eXperimental Infrastructures for the Future Internet

XIFI Webinar

XIFI for Developers

A brief survey of how to use FIWARE-Lab and FIWARE-Ops

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FUTURE INTERNET PPP

SEVENTH FRAMEWORK PROGRAMME

Agenda

XIFI Webinar - XIFI for Developers

- **Using the FIWARE Lab portal**
  - Getting access, getting started, getting help
  - Setting up your tenant
  - Working with your tenant
  - Exploring the cloud
- **Using command line tools**
  - Installing OpenStack client tools
  - Managing virtual machine images
  - Working with virtual machines
  - Working with volumes

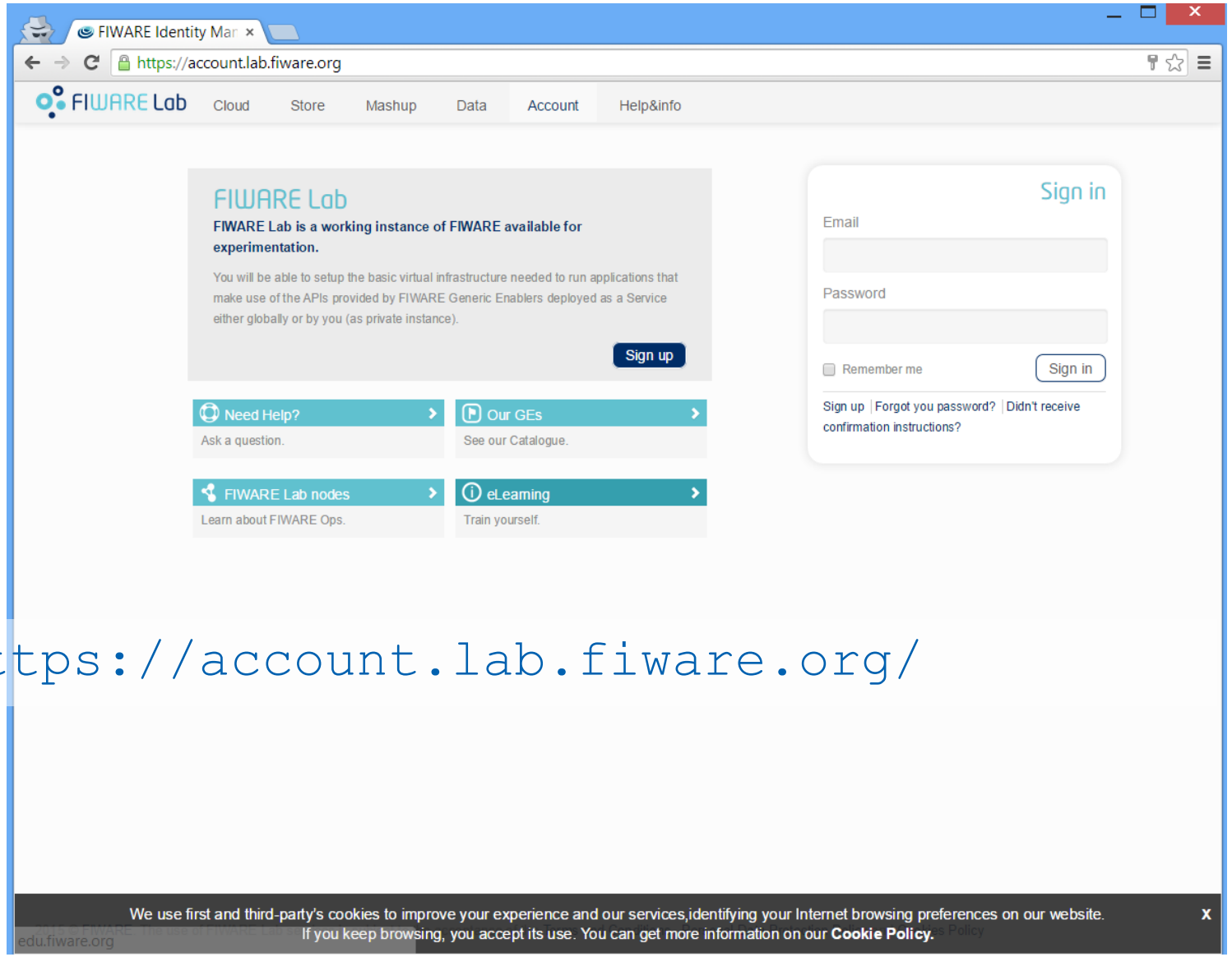
Using the FIWARE Lab portal

XIFI FOR DEVELOPERS

FUTURE INTERNET PPP

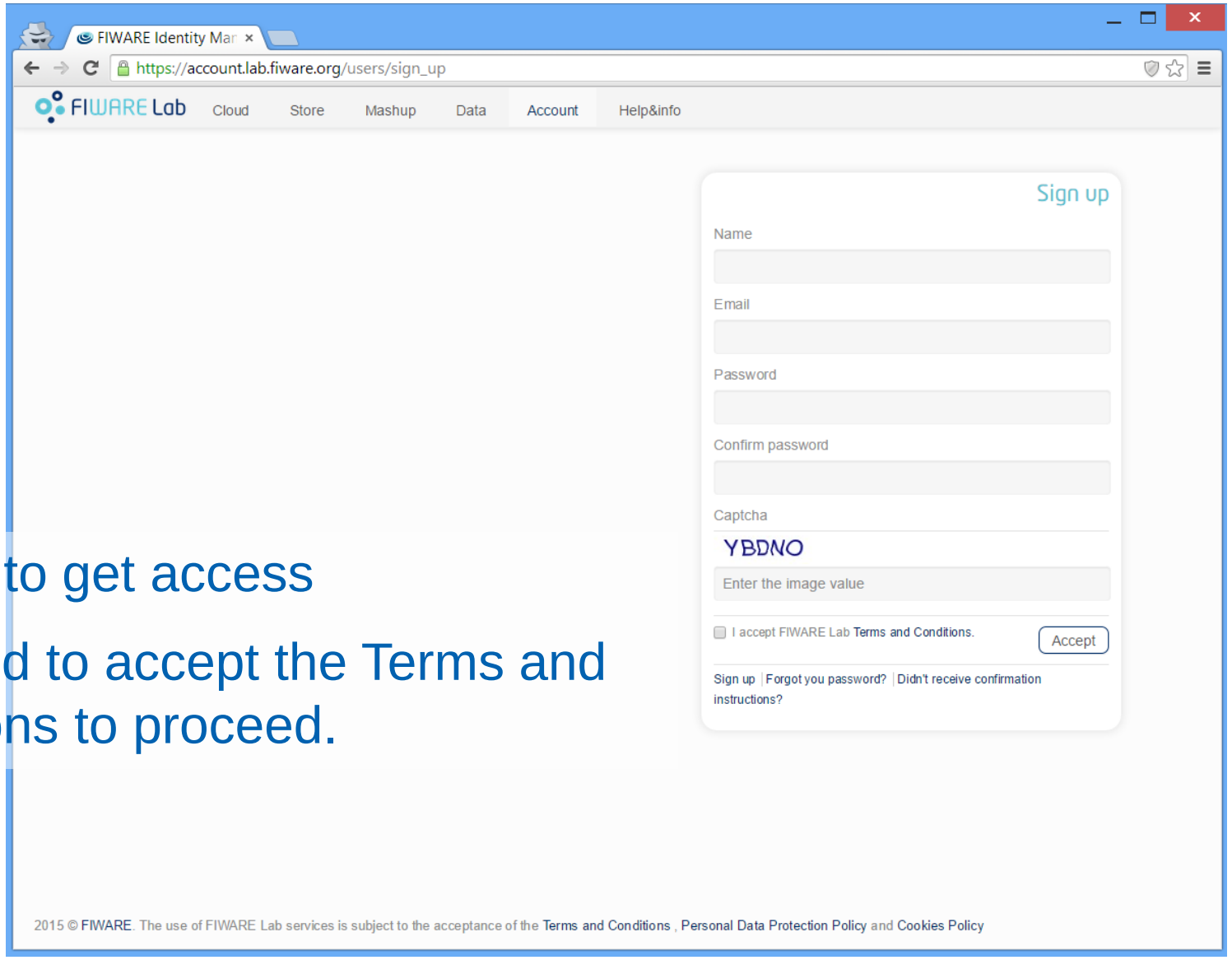
SEVENTH FRAMEWORK PROGRAMME

Using the FIWARE Lab portal
Getting access (1 of 2)



URL: https://account.lab.fiware.org/

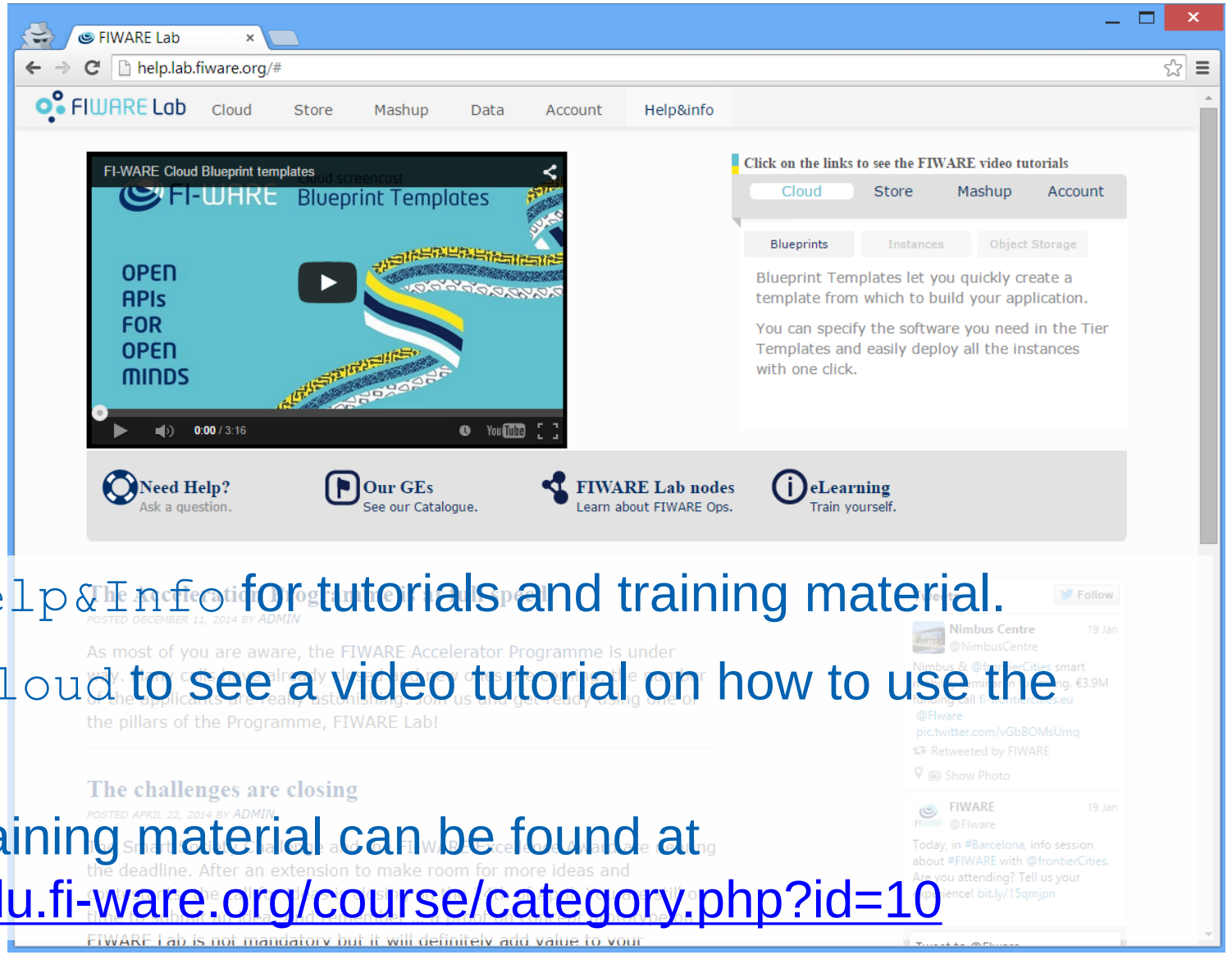
Using the FIWARE Lab portal
Getting access (2 of 2)



Sign up to get access

You need to accept the Terms and Conditions to proceed.

Using the FIWARE Lab portal
Getting help (1 of 7)

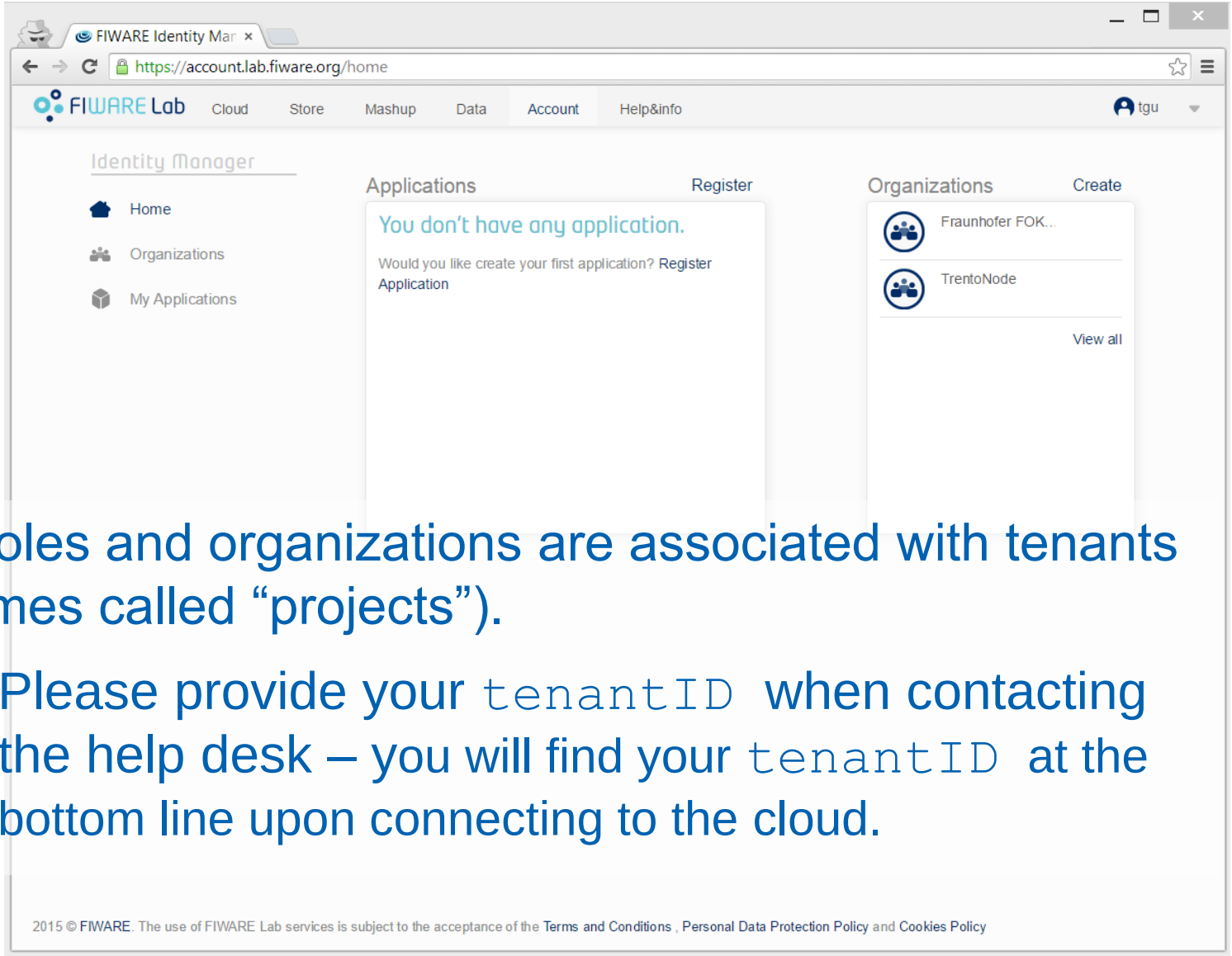


Click `Help&Info` for tutorials and training material.

Click `Cloud` to see a video tutorial on how to use the portal.

More training material can be found at http://edu.fi-ware.org/course/category.php?id=10

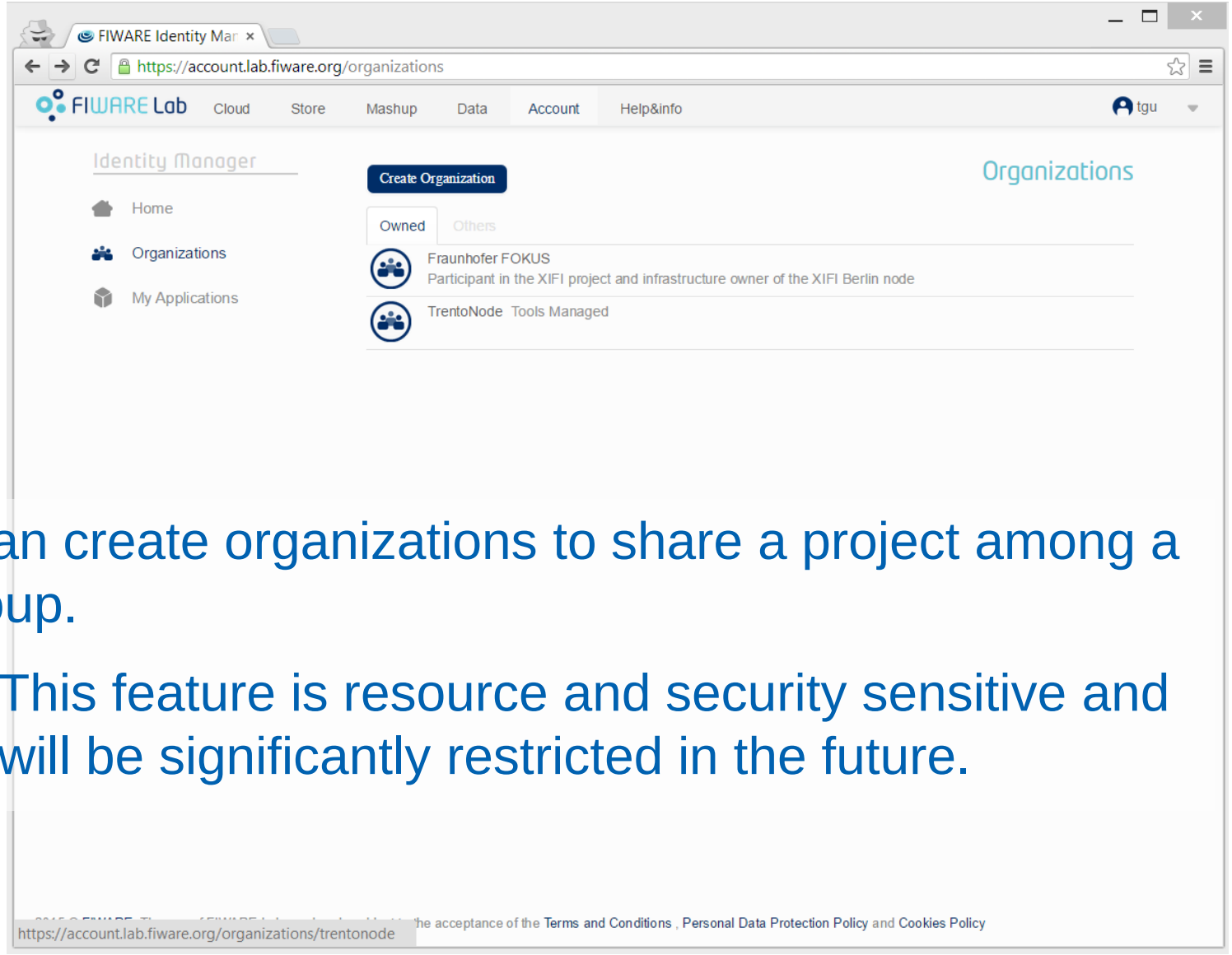
Using the FIWARE Lab portal
Getting started (2 of 7)



User's roles and organizations are associated with tenants (sometimes called "projects").

Please provide your `tenantID` when contacting the help desk – you will find your `tenantID` at the bottom line upon connecting to the cloud.

