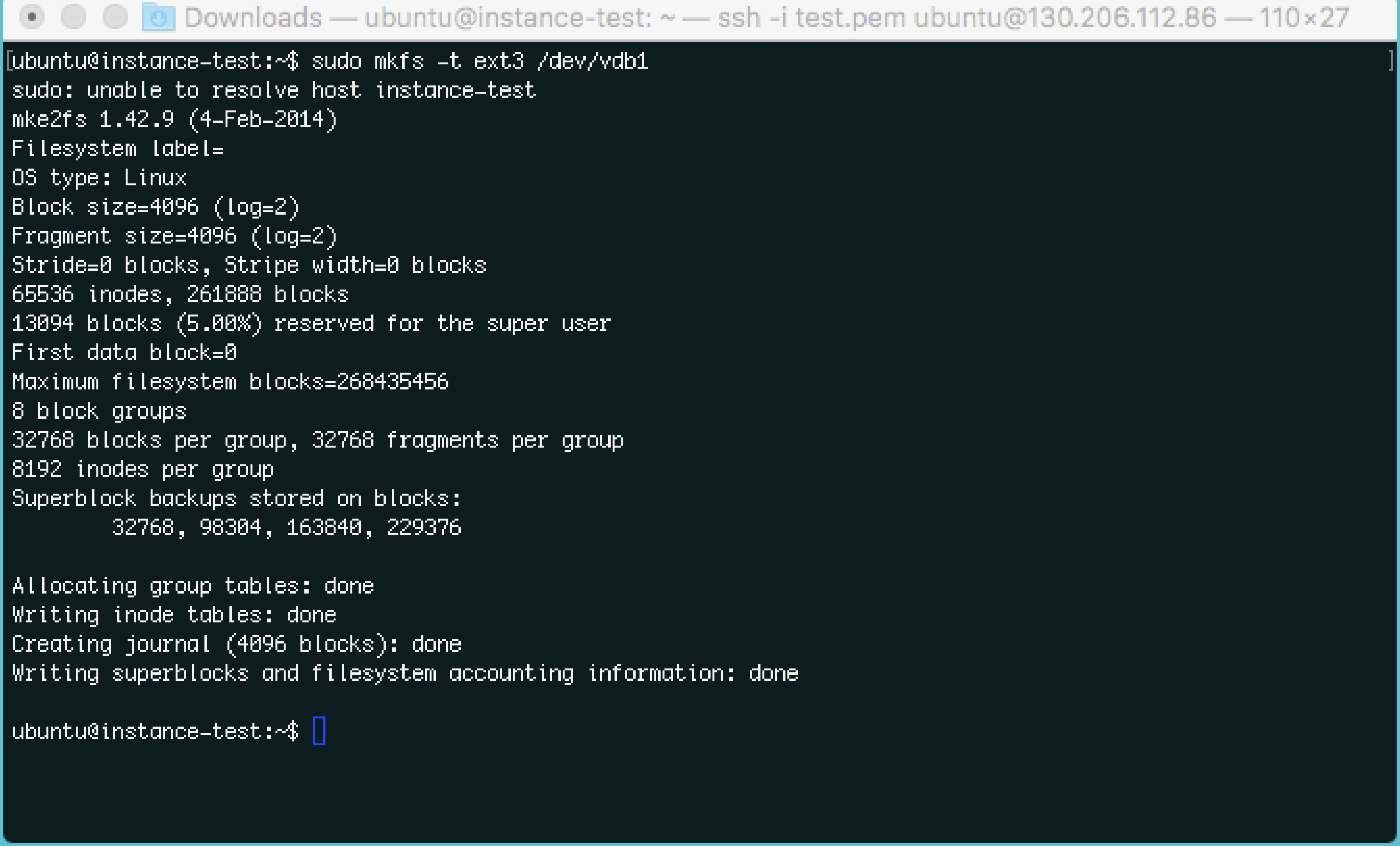
```
[ubuntu@instance-test:~$ sudo fdisk -l
sudo: unable to resolve host instance-test

Disk /dev/vda: 21.5 GB, 21474836480 bytes
4 heads, 32 sectors/track, 327680 cylinders, total 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000bf53c

   Device Boot      Start         End      Blocks   Id  System
/dev/vda1   *        2048    41943039    20970496   83  Linux

Disk /dev/vdb: 1073 MB, 1073741824 bytes
16 heads, 63 sectors/track, 2080 cylinders, total 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/vdb doesn't contain a valid partition table
ubuntu@instance-test:~$
```

Create a partition table on our new volume


Downloads — ubuntu@instance-test: ~ — ssh -i test.pem ubuntu@130.206.112.86 — 110×27

```
[ubuntu@instance-test:~$ sudo fdisk /dev/vdb
 sudo: unable to resolve host instance-test
 Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
 Building a new DOS disklabel with disk identifier 0x7911551d.
 Changes will remain in memory only, until you decide to write them.
 After that, of course, the previous content won't be recoverable.

 Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)

[Command (m for help): n
 Partition type:
    p   primary (0 primary, 0 extended, 4 free)
    e   extended
[Select (default p): p
[Partition number (1-4, default 1):
 Using default value 1
[First sector (2048-2097151, default 2048):
 Using default value 2048
[Last sector, +sectors or +size{K,M,G} (2048-2097151, default 2097151):
 Using default value 2097151

[Command (m for help): w
 The partition table has been altered!

 Calling ioctl() to re-read partition table.
 Syncing disks.
 ubuntu@instance-test:~$ 
```

Create a ext3 file system


Downloads — ubuntu@instance-test: ~ — ssh -i test.pem ubuntu@130.206.112.86 — 110×27

```
[ubuntu@instance-test:~$ sudo mkfs -t ext3 /dev/vdb1
sudo: unable to resolve host instance-test
mke2fs 1.42.9 (4-Feb-2014)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 261888 blocks
13094 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

ubuntu@instance-test:~$ 
```

Mounting our new volume.

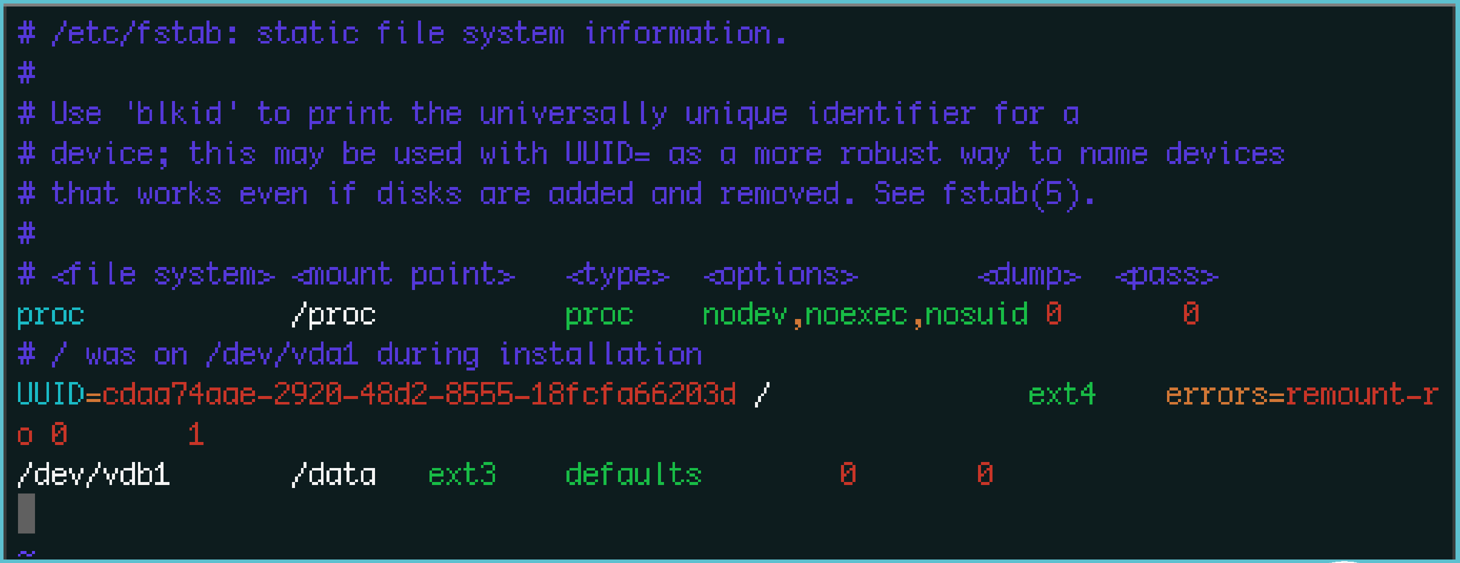
- Create a mount point called /data and mount /dev/vdb1

  $ sudo mkdir /data

  $ sudo mount /dev/vdb1 /data

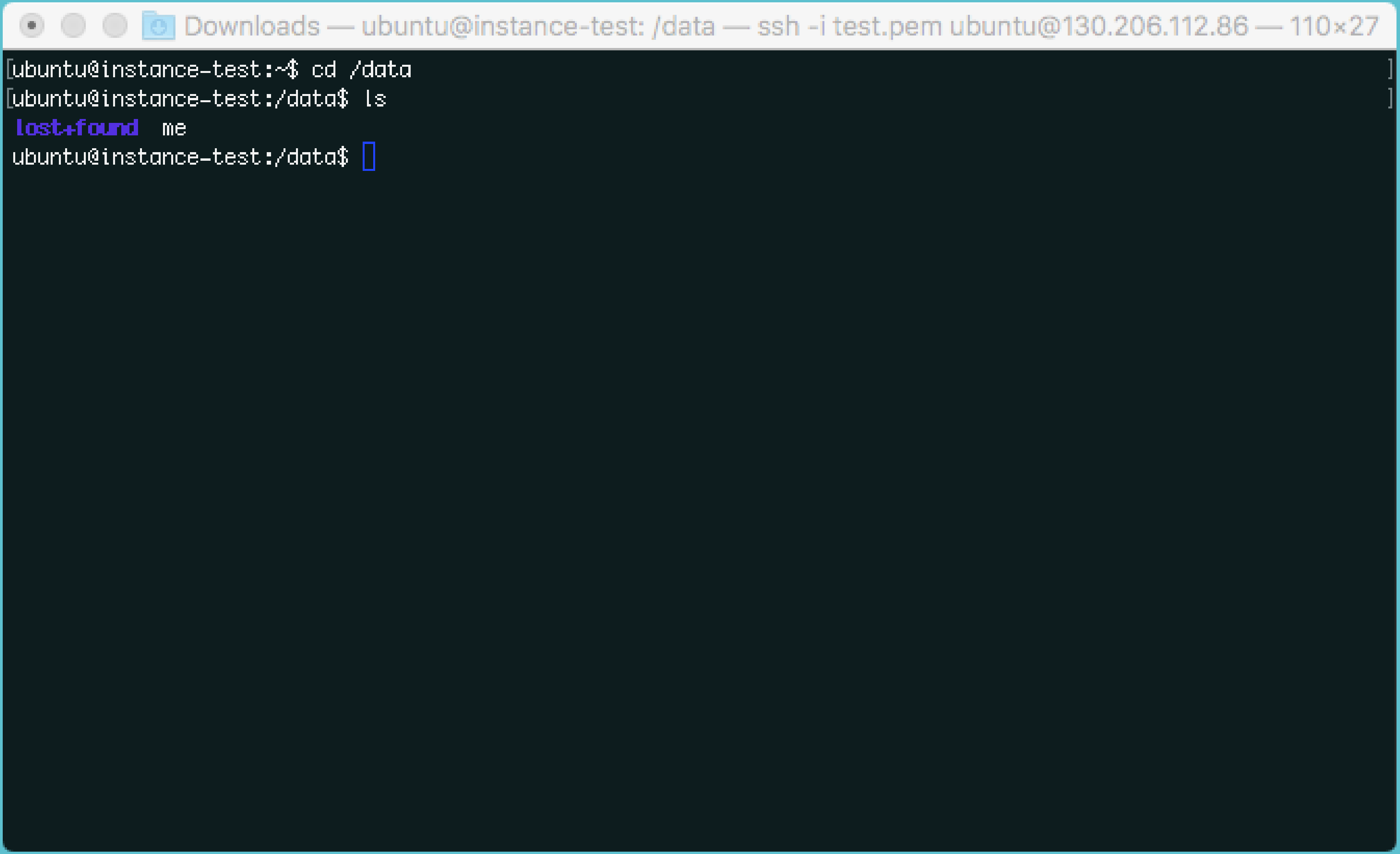
- At this point, the volume's storage is accessible to Linux.

- Modify /etc/fstab to allow remounts the volume on restarts.



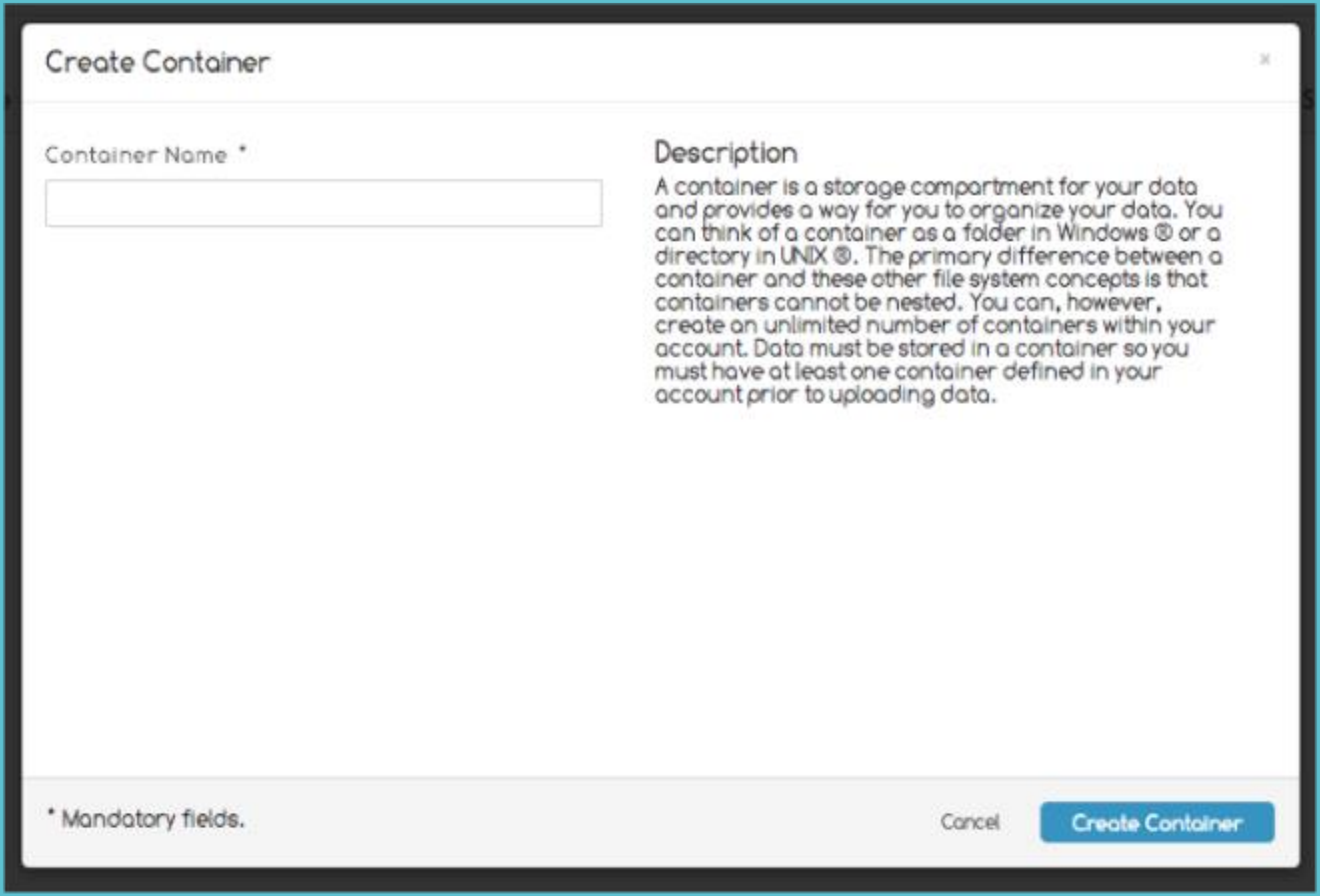
```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
proc            /proc           proc    nodev,noexec,nosuid 0       0
# / was on /dev/vda1 during installation
UUID=cdaa74aae-2920-48d2-8555-18fcfa66203d /               ext4    errors=remount-r
o 0       1
/dev/vdb1       /data   ext3    defaults        0       0

~
```

Check the created volume


Downloads — ubuntu@instance-test: /data — ssh -i test.pem ubuntu@130.206.112.86 — 110×27

```
[ubuntu@instance-test:~$ cd /data
[ubuntu@instance-test:/data$ ls
 lost+found  me
ubuntu@instance-test:/data$ 
```

Object Storage: Create a container

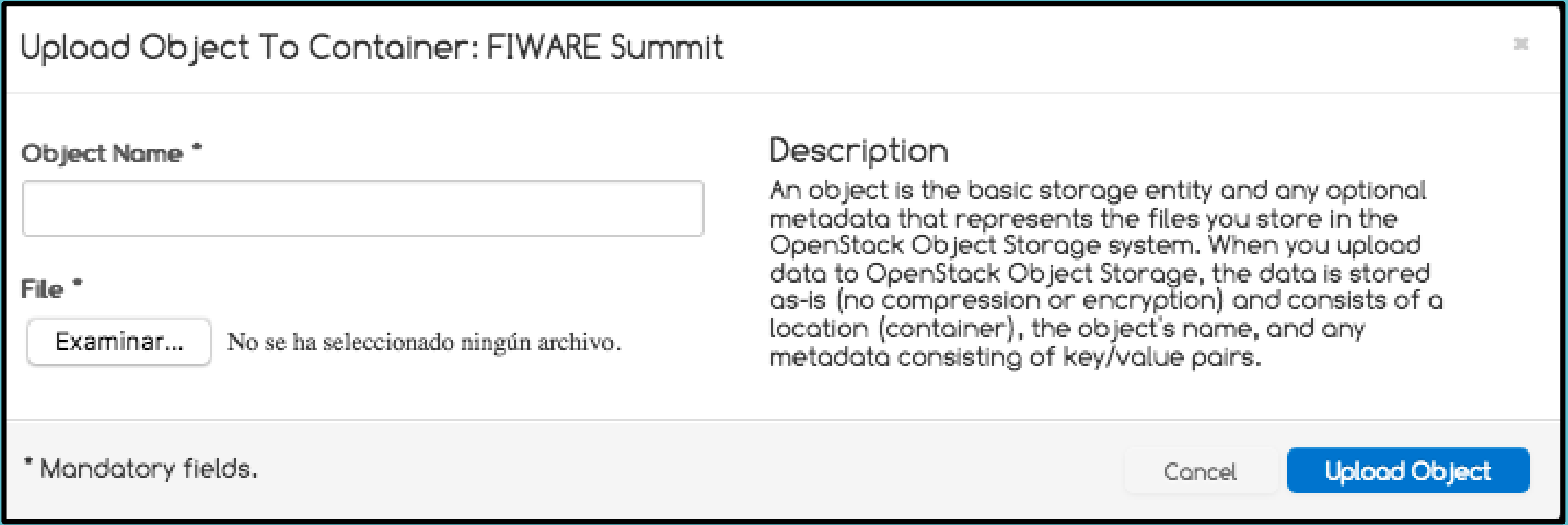


Description

A container is a storage compartment for your data and provides a way for you to organize your data. You can think of a container as a folder in Windows ® or a directory in UNIX ®. The primary difference between a container and these other file system concepts is that containers cannot be nested. You can, however, create an unlimited number of containers within your account. Data must be stored in a container so you must have at least one container defined in your account prior to uploading data.

* Mandatory fields.

Upload an object into the container



Upload Object To Container: FIWARE Summit

Object Name *

File *

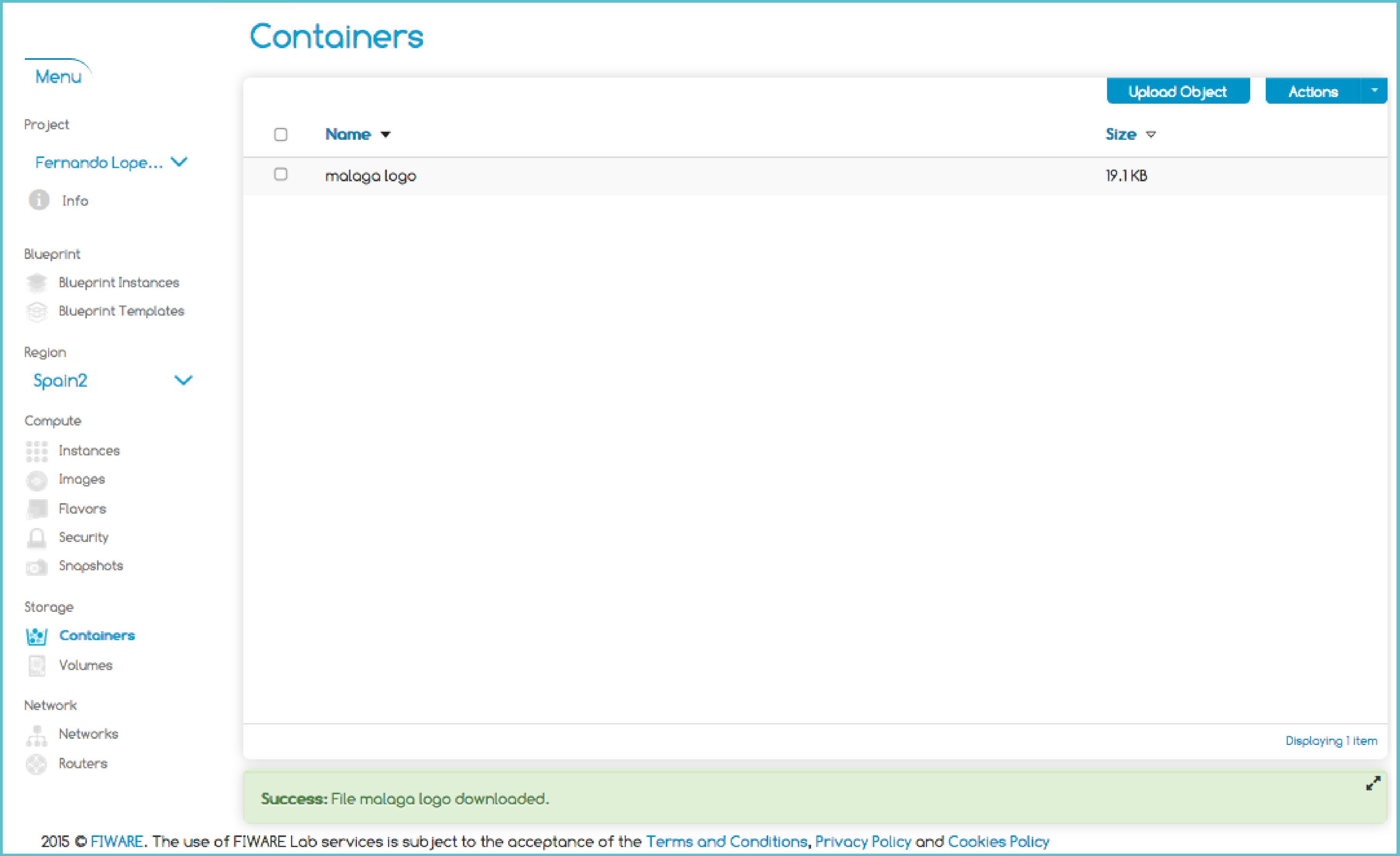
No se ha seleccionado ningún archivo.

Description

An object is the basic storage entity and any optional metadata that represents the files you store in the OpenStack Object Storage system. When you upload data to OpenStack Object Storage, the data is stored as-is (no compression or encryption) and consists of a location (container), the object's name, and any metadata consisting of key/value pairs.