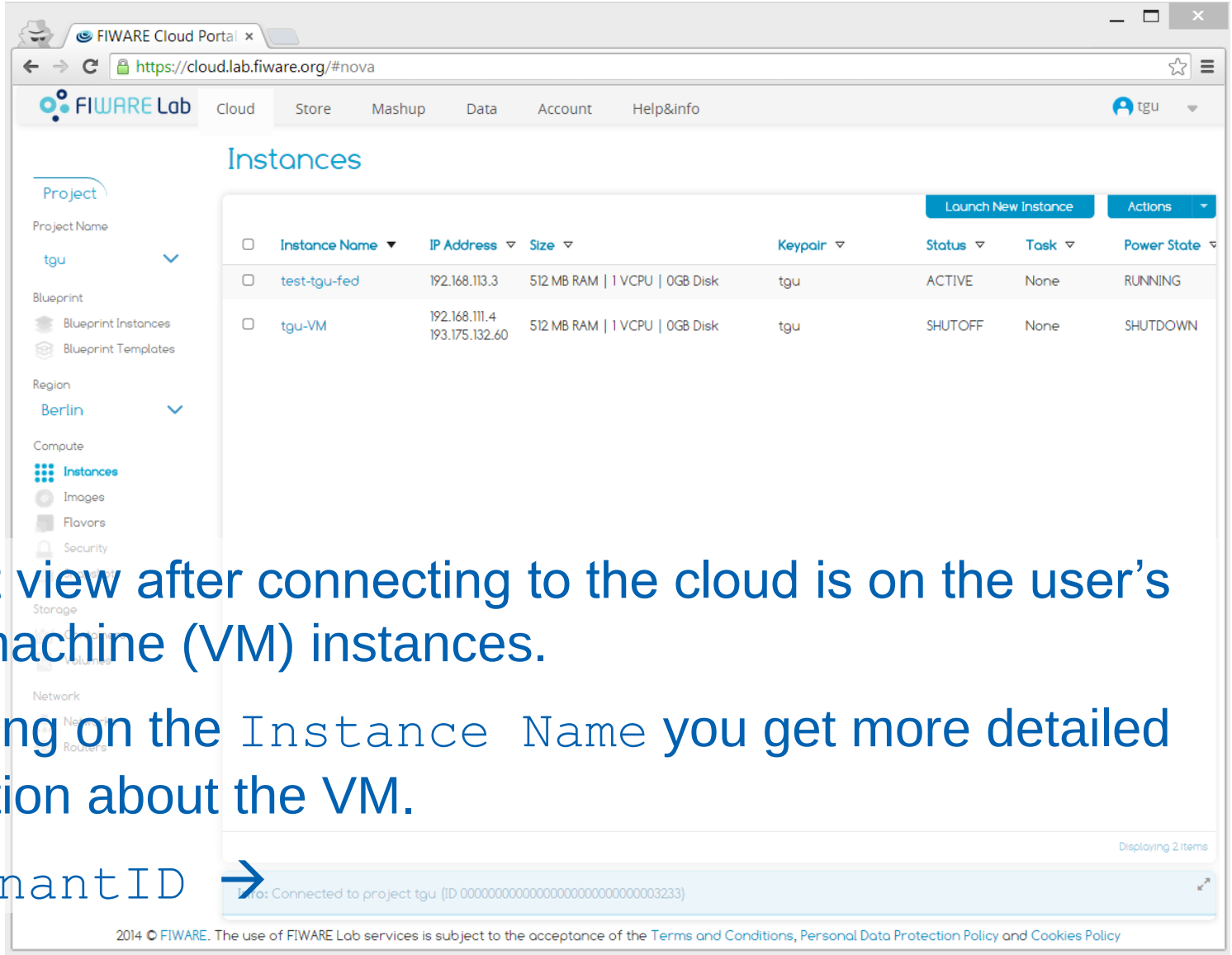
Using the FIWARE Lab portal
Getting started (3 of 7)



Users can create organizations to share a project among a user group.

This feature is resource and security sensitive and will be significantly restricted in the future.

Using the FIWARE Lab portal
Getting started (4 of 7)

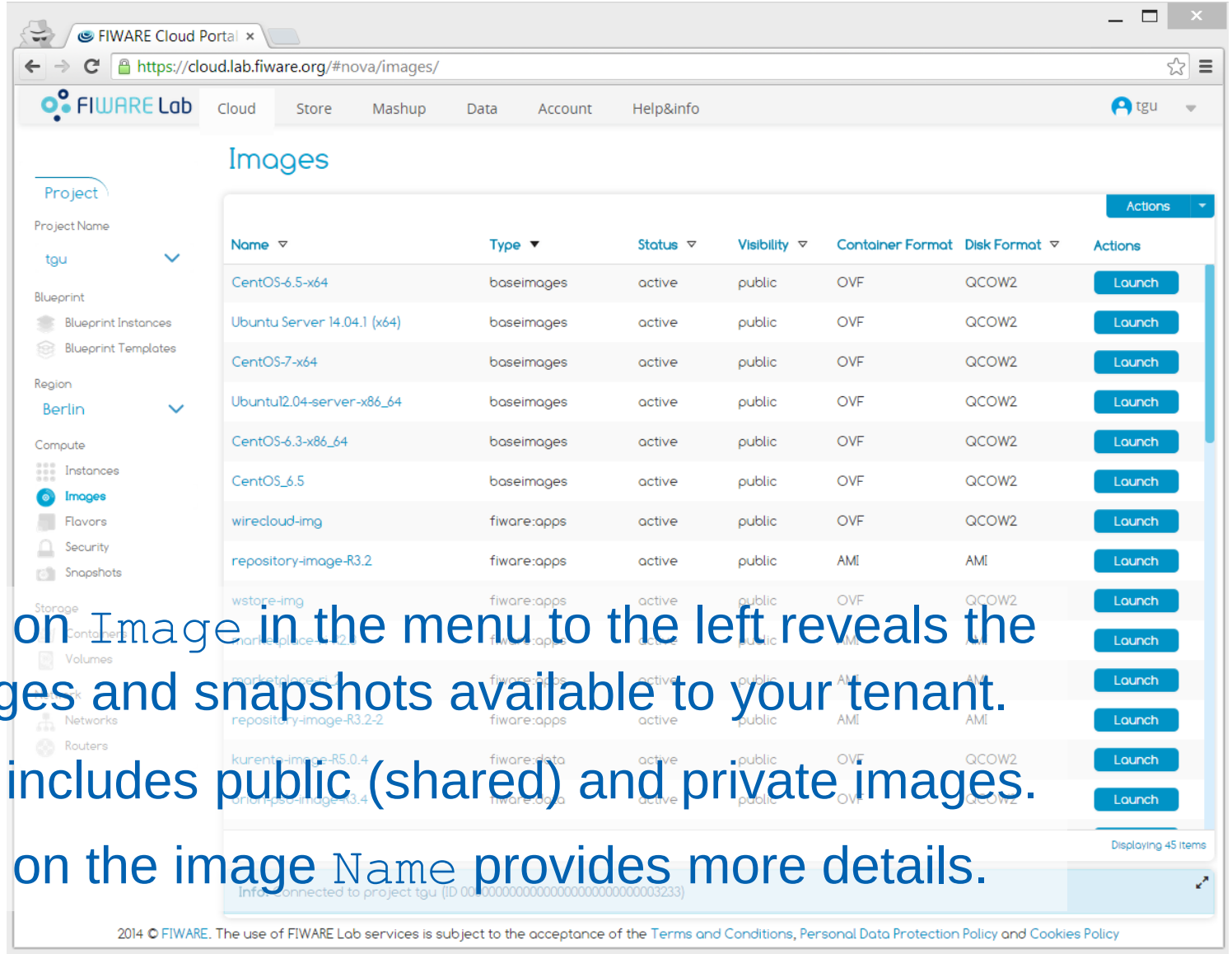


The first view after connecting to the cloud is on the user's virtual machine (VM) instances.

By clicking on the `Instance Name` you get more detailed information about the VM.

Your `tenantID` →

Using the FIWARE Lab portal
Getting started (5 of 7)

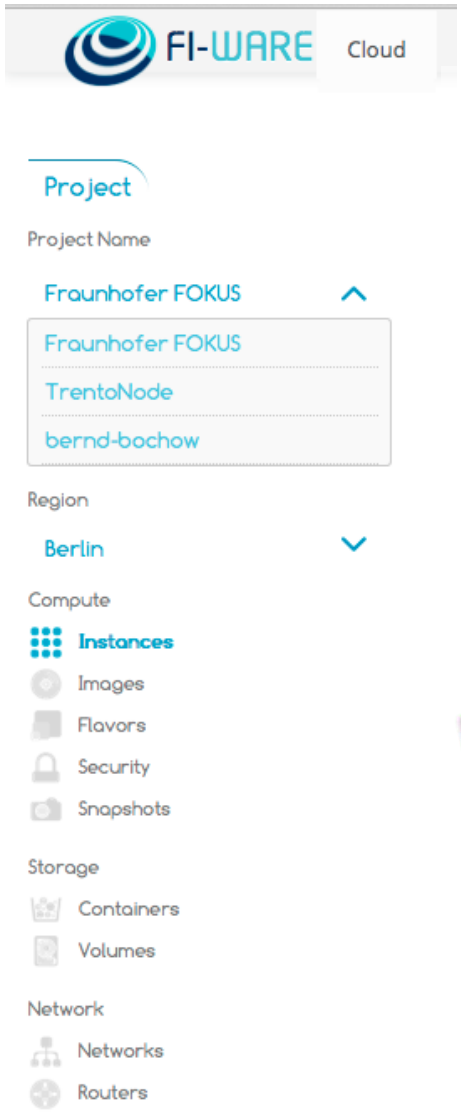


Clicking on `Image` in the menu to the left reveals the VM images and snapshots available to your tenant.

This list includes public (shared) and private images.

Clicking on the image `Name` provides more details.

Using the FIWARE Lab portal
Getting started (6 of 7)



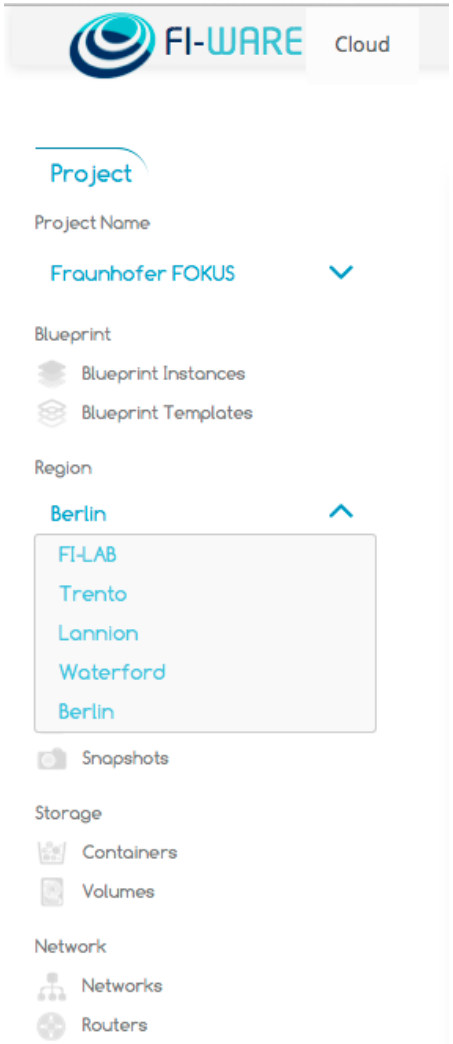
Select your active tenant from the `Project Name` list in the in the menu to the left.

The list includes all tenants (projects or organizations) you are allowed to access including those shared.

Your tenant is valid for all regions.

Although OpenStack APIs enable to share images among tenants, this feature is currently not accessible.

Using the FIWARE Lab portal
Getting started (7 of 7)



Select your active region from the `Region` list in the in the menu to the left.

The region name unambiguously identifies a particular infrastructure node in the cloud – all further actions apply to the region selected.

Regions differ in terms of resources, capacities and services offered – please choose the most suitable for your project.

When contacting the help desk, please provide the name of the region you are working with.

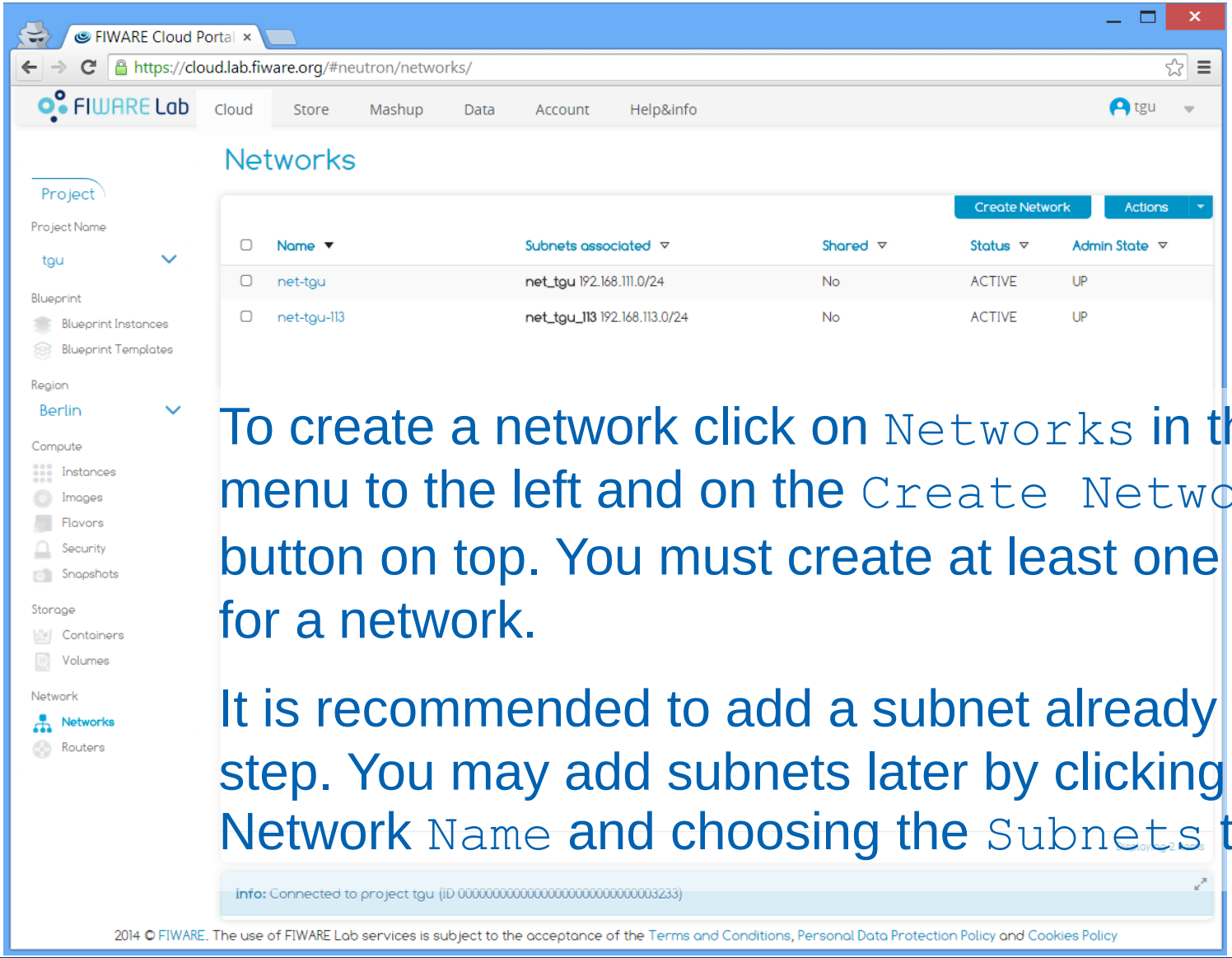
Using the FIWARE Lab portal
Setting up your tenant (1 of 10)

VMs must connect to a network – prior to launching an image you should have one or two thoughts about your configuration. You should set-up your tenant accordingly.

- At least one tenant (private) network;
- At least one tenant router between networks;
- At least one default router between a exactly one tenant network and exactly one public network;
- Zero or more floating IP addresses.

All regions have a strictly limited pool of public IPv4 addresses available for tenants. Public addresses are granted upon availability and may be revoked if needed.

Using the FIWARE Lab portal
Setting up your tenant (2 of 10)

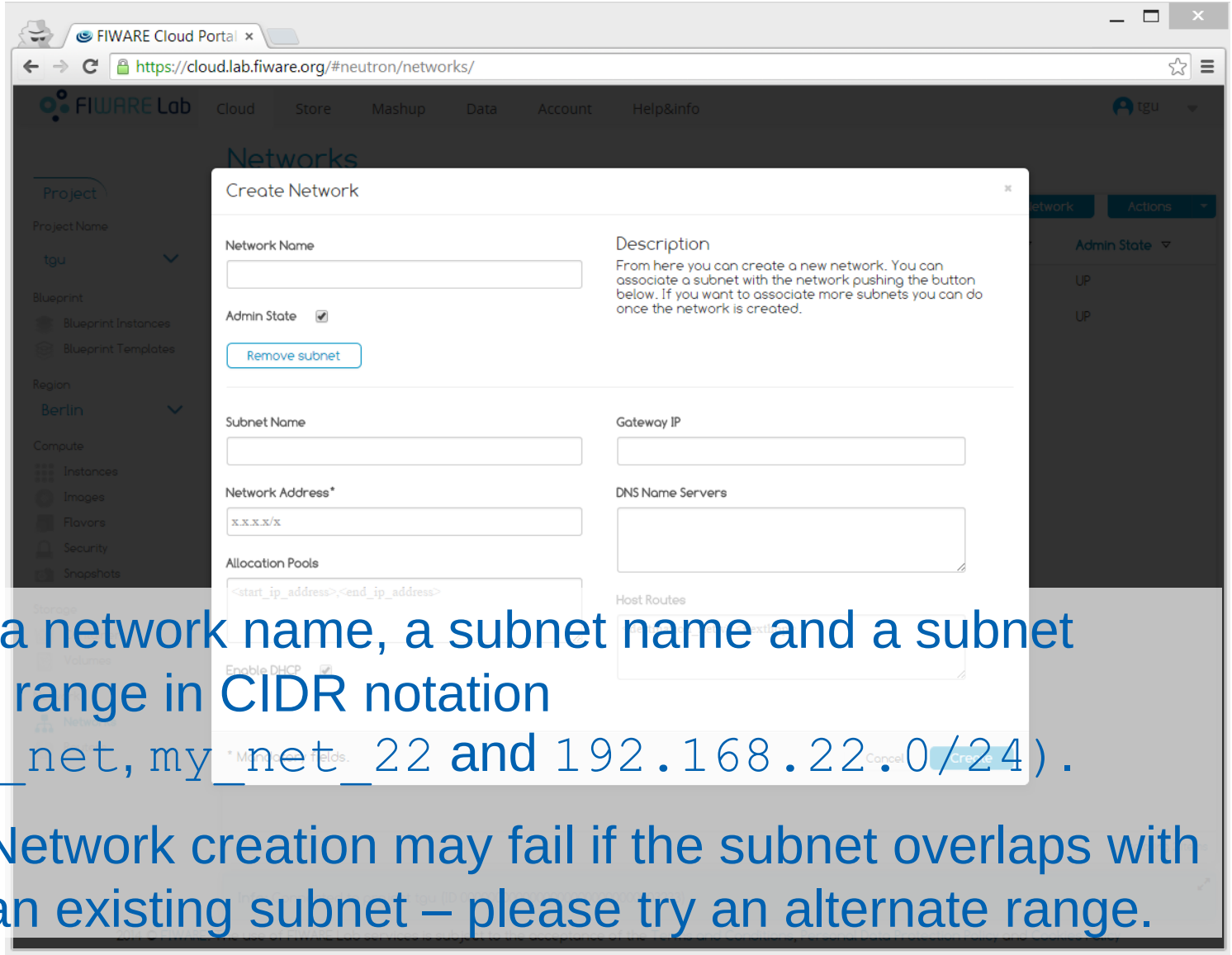


To create a network click on `Networks` in the menu to the left and on the `Create Network` button on top. You must create at least one subnet for a network.

It is recommended to add a subnet already in this step. You may add subnets later by clicking on the Network `Name` and choosing the `Subnets` tab.