* Mandatory fields.

Upload an object to the container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Routers
Upload Object
Actions

☐	Name	Size
☐	malaga logo	19.1 KB

Displaying 1 item

Success: File malaga logo downloaded.

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Extended functionalities: Network Services

FIWARE Lab Cloud Hosting: networks functionalities

- Create your own network
- Create your subnet associate to the previous network
- Create a router
- Set gateway

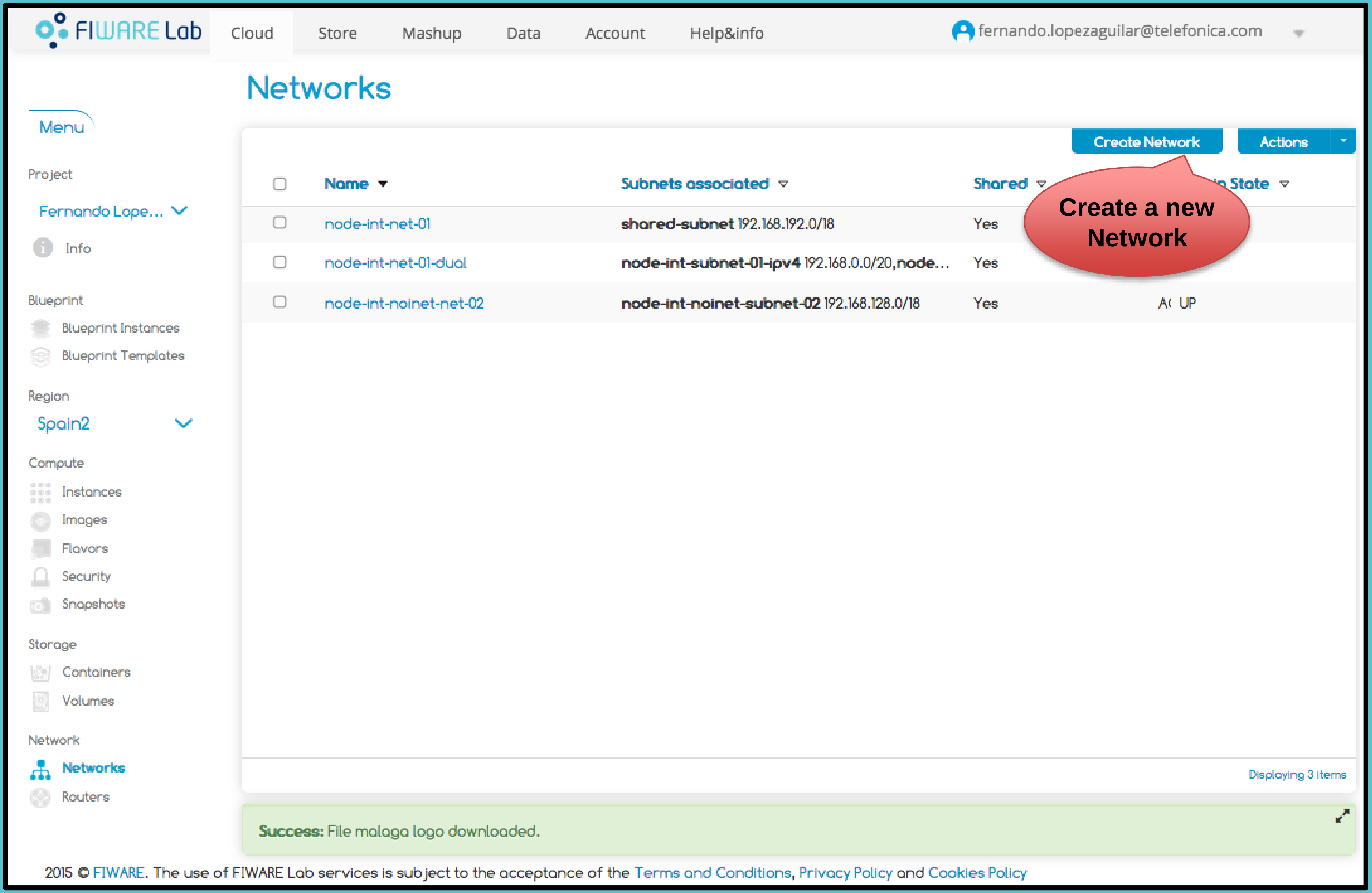
FIWARE Lab Cloud Hosting: networks functionalities

- Assign subnet
- Deploy your instance
- Assign public IP to your instance
- Check the new instance.

FIWARE Lab Cloud Hosting: working with networks

- Multi-tenancy
  - High or Low?
- Do I need to isolate tenants?
  - Even if you trust them, you might want isolation.
  - Tenant creates his own network(s) and router(s) allowing complex network topologies for multi-tier applications.

Create your own network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Networks
Routers
Create Network
Actions

Networks

☐	Name	Subnets associated	Shared		n State
☐	node-int-net-01	**shared-subnet** 192.168.192.0/18	Yes		
☐	node-int-net-01-dual	**node-int-subnet-01-ipv4** 192.168.0.0/20,**node...**	Yes		
☐	node-int-noinet-net-02	**node-int-noinet-subnet-02** 192.168.128.0/18	Yes	A(	UP

Displaying 3 items

Success: File malaga logo downloaded.

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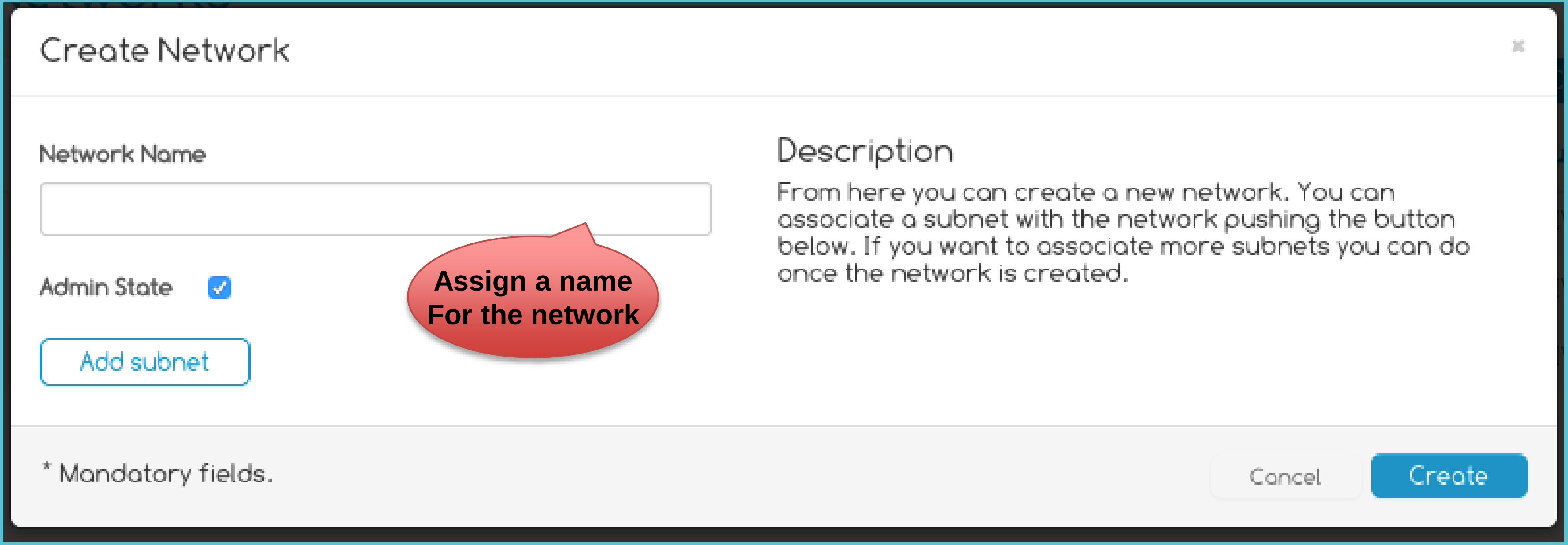
Create a new Network

Create your own network



Create Network
×
Network Name
Admin State ☑
Add subnet
Cancel
Create

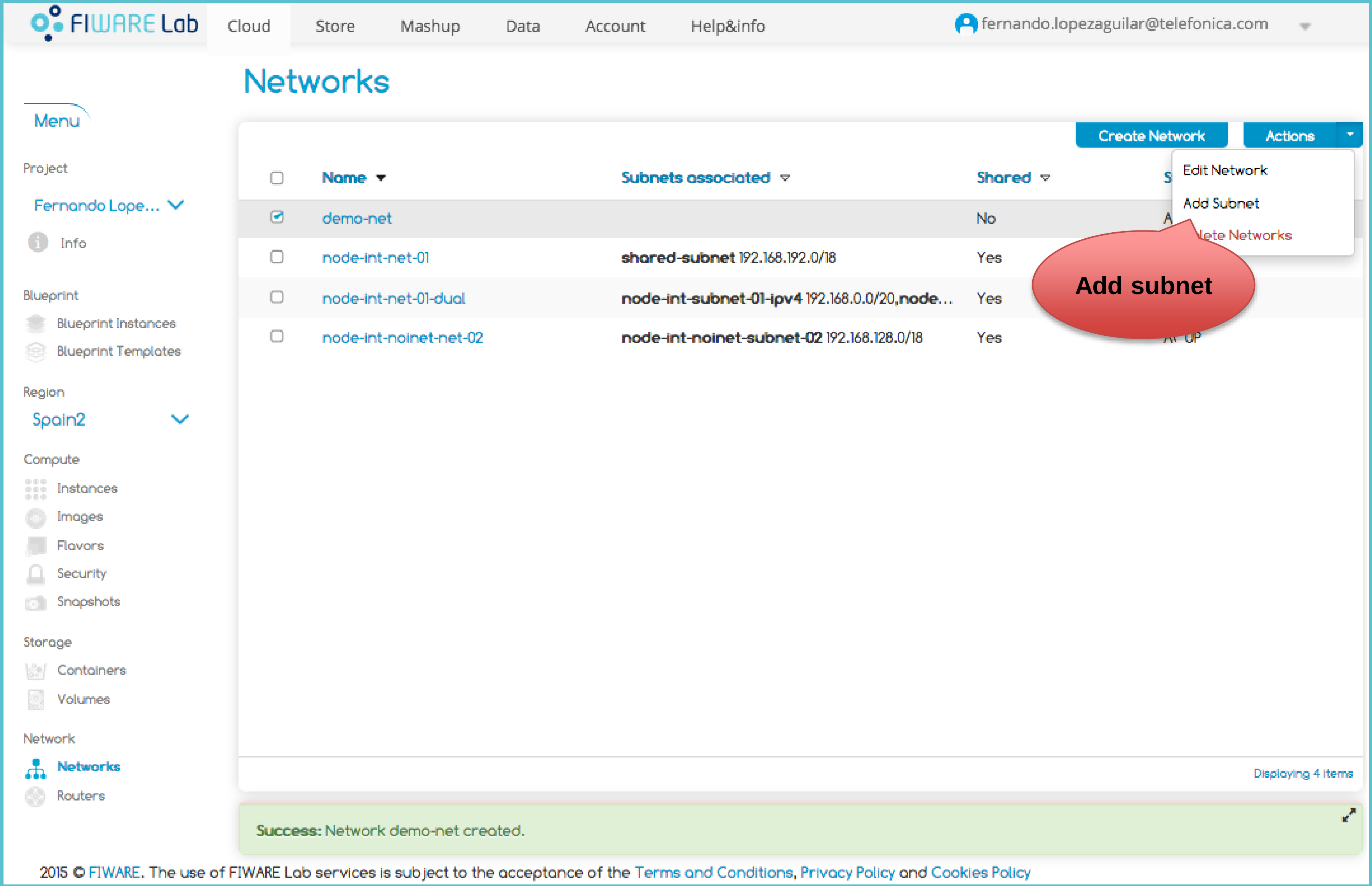
Description

From here you can create a new network. You can associate a subnet with the network pushing the button below. If you want to associate more subnets you can do once the network is created.

* Mandatory fields.

Assign a name
For the network

Add subnet associate to the previous network


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fernando.lopezaguilar@telefonica.com
Menu
Project
Fernando Lope...
Info
Blueprint
Blueprint Instances
Blueprint Templates
Region
Spain2
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Containers
Volumes
Network
Networks
Routers
Create Network
Actions
Edit Network
Add Subnet
lete Networks

Networks

☐	Name	Subnets associated	Shared	S
☑	demo-net		No	A
☐	node-int-net-01	**shared-subnet** 192.168.192.0/18	Yes	
☐	node-int-net-01-dual	**node-int-subnet-01-ipv4** 192.168.0.0/20,**node...**	Yes	
☐	node-int-noinet-net-02	**node-int-noinet-subnet-02** 192.168.128.0/18	Yes	A UP

Displaying 4 items

Success: Network demo-net created.

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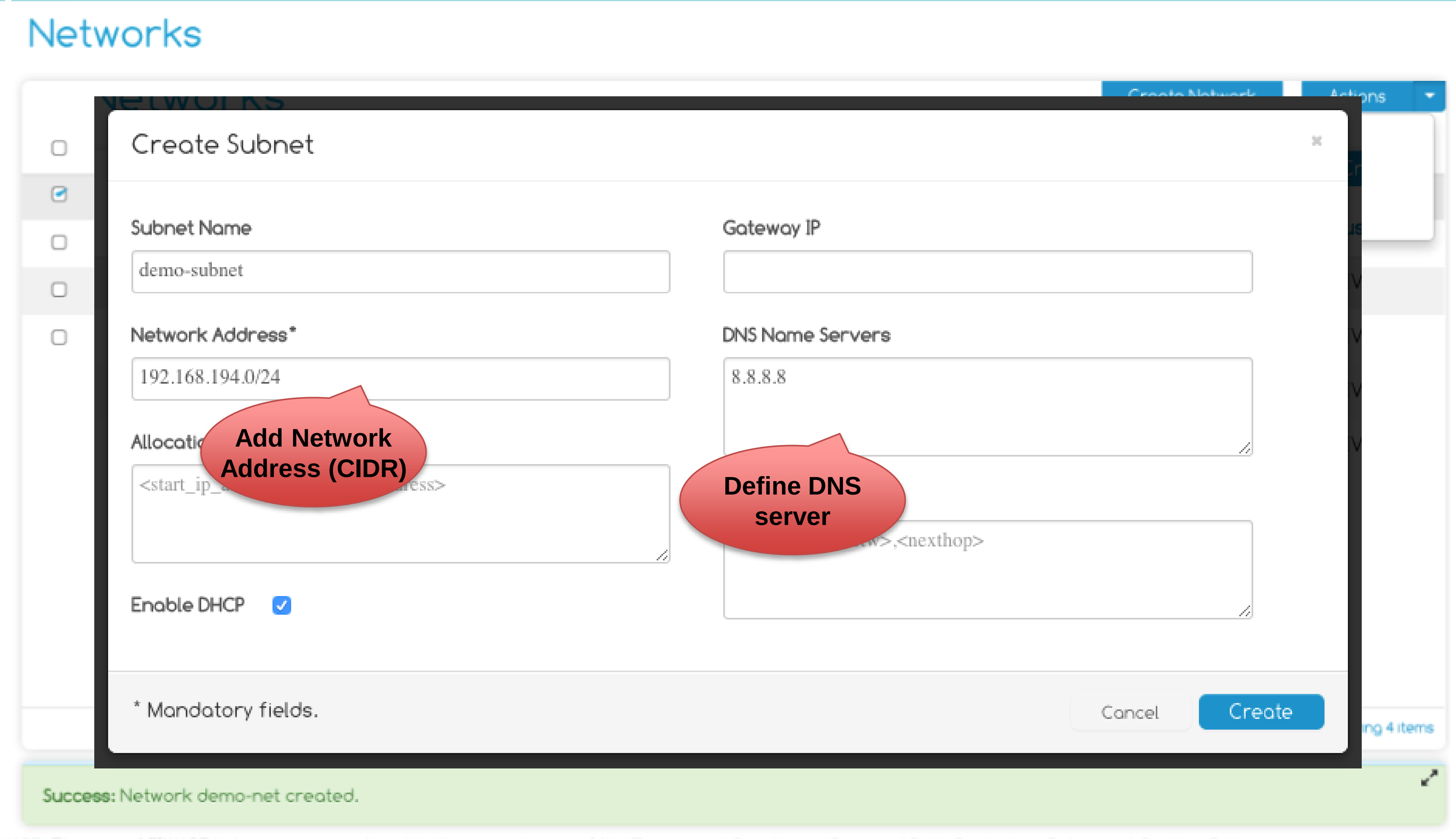
Add subnet

Add subnet associate to the previous network



Networks
Create Network
Actions

Create Subnet

Subnet Name: demo-subnet

Gateway IP:

Network Address*: 192.168.194.0/24

DNS Name Servers: 8.8.8.8

Allocati

<start_ip_a ress>

w>,<nexthop>

Enable DHCP ☑

* Mandatory fields.

Cancel
Create
×

Add Network Address (CIDR)

Define DNS server

Success: Network demo-net created.

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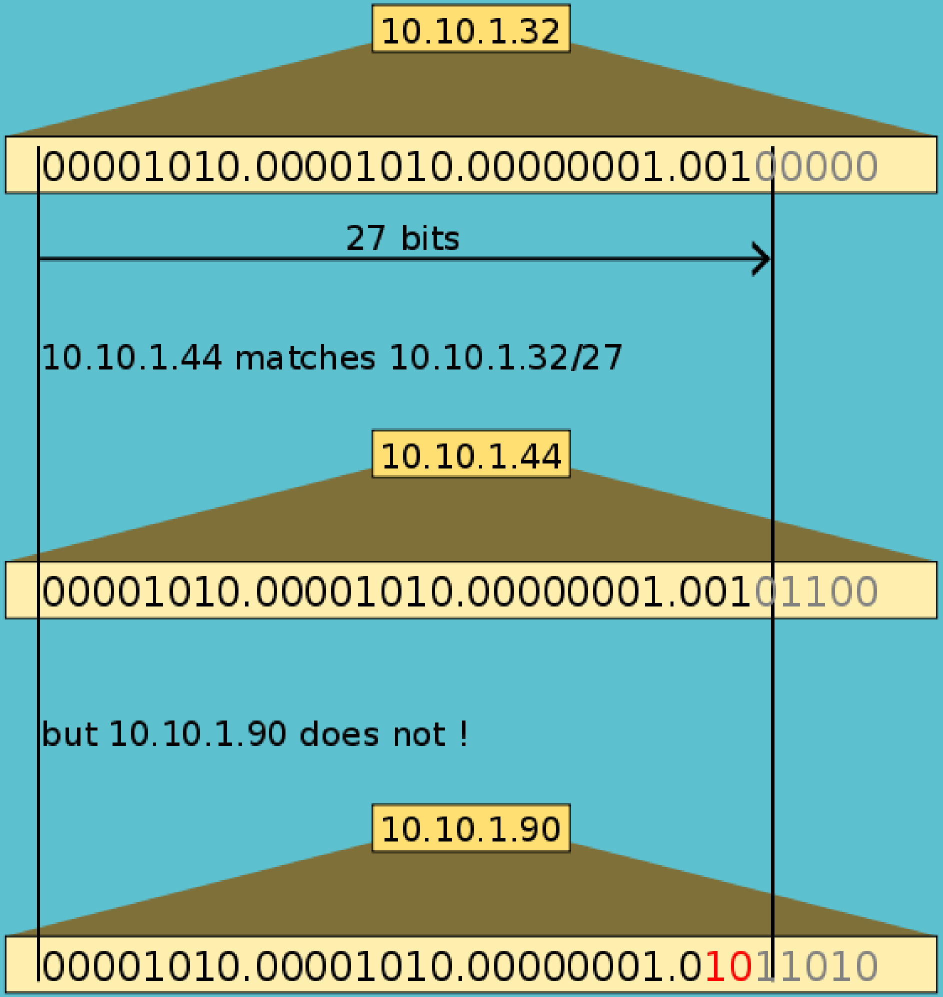
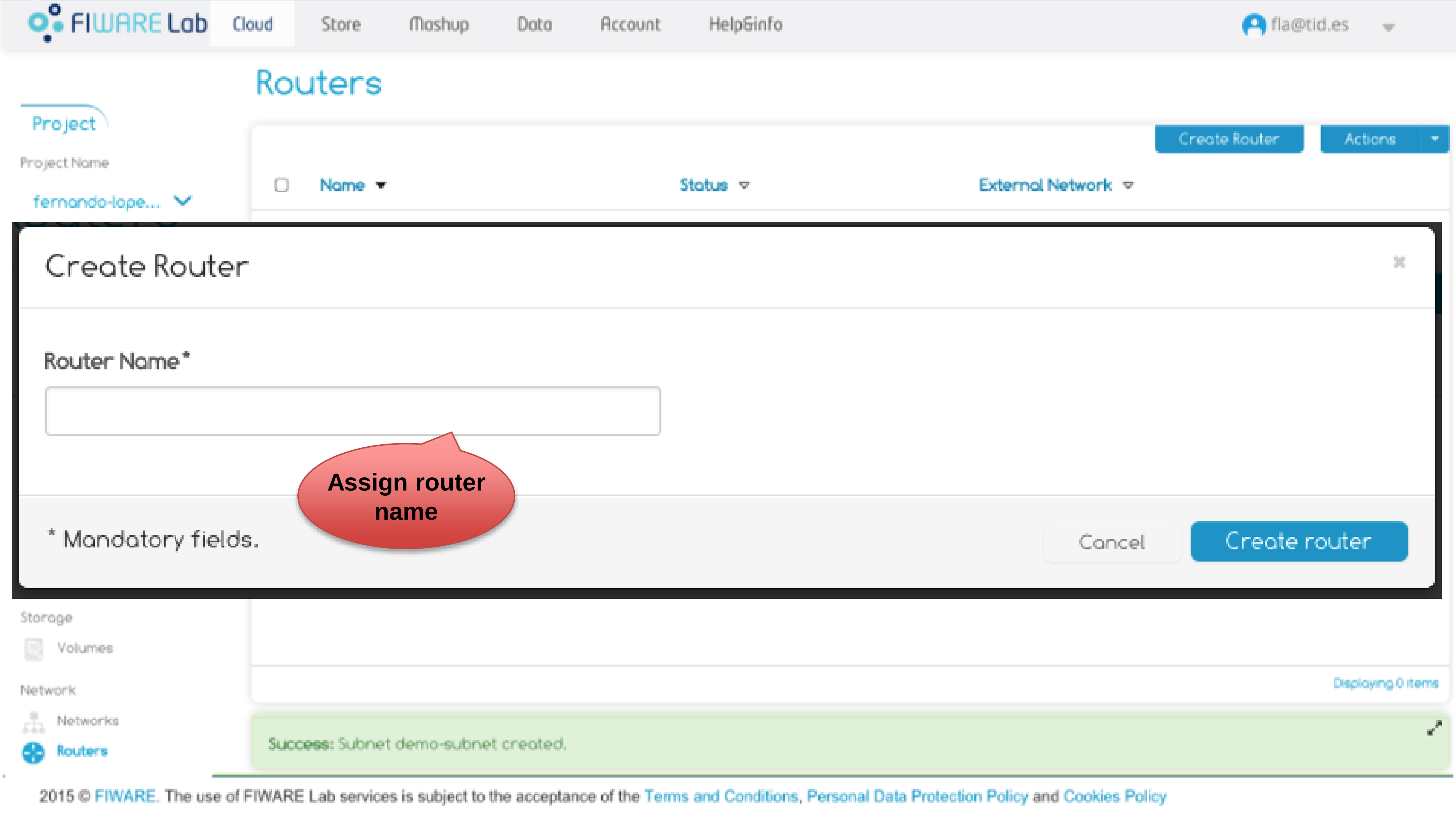
CIDR notation

10.10.1.32/27 represents:

- The given IPv4 address and its associated routing prefix 10.10.1.32, or equivalently.
- Its subnet mask 255.255.255.224, which has 27 leading 1-bits.