Using the FIWARE Lab portal

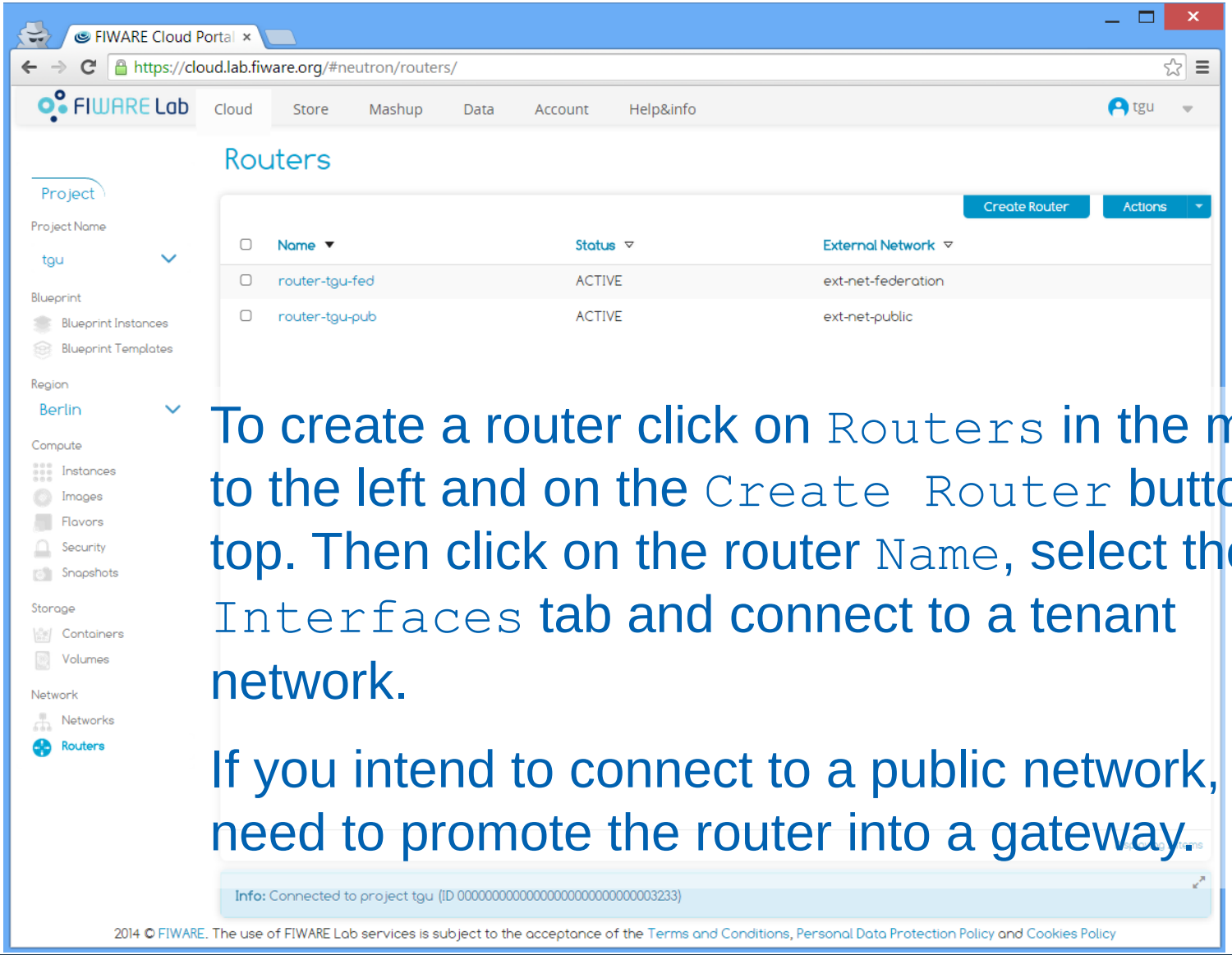
Setting up your tenant (3 of 10)



Specify a network name, a subnet name and a subnet address range in CIDR notation (e.g. `my_net`, `my_net_22` and `192.168.22.0/24`).

Network creation may fail if the subnet overlaps with an existing subnet – please try an alternate range.

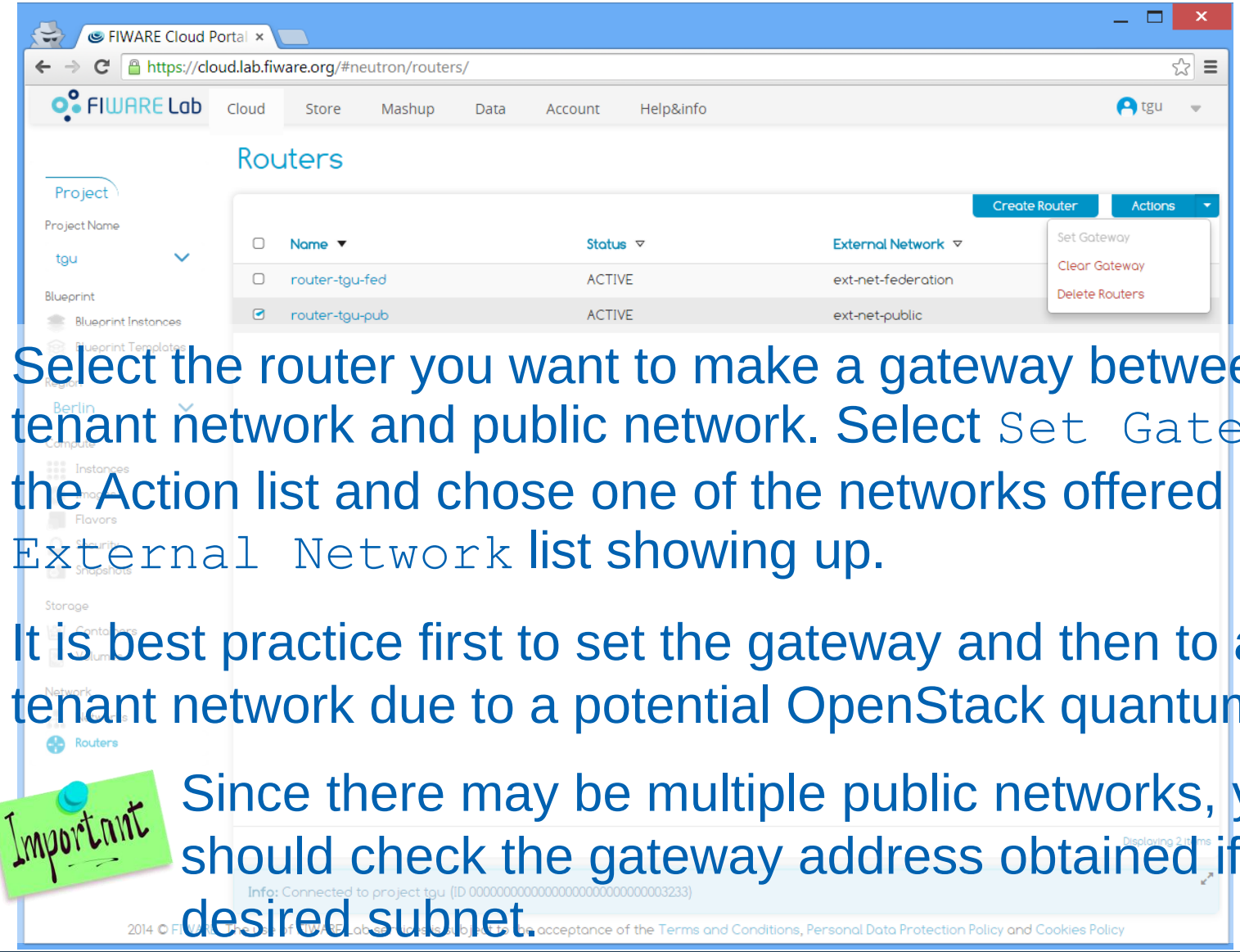
Using the FIWARE Lab portal
Setting up your tenant (4 of 10)



To create a router click on `Routers` in the menu to the left and on the `Create Router` button on top. Then click on the router `Name`, select the `Interfaces` tab and connect to a tenant network.

If you intend to connect to a public network, you need to promote the router into a gateway.

Using the FIWARE Lab portal
Setting up your tenant (5 of 10)

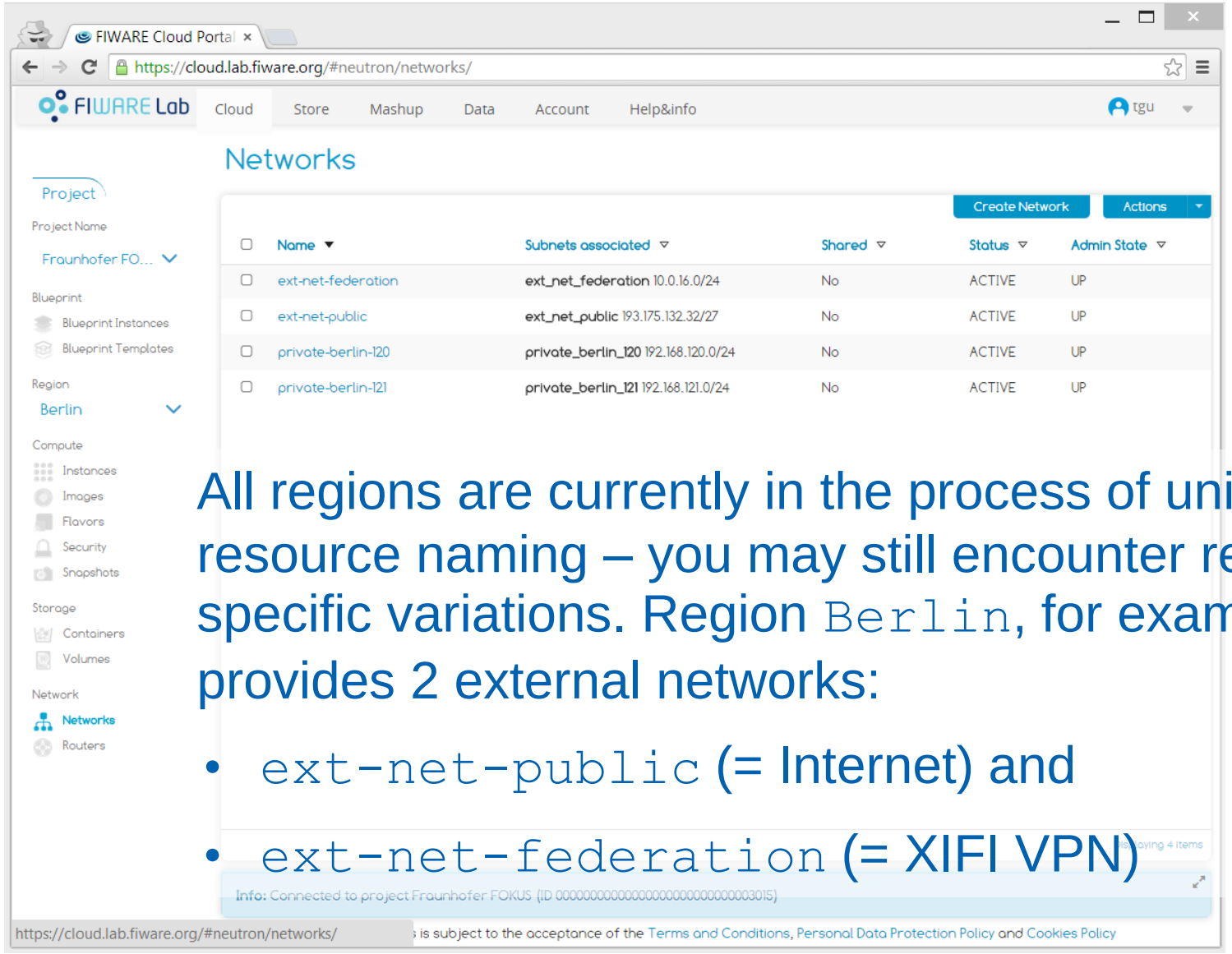


Select the router you want to make a gateway between tenant network and public network. Select `Set Gateway` in the Action list and chose one of the networks offered in the `External Network` list showing up.

It is best practice first to set the gateway and then to attach a tenant network due to a potential OpenStack quantum issue.

Since there may be multiple public networks, you should check the gateway address obtained if it is the desired subnet.

Using the FIWARE Lab portal
Setting up your tenant (6 of 10)



All regions are currently in the process of unifying resource naming – you may still encounter region specific variations. Region `Berlin`, for example, provides 2 external networks:

- `ext-net-public` (= Internet) and
- `ext-net-federation` (= XIFI VPN)

Using the FIWARE Lab portal
Setting up your tenant (7 of 10)

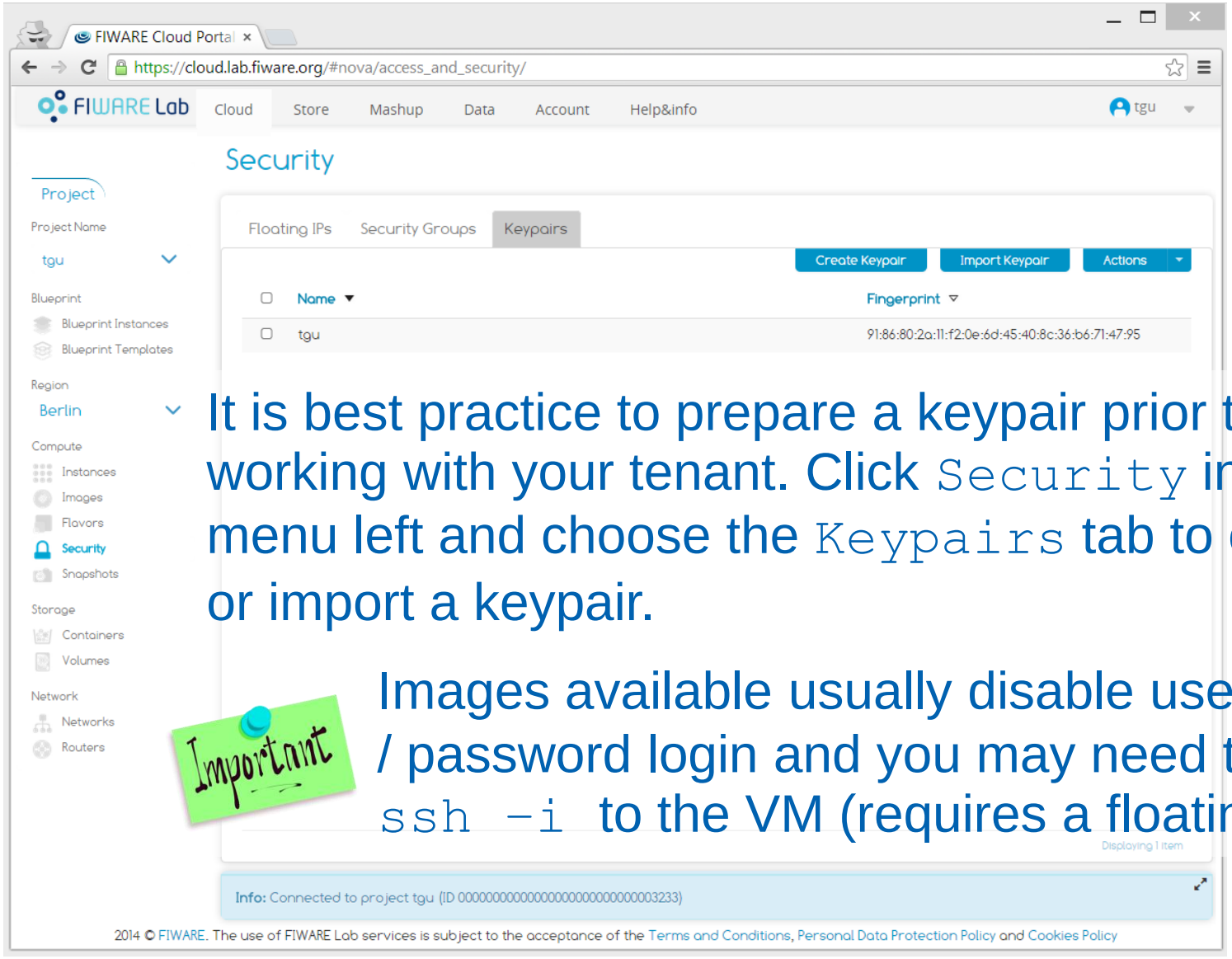
At this time you may have a single private (tenant) network and a gateway that is routing and NATing between the private network and a public network. A VM then can

- connect to the private network and obtain an IP address from the subnet it attaches to by DHCP (keep in mind that the network might have multiple subnets).
- can access the associated public (external) network through the NAT gateway.
- be associated with a dedicated IP address in case exactly that external network offers a floating IP pool.

The latter is required only, if the VM must be reachable under a well-known fixed IP address.

Using the FIWARE Lab portal

Setting up your tenant (8 of 10)

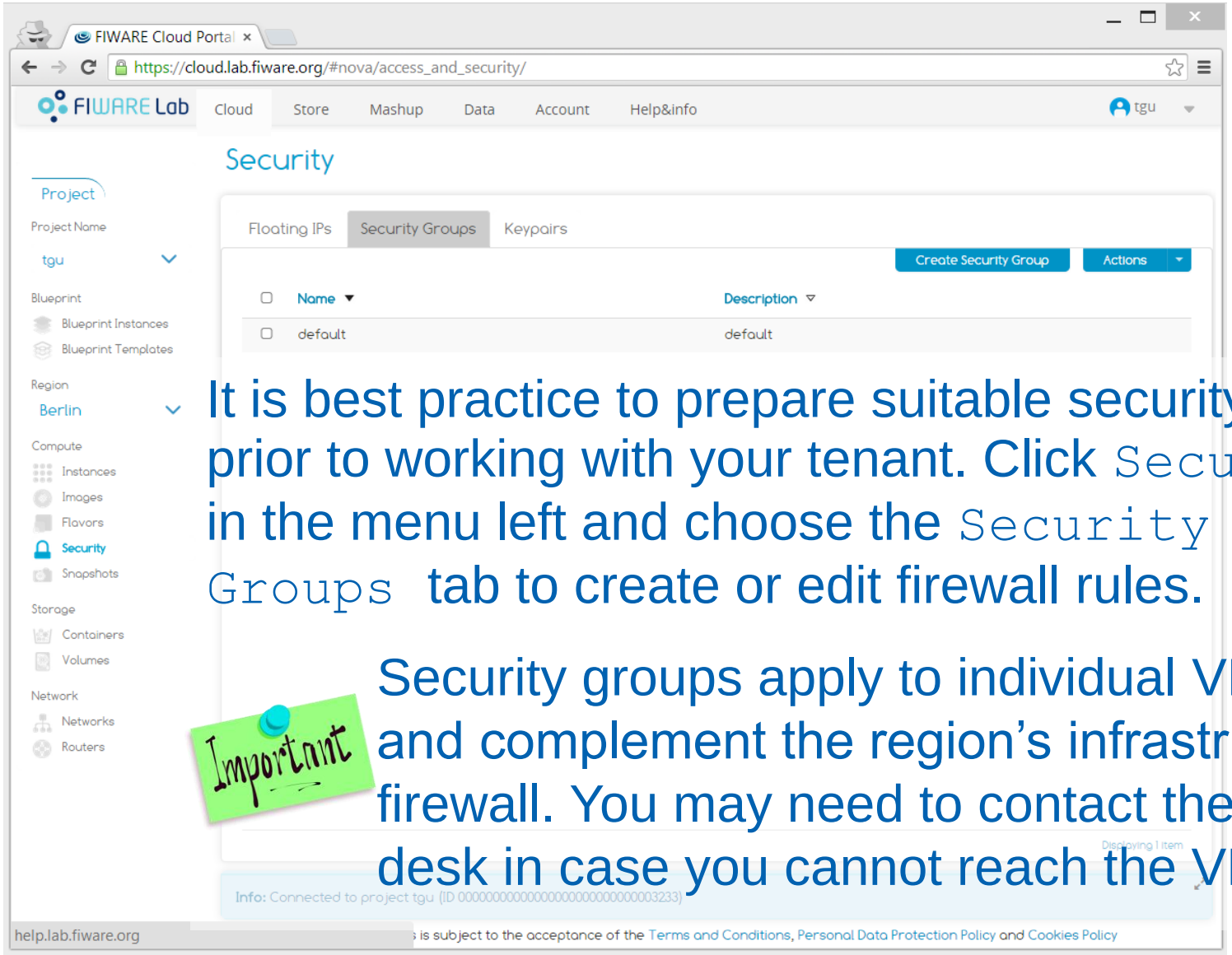


It is best practice to prepare a keypair prior to working with your tenant. Click `Security` in the menu left and choose the `Keypairs` tab to create or import a keypair.

Images available usually disable username / password login and you may need to `ssh -i` to the VM (requires a floating IP).