10.10.1.32
00001010.00001010.00000001.00100000
27 bits
10.10.1.44 matches 10.10.1.32/27
10.10.1.44
00001010.00001010.00000001.00101100
but 10.10.1.90 does not !
10.10.1.90
00001010.00001010.00000001.01011010

Create a router



FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fla@tid.es
Routers
Project
Project Name
fernando-lope...
Create Router
Actions
Name
Status
External Network
Create Router
Router Name *
* Mandatory fields.
Cancel
Create router
Storage
Volumes
Network
Networks
Routers
Displaying 0 items

Assign router name

Success: Subnet demo-subnet created.

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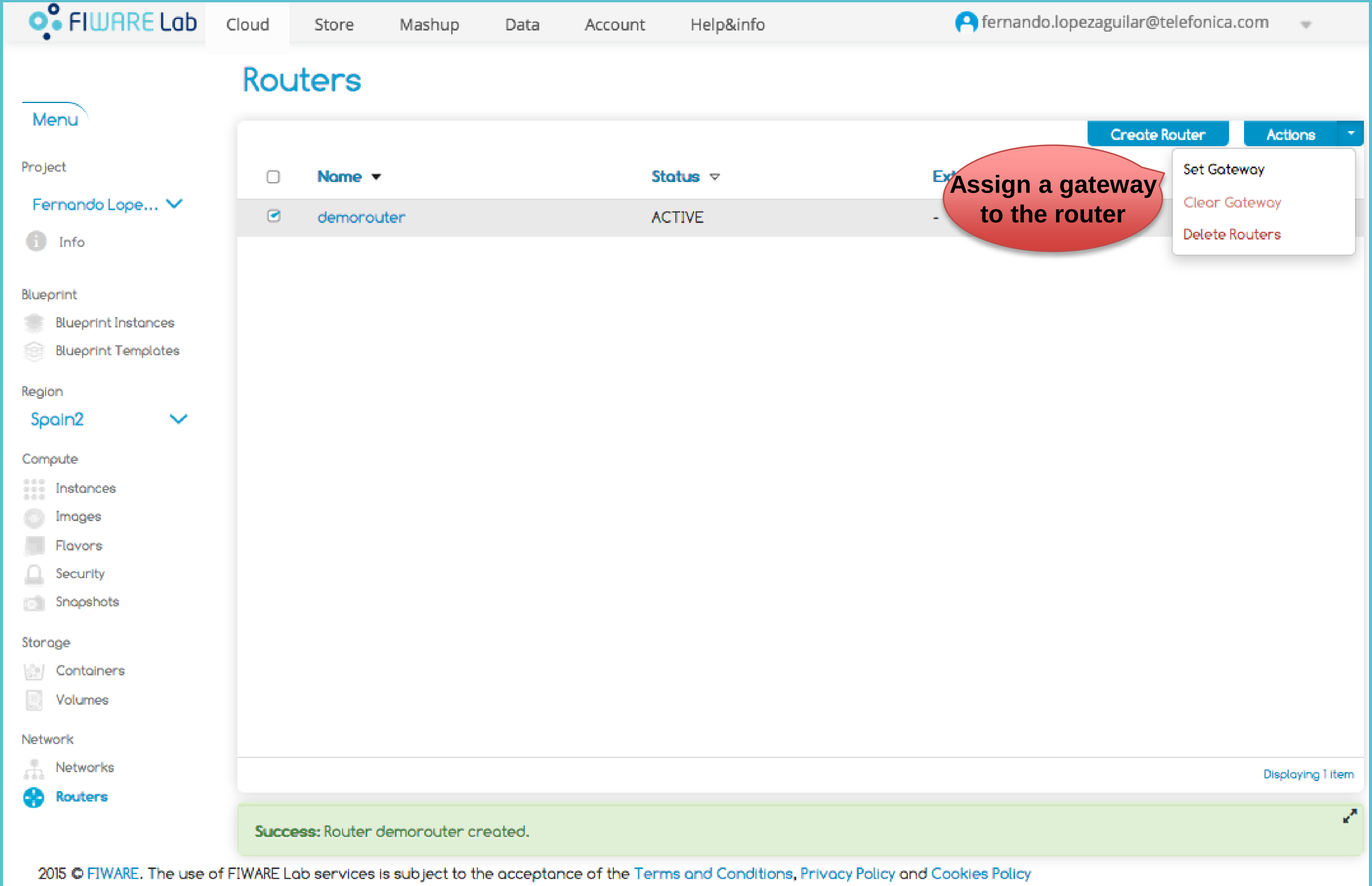
Set gateway


FIWARE Lab
Cloud
Store
Mashup
Data
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Help&info
fernando.lopezaguilar@telefonica.com
Menu
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Fernando Lope...
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Storage
Containers
Volumes
Network
Networks
Routers
Create Router
Actions
Set Gateway
Clear Gateway
Delete Routers

Routers

☐	Name	Status	Ex
☑	demorouter	ACTIVE	-

Displaying 1 item

Success: Router demorouter created.

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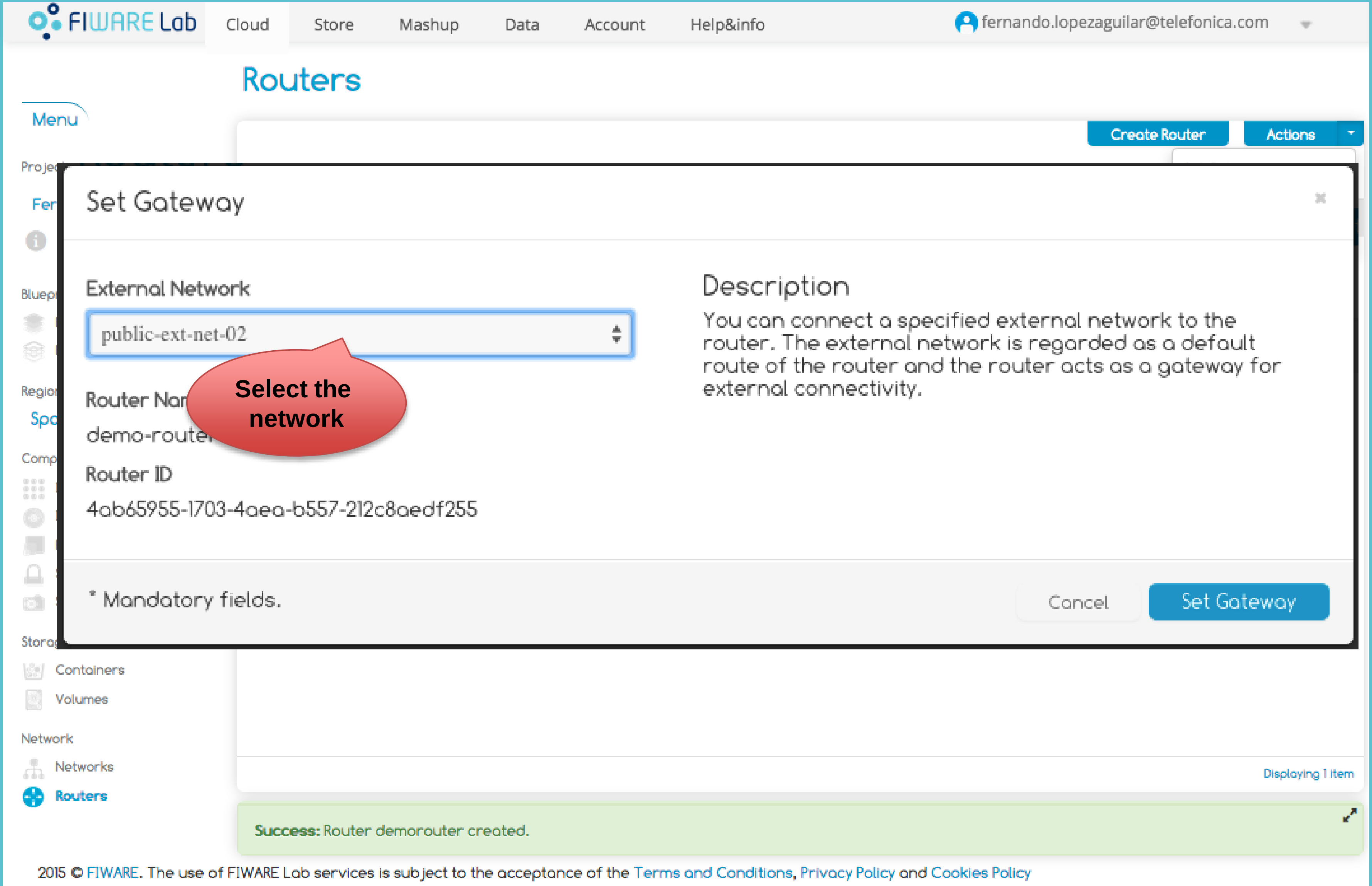
Assign a gateway to the router

Set gateway



FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fernando.lopezaguilar@telefonica.com
Routers
Menu
Create Router
Actions
Containers
Volumes
Network
Networks
Routers
Displaying 1 item

Set Gateway

External Network

public-ext-net-02

Router Name

demo-router

Router ID

4ab65955-1703-4aea-b557-212c8aedf255

Description

You can connect a specified external network to the router. The external network is regarded as a default route of the router and the router acts as a gateway for external connectivity.

* Mandatory fields.

Cancel
Set Gateway

Success: Router demorouter created.

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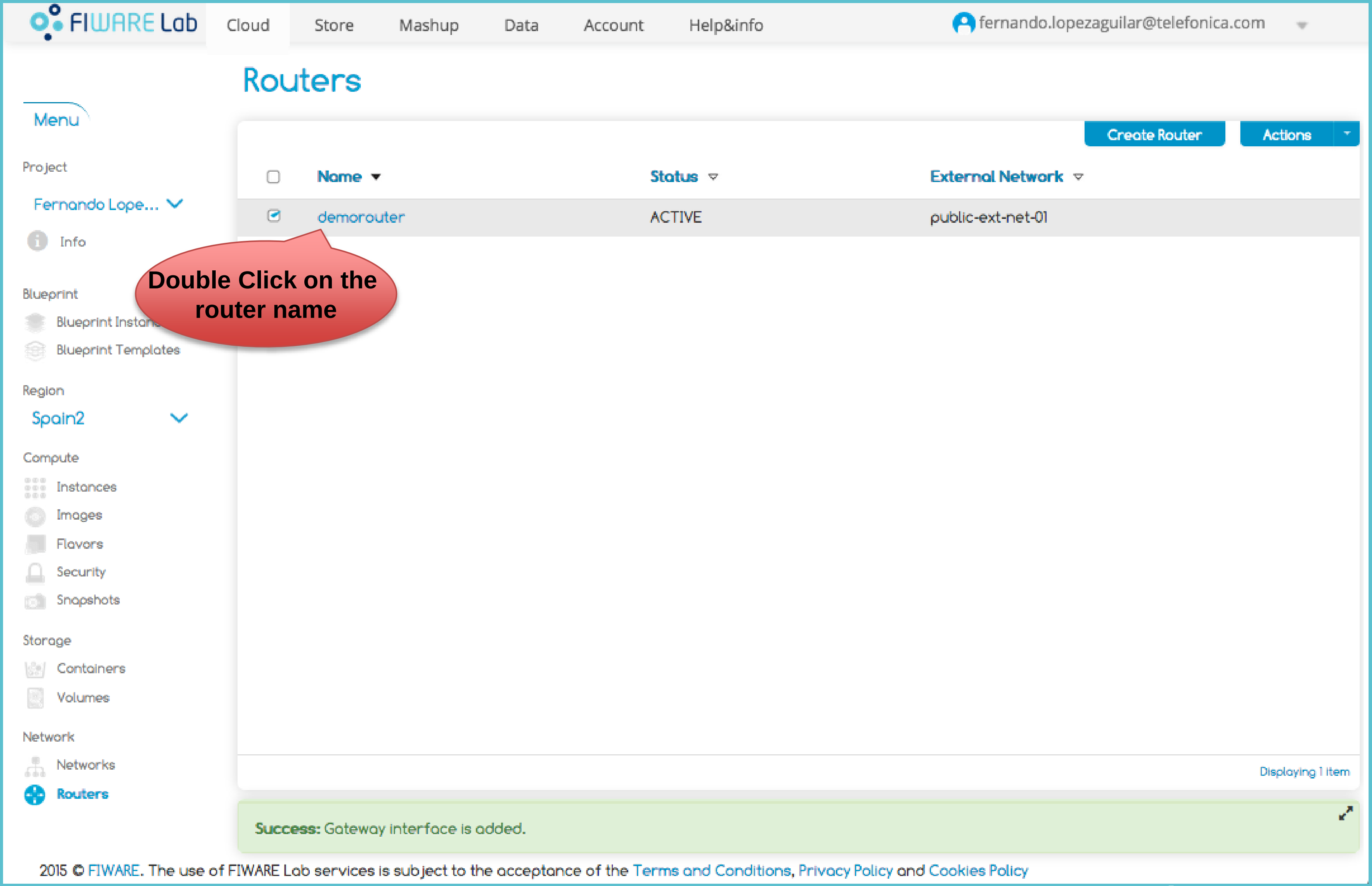
Select the network

Assign interface



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Instances
Images
Flavors
Security
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Storage
Containers
Volumes
Network
Networks
Routers
Create Router
Actions

Routers

☐	Name	Status	External Network
☑	demorouter	ACTIVE	public-ext-net-01

Displaying 1 item

Success: Gateway interface is added.

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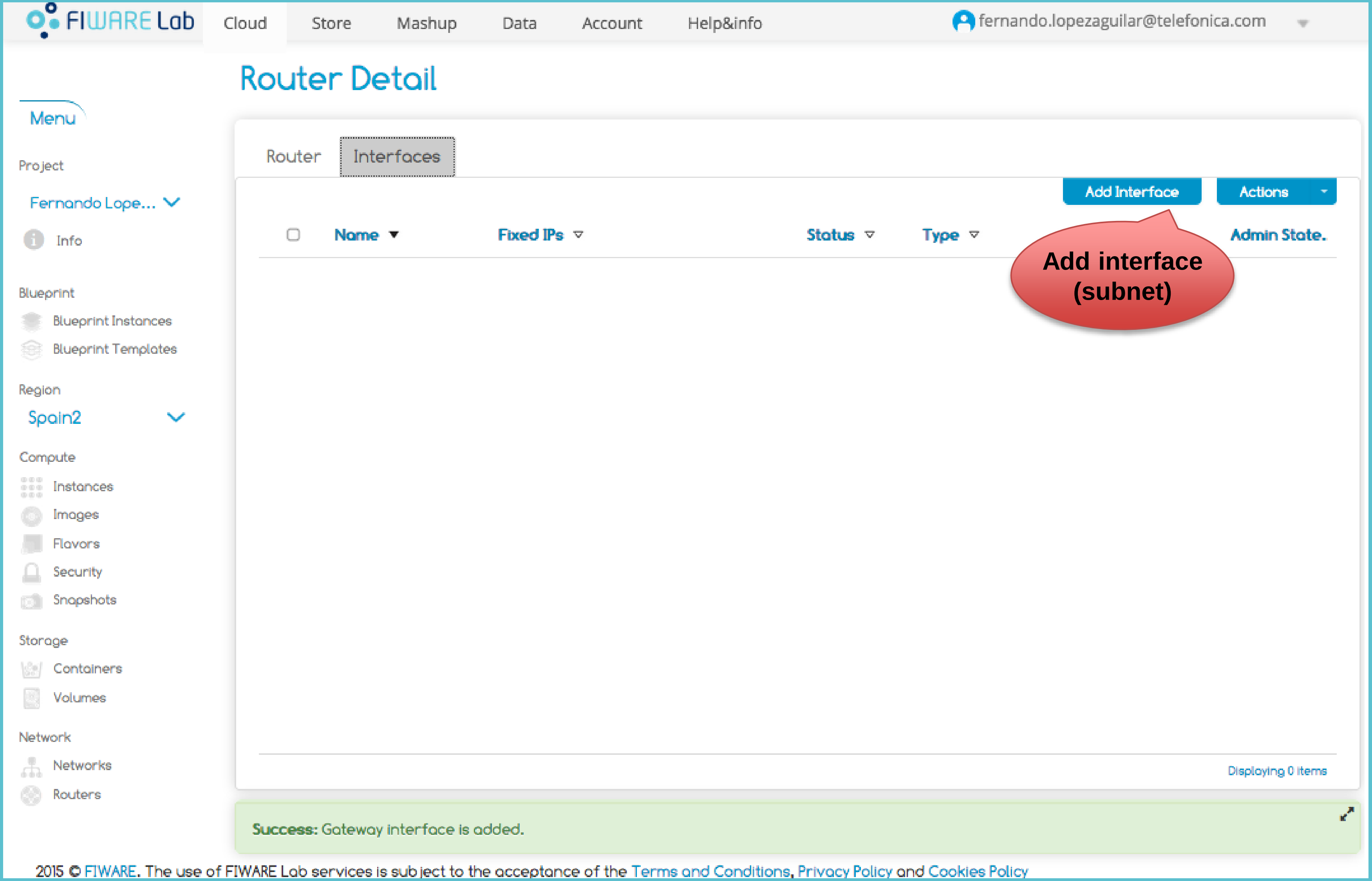
Double Click on the router name

Assign interface


FIWARE Lab
Cloud
Store
Mashup
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fernando.lopezaguilar@telefonica.com
Menu
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Fernando Lope...
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Security
Snapshots
Storage
Containers
Volumes
Network
Networks
Routers
Router
Interfaces
Add Interface
Actions
Name
Fixed IPs
Status
Type
Admin State.
Displaying 0 items

Router Detail

Success: Gateway interface is added.

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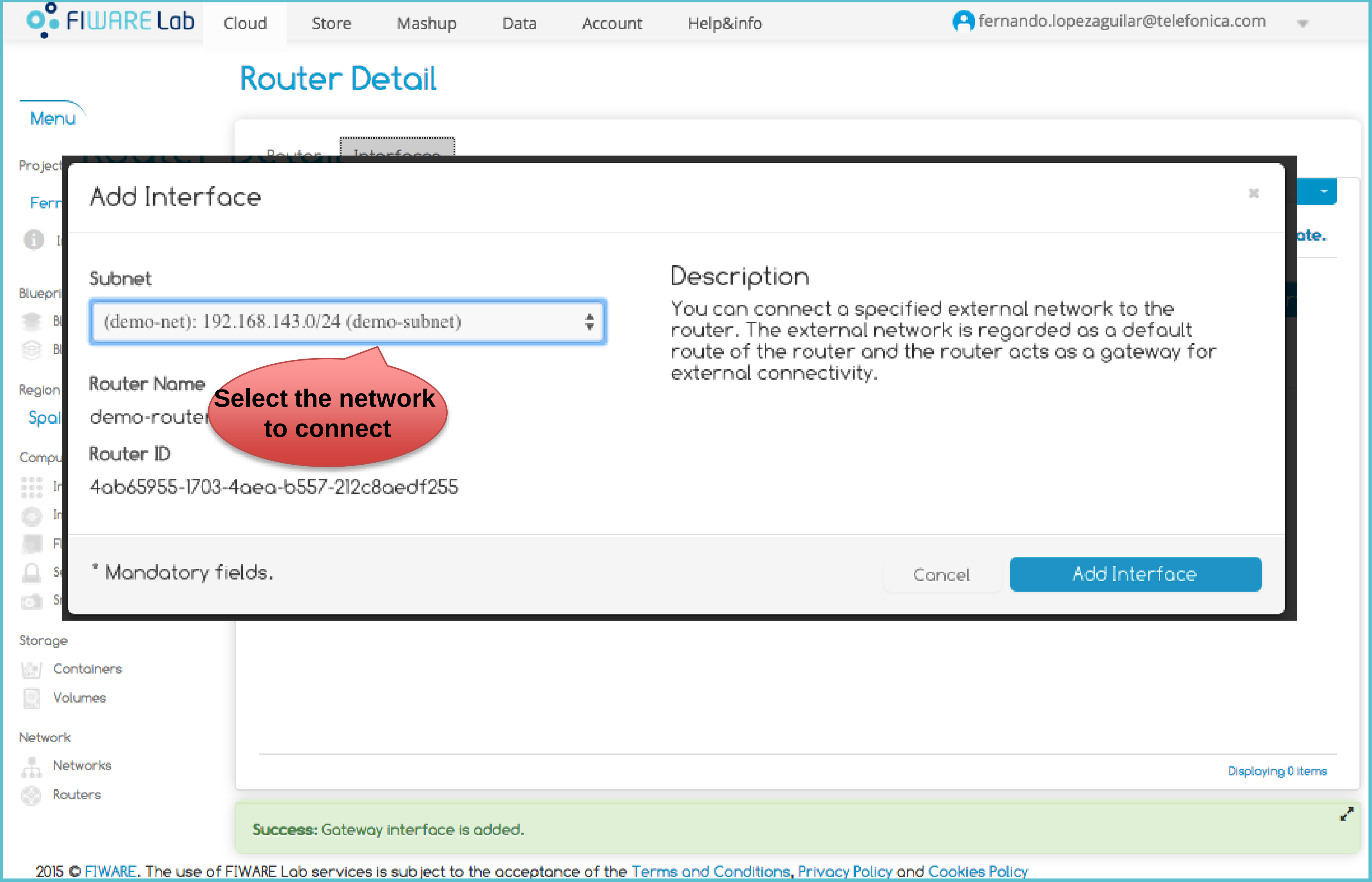
Add interface (subnet)

Assign interface



FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fernando.lopezaguilar@telefonica.com
Menu
Storage
Containers
Volumes
Network
Networks
Routers
Displaying 0 items

Router Detail

Add Interface

Subnet

(demo-net): 192.168.143.0/24 (demo-subnet)

Router Name

demo-router

Router ID

4ab65955-1703-4aea-b557-212c8aedf255

Description

You can connect a specified external network to the router. The external network is regarded as a default route of the router and the router acts as a gateway for external connectivity.

* Mandatory fields.

Cancel
Add Interface

Select the network to connect

Success: Gateway interface is added.

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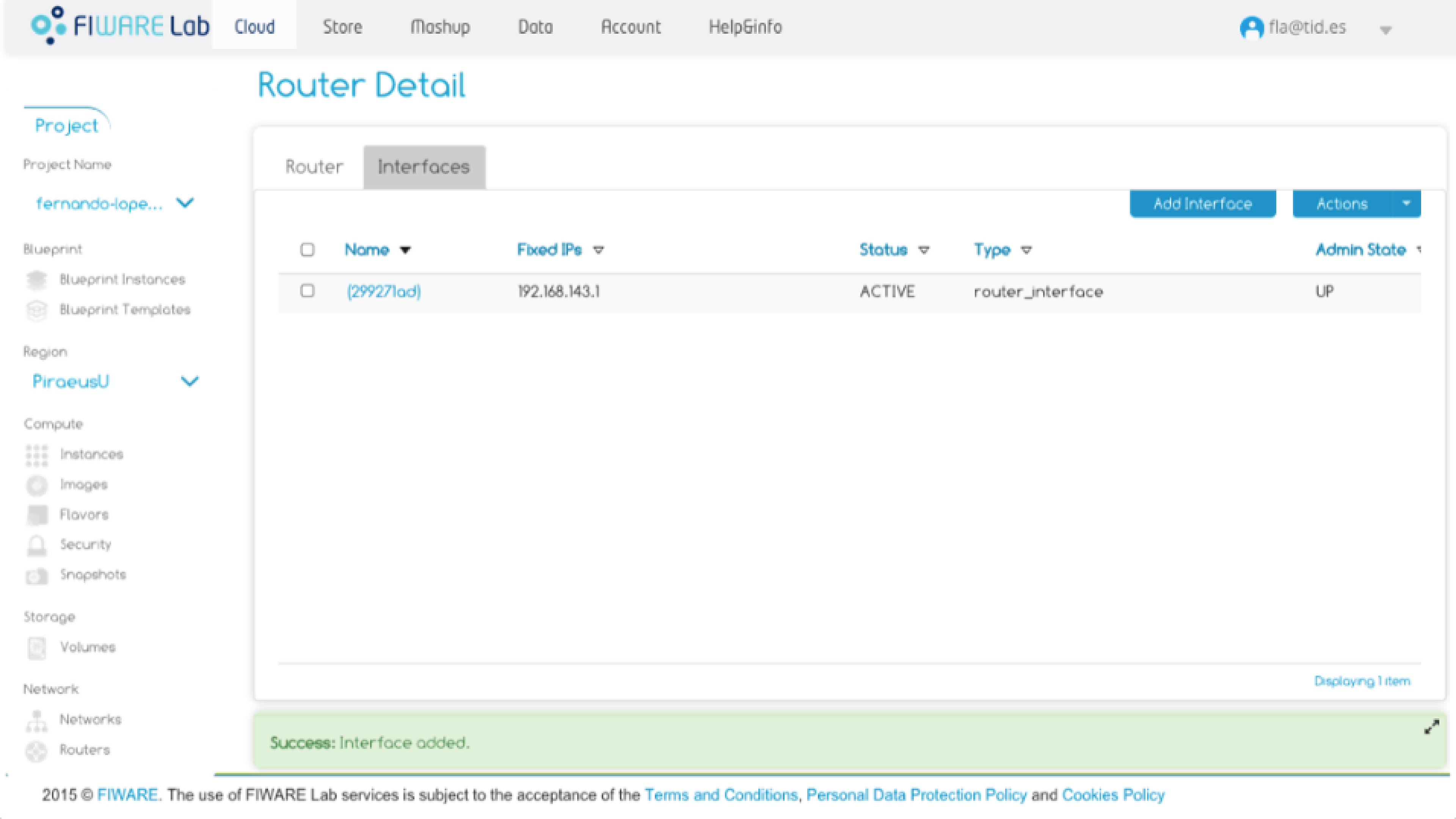
Assign interface


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fla@tid.es
Project
Project Name
fernando-lope...
Blueprint
Blueprint Instances
Blueprint Templates
Region
PiraeusU
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Volumes
Network
Networks
Routers
Router
Interfaces
Add Interface
Actions

Router Detail

☐	Name	Fixed IPs	Status	Type	Admin State
☐	(299271ad)	192.168.143.1	ACTIVE	router_interface	UP

Displaying 1 item

Success: Interface added.

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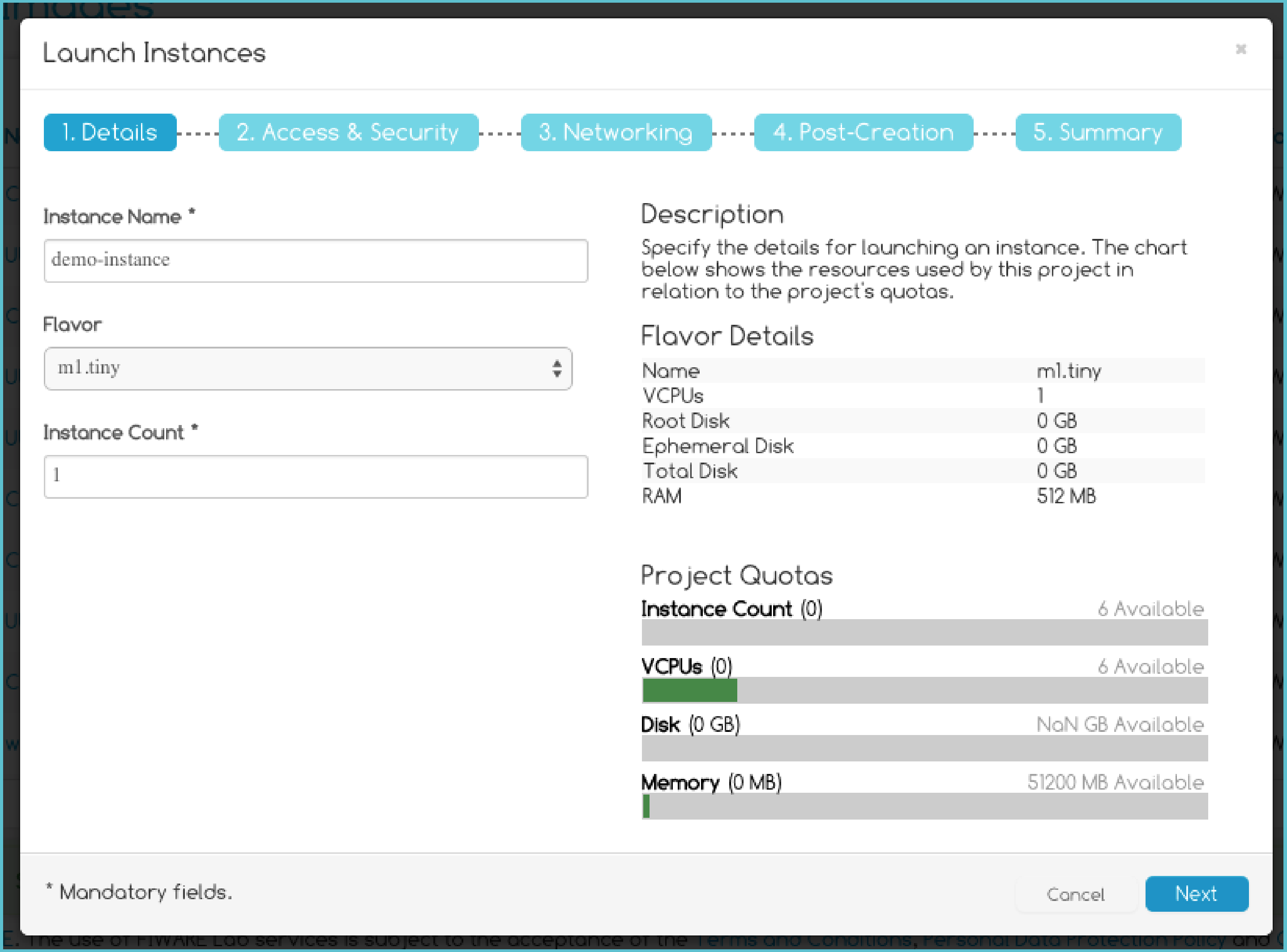
Deploy a new instance: Details



Launch Instances

×
1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Instance Name *

demo-instance

Flavor

m1.tiny

Instance Count *

1

Description

Specify the details for launching an instance. The chart below shows the resources used by this project in relation to the project's quotas.

Flavor Details

Name	m1.tiny
VCPUs	1
Root Disk	0 GB
Ephemeral Disk	0 GB
Total Disk	0 GB
RAM	512 MB

Project Quotas

Instance Count (0) 6 Available

VCPUs (0) 6 Available

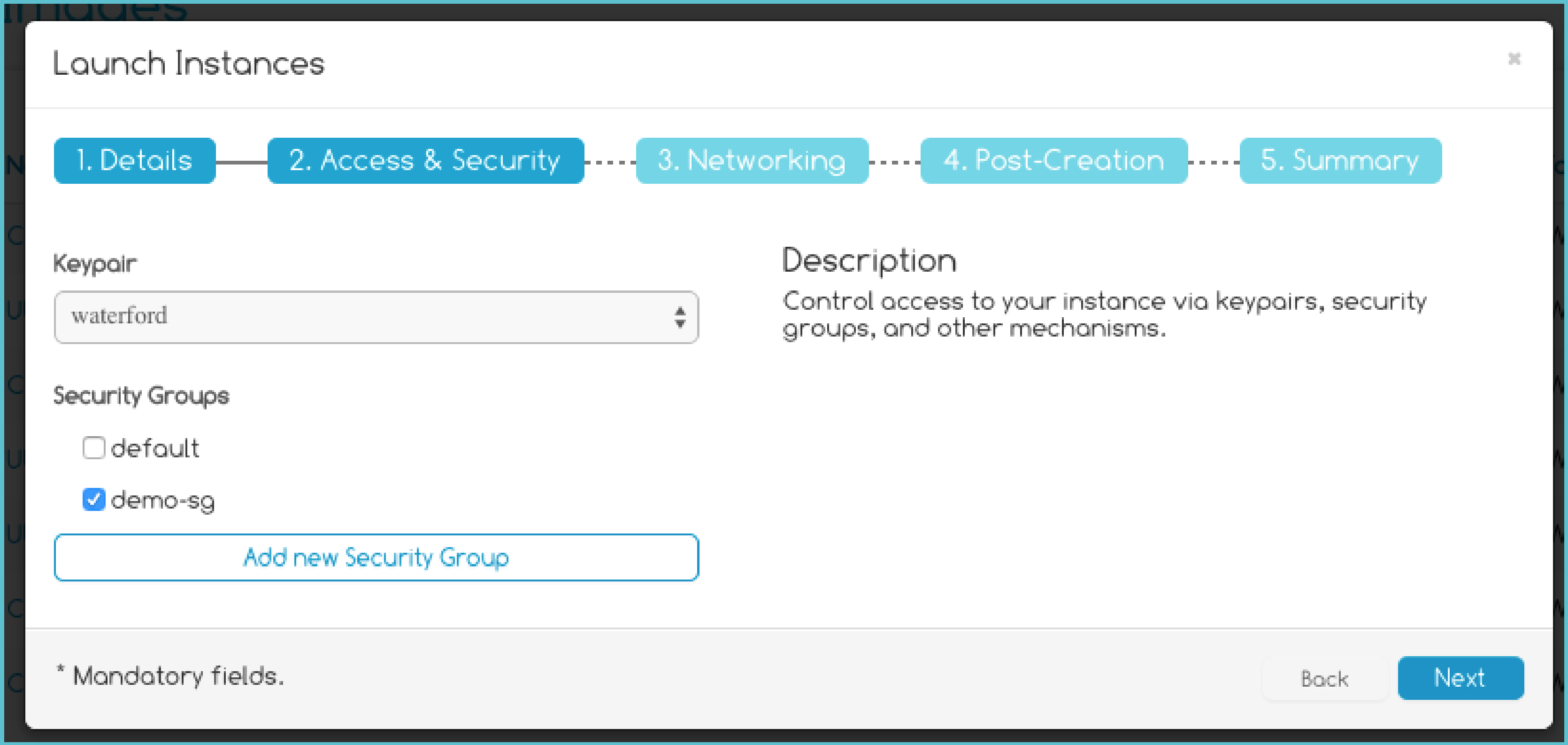
Disk (0 GB) NaN GB Available

Memory (0 MB) 51200 MB Available

* Mandatory fields.

Cancel
Next

Deploy a new instance: Access & Security



Launch Instances

1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Keypair: waterford

Security Groups

☐ default

☑ demo-sg

Add new Security Group

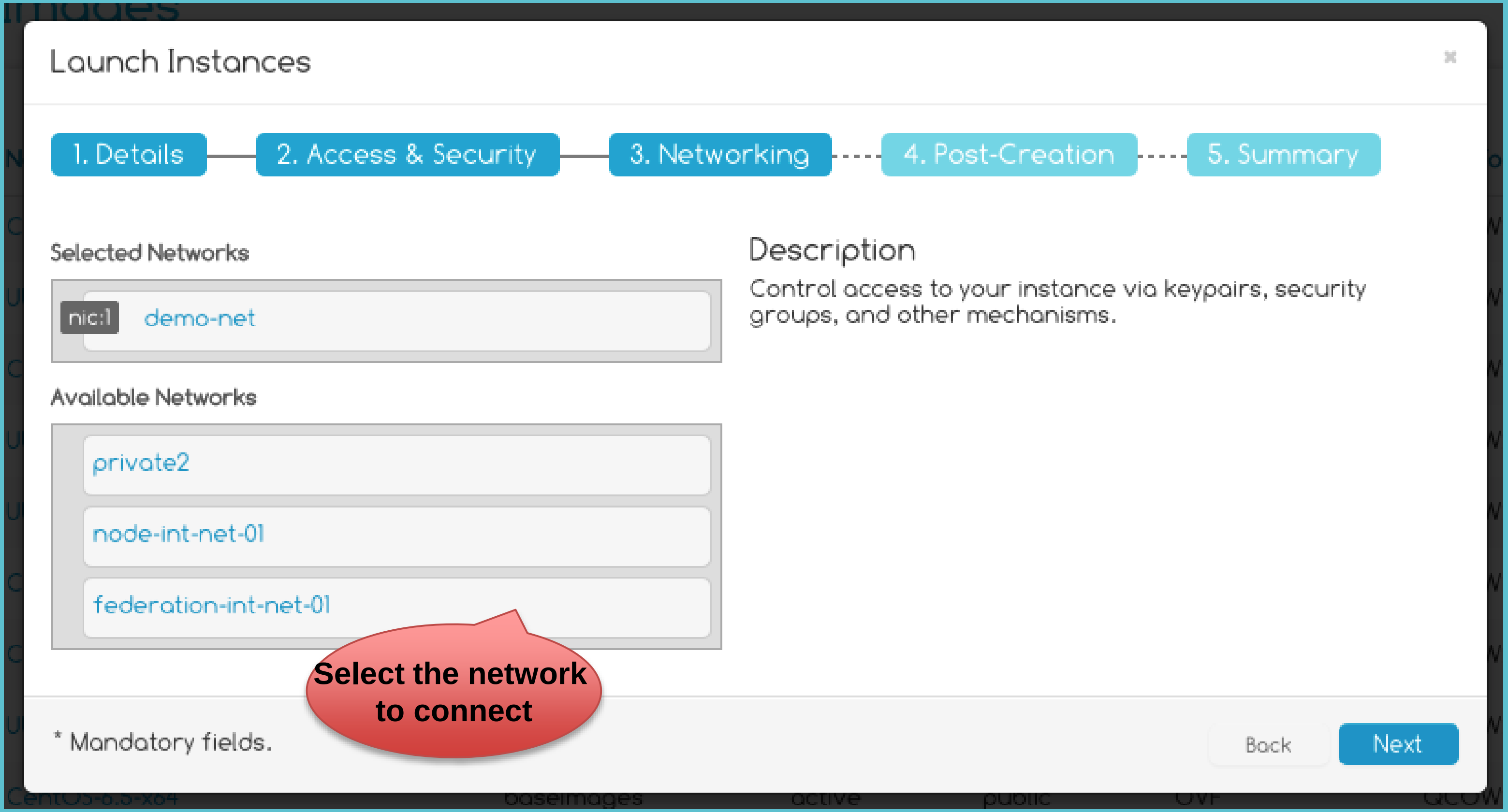
Description

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

* Mandatory fields.

Back
Next

Deploy a new instance: Networking



Launch Instances

1. Details
2. Access & Security
3. Networking
4. Post-Creation
5. Summary

Selected Networks

nic:1 demo-net

Available Networks

private2

node-int-net-01

federation-int-net-01

Description

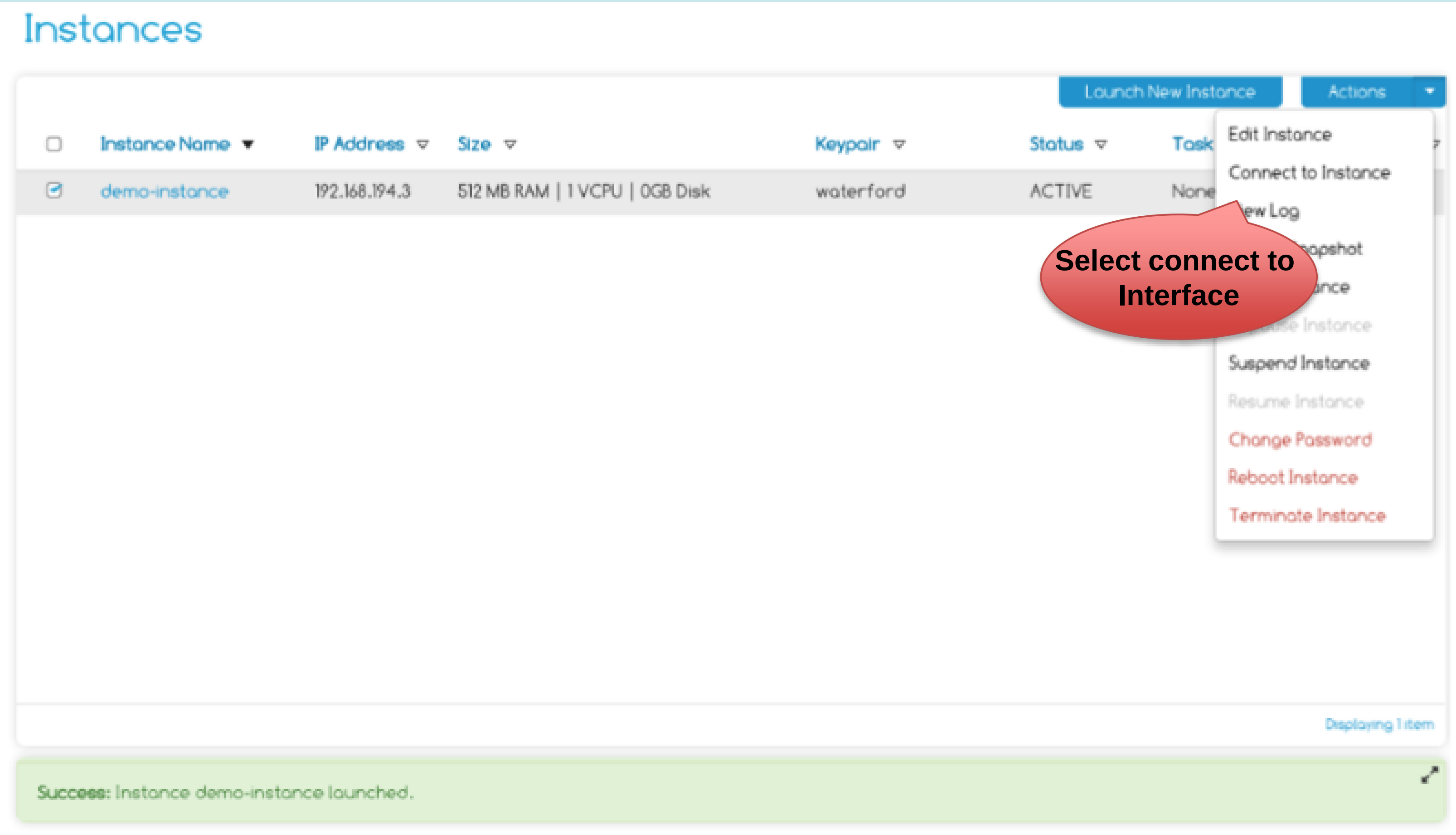
Control access to your instance via keypairs, security groups, and other mechanisms.

* Mandatory fields.

Back
Next

Select the network to connect

Deploy a new instance: connect to VM display


Instances
Launch New Instance
Actions
Edit Instance
Connect to Instance
ew Log
apshot
nce
e Instance
Suspend Instance
Resume Instance
Change Password
Reboot Instance
Terminate Instance
Displaying 1 item

☐	Instance Name	IP Address	Size	Keypair	Status	Task
☑	demo-instance	192.168.194.3	512 MB RAM | 1 VCPU | 0GB Disk	waterford	ACTIVE	None

Success: Instance demo-instance launched.

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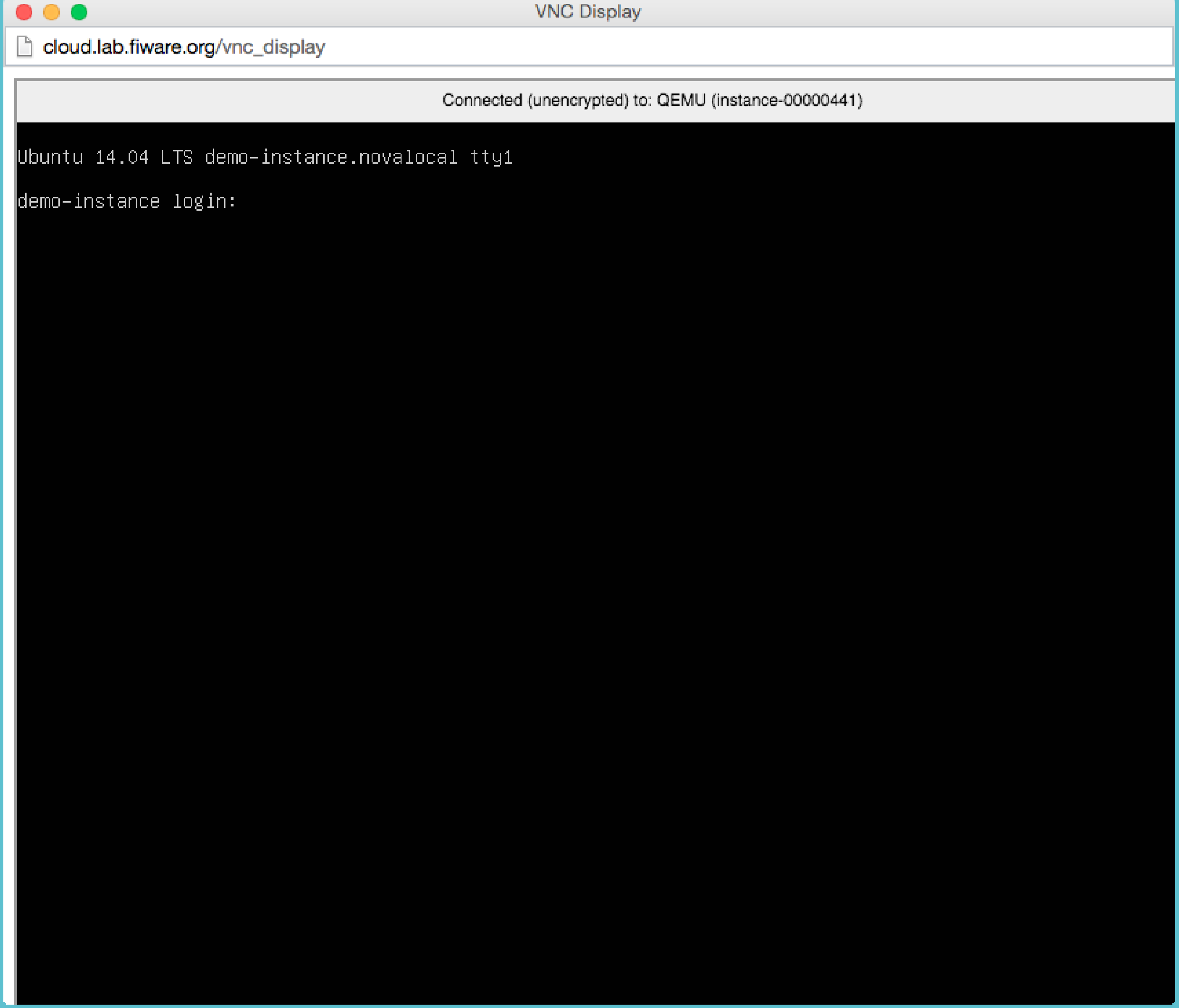
Select connect to Interface