Using the FIWARE Lab portal

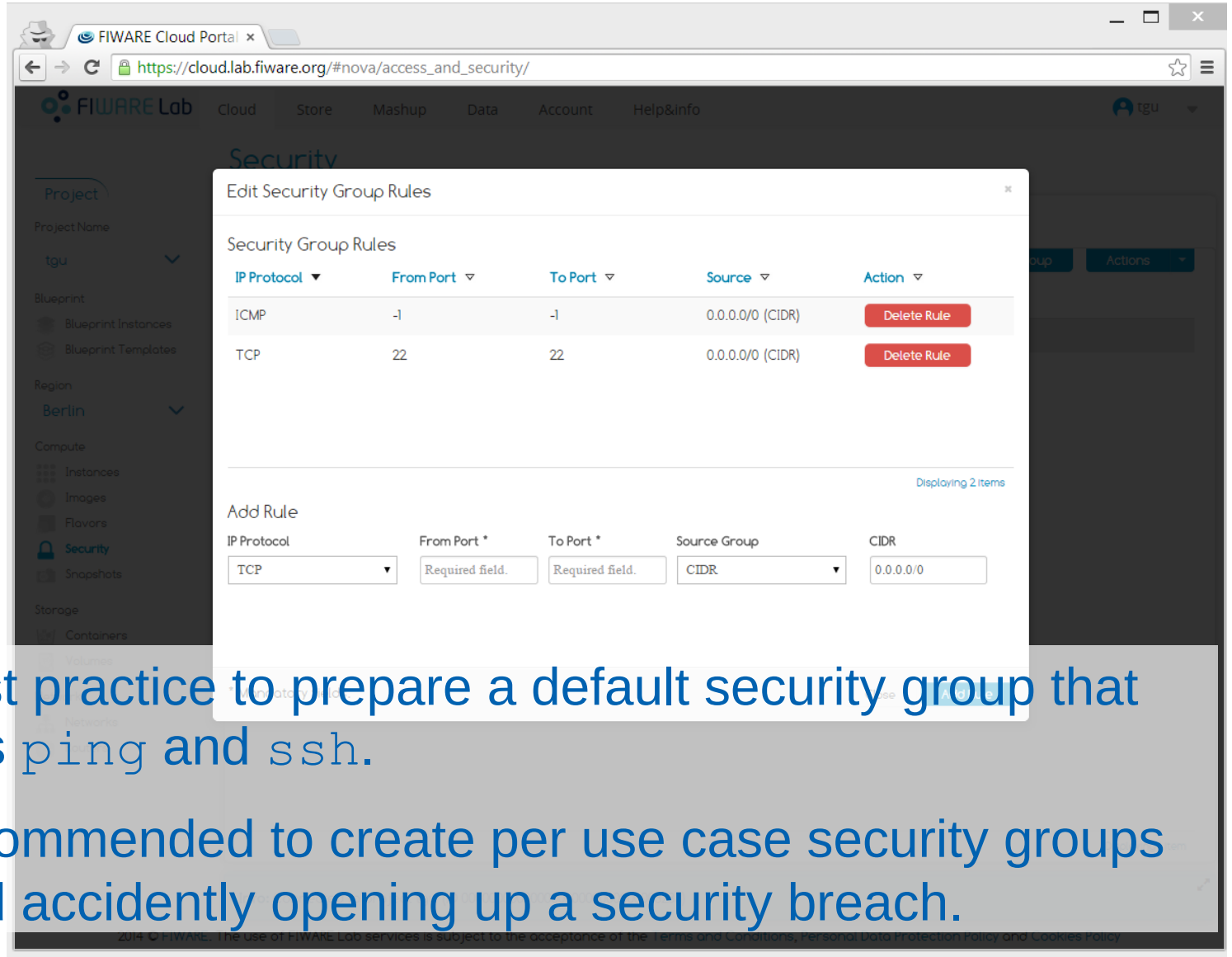
Setting up your tenant (9 of 10)



It is best practice to prepare suitable security rules prior to working with your tenant. Click `Security` in the menu left and choose the `Security Groups` tab to create or edit firewall rules.

Security groups apply to individual VMs and complement the region's infrastructure firewall. You may need to contact the help desk in case you cannot reach the VM.

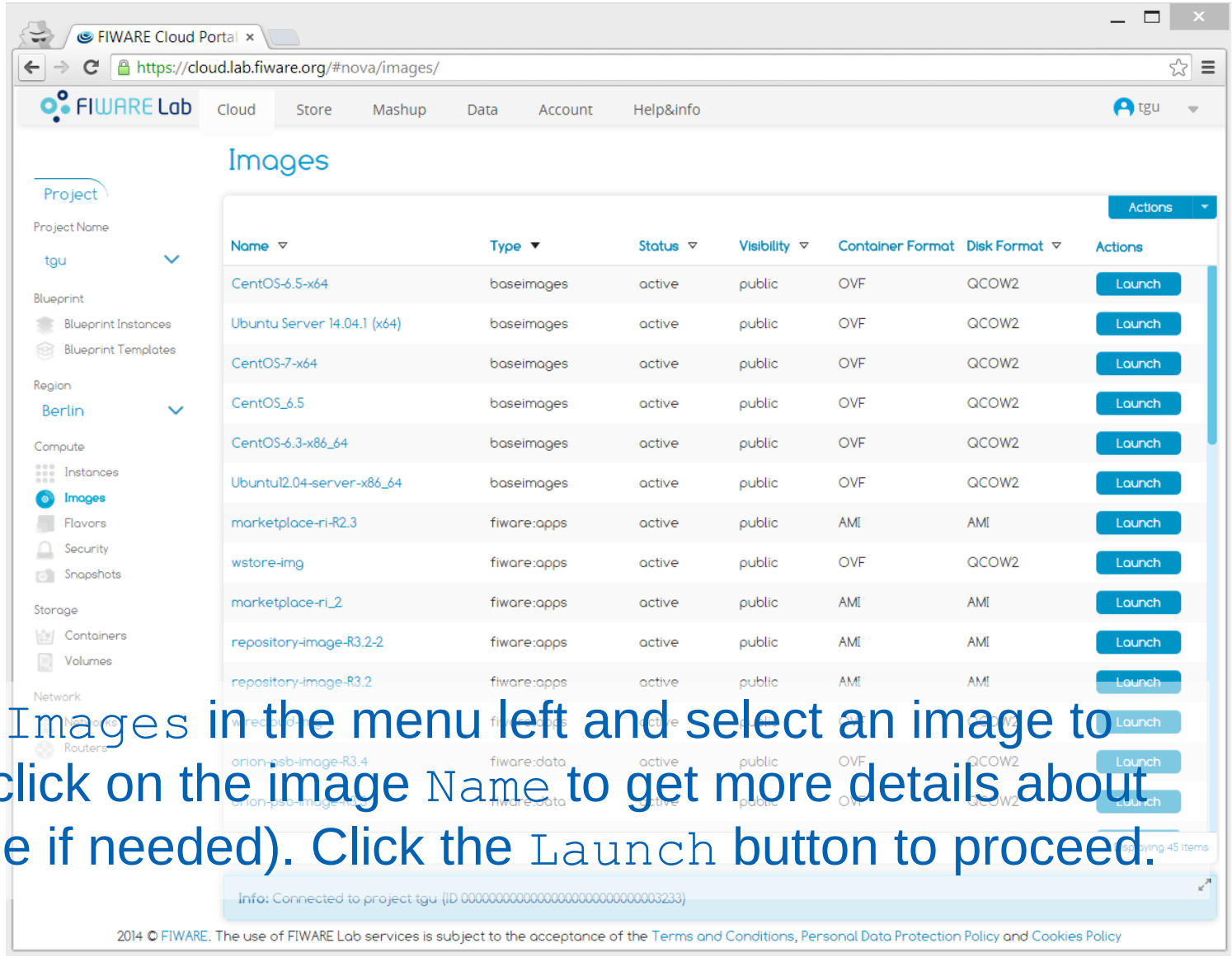
Using the FIWARE Lab portal
Setting up your tenant (10 of 10)



It is best practice to prepare a default security group that enables `ping` and `ssh`.

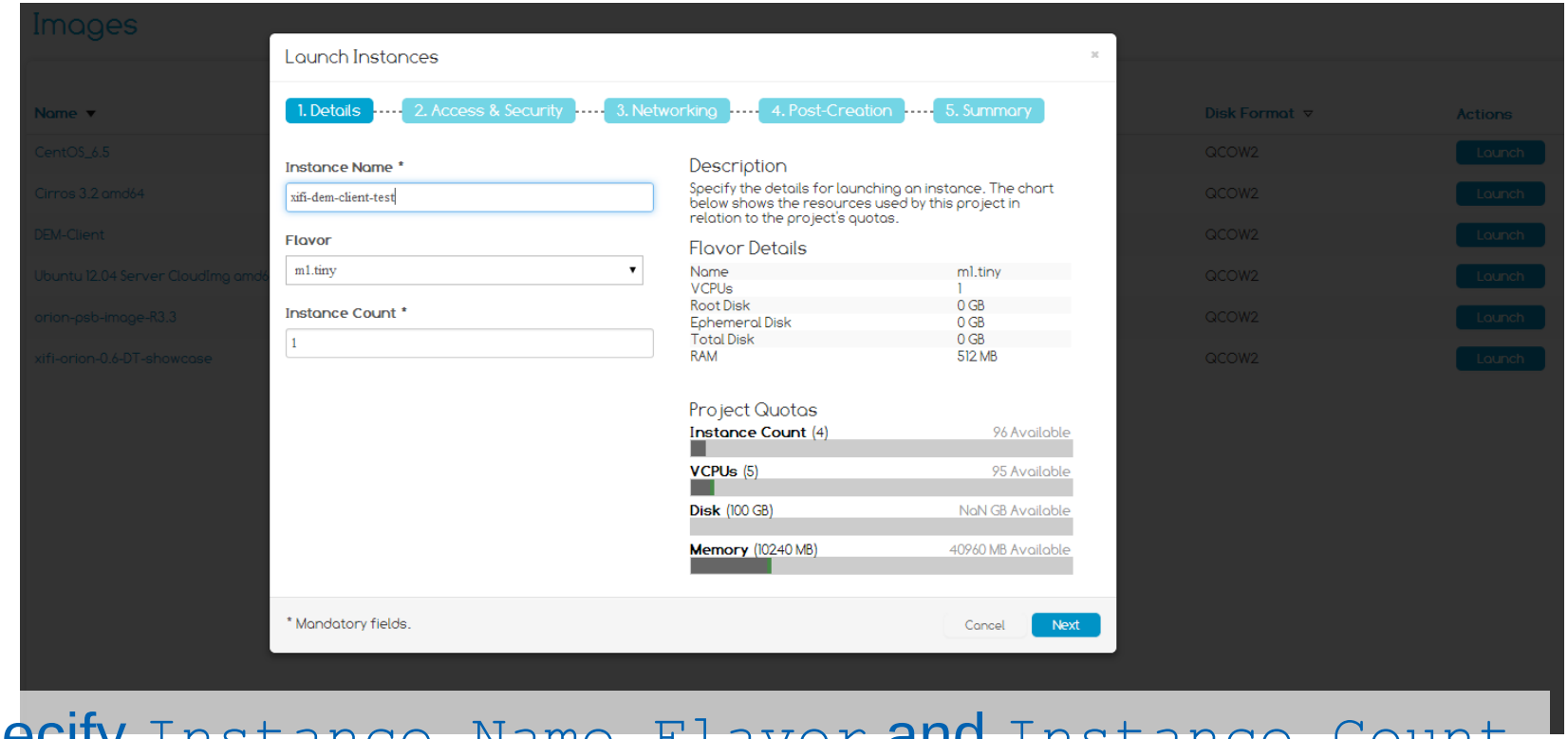
It is recommended to create per use case security groups to avoid accidently opening up a security breach.

Using the FIWARE Lab portal
Working with your tenant (1 of 20)



Click on `Images` in the menu left and select an image to launch (click on the image `Name` to get more details about the image if needed). Click the `Launch` button to proceed.

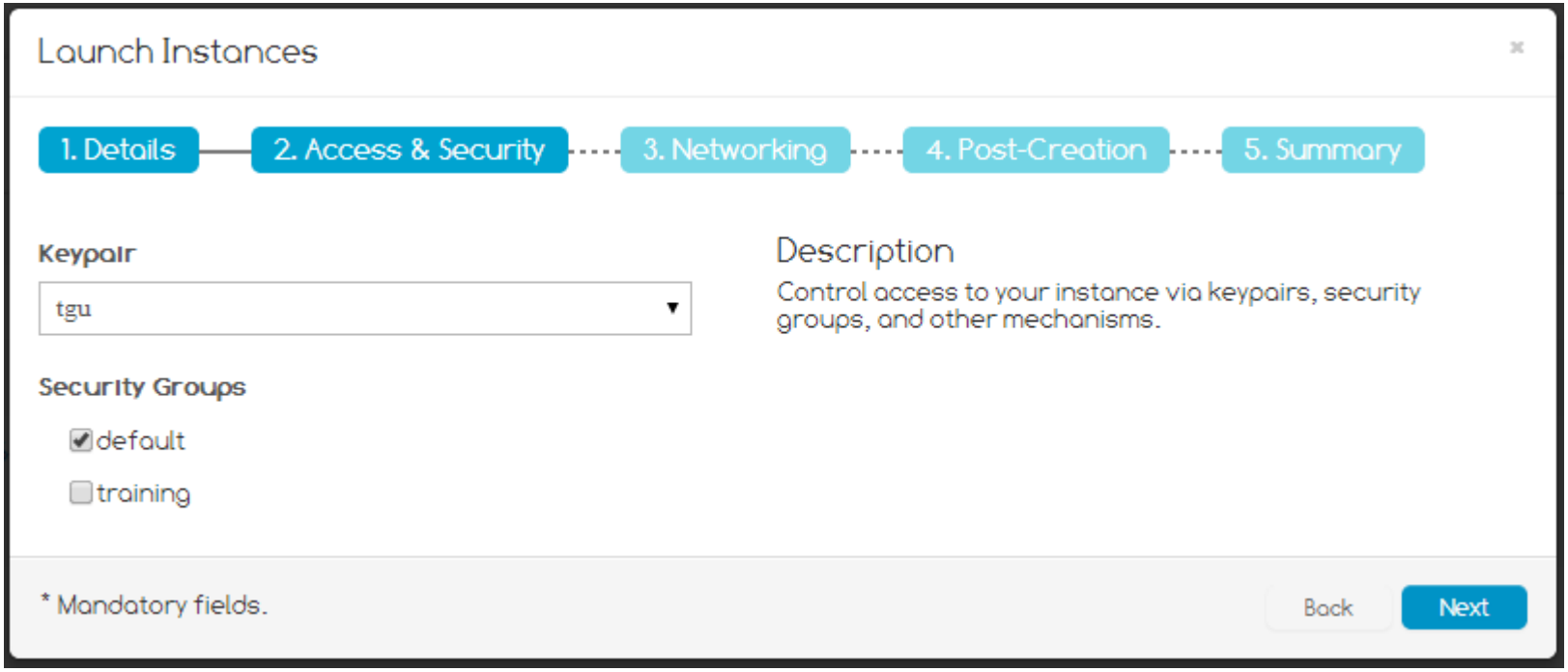
Using the FIWARE Lab portal
Working with your tenant (2 of 20)



Specify `Instance Name`, `Flavor` and `Instance Count`. Details regarding flavors provided can be obtained through clicking `Flavors` in the menu left.

Don't forget to check against your quota – in particular when using large flavors.

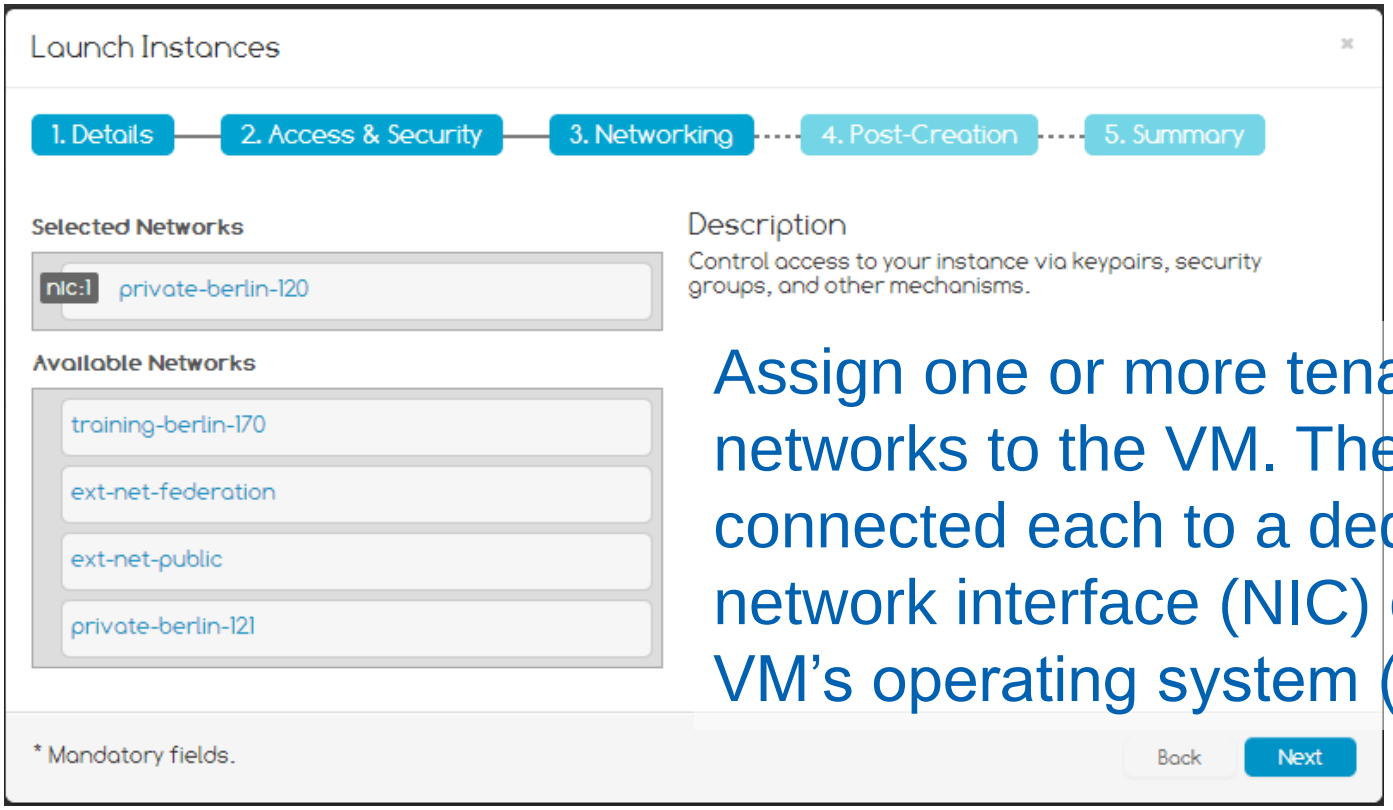
Using the FIWARE Lab portal
Working with your tenant (3 of 20)



Assign a `Keypair` and one or more `Security Groups` to the instance as needed.

Security rules are of additive “allow-type”. It is best practice to tailor VM security using multiple security groups.

Using the FIWARE Lab portal
Working with your tenant (4 of 20)



Assign one or more tenant networks to the VM. They will be connected each to a dedicated network interface (NIC) of the VM's operating system (OS).

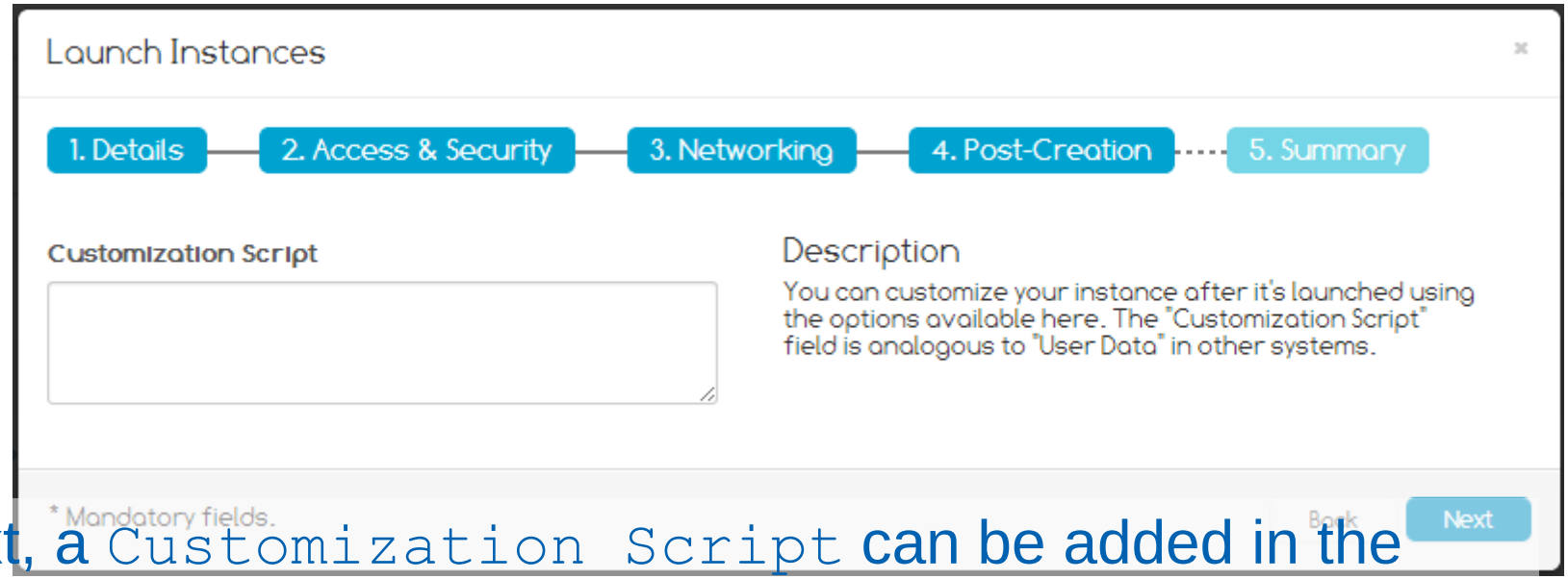
There are some intricacies to consider when assigning tenant networks – see the next slide.

Using the FIWARE Lab portal
Working with your tenant (5 of 20)

When assigning tenant networks to a VM instance you need to consider the following:

- A VM fails to start-up with no tenant network assigned.
- If you want to associate a floating IP to the VM later on, you should ensure that the correct tenant network is used (i.e. a network that has a suitable gateway to an external network).
- Some OSs check a NICs MAC Id upon start up. This may disable a NIC since a VMs NICs are virtualized and get random private MAC IDs assigned by OpenStack.
- Assigning multiple tenant networks currently may cause a VM to fail due to an open issue with multiple DHCP servers causing all except the first NIC to fail receiving a DHCP configuration. You may use fixed IPs in certain use cases.