Deploy a new instance: connect to VM display

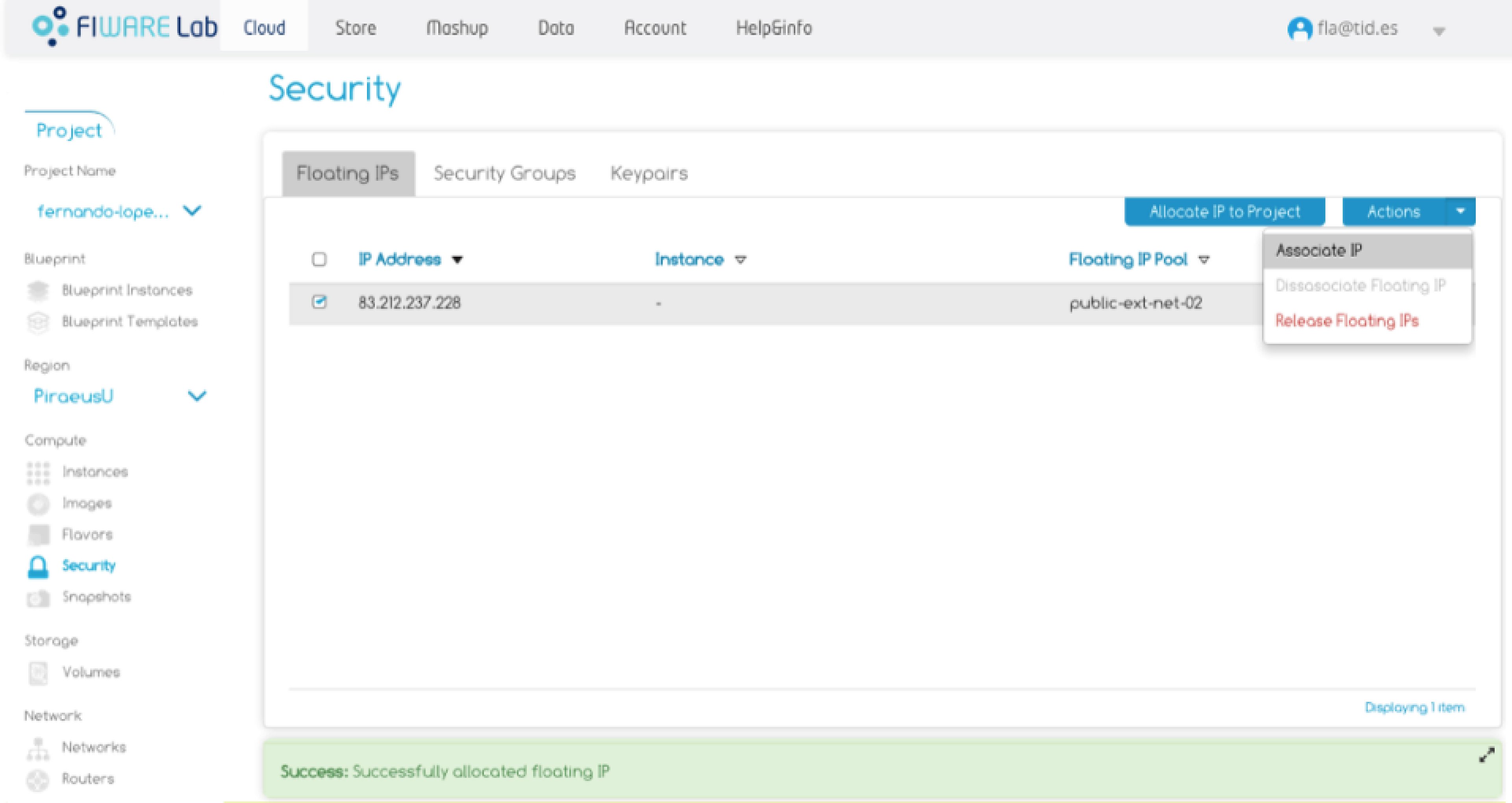

VNC Display
cloud.lab.fiware.org/vnc_display

Connected (unencrypted) to: QEMU (instance-00000441)

```
Ubuntu 14.04 LTS demo-instance.novalocal tty1

demo-instance login:
```

Assign public IP to your instance


FIWARE Lab
Cloud
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Mashup
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Account
Help&Info
fla@tid.es
Security
Project
Project Name
fernando-lope...
Blueprint
Blueprint Instances
Blueprint Templates
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PiraeusU
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Volumes
Network
Networks
Routers
Floating IPs
Security Groups
Keypairs
Allocate IP to Project
Actions
Associate IP
Dissasociate Floating IP
Release Floating IPs
Displaying 1 item

☐	IP Address	Instance	Floating IP Pool
☑	83.212.237.228	-	public-ext-net-02

Success: Successfully allocated floating IP

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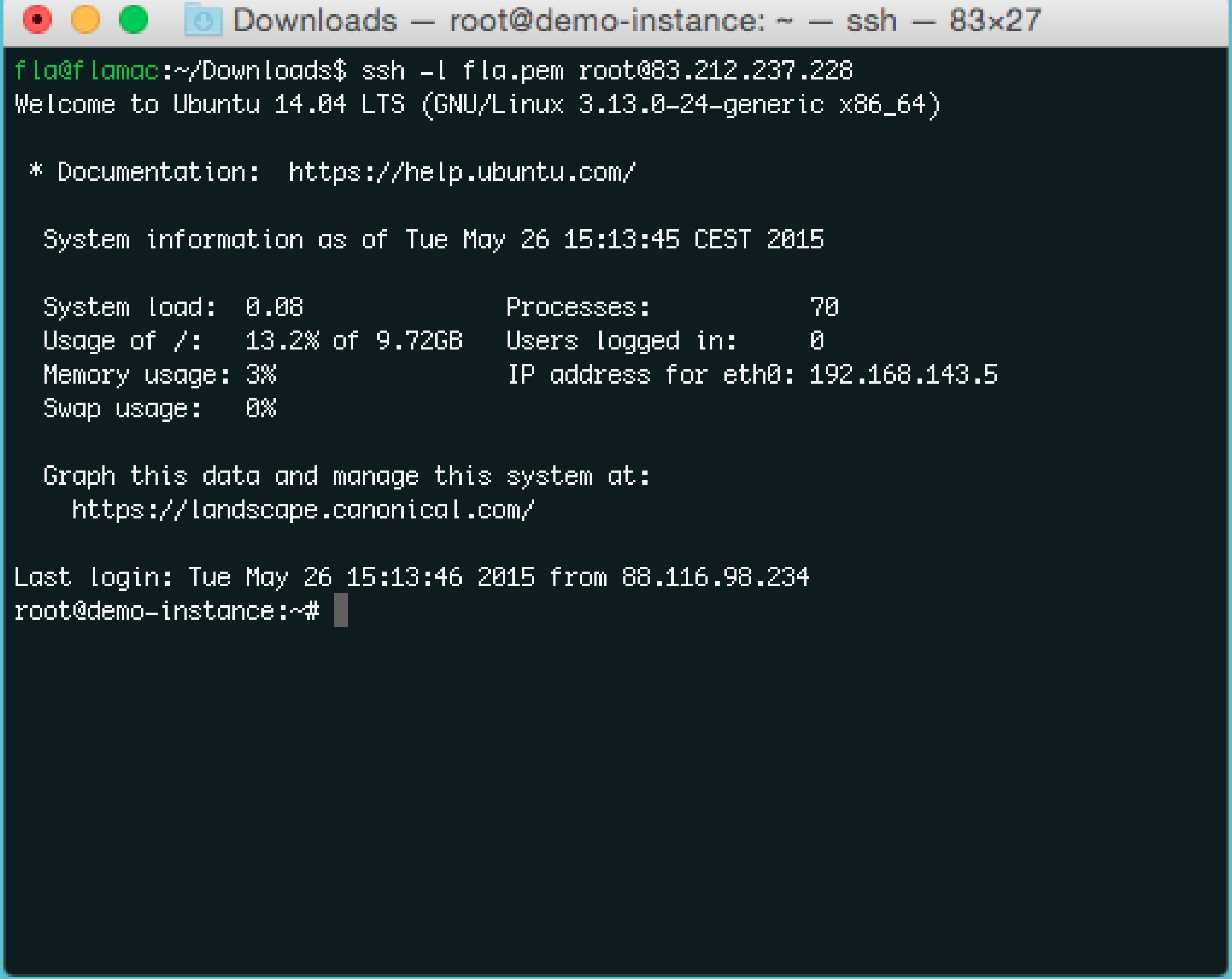
Check the new instance



```
flа@flamac:~/Downloads$ ssh -l fla.pem root@83.212.237.228
Welcome to Ubuntu 14.04 LTS (GNU/Linux 3.13.0-24-generic x86_64)

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

  System information as of Tue May 26 15:13:45 CEST 2015

  System load:  0.08               Processes:           70
  Usage of /:   13.2% of 9.72GB    Users logged in:     0
  Memory usage: 3%                 IP address for eth0: 192.168.143.5
  Swap usage:   0%

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

Last login: Tue May 26 15:13:46 2015 from 88.116.98.234
root@demo-instance:~# 
```

Extended functionalities: PaaS, working with Blueprints

FIWARE Lab Cloud Hosting

- Deploying components for your application.
- Create blueprint templates.
- Create Tiers on a blueprint template.

FIWARE Lab Cloud Hosting

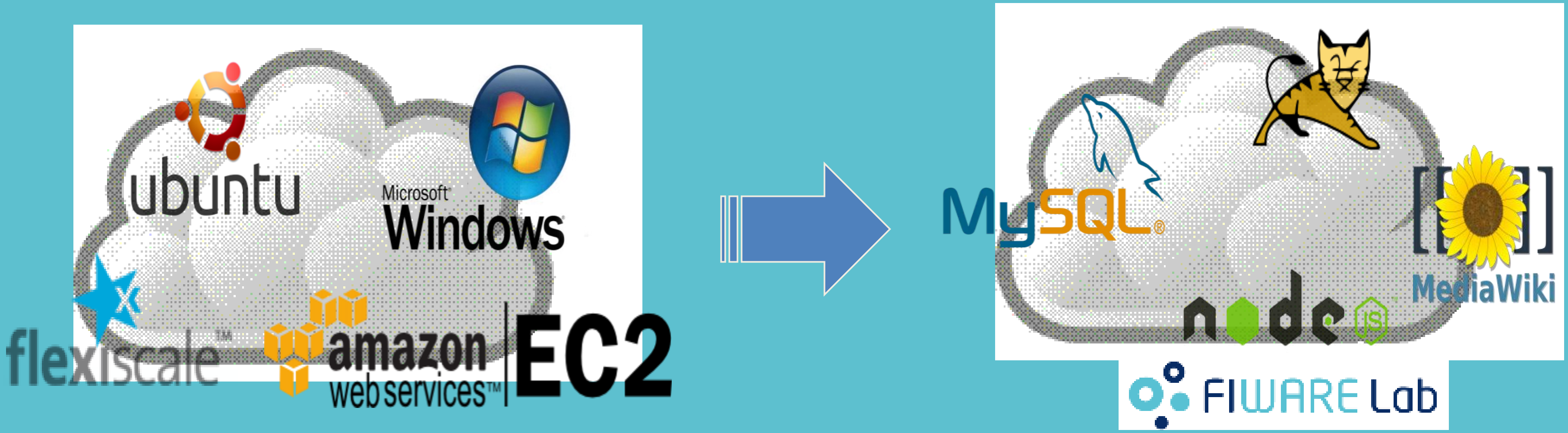
- Launch blueprint templates -> create blueprint instances
- See details of the blueprint instance
- Check the SW installed on the blueprint instance

Real scenario

- Users want to define lots of parameters.
  - Password, ports, default installation.
- Users want to install several things in the same server.
  - Tomcat + git, tomcat + java + git, …
- Users need to deploy complex environment.
  - One server for Tomcat, another for MySQL, …
- Some parameters are unknown before instantiate the system.

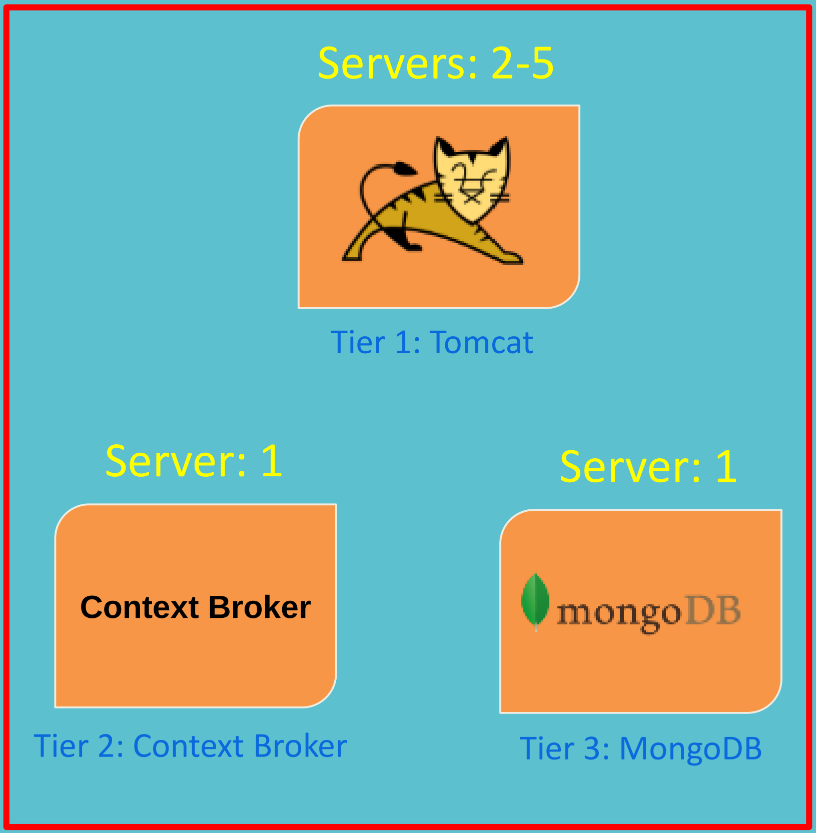
Deploying components for your application

- Deploying applications and not only Servers.
- Ad hoc installation (not template usage).
- Managing applications in Servers (install, uninstall, configure, snapshot…).
- Deploying different environments for that applications.


ubuntu
Microsoft Windows
flexiscale
amazon web services
EC2
MySQL
MediaWiki
node js
FIWARE Lab

Deploy example

Blueprint template: fiware1



Servers: 2-5

Tier 1: Tomcat

Server: 1

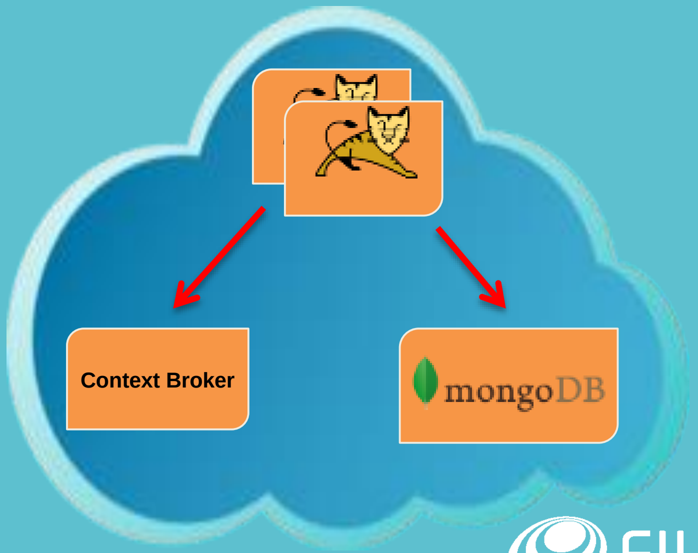
Context Broker

Tier 2: Context Broker

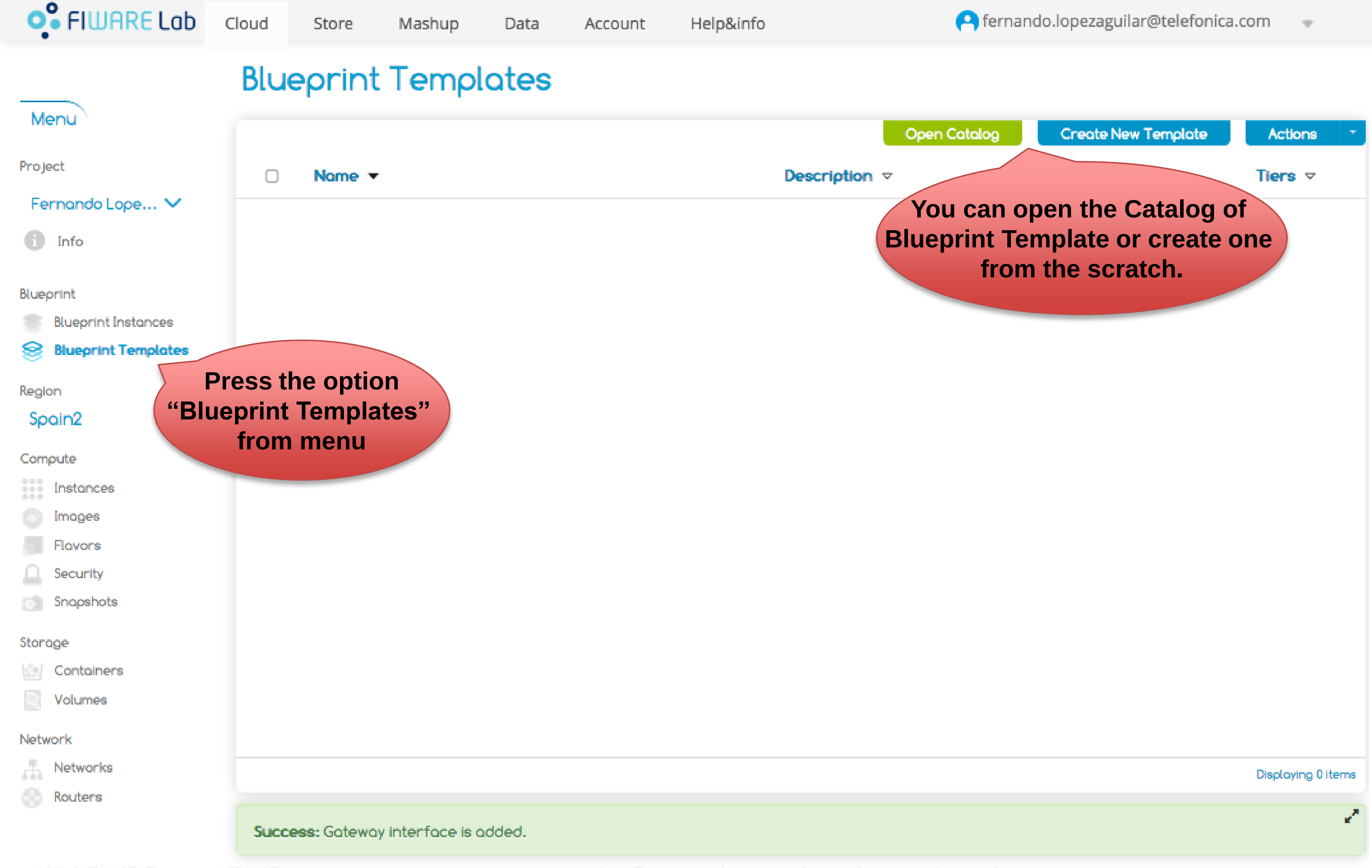
Server: 1

Tier 3: MongoDB

- Blueprint Template: platform specification to be deployed.
- Tier: Each kind of software and server to be deployed.
- Each Tier can be deployed in one or several servers (e.g. tomcat, 2-5 servers).
- Blueprint Instance: Deployed in the testbed.



Create a new blueprint template


FIWARE Lab
Cloud
Store
Mashup
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Account
Help&info
fernando.lopezaguilar@telefonica.com
Blueprint Templates
Menu
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Fernando Lope...
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Spain2
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Images
Flavors
Security
Snapshots
Storage
Containers
Volumes
Network
Networks
Routers
Open Catalog
Create New Template
Actions
☐ Name
Description
Tiers
Displaying 0 items

Success: Gateway interface is added.

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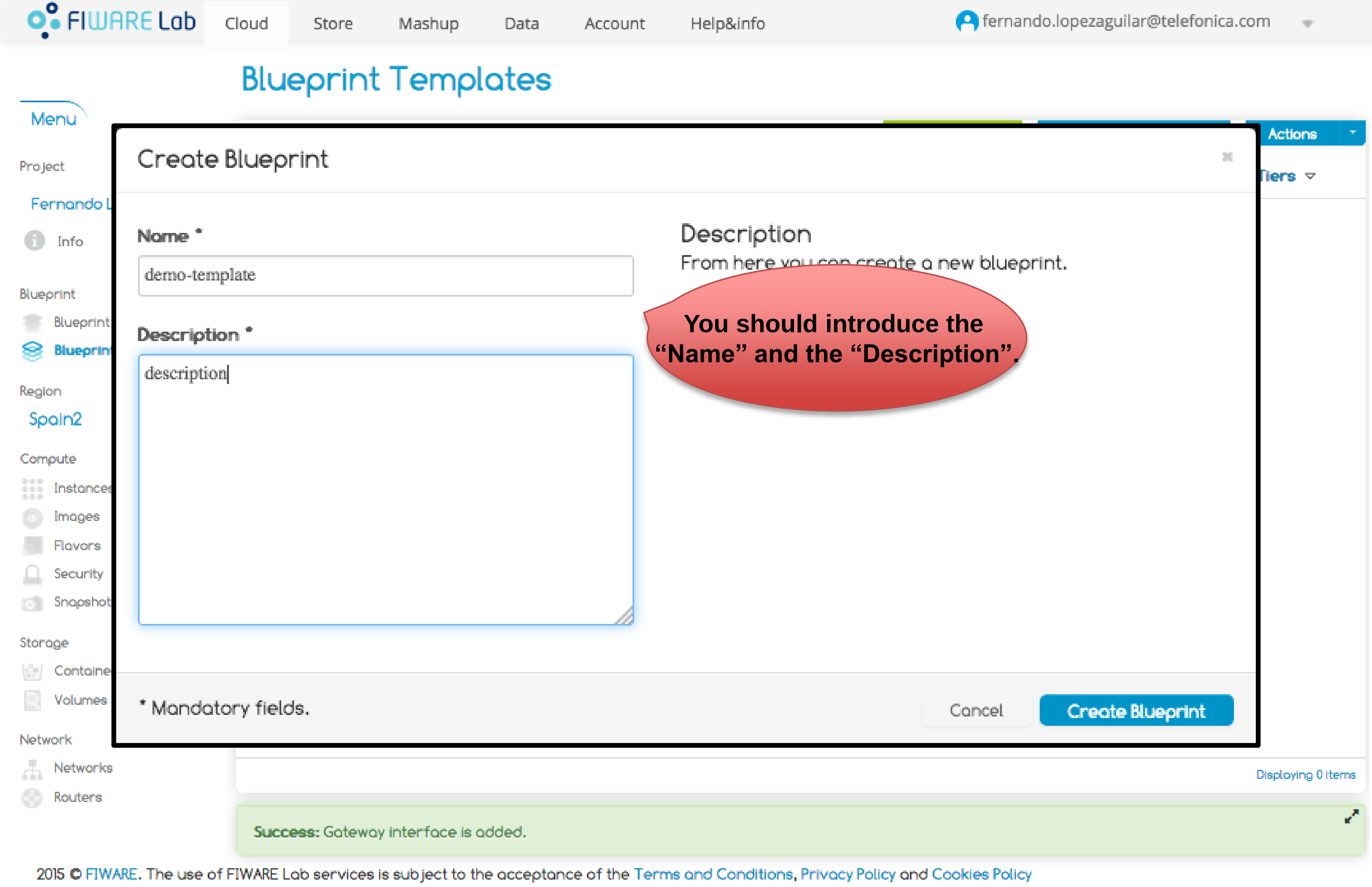
You can open the Catalog of Blueprint Template or create one from the scratch.

Press the option "Blueprint Templates" from menu

Create a new blueprint template


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fernando.lopezaguilar@telefonica.com
Blueprint Templates
Menu
Project
Fernando L
Info
Blueprint
Blueprint
Blueprin
Region
Spain2
Compute
Instances
Images
Flavors
Security
Snapshot
Storage
Containe
Volumes
Network
Networks
Routers
Actions
Tiers
Displaying 0 items
Cancel
Create Blueprint

Create Blueprint

Name *

demo-template

Description *

description

Description

From here you can create a new blueprint.

* Mandatory fields.

Success: Gateway interface is added.

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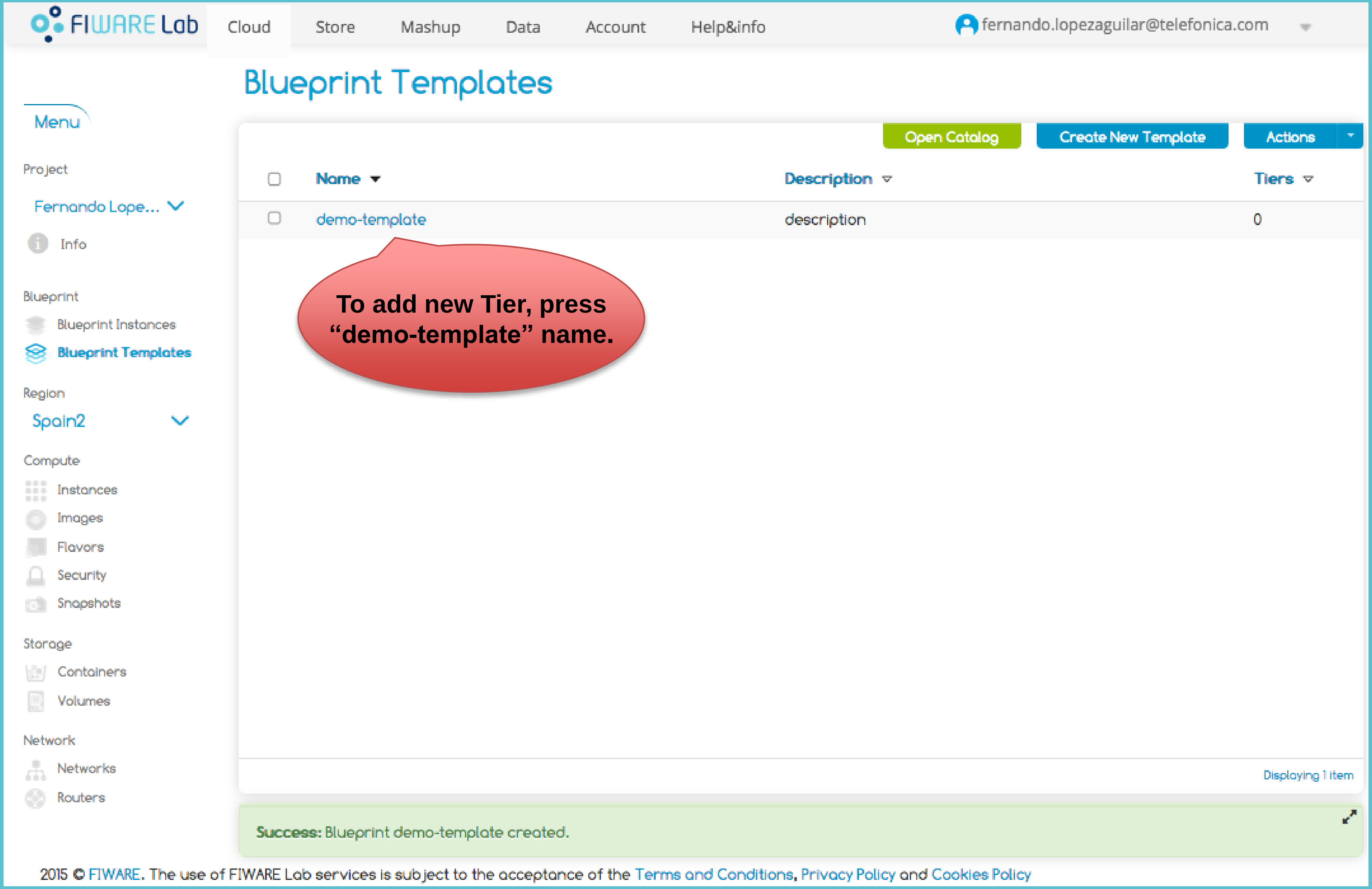
You should introduce the "Name" and the "Description".

Add tiers


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fernando.lopezaguilar@telefonica.com
Blueprint Templates
Menu
Project
Fernando Lope...
Info
Blueprint
Blueprint Instances
Blueprint Templates
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Spain2
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Containers
Volumes
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Networks
Routers
Open Catalog
Create New Template
Actions
Displaying 1 item

☐	Name	Description	Tiers
☐	demo-template	description	0

Success: Blueprint demo-template created.

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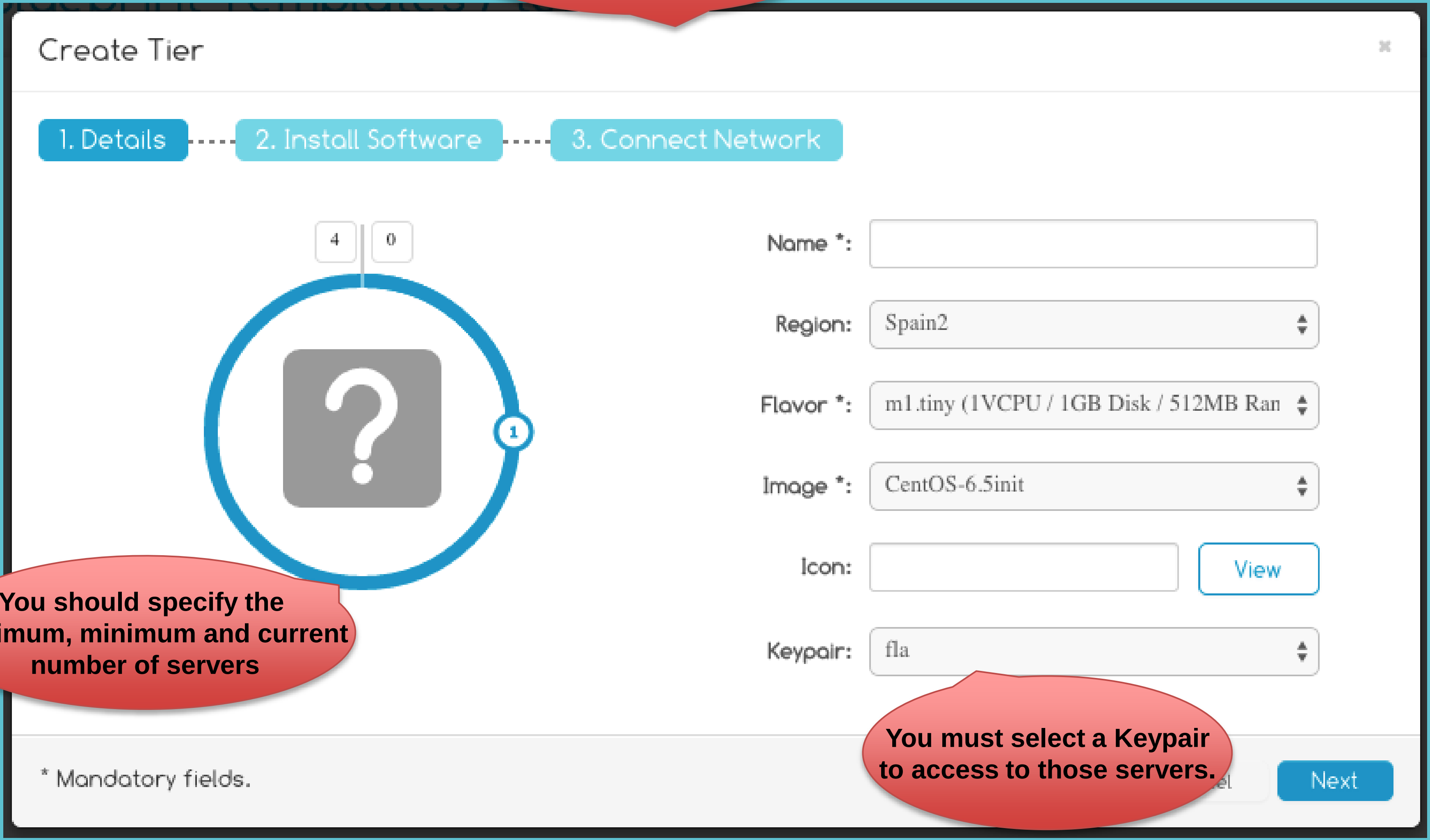
To add new Tier, press “demo-template” name.

Add tiers

After press “Add Tier” you see this windows to define the servers of this tier.



Create Tier

1. Details 2. Install Software 3. Connect Network

Name *:

Region: Spain2

Flavor *: m1.tiny (1VCPU / 1GB Disk / 512MB Ran

Image *: CentOS-6.5init

Icon:

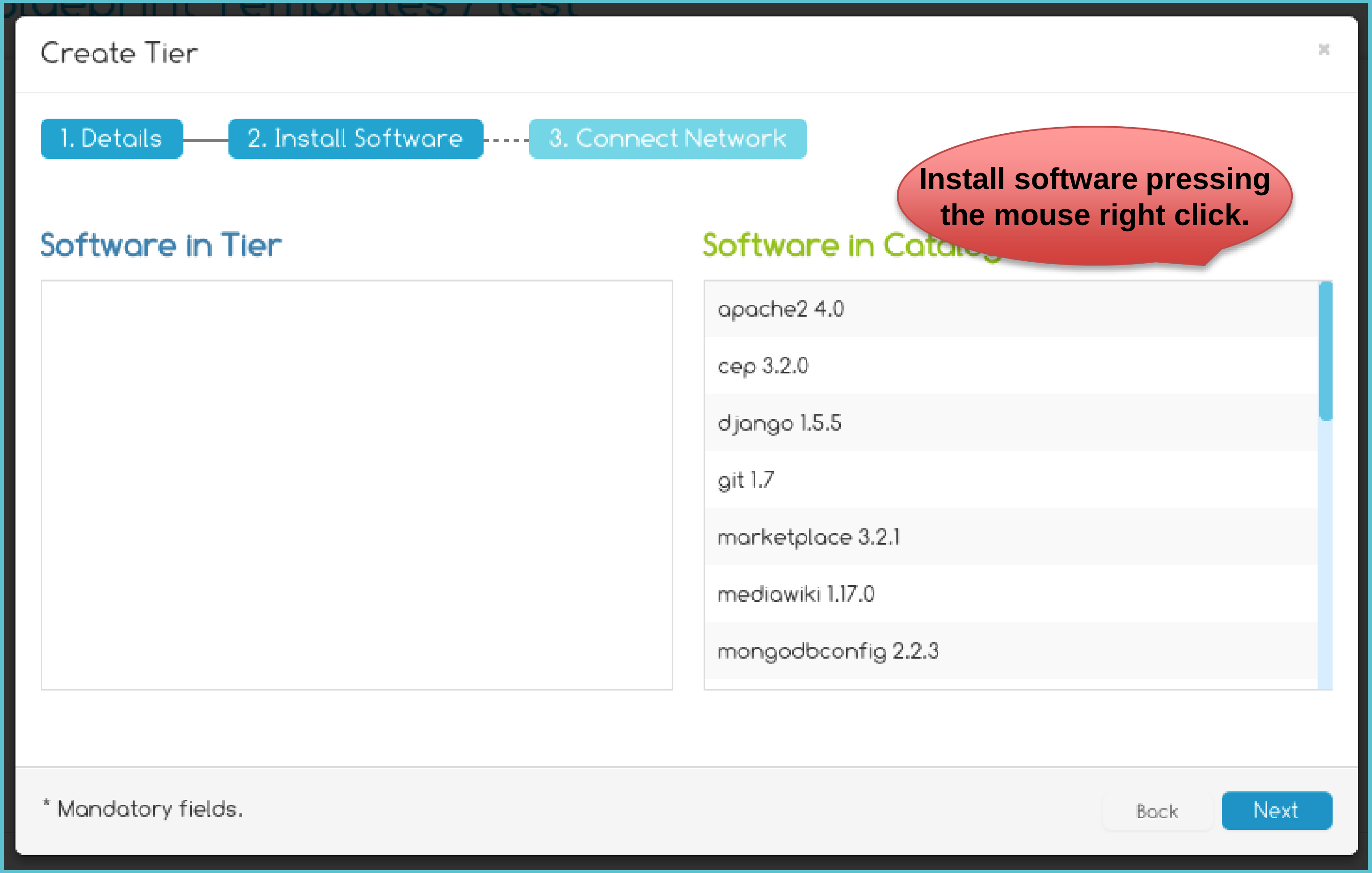
Keypair: fla

* Mandatory fields.

You should specify the maximum, minimum and current number of servers

You must select a Keypair to access to those servers.

Add software in tier



Create Tier

×
1. Details
2. Install Software
3. Connect Network

Install software pressing the mouse right click.

Software in Tier

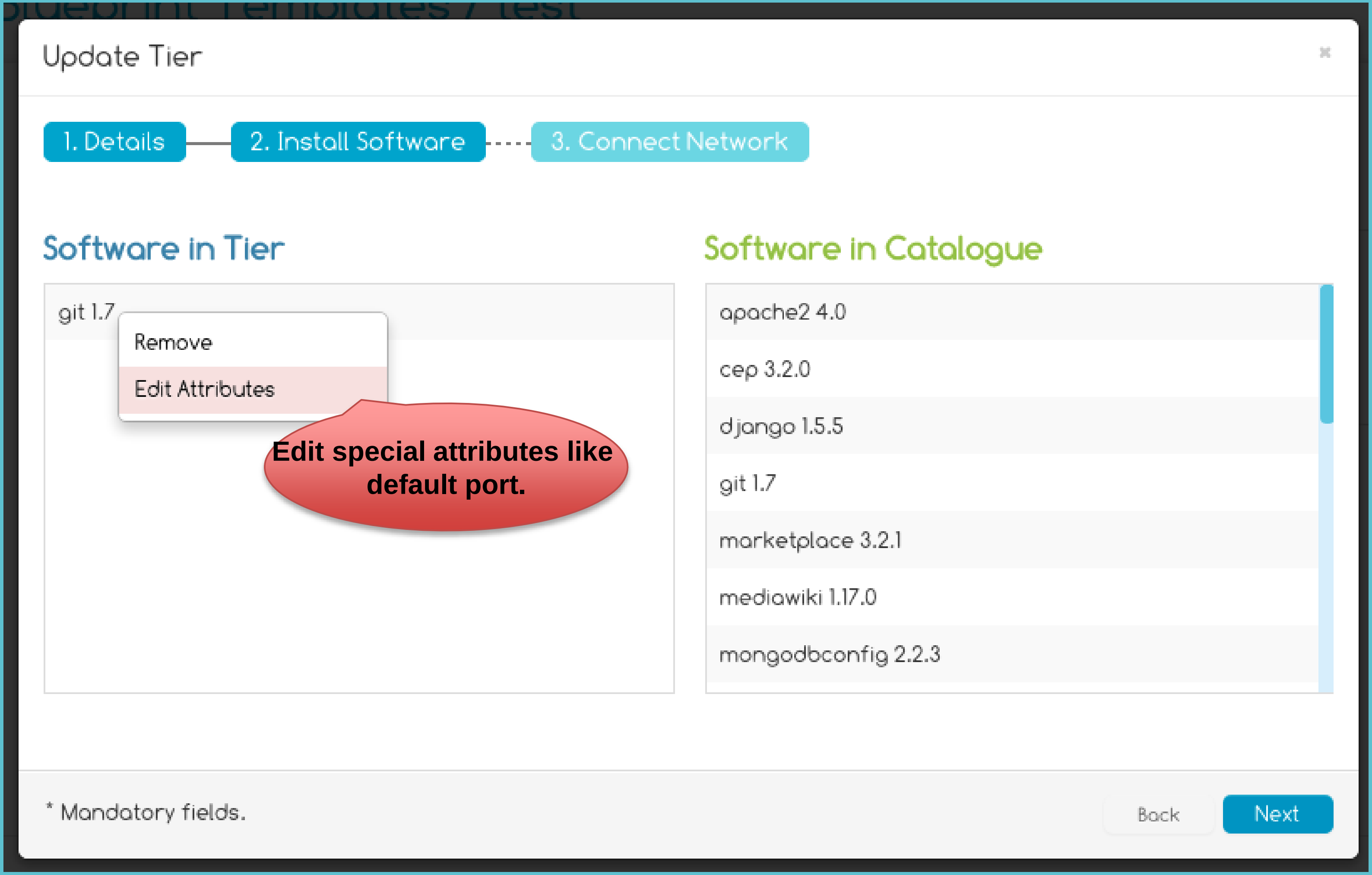
Software in Catalog

- apache2 4.0
- cep 3.2.0
- django 1.5.5
- git 1.7
- marketplace 3.2.1
- mediawiki 1.17.0
- mongodbconfig 2.2.3

* Mandatory fields.

Back
Next

Add software in tier



Update Tier

×
1. Details
2. Install Software
3. Connect Network

Software in Tier

- git 1.7

Remove
Edit Attributes

Software in Catalogue

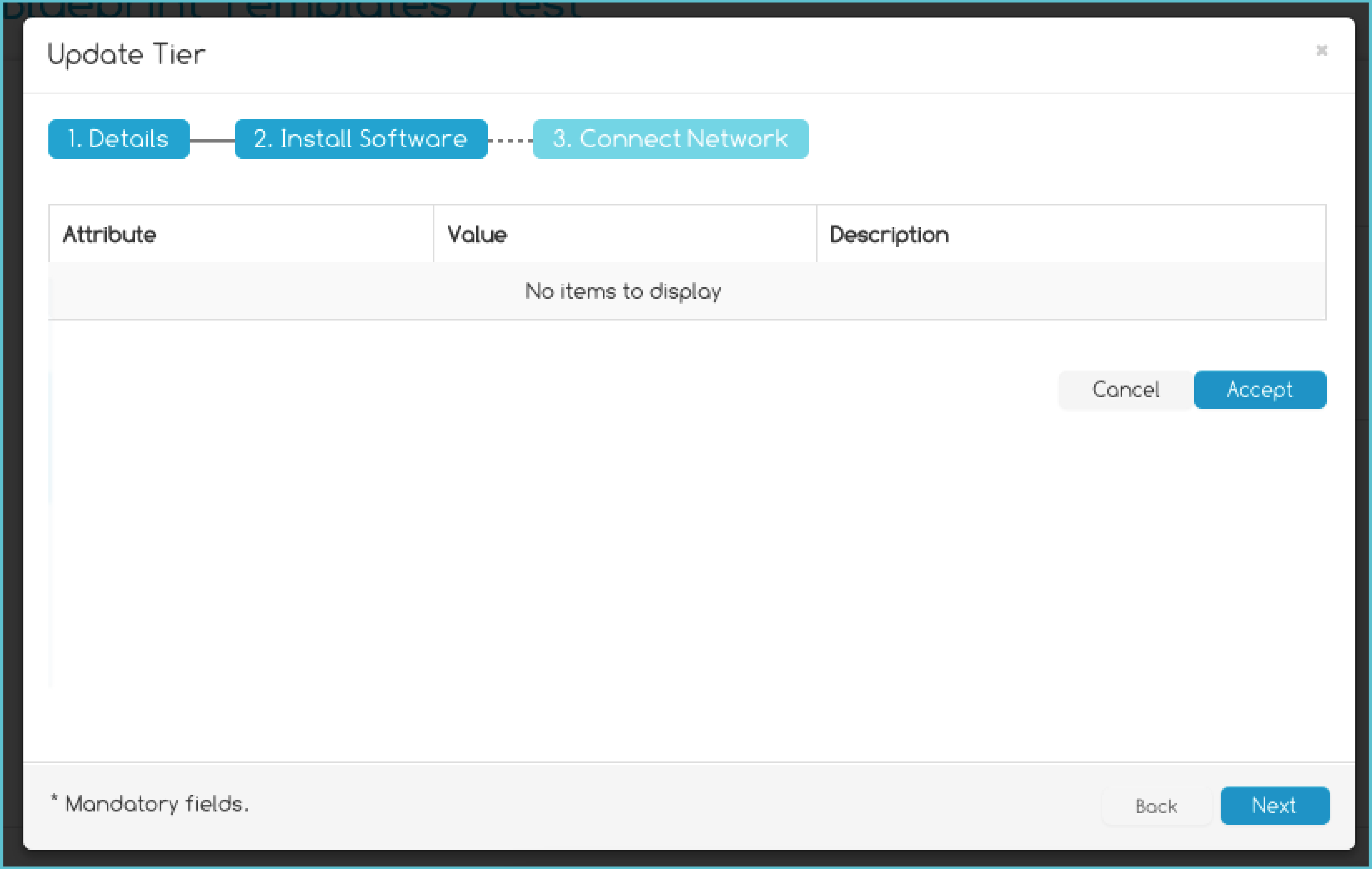
- apache2 4.0
- cep 3.2.0
- django 1.5.5
- git 1.7
- marketplace 3.2.1
- mediawiki 1.17.0
- mongodbconfig 2.2.3

* Mandatory fields.

Back
Next

Edit special attributes like default port.

Add software in tier

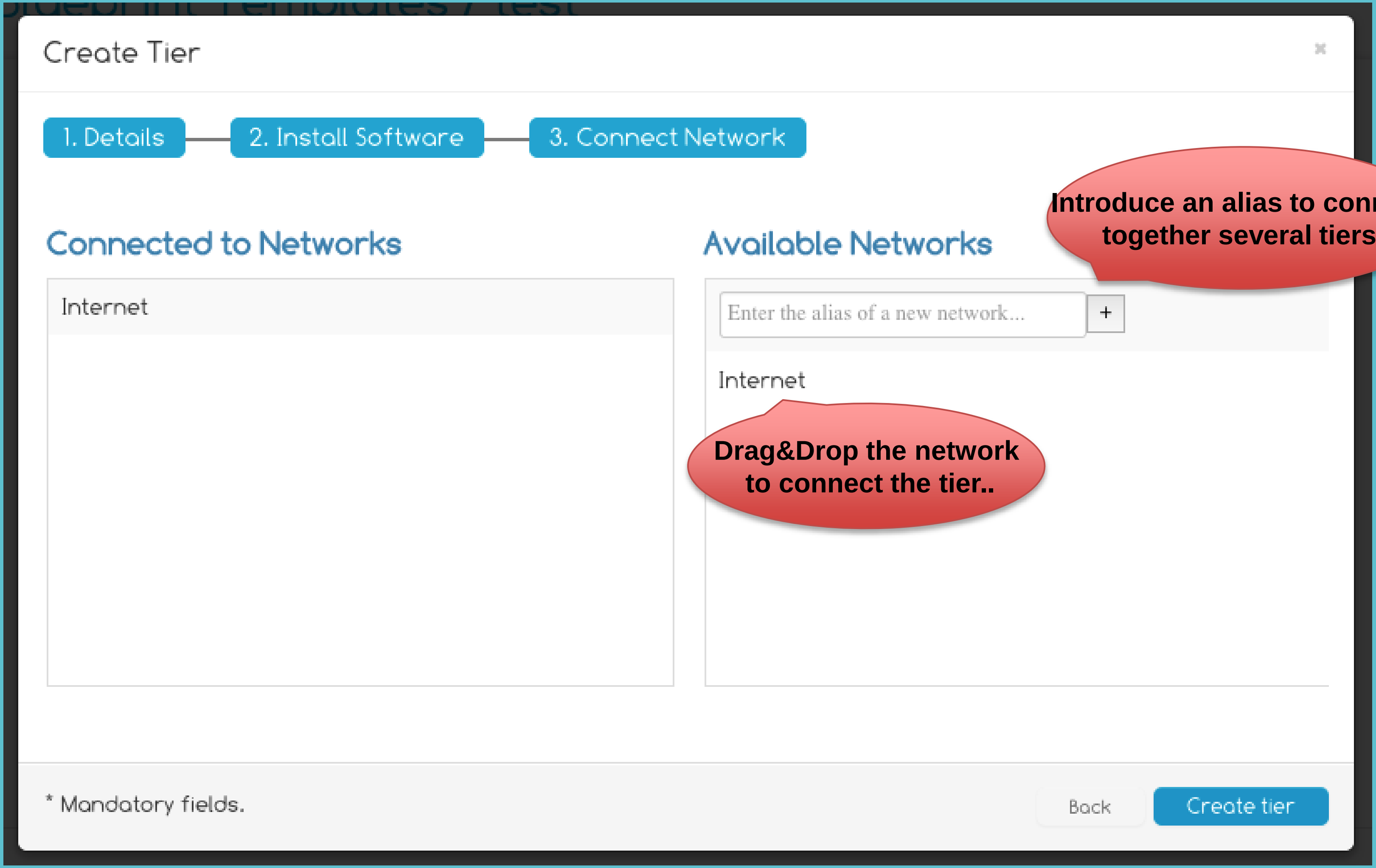

×
1. Details
2. Install Software
3. Connect Network
Cancel
Accept
Back
Next

Update Tier

Attribute	Value	Description
No items to display		

* Mandatory fields.