Using the FIWARE Lab portal
Working with your tenant (6 of 20)

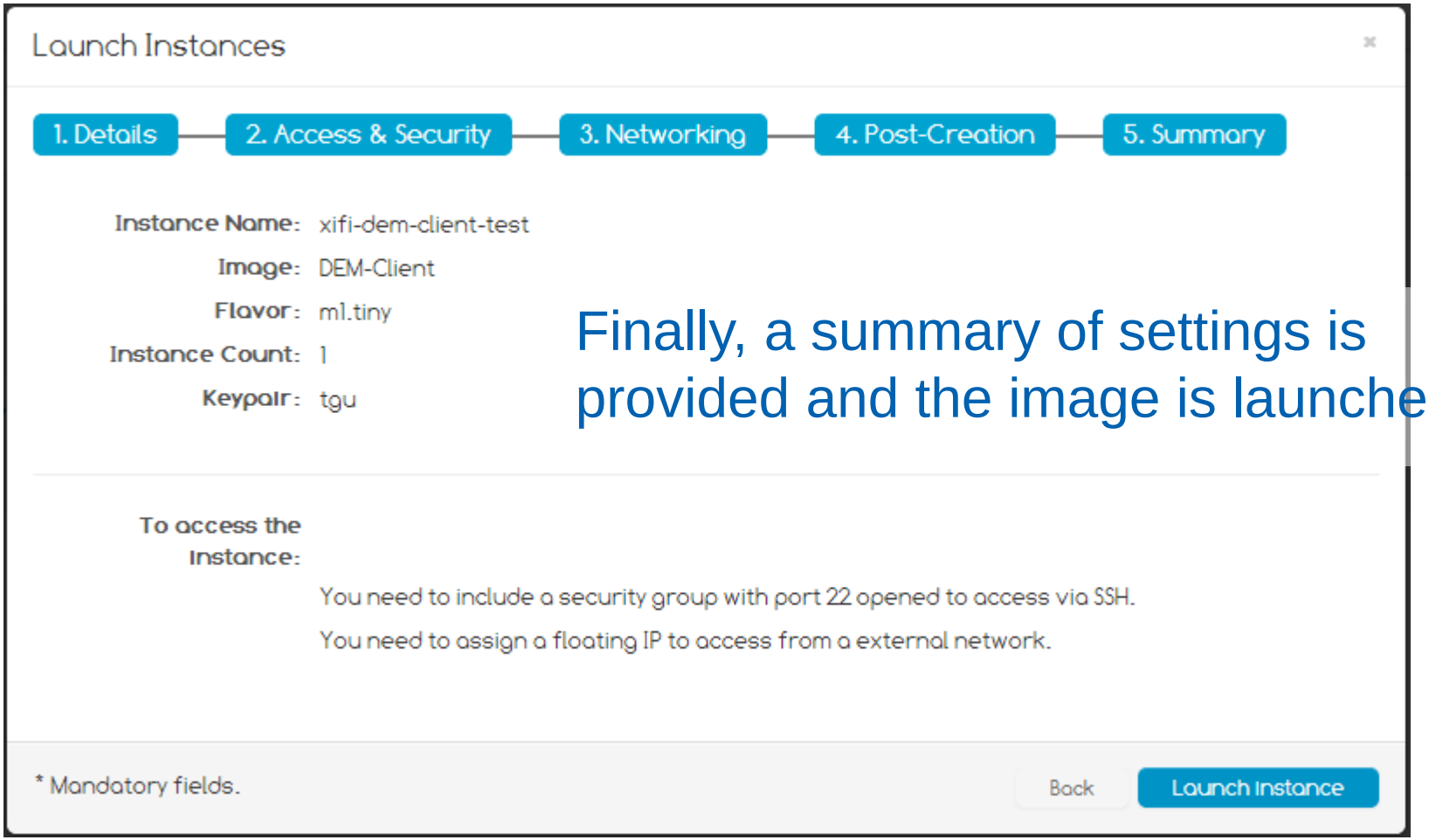


Next, a `Customization Script` can be added in the corresponding edit box.

It is executed after the VM started its operating system.

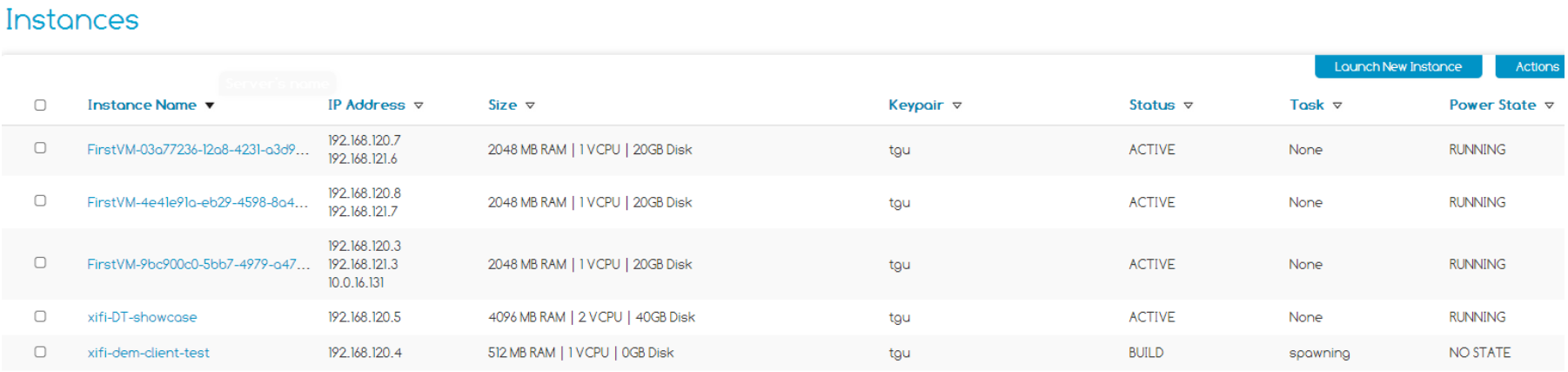
Currently a default script is provided as an example that configures the VMs network interfaces after the VM has been created.

Using the FIWARE Lab portal
Working with your tenant (7 of 20)



Finally, a summary of settings is provided and the image is launched.

Using the FIWARE Lab portal
Working with your tenant (8 of 20)



If you successfully completed the previous steps a newly created VM should show up in the Instances list.

It is recommended to observe `Status.Task` and `Power State` during VM instantiation and to check the details of a potential `Error` message shown at the bottom of the page.

Some hints are given on the next slide.

Using the FIWARE Lab portal
Working with your tenant (9 of 20)

VM instantiation may fail for many reasons and error reporting from the portal is less detailed.

- It helps to know which task was causing an error (image decompression, creation, networking …) and in which state the VM settled. Re-check after a few minutes (the VM may have done a shutdown automatically).
- When contacting the help desk, please provide details of the VM (e.g. `Name`, `ID`). Click on the `Instance Name` of the VM and cycle through the tabs `Overview` and `Log` to collect information from the VM and from the VMs OS.
- If everything seems ok, try also the `Connection` tab to get a VNC terminal to the instance and check if the VMs OS started up correctly (check if you get a login prompt, try to log in and check the network status from within).
- Please check with the command line tools section for further hints.

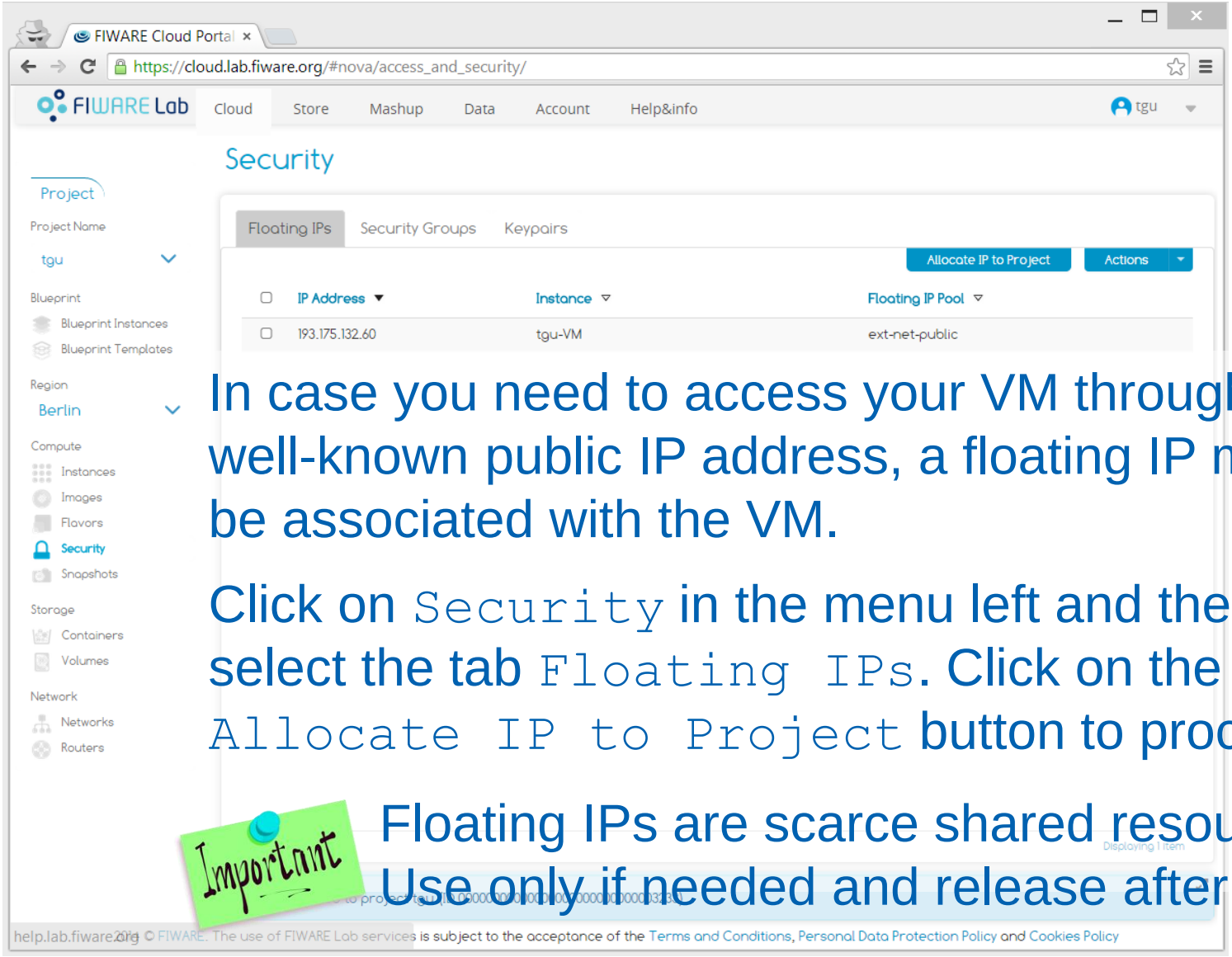
Using the FIWARE Lab portal
Working with your tenant (10 of 20)

It is best practice to take a snapshot of a customized VM as a backup or for a later roll-back in case of failures. Select an `Instance Name` and click the `Action` button. Then select `Create Snapshot`.

The newly created Snapshot shows up in the `Snapshots` and `Images` Menus to the left.

A snapshot can be launched from the `Images` Menu.

Using the FIWARE Lab portal
Working with your tenant (11 of 20)

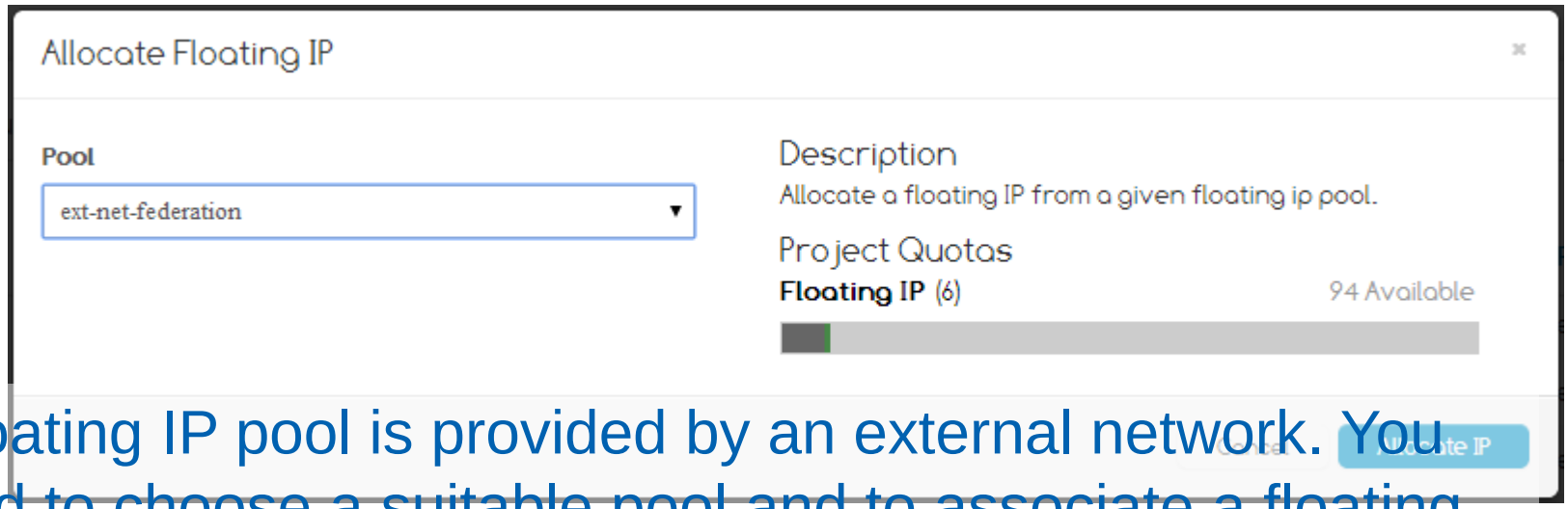


In case you need to access your VM through a well-known public IP address, a floating IP must be associated with the VM.

Click on `Security` in the menu left and then select the tab `Floating IPs`. Click on the `Allocate IP to Project` button to proceed.

Floating IPs are scarce shared resources. Use only if needed and release after use.

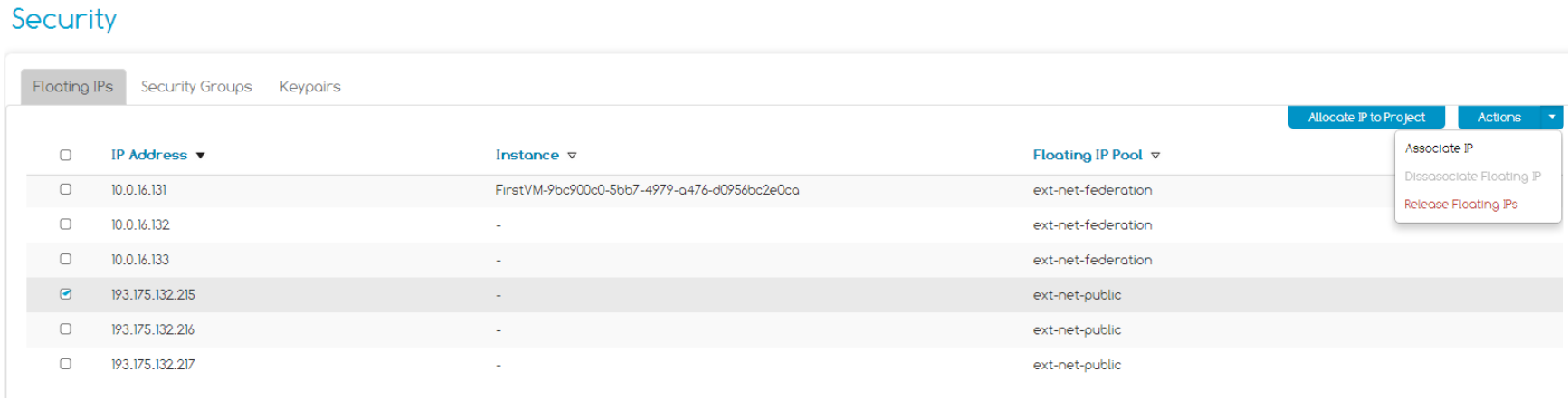
Using the FIWARE Lab portal
Working with your tenant (12 of 20)



A floating IP pool is provided by an external network. You need to choose a suitable pool and to associate a floating IP from that pool to your tenant.

First check, if your tenant has a gateway between the tenant network and the external network. If not, associating the IP to a VM will fail. Additionally, the pool might be exhausted, which often occurs since the gateway already occupies one IP from that pool.

Using the FIWARE Lab portal
Working with your tenant (13 of 20)

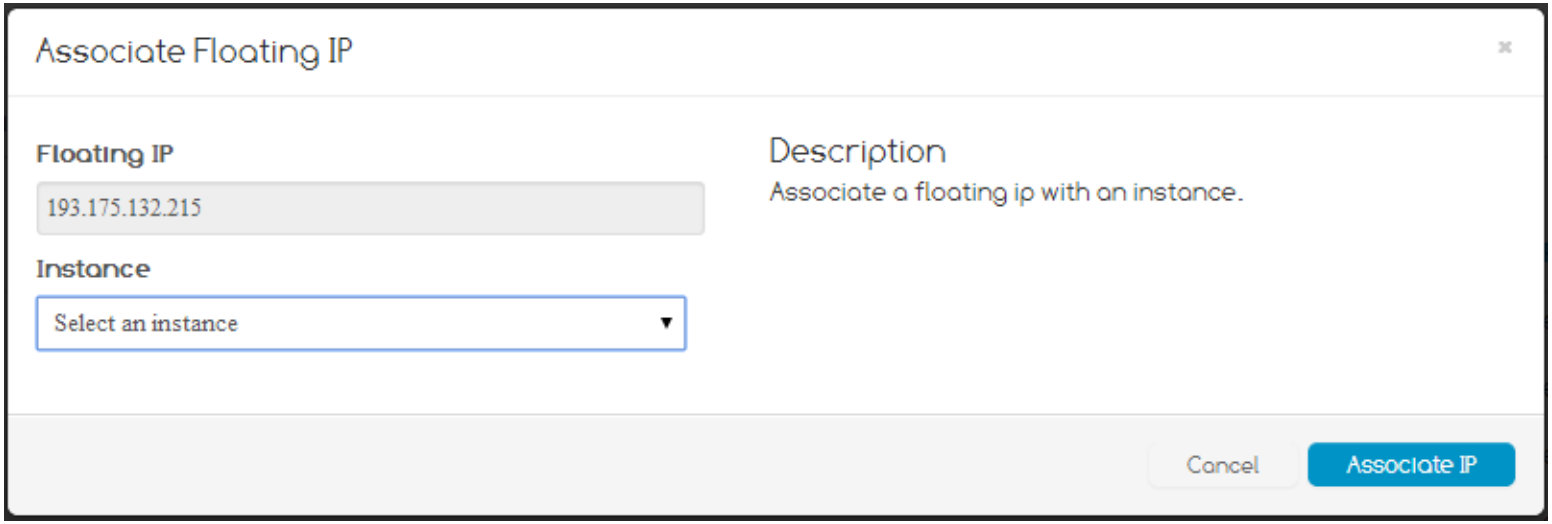


Floating IPs allocated to the tenant will be shown in the list.

Floating IPs from the list can be associated with a VM.

Consider to release unused floating IPs quickly. Select the IPs to release, click on the `Action` button and chose `Release Floating IPs`.

Using the FIWARE Lab portal
Working with your tenant (14 of 20)



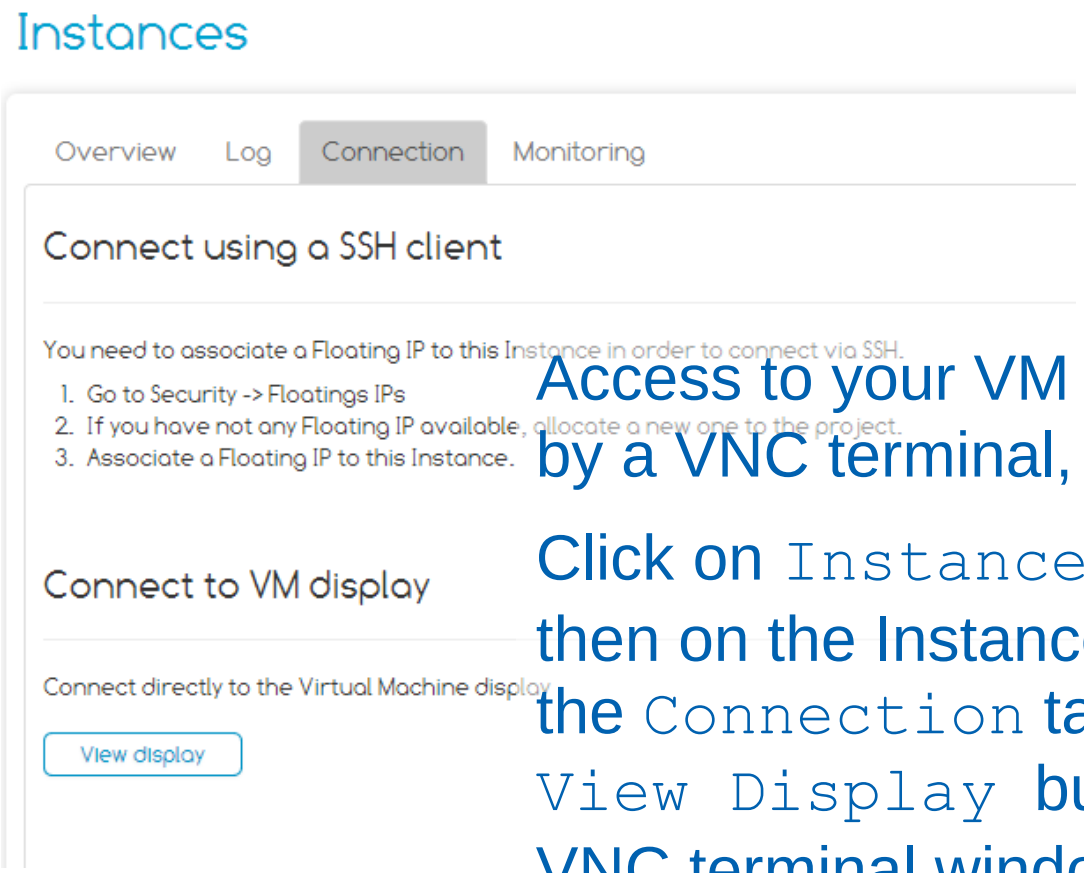
When associated, Instance name and floating IP appear together in the various lists.

Security

Floating IPs | Security Groups | Keypairs

	IP Address	Instance	Floating IP Pool
☐	10.0.16.131	FirstVM-9bc900c0-5bb7-4979-a476-d0956bc2e0ca	ext-net-federation
☐	10.0.16.132	-	ext-net-federation
☐	10.0.16.133	-	ext-net-federation
☑	193.175.132.215	xifi-dem-client-test	ext-net-public
☐	193.175.132.216	-	ext-net-public
☐	193.175.132.217	-	ext-net-public

Using the FIWARE Lab portal
Working with your tenant (15 of 20)

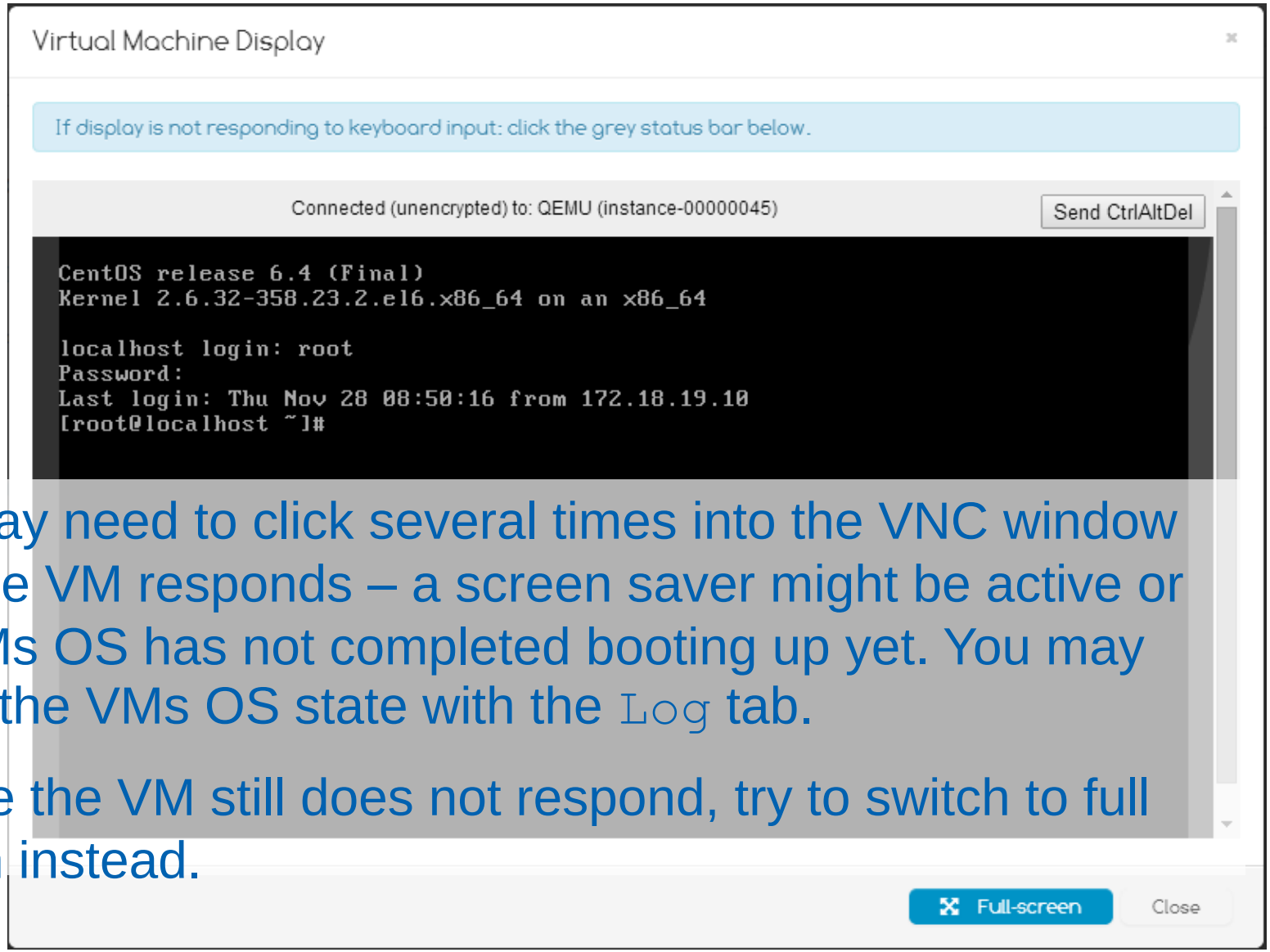


Access to your VM is through the portal by a VNC terminal, or by SSH.

Click on `Instances` in the left menu, then on the Instance name, then select the `Connection` tab and click on the `View Display` button to obtain a VNC terminal window.

Your VM's OS may be configured to reject a terminal login. In that case you need to use SSH.

Using the FIWARE Lab portal
Working with your tenant (16 of 20)

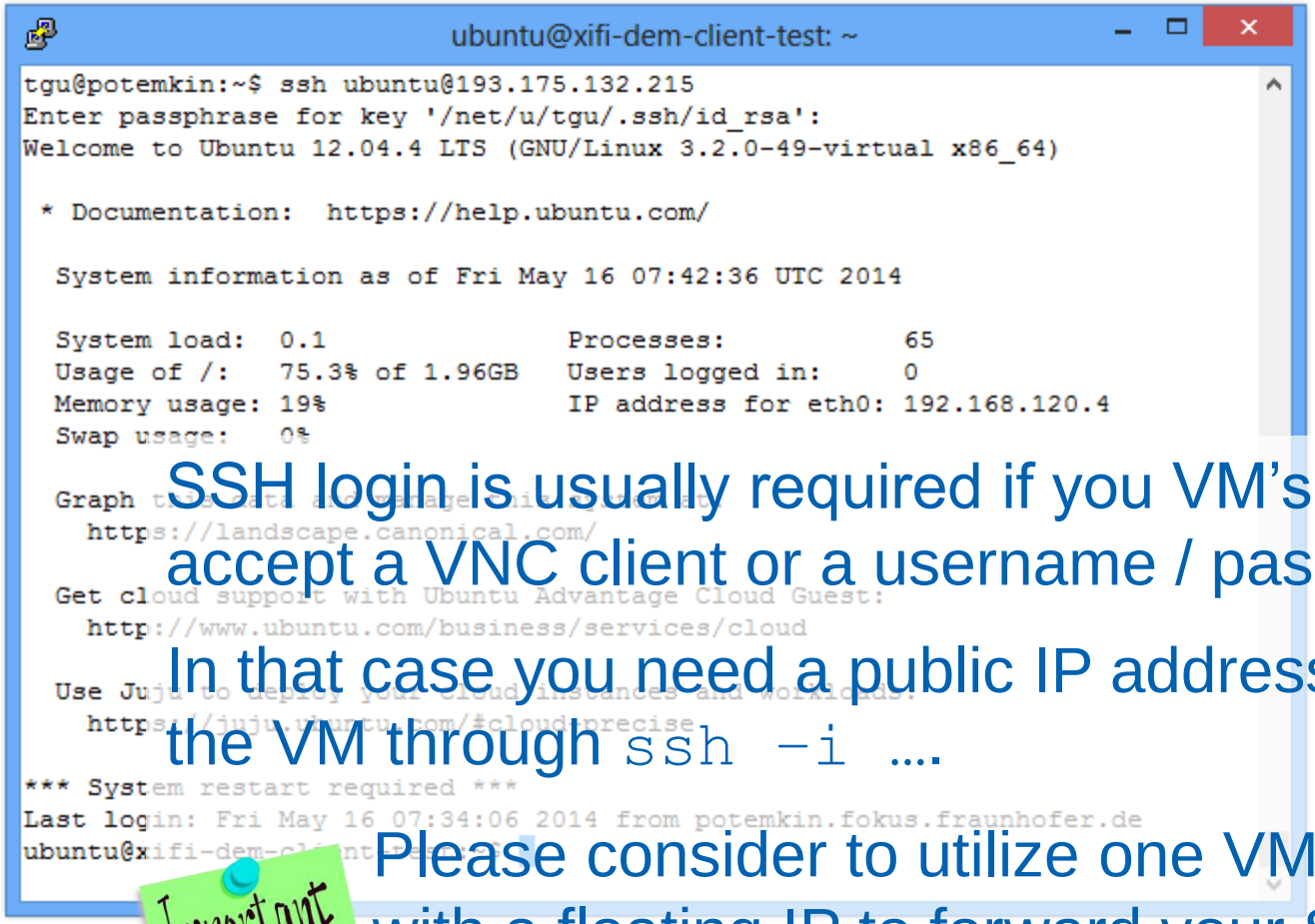


You may need to click several times into the VNC window until the VM responds – a screen saver might be active or the VMs OS has not completed booting up yet. You may check the VMs OS state with the `Log` tab.

In case the VM still does not respond, try to switch to full screen instead.

Using the FIWARE Lab portal

Working with your tenant (17 of 20)

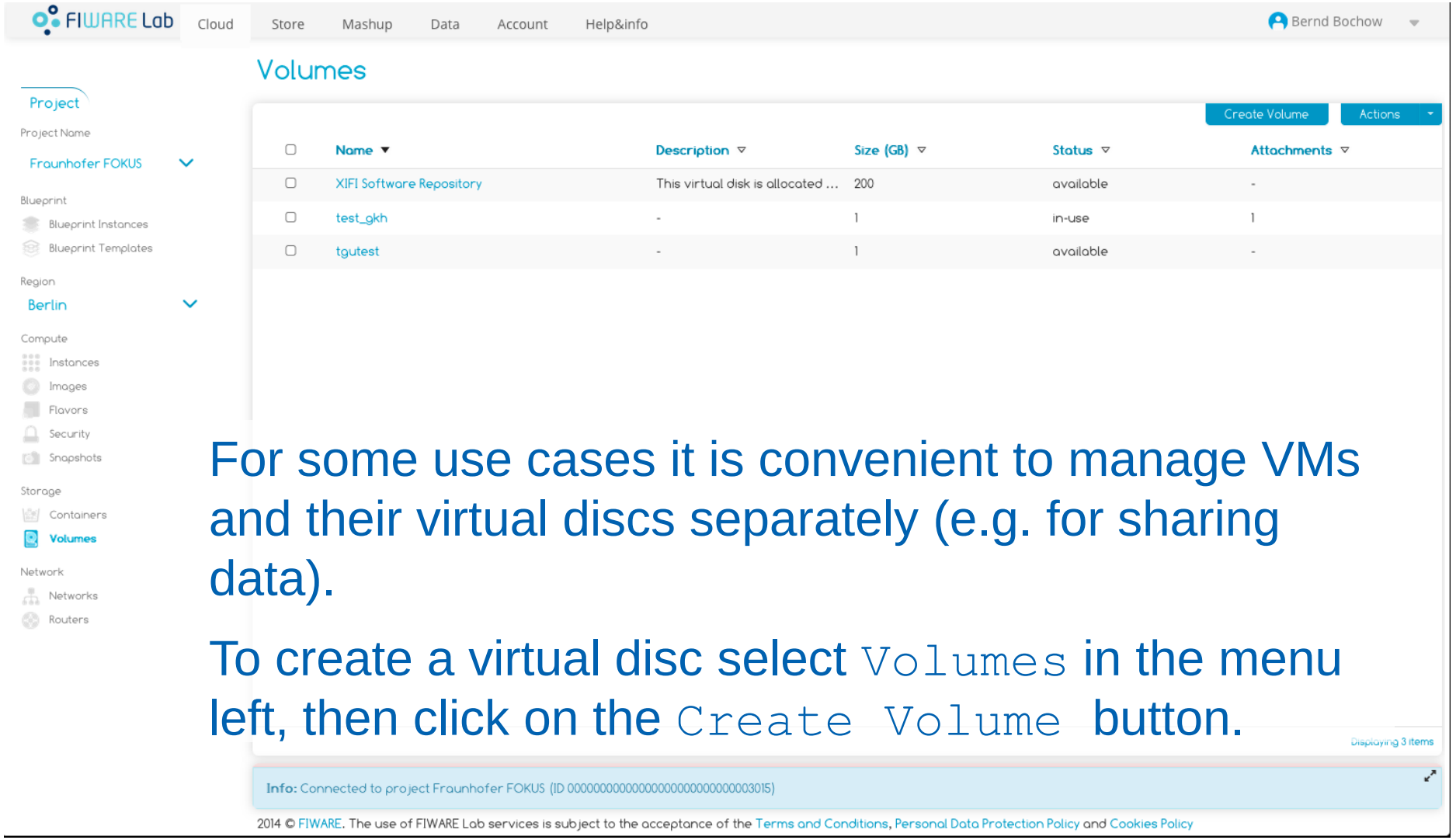


SSH login is usually required if you VM's OS does not accept a VNC client or a username / password login.

In that case you need a public IP address to access the VM through `ssh -i ....`

Please consider to utilize one VM associated with a floating IP to forward your SSH to other VMs of the tenant through their private address, avoiding to request more floating IPs.

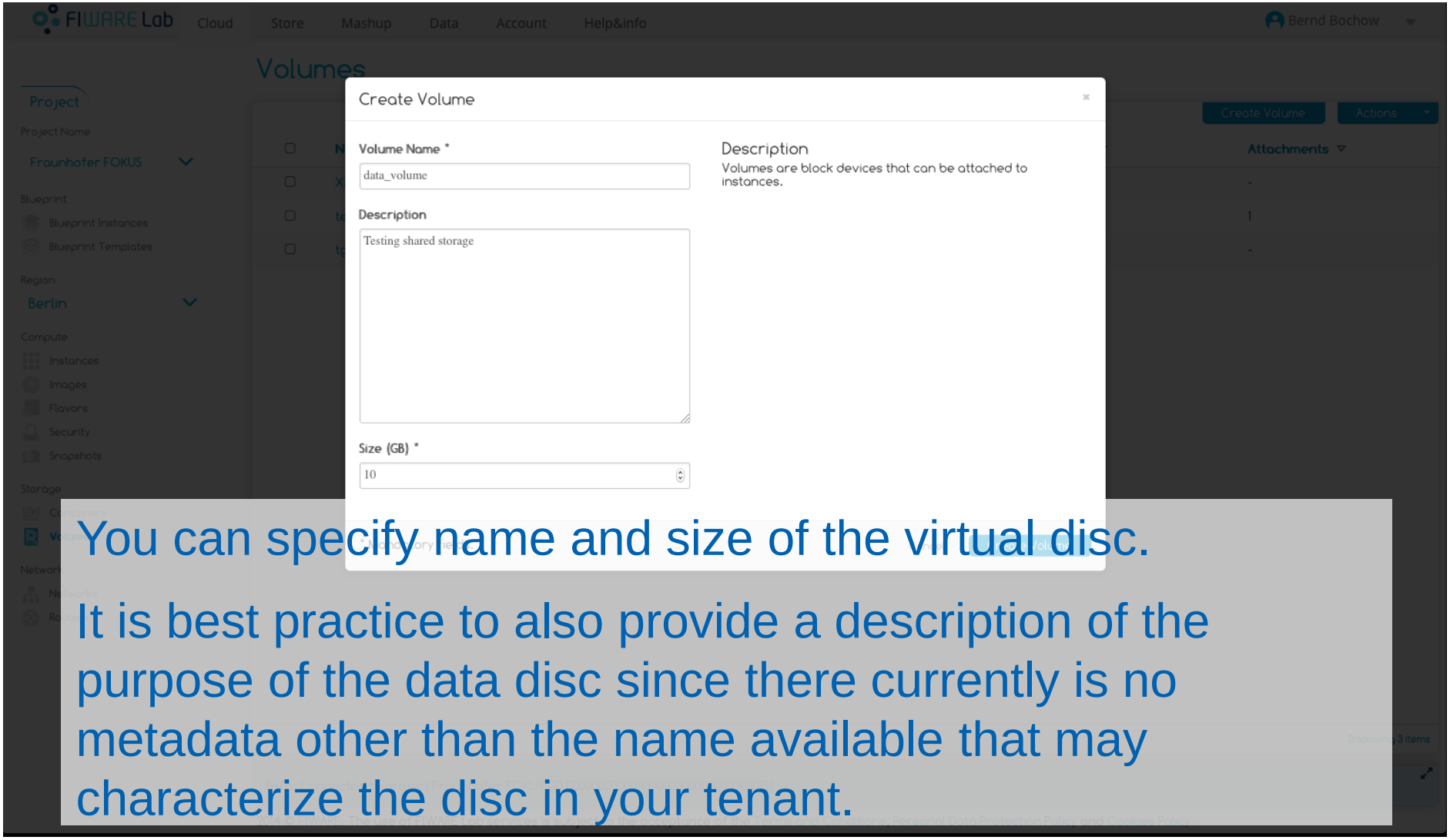
Using the FIWARE Lab portal
Working with your tenant (18 of 20)



For some use cases it is convenient to manage VMs and their virtual discs separately (e.g. for sharing data).

To create a virtual disc select `Volumes` in the menu left, then click on the `Create Volume` button.

Using the FIWARE Lab portal
Working with your tenant (19 of 20)

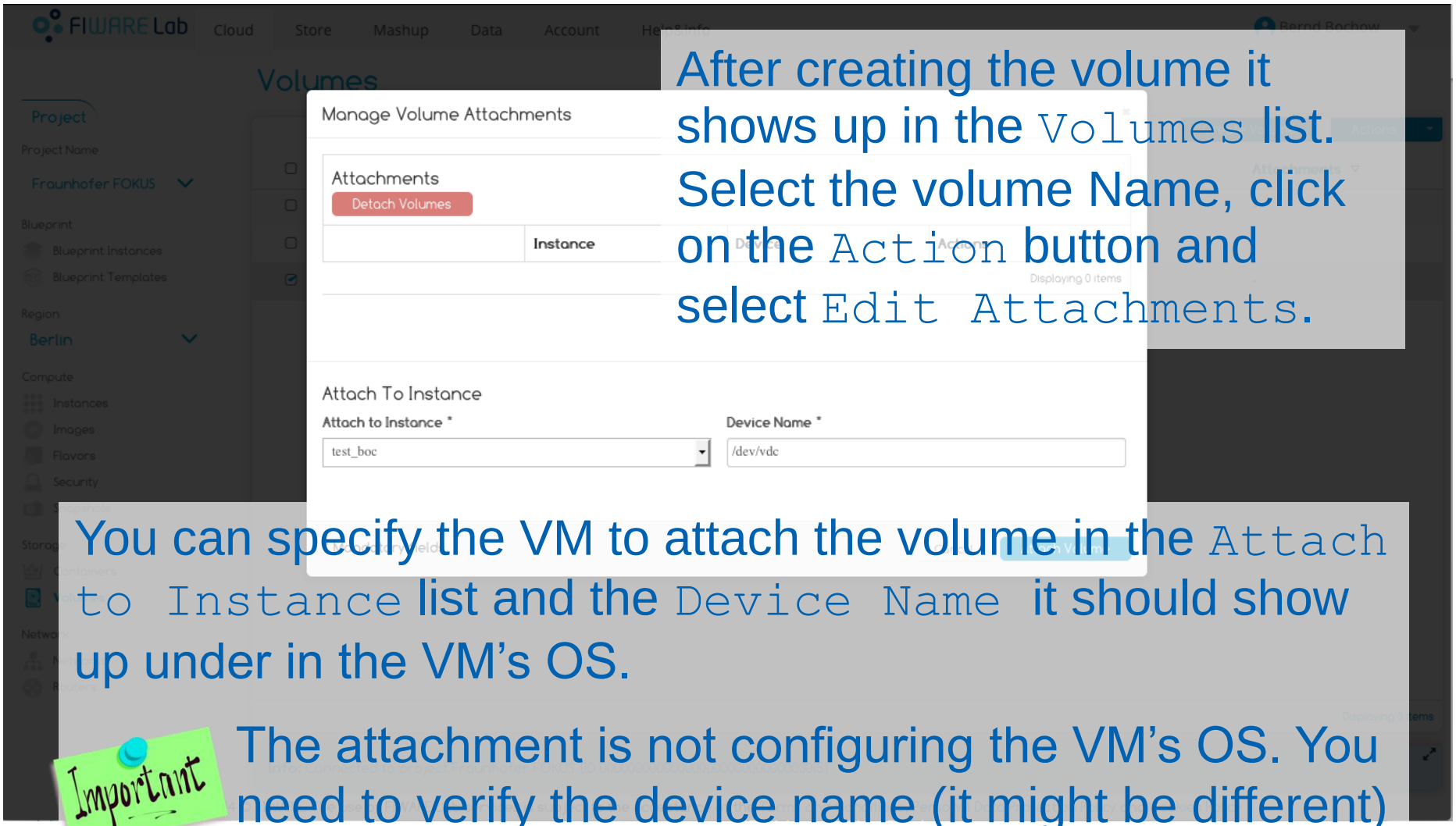


You can specify name and size of the virtual disc.