Connect network



Create Tier

×
1. Details
2. Install Software
3. Connect Network

Connected to Networks

Internet

Available Networks

Enter the alias of a new network...

+

Internet

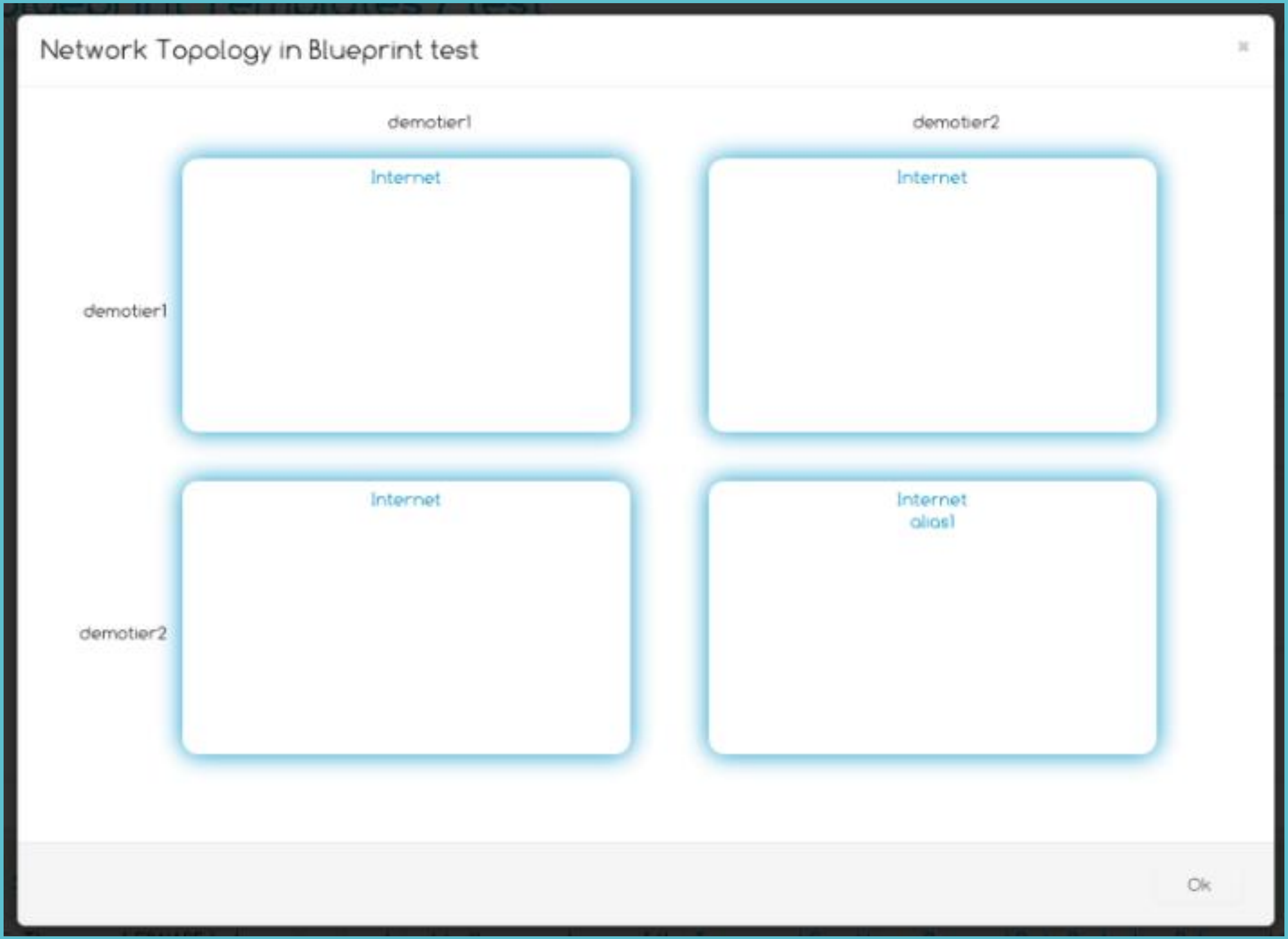
* Mandatory fields.

Back
Create tier

Introduce an alias to connect together several tiers.

Drag&Drop the network to connect the tier..

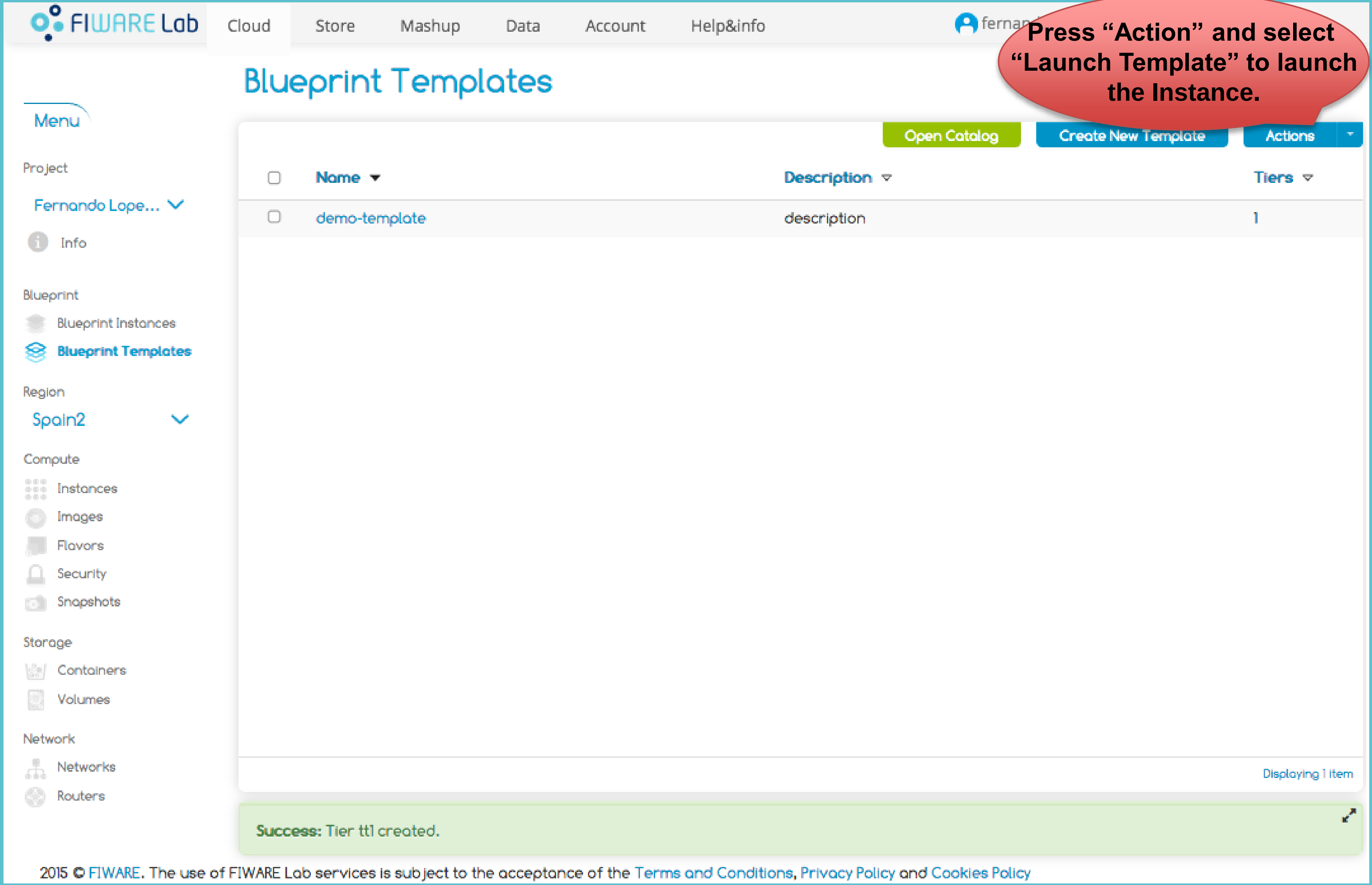
Topology



Network Topology in Blueprint test

×
demotier1
demotier2
demotier1
Internet
Internet
demotier2
Internet
Internet
alias1
Ok

Launch a Blueprint Template -> Blueprint Instance


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fernan
Menu
Project
Fernando Lope...
Info
Blueprint
Blueprint Instances
Blueprint Templates
Region
Spain2
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Containers
Volumes
Network
Networks
Routers
Open Catalog
Create New Template
Actions

Blueprint Templates

☐	Name	Description	Tiers
☐	demo-template	description	1

Displaying 1 item

Success: Tier tt1 created.

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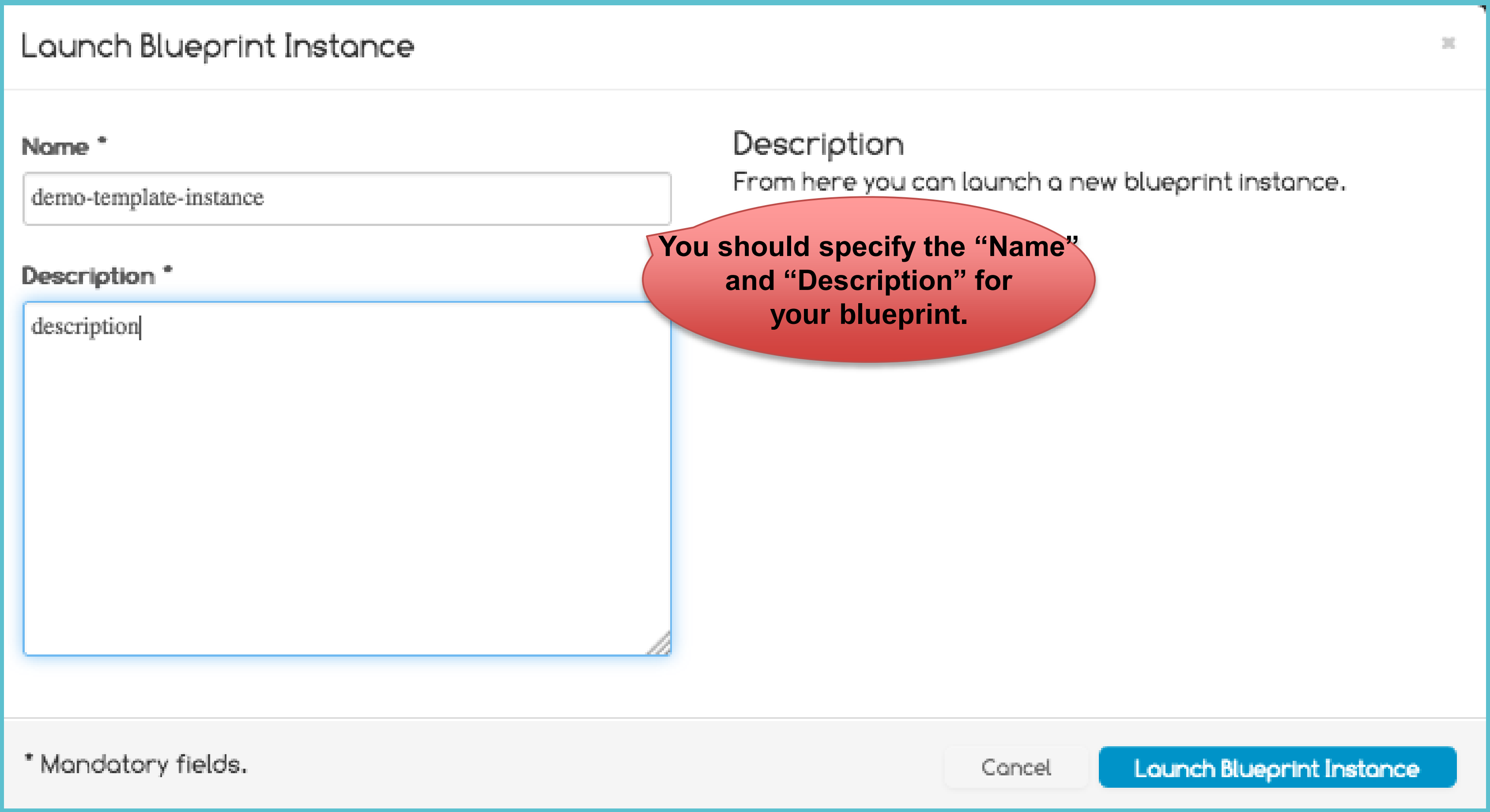
Press "Action" and select "Launch Template" to launch the Instance.

Launch a Blueprint Template -> Blueprint Instance



Launch Blueprint Instance

Name *

demo-template-instance

Description *

description

Description

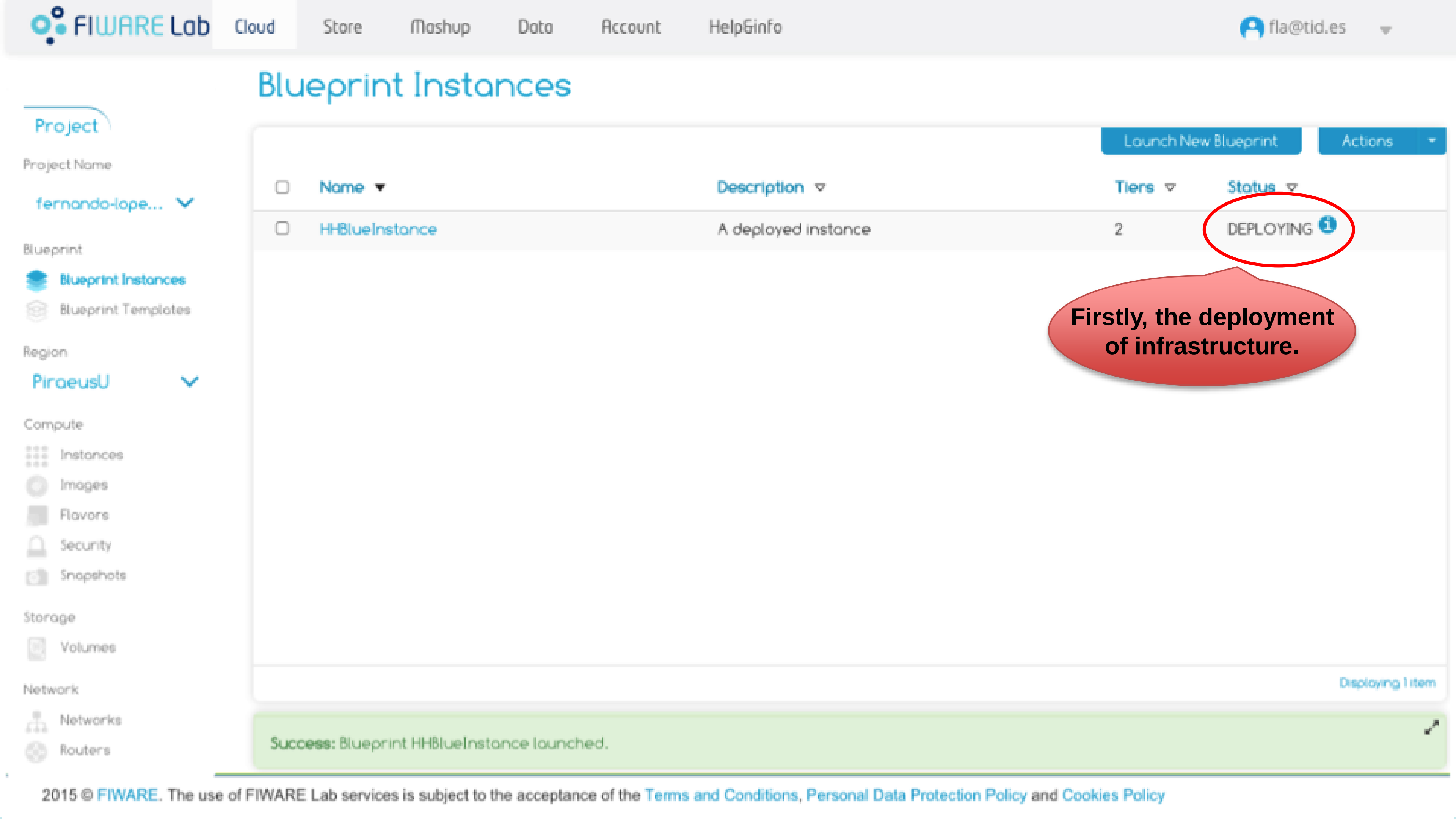
From here you can launch a new blueprint instance.

* Mandatory fields.

×
Cancel
Launch Blueprint Instance

You should specify the "Name" and "Description" for your blueprint.

Demo


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fla@tid.es
Project
Project Name
fernando-lope...
Blueprint
Blueprint Instances
Blueprint Templates
Region
PiraeusU
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Volumes
Network
Networks
Routers
Launch New Blueprint
Actions

Blueprint Instances

☐	Name	Description	Tiers	Status
☐	HHBlueInstance	A deployed instance	2	DEPLOYING

Displaying 1 item

Success: Blueprint HHBlueInstance launched.

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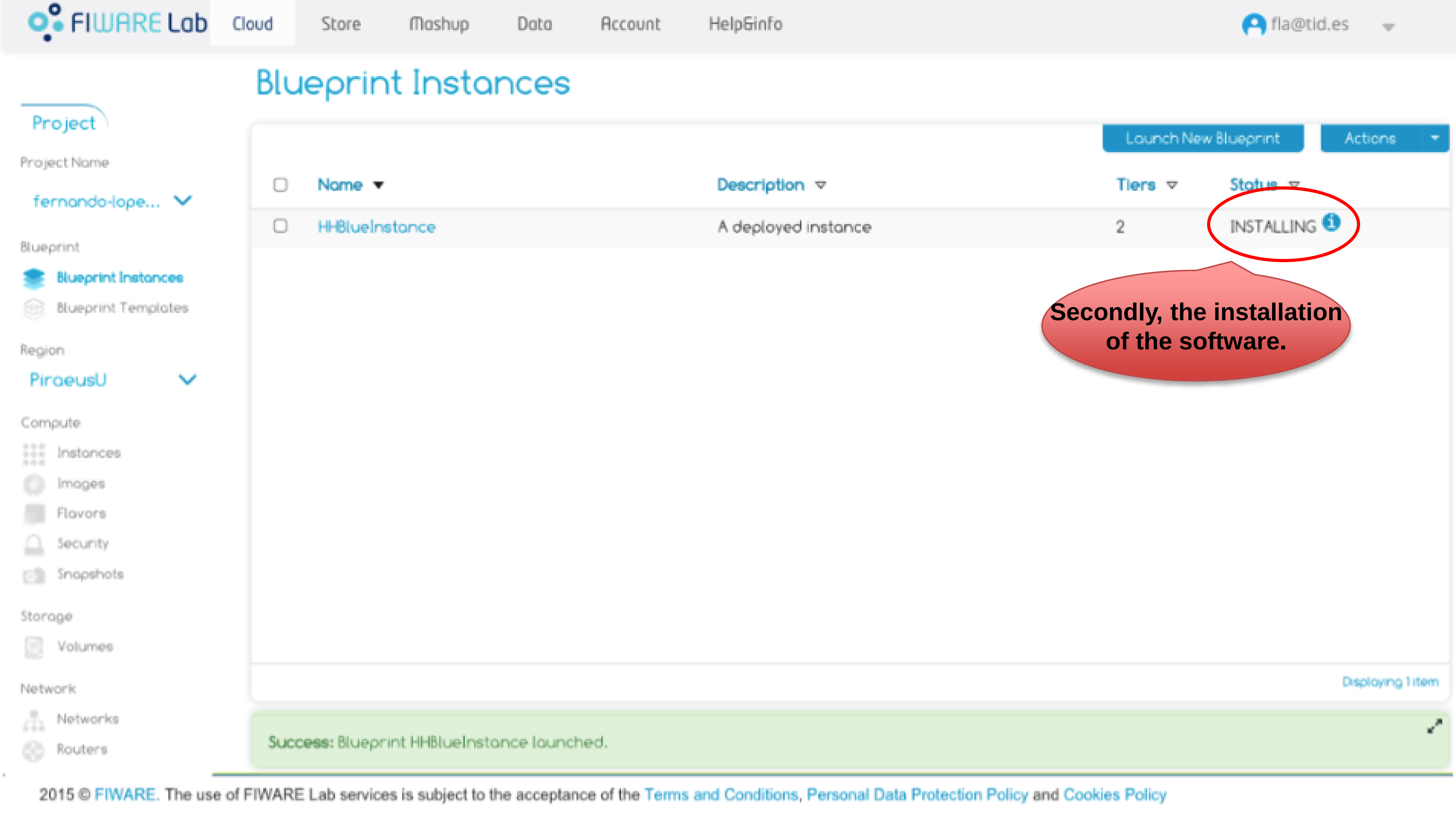
Firstly, the deployment of infrastructure.

Demo



FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
fla@tid.es
Project
Project Name
fernando-lope...
Blueprint
Blueprint Instances
Blueprint Templates
Region
PiraeusU
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Volumes
Network
Networks
Routers
Launch New Blueprint
Actions

Blueprint Instances

☐	Name	Description	Tiers	Status
☐	HHBlueInstance	A deployed instance	2	INSTALLING

Displaying 1 item

Success: Blueprint HHBlueInstance launched.

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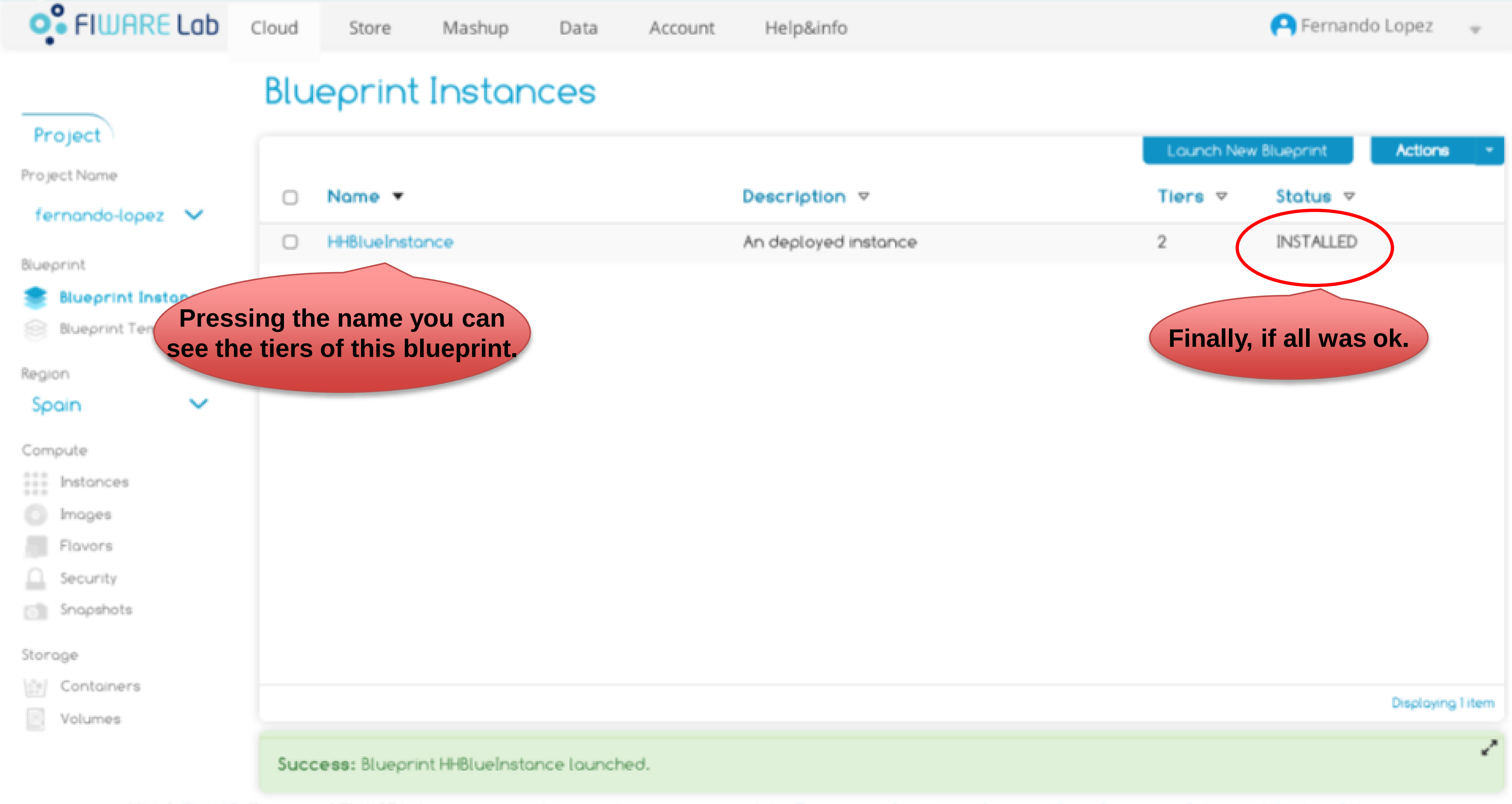
Secondly, the installation of the software.