It is best practice to also provide a description of the purpose of the data disc since there currently is no metadata other than the name available that may characterize the disc in your tenant.

Using the FIWARE Lab portal

Working with your tenant (20 of 20)



After creating the volume it shows up in the `Volumes` list. Select the volume Name, click on the `Action` button and select `Edit Attachments`.

You can specify the VM to attach the volume in the `Attach to Instance` list and the `Device Name` it should show up under in the VM's OS.

The attachment is not configuring the VM's OS. You need to verify the device name (it might be different) and to mount the volume manually in the VM.

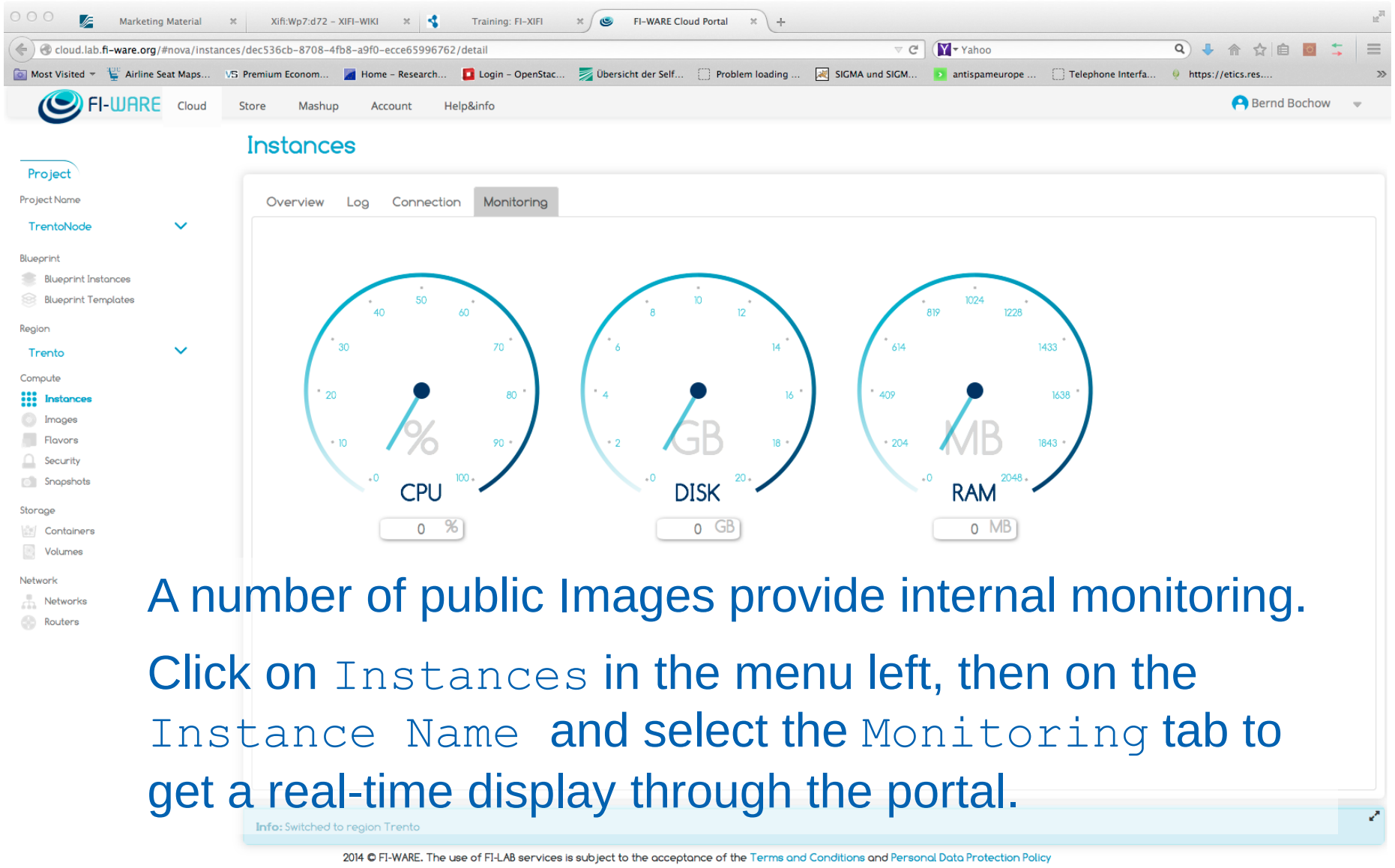
Using the FIWARE Lab portal
Exploring the cloud (1 of 8)

The XIFI federation offers a number of public images – mostly Generic Enablers (GEs) and Specific Enablers (SEs).

Many regions also provide instances of commonly used GEs and particular SEs to support dedicated local services.

For more details on available GEs see `http://catalogue.fiware.org/`

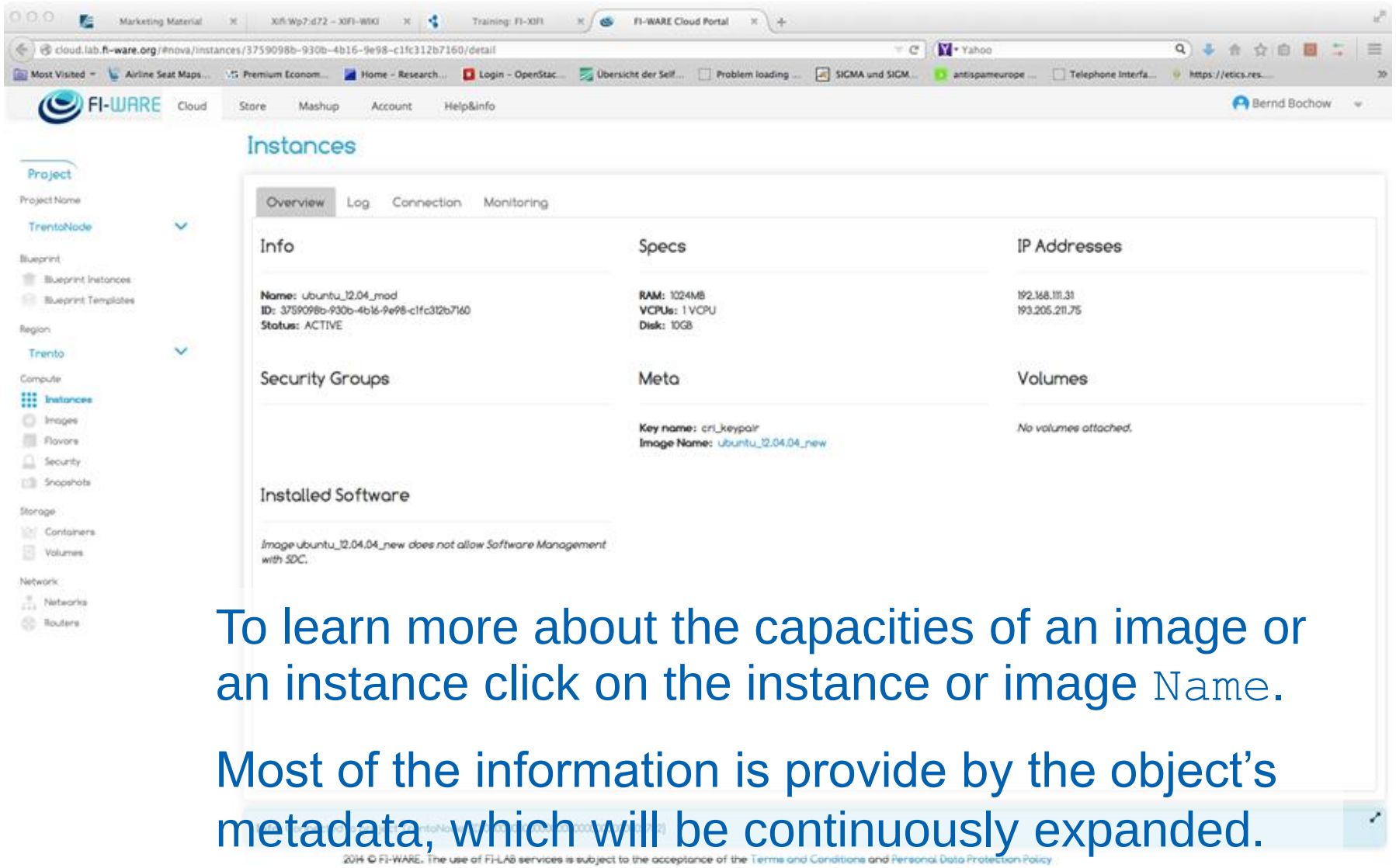
Using the FIWARE Lab portal
Exploring the cloud (2 of 8)



A number of public Images provide internal monitoring.

Click on `Instances` in the menu left, then on the `Instance Name` and select the `Monitoring` tab to get a real-time display through the portal.

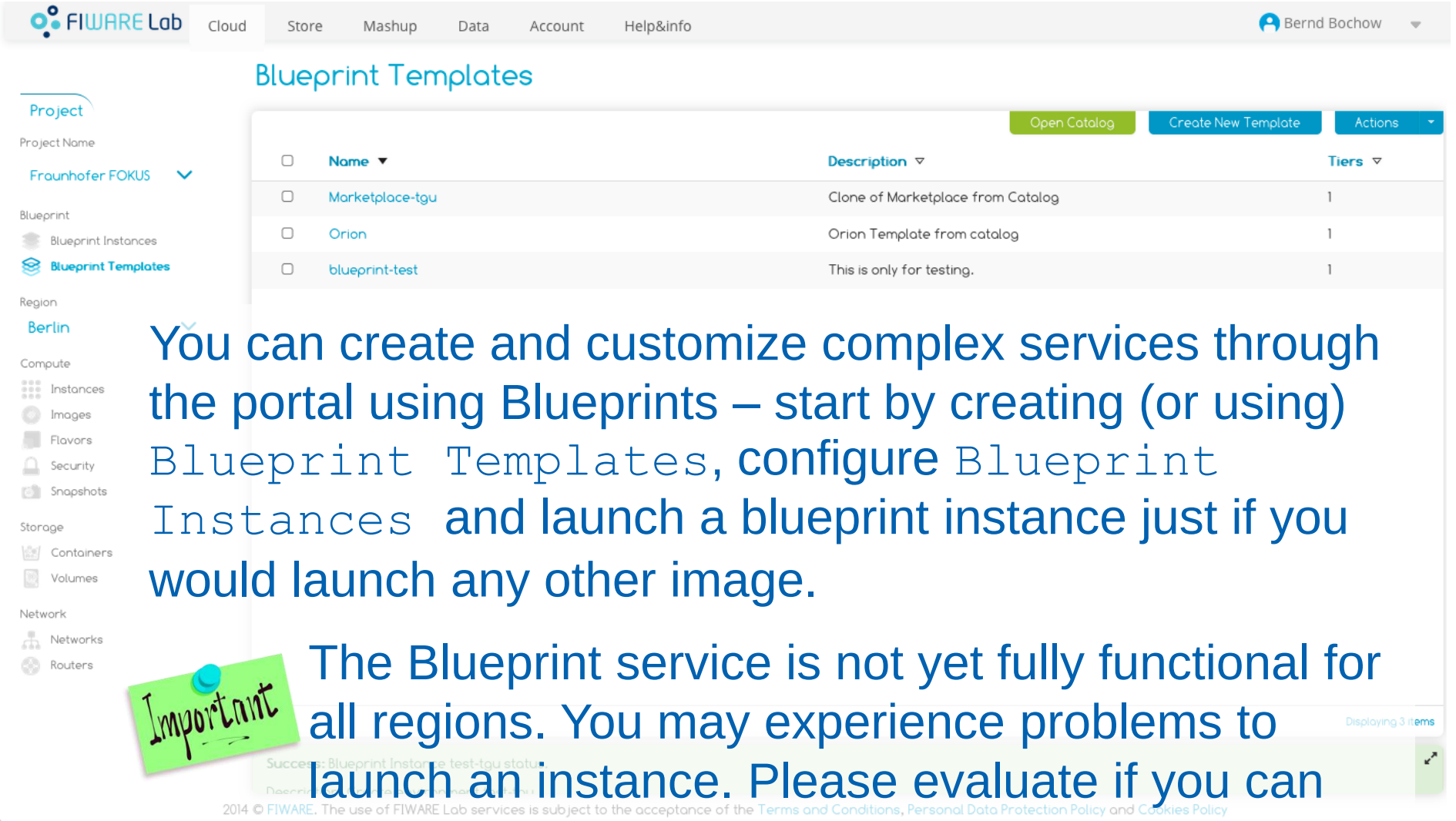
Using the FIWARE Lab portal
Exploring the cloud (3 of 8)



To learn more about the capacities of an image or an instance click on the instance or image `Name`.

Most of the information is provide by the object's metadata, which will be continuously expanded.

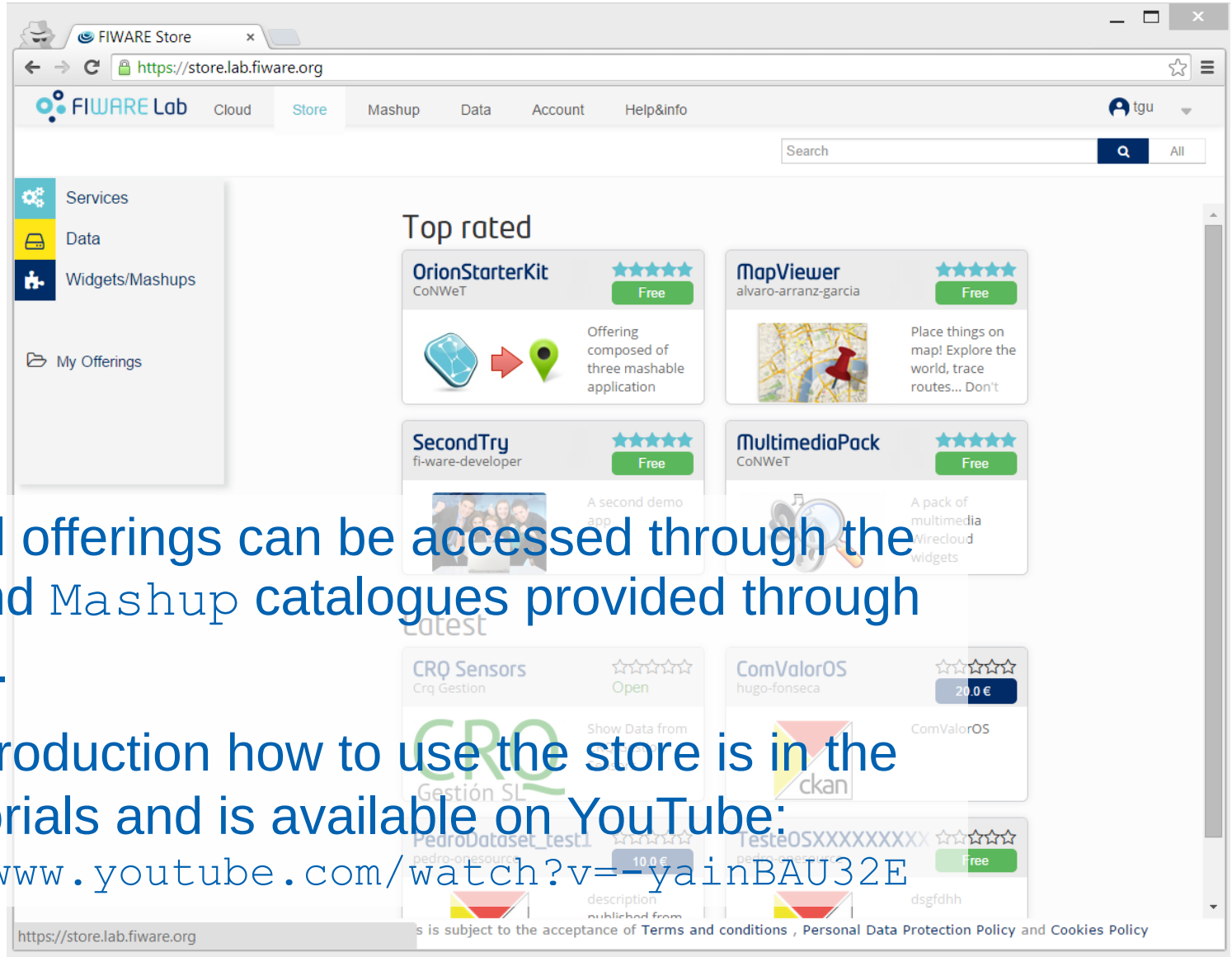
Using the FIWARE Lab portal
Exploring the cloud (4 of 8)



You can create and customize complex services through the portal using Blueprints – start by creating (or using) `Blueprint Templates`, configure `Blueprint Instances` and launch a blueprint instance just if you would launch any other image.

The Blueprint service is not yet fully functional for all regions. You may experience problems to launch an instance. Please evaluate if you can switch regions before contacting the help-desk.

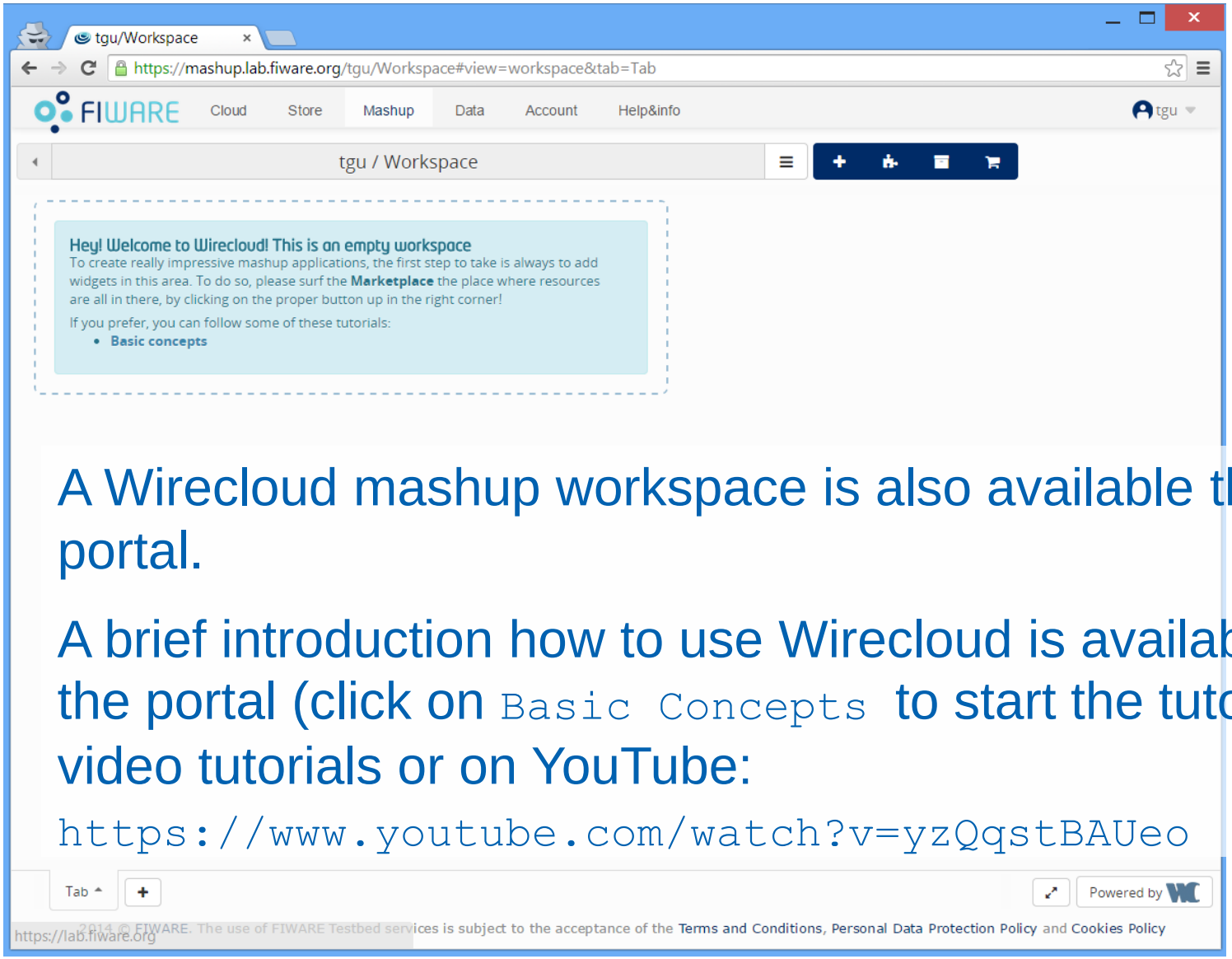
Using the FIWARE Lab portal
Exploring the cloud (5 of 8)



Additional offerings can be accessed through the `Store` and `Mashup` catalogues provided through the portal.