Demo


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
Fernando Lopez
Project
Project Name
fernando-lopez
Blueprint
Blueprint Instances
Blueprint Templates
Region
Spain
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Containers
Volumes
Launch New Blueprint
Actions

Blueprint Instances

☐	Name	Description	Tiers	Status
☐	HHBlueInstance	An deployed instance	2	INSTALLED

Displaying 1 item

Success: Blueprint HHBlueInstance launched.

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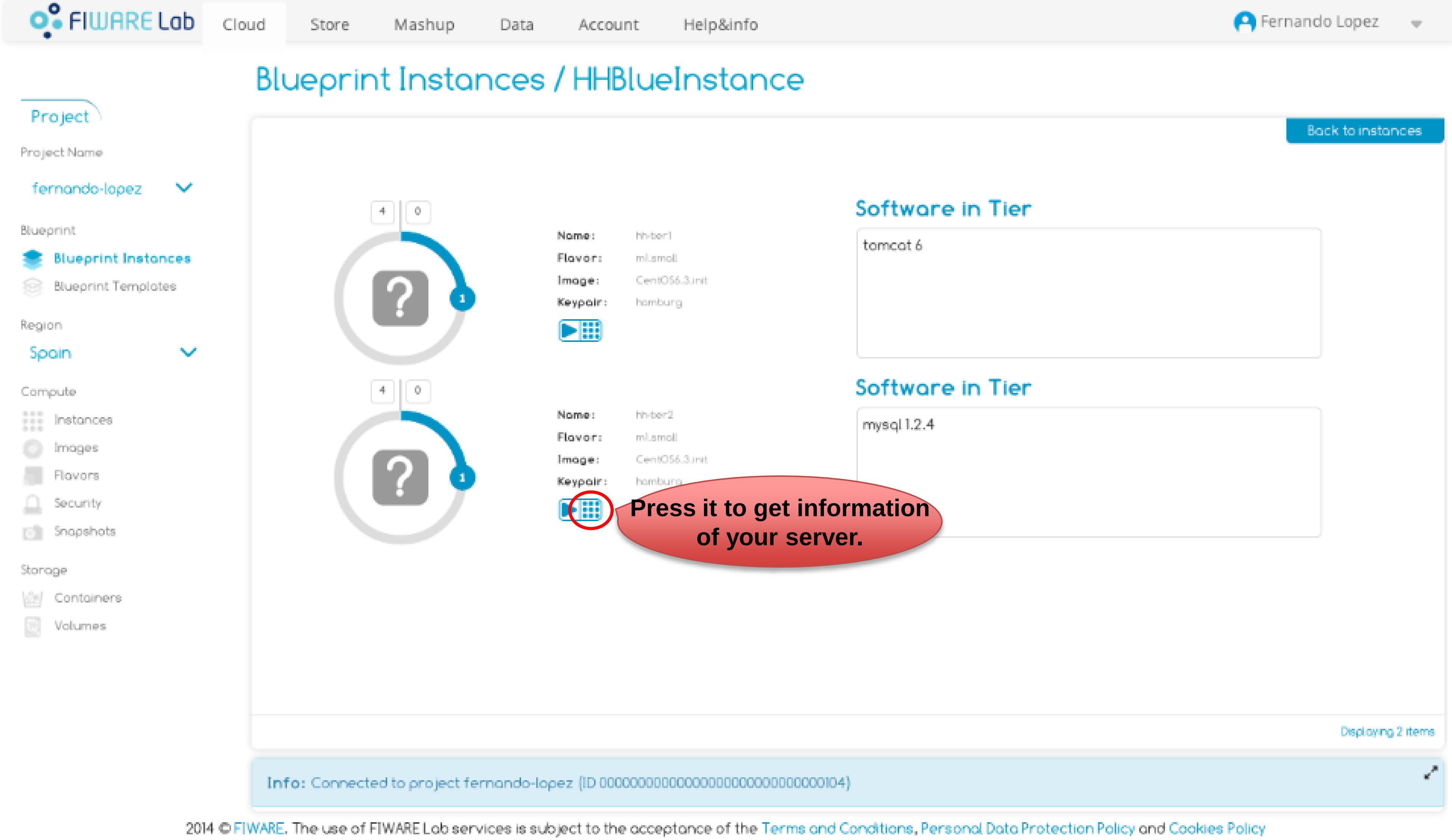
Pressing the name you can see the tiers of this blueprint.

Finally, if all was ok.

FIWARE

Demo


FIWARE Lab
Cloud
Store
Mashup
Data
Account
Help&info
Fernando Lopez
Project
Project Name
fernando-lopez
Blueprint
Blueprint Instances
Blueprint Templates
Region
Spain
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Containers
Volumes
Back to instances
4
0
1
4
0
1

Blueprint Instances / HHBlueInstance

Name: hh-tier1
Flavor: m1.small
Image: CentOS6.3.init
Keypair: hamburg

Software in Tier

tomcat 6

Name: hh-tier2
Flavor: m1.small
Image: CentOS6.3.init
Keypair: hamburg

Software in Tier

mysql 1.2.4

Displaying 2 items

Info: Connected to project fernando-lopez (ID 00000000000000000000000000000104)

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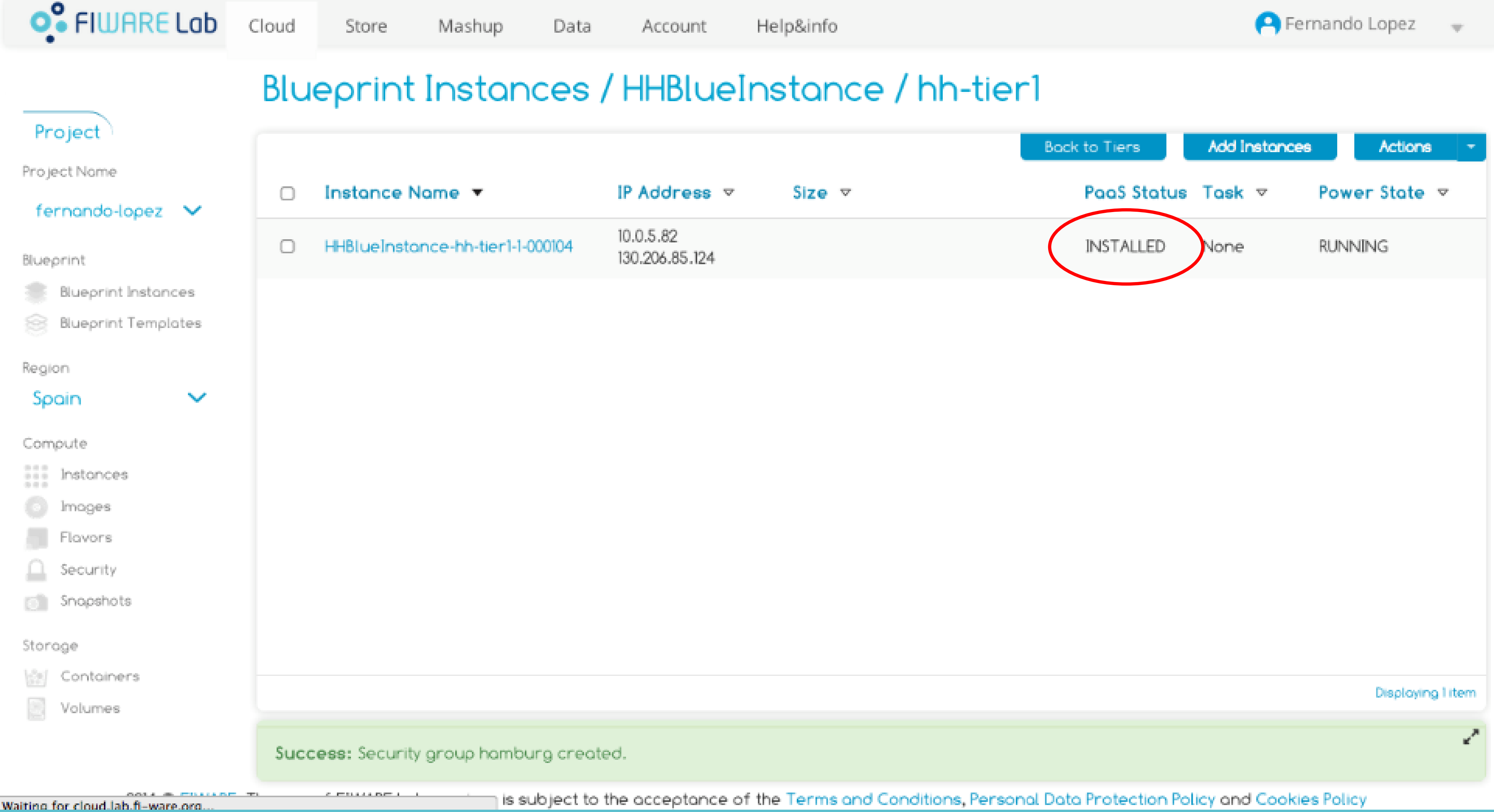
Press it to get information of your server.

Demo


FIWARE Lab
Cloud
Store
Mashup
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Help&info
Fernando Lopez
Project
Blueprint
Blueprint Instances
Blueprint Templates
Region
Compute
Instances
Images
Flavors
Security
Snapshots
Storage
Containers
Volumes
Back to Tiers
Add Instances
Actions

Blueprint Instances / HHBlueInstance / hh-tier1

Project Name: fernando-lopez

Region: Spain

☐	Instance Name	IP Address	Size	PaaS Status	Task	Power State
☐	HHBlueInstance-hh-tier1-1-000104	10.0.5.82 130.206.85.124		INSTALLED	None	RUNNING

Displaying 1 item

Success: Security group hamburg created.

Waiting for cloud.lab.fi-ware.org...

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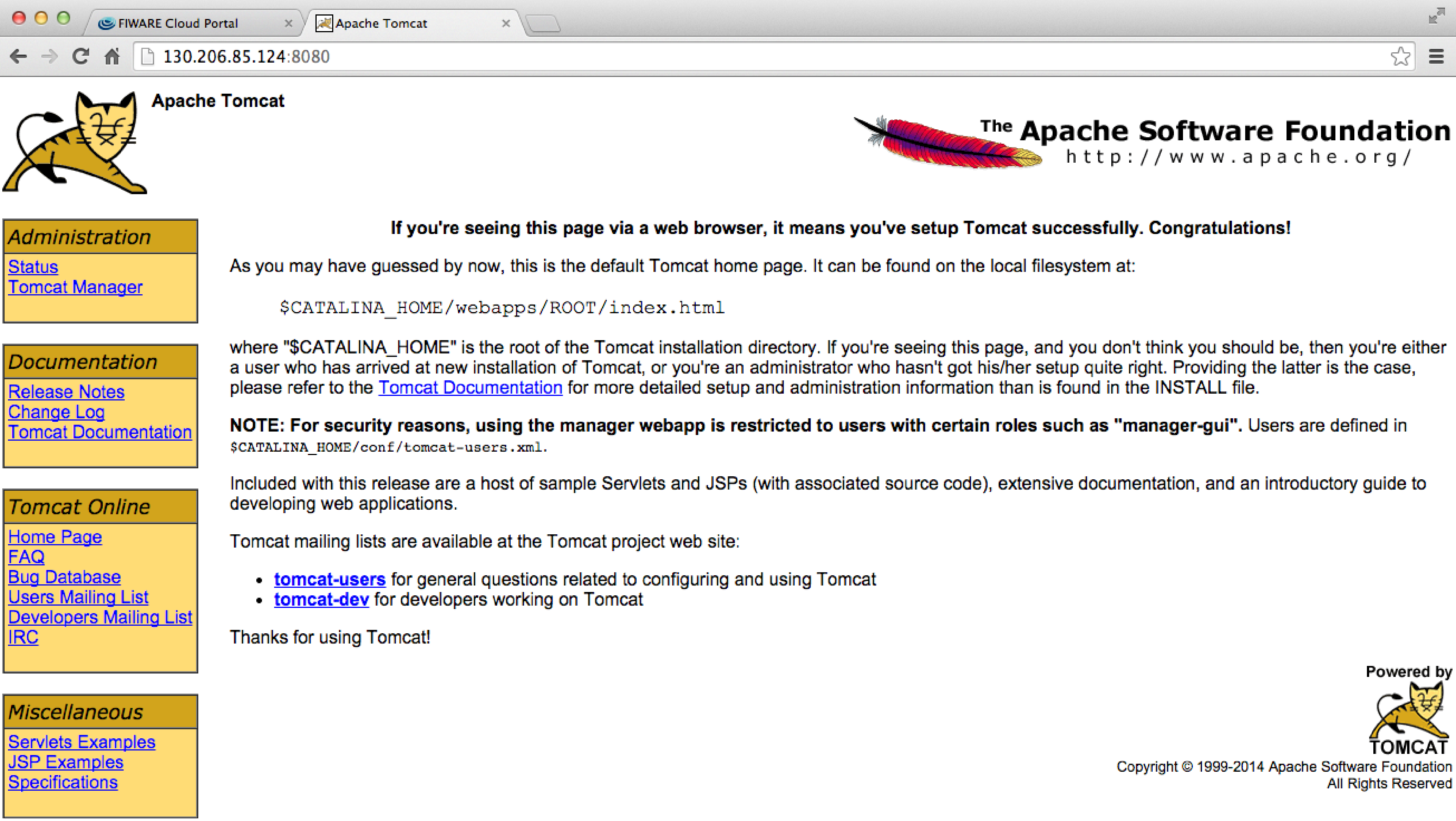
Demo



Administration

Status
Tomcat Manager

Documentation

Release Notes
Change Log
Tomcat Documentation

Tomcat Online

Home Page
FAQ
Bug Database
Users Mailing List
Developers Mailing List
IRC

Miscellaneous

Servlets Examples
JSP Examples
Specifications

If you're seeing this page via a web browser, it means you've setup Tomcat successfully. Congratulations!

As you may have guessed by now, this is the default Tomcat home page. It can be found on the local filesystem at:

```
$CATALINA_HOME/webapps/ROOT/index.html
```

where "$CATALINA_HOME" is the root of the Tomcat installation directory. If you're seeing this page, and you don't think you should be, then you're either a user who has arrived at new installation of Tomcat, or you're an administrator who hasn't got his/her setup quite right. Providing the latter is the case, please refer to the Tomcat Documentation for more detailed setup and administration information than is found in the INSTALL file.

NOTE: For security reasons, using the manager webapp is restricted to users with certain roles such as "manager-gui". Users are defined in `$CATALINA_HOME/conf/tomcat-users.xml`.

Included with this release are a host of sample Servlets and JSPs (with associated source code), extensive documentation, and an introductory guide to developing web applications.

Tomcat mailing lists are available at the Tomcat project web site:

- **tomcat-users** for general questions related to configuring and using Tomcat
- **tomcat-dev** for developers working on Tomcat

Thanks for using Tomcat!

Powered by
TOMCAT

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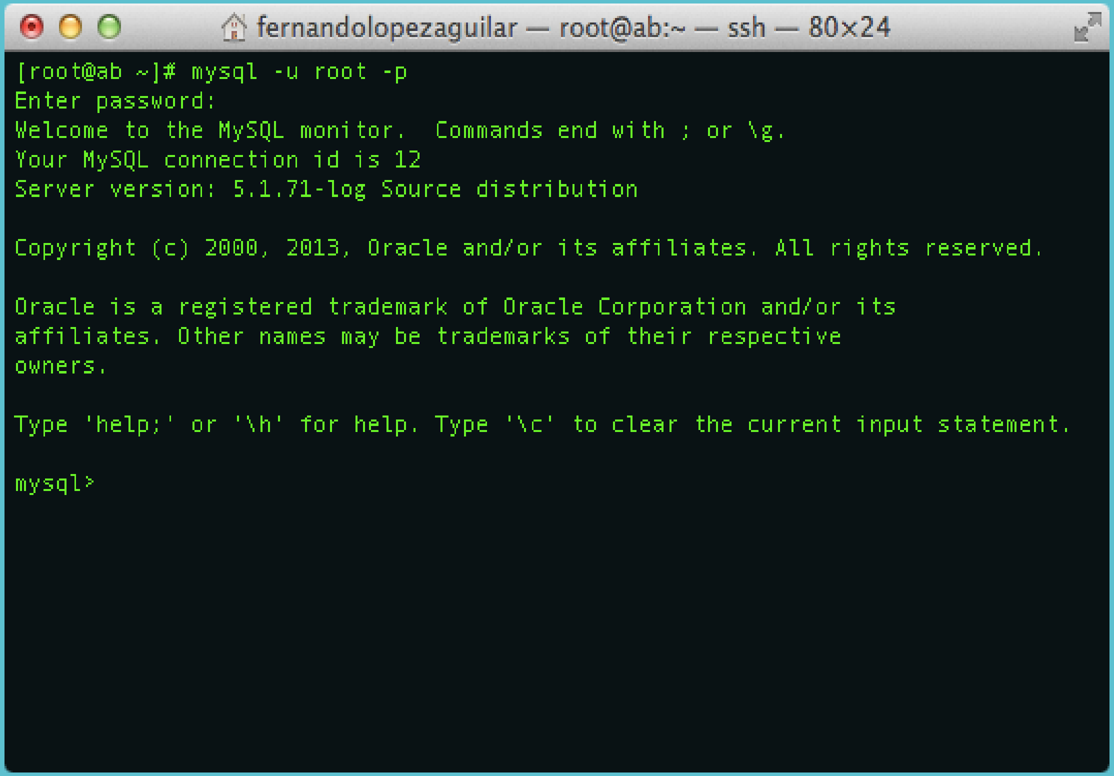
Demo



```
[root@ab ~]# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 5.1.71-log Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```
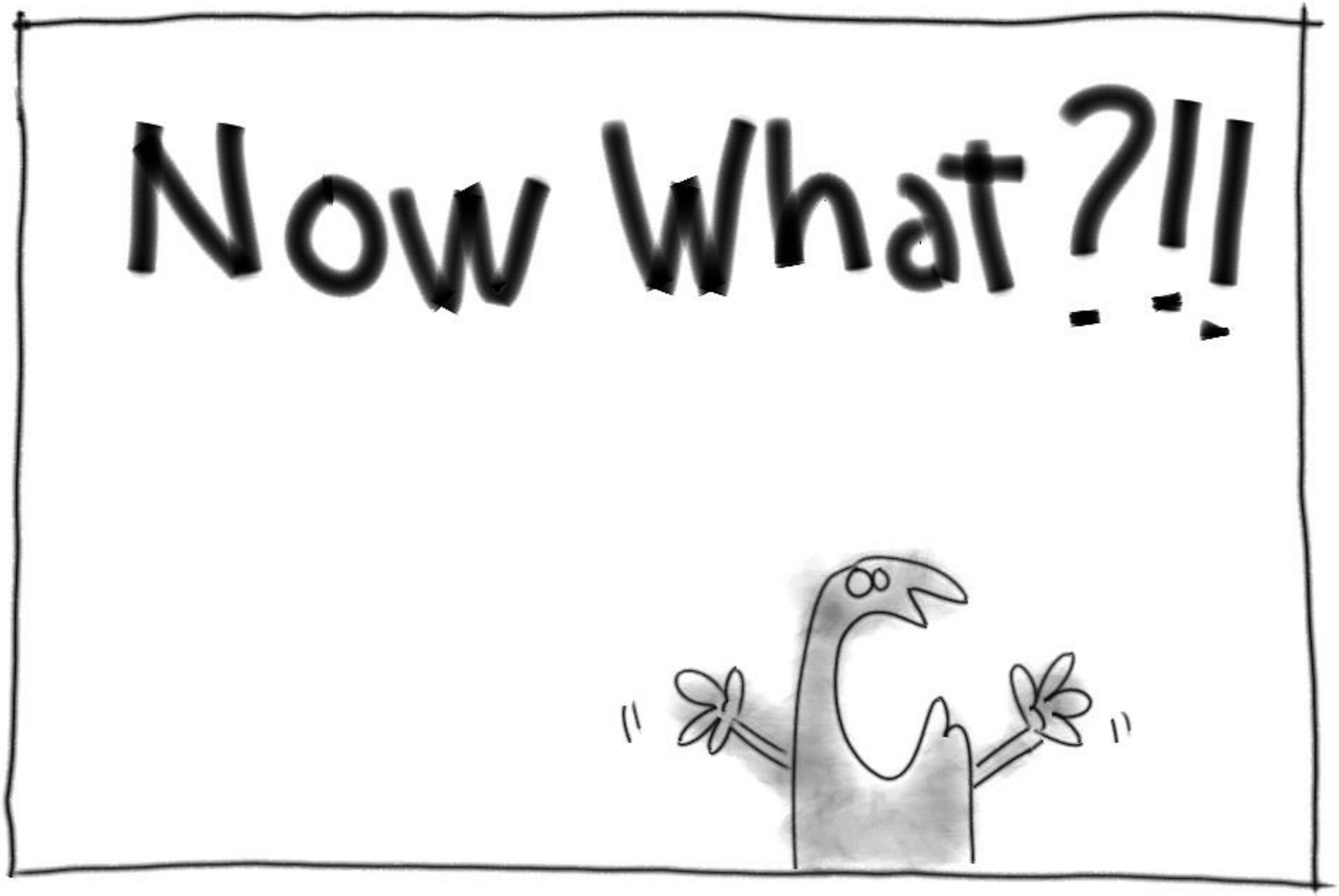

Reference Information

Documentation

- FIWARE Cloud Portal:
  - Documentation: **http://catalogue.fi-ware.org/enablers/self-service-interfaces-cloud-portal-upm**
- FIWARE Cloud Infrastructure
  - Account: **http://catalogue.fi-ware.org/enablers/identity-management-keyrock**
  - SDC: **http://catalogue.fi-ware.org/enablers/software-deployment-configuration-sagitta**
  - PaaS Manager: **http://catalogue.fi-ware.org/enablers/paas-manager-pegasus**
- FIWARE eLearning Platform
  - **http://edu.fi-ware.org/**


Now What?!!

If you have any question or problem contact to

fiware-lab-help@lists.fi-ware.org

You can go to stackoverflow and ask question with the tag fiware and/or filab.

DREAM BIG

IT WORKS

FIWARE

Open APIs for Open Minds

Thank you!

http://fiware.org
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