A brief introduction how to use the store is in the video tutorials and is available on YouTube:
`https://www.youtube.com/watch?v=-yainBAU32E`

Using the FIWARE Lab portal
Exploring the cloud (6 of 8)

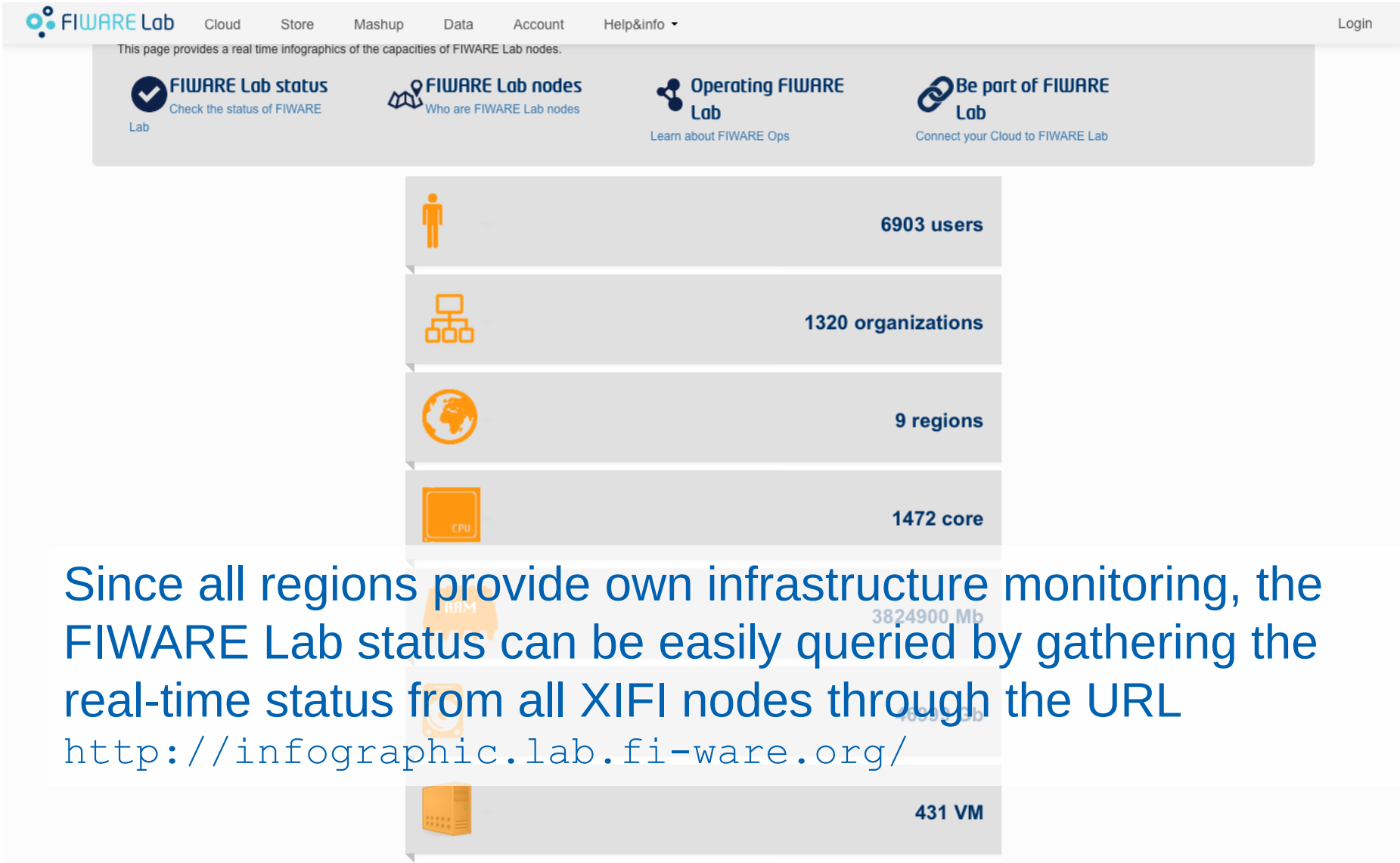


A Wirecloud mashup workspace is also available through the portal.

A brief introduction how to use Wirecloud is available through the portal (click on `Basic Concepts` to start the tutorial), in the video tutorials or on YouTube:

`https://www.youtube.com/watch?v=yzQqstBAUeo`

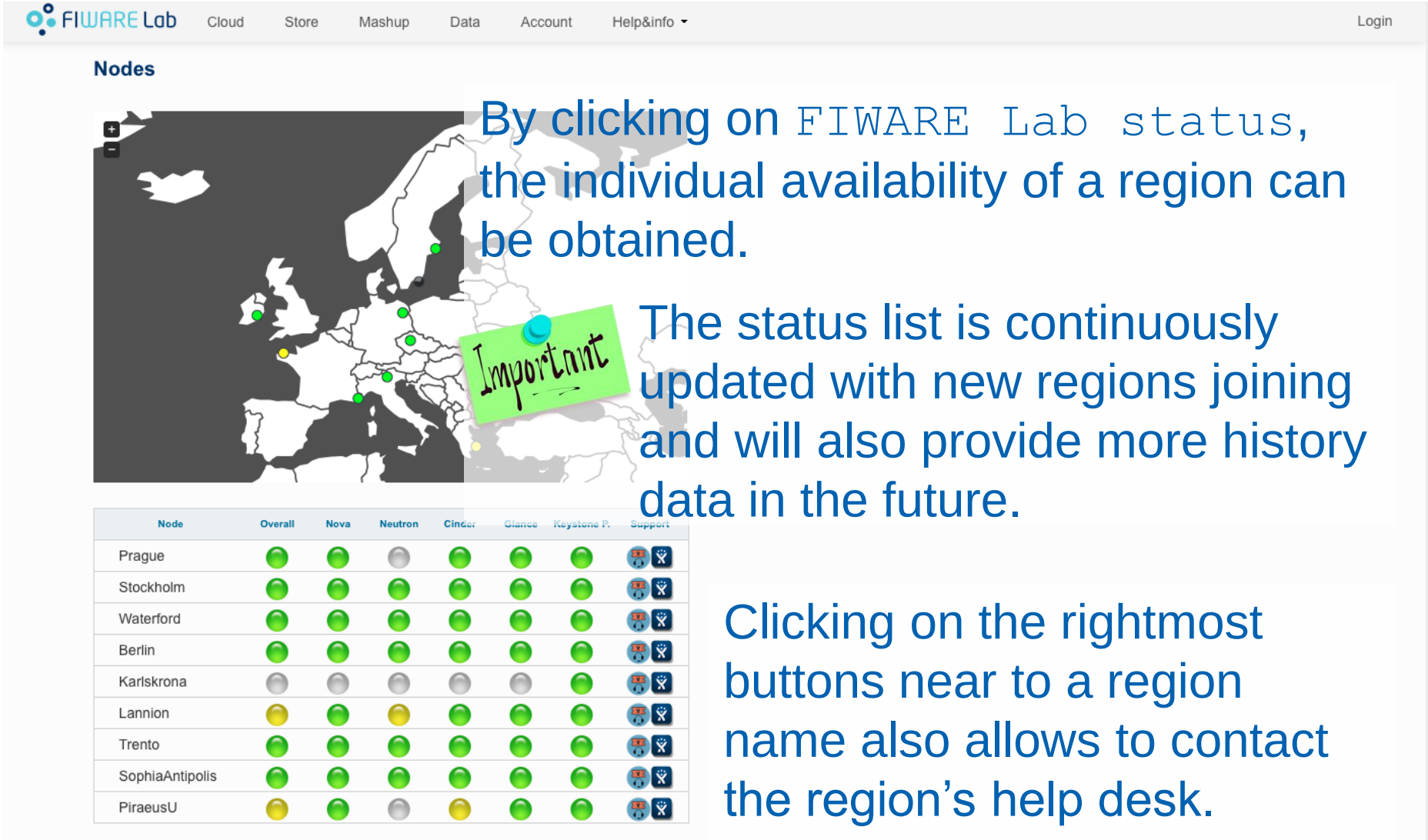
Using the FIWARE Lab portal
Exploring the cloud (7 of 8)



Since all regions provide own infrastructure monitoring, the FIWARE Lab status can be easily queried by gathering the real-time status from all XIFI nodes through the URL

`http://infographic.lab.fi-ware.org/`

Using the FIWARE Lab portal
Exploring the cloud (8 of 8)



By clicking on `FIWARE Lab status`, the individual availability of a region can be obtained.

The status list is continuously updated with new regions joining and will also provide more history data in the future.

Clicking on the rightmost buttons near to a region name also allows to contact the region's help desk.

Using command line tools

XIFI FOR DEVELOPERS

FUTURE INTERNET PPP

SEVENTH FRAMEWORK PROGRAMME

Using command line tools
Installing OpenStack client tools (1 of 3)

OpenStack client tools for the command line are available for several platforms – see http://docs.openstack.org/user-guide/content/install_clients.html.

They can be obtained from your favorite python repository.

You may install the following tools locally:

- cinder - Block Storage API and extensions
- glance - Image Service API
- keystone - Identity service API and extensions
- quantum / neutron - Networking API
- nova - Compute API and extensions
- swift - Object Storage API

Using command line tools
Installing OpenStack client tools (2 of 3)

Installation of the client tools is straight forward. The example below is for Linux:

- Install the Python Package Index

```
# sudo apt-get install python-pip
```

- Install the client packages

```
# pip install python-novaclient python-keystoneclient \
python-glanceclient python-neutronclient
```

In case you experience version conflicts with your existing Python environment that cause one or more of the client tools to fail with cryptic errors, it is suggested to consider installing Virtual Environments first – see http://docs.python-guide.org/en/latest/dev/virtualenvs/

Using command line tools
Installing OpenStack client tools (3 of 3)

Prior the using the tools you need to set-up some environment variables.

It is best practice to source these from a file since you may need to switch between regions frequently.

Example:

```
export OS_TENANT_NAME="<your_tenantID>„
export OS_USERNAME=<your_username>
export OS_PASSWORD=<your_password>
export OS_AUTH_URL=http://cloud.lab.fi-ware.org:4730/v2.0
export OS_REGION_NAME=<your_region>
```

OpenStack client tool documentation usually refers to the most recent release. Try the `help` command to check for supported commands / options.

Using command line tools
Managing images (1 of 4)

The portal has limited functionality regarding image manipulation – it is recommended to utilize the glance client tool for managing images.

Glance CLI man page and command reference see
http://docs.openstack.org/developer/python-glanceclient/man/glance.html

http://docs.openstack.org/cli-reference/content/glanceclient_commands.html

Listing images (including VM snapshots)

```
# glance image-list
```

ID	Name	Disk Format	Container Format	Size	Status
b383bea1-7844-45de-adad-f292b798da85	CentOS_6.5	qcow2	ovf	344457216	active
cc4fc2a8-7006-4fe4-b89e-ed3e3892507d	Cirros 3.2 amd64	qcow2	bare	13167616	active
074766de-1fee-4361-bdcf-60efbaef8665	Ubuntu 12.04 Server CloudImg amd64	qcow2	bare	260309504	active
0973cdbc-1585-45e2-bf76-e8dfd0fd658f	xifi-mon-dem-snapshot	qcow2	bare	1090715648	active
96c93d65-a955-443b-866c-f6a1dfb07bd1	xifi-orion-0.6-DT-showcase	qcow2	bare	2063204352	active

Images can be created from a file import.

```
# glance image-create --name DEM-Client --disk-format=qcow2 \
  --container-format=bare --file /tmp/DEM-Client.img
```

Property	Value
checksum	67f3761fad4246d90af4177cbf832528
container_format	bare
created_at	2014-05-16T07:04:02
deleted	False
deleted_at	None
disk_format	qcow2
id	ffe3a570-3f96-45ca-b871-f0e06372f60d
is_public	False
min_disk	0
min_ram	0
name	DEM-Client
owner	00000000000000000000000000003015
protected	False
size	2029780992
status	active
updated_at	2014-05-16T07:05:01

Using command line tools
Managing images (3 of 4)

Properties can be explored revealing more details than through the portal.

```
# glance image-show 100e2c2f-ddb0-47d7-bcb5-4ec55d845934
+------------------+--------------------------------------+
| Property         | Value                                |
+------------------+--------------------------------------+
| Property 'nid'   | 855                                  |
| Property 'type'  | fiware:data                          |
| checksum         | 4d707bf0b1a3f60370cccc31ad8ea6e0     |
| container_format | ovf                                  |
| created_at       | 2014-11-27T15:22:22                  |
| deleted          | False                                |
| disk_format      | qcow2                                |
| id               | 100e2c2f-ddb0-47d7-bcb5-4ec55d845934 |
| is_public        | True                                 |
| min_disk         | 0                                    |
| min_ram          | 0                                    |
| name             | kurento-image-R5.0.4                 |
| owner            | 00000000000000000000000000000001     |
| protected        | False                                |
| size             | 3849977856                           |
| status           | active                               |
| updated_at       | 2014-11-27T15:25:51                  |
+------------------+--------------------------------------+
```

Using command line tools
Managing images (4 of 4)

Further manipulations can be applied to images, for example:

- Delete a virtual machine image

```
# glance image-delete 0973cdbc-1585-45e2-bf76-e8dfd0fd658f
```

- Update image metadata

```
# glance update 4319f871-6d9b-47ab-b1b2-86fcb702598b is_public=Yes
protected=No nid=344
```

- Export image

```
# glance image-download 177d05a5-3b9c-447d-bd49-4dee946c907f --
file /tmp/DEM-Client.img
```

Using command line tools
Working with virtual machines (1 of 4)

The portal does not yet reveal everything about instances – it is recommended to utilize the nova client tool for exploring into the details and status of instances.

Nova CLI man page and command reference see
http://docs.openstack.org/developer/python-novaclient/man/nova.html

http://docs.openstack.org/cli-reference/content/novaclient_commands.html

Listing instances

```
# nova list
```

```
+--------------------------------------+-----------------------------------+----------+------------+-------------+-----------------------------------------------------+
| ID                                   | Name                              | Status   | Task State | Power State | Networks                                            |
+--------------------------------------+-----------------------------------+----------+------------+-------------+-----------------------------------------------------+
| 97cbea1e-d1c2-4465-80b6-55428591f3c1 | test_boc                          | ACTIVE   | -          | Running     | test_boc=192.168.101.2                              |
| ac03aeb9-bd22-4b24-942f-b4c590bd18a0 | test_vm                           | ACTIVE   | -          | Running     | internal-net=10.10.10.3                             |
| 0b91399f-0315-41a1-874d-e07003ab92b5 | xifi-sw-repository                | SHUTOFF  | deleting   | Shutdown    | private-berlin-120=192.168.120.14, 193.175.132.52   |
+--------------------------------------+-----------------------------------+----------+------------+-------------+-----------------------------------------------------+
```

Listing properties of instances

```
# nova show 0b91399f-0315-41a1-874d-e07003ab92b5
```

Property	Value
OS-DCF:diskConfig	MANUAL
OS-EXT-AZ:availability_zone	nova
OS-EXT-SRV-ATTR:host	node-5
OS-EXT-SRV-ATTR:hypervisor_hostname	node-5.fokus.fraunhofer.de
OS-EXT-SRV-ATTR:instance_name	instance-000001f7
OS-EXT-STS:power_state	4
OS-EXT-STS:task_state	deleting
OS-EXT-STS:vm_state	stopped
accessIPv4	
accessIPv6	
config_drive	
created	2014-10-22T10:15:06Z
flavor	m1.medium (3)
hostId	bc06d71bf32577ae56362103ef501dd04abf2aad316243057209837e
id	0b91399f-0315-41a1-874d-e07003ab92b5
image	xifi-sw-repository_20141023 (8a3a26b2-5ae6-4b79-8ae7-47dc3efb37ae)
key_name	boc_XIFI
name	xifi-sw-repository
private-berlin-120 network	192.168.120.14, 193.175.132.52
status	SHUTOFF
tenant_id	00000000000000000000000000003015
updated	2015-01-14T15:44:12Z
user_id	bernd-bochow

Using command line tools
Working with virtual machines (3 of 4)

The client tools also reveal more details on VMs in error.

```
+------------------------------------+--------------------------------------------------------------------------------
| Property                           | Value
+------------------------------------+--------------------------------------------------------------------------------
  :
| OS-EXT-STS:task_state              | deleting
| OS-EXT-STS:vm_state                | error
  :
| fault                              | {"message": "ClientException", "code": 500, "details": "The server has
either erred or is incapable of performing the requested operation. (HTTP 500) (Request-ID: req-817997f7-fb57-
4ea8-bd9c-25d9aad9fc0e)
|      File \"/usr/lib/python2.7/dist-packages/nova/compute/manager.py\", line 224, in decorated_function
         return function(self, context, *args, **kwargs)
       File \"/usr/lib/python2.7/dist-packages/nova/compute/manager.py\", line 1416, in terminate_instance
         do_terminate_instance(instance, bdms)
       File \"/usr/lib/python2.7/dist-packages/nova/openstack/common/lockutils.py\", line 242, in inner
         retval = f(*args, **kwargs)
       File \"/usr/lib/python2.7/dist-packages/nova/compute/manager.py\", line 1408, in do_terminate_instance
         reservations=reservations)
       File \"/usr/lib/python2.7/dist-packages/nova/hooks.py\", line 85, in inner
         rv = f(*args, **kwargs)
       File \"/usr/lib/python2.7/dist-packages/nova/compute/manager.py\", line 1371, in _delete_instance
         project_id=project_id)
       :
       File \"/usr/lib/python2.7/dist-packages/cinderclient/client.py\", line 135, in request
         raise exceptions.from_response(resp, body)
```

Using command line tools
Working with virtual machines (4 of 4)

The client tools can (sometimes) help to clean-up blocked resources from earlier faults

```
# nova reset-state --active 0b91399f-0315-41a1-874d-e07003ab92b5
# nova delete 0b91399f-0315-41a1-874d-e07003ab92b5
```

can be used to create own resources

```
# nova flavor-create test_boc auto 1000 1 2
+--------------------------------------+----------+-----------+------+-----------+------+-------+-------------+-----------+
| ID                                   | Name     | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor | Is_Public |
+--------------------------------------+----------+-----------+------+-----------+------+-------+-------------+-----------+
| 0ad1613c-016c-47c4-afd1-511c02ff3735 | test_boc | 1000      | 1    | 0         |      | 2     | 1.0         | True      |
+--------------------------------------+----------+-----------+------+-----------+------+-------+-------------+-----------+
```

or to query resource pools.

```
# nova floating-ip-pool-list
# nova floating-ip-list
```

Using command line tools
Working with volumes (1 of 2)

The portal does not yet allow many operations on volumes such as resizing or managing metadata – it is recommended to utilize the cinder client tool for exploring into the details and status of volumes.

Cinder CLI man page and command reference see
http://docs.openstack.org/developer/python-cinderclient/man/cinder.html

http://docs.openstack.org/cli-reference/content/cinderclient_commands.html

Listing volumes

```
# cinder list
```

```
+--------------------------------------+-----------+--------------------------+------+-------------+----------+--------------------------------------+
|                  ID                  |   Status  |       Display Name       | Size | Volume Type | Bootable |             Attached to              |
+--------------------------------------+-----------+--------------------------+------+-------------+----------+--------------------------------------+
| 1ff4f5a8-2d07-4f4e-b9f4-f053f846c192 | available | XIFI Software Repository | 200  |     None    |  false   |                                      |
| 36b2c085-3911-4f0e-a94b-b5c38535dbdd |   in-use  |         test_gkh         |  1   |     None    |  false   | 90d5bc0a-4638-451d-9ab8-2dff0e7faabb |
| 3f70d1ff-213a-4a78-b859-df8b59a5d033 | available |         tgutest          |  1   |     None    |  false   |                                      |
+--------------------------------------+-----------+--------------------------+------+-------------+----------+--------------------------------------++
```

Listing properties of volumes

```
# cinder show 1ff4f5a8-2d07-4f4e-b9f4-f053f846c192
```

Property	Value
attachments	[{u'device': u'/dev/vdb', u'server_id': u'0b91399f-0315-41a1-874d-e07003ab92b5', u'id': u'1ff4f5a8-2d07-4f4e-b9f4-f053f846c192', u'volume_id': u'1ff4f5a8-2d07-4f4e-b9f4-f053f846c192'}]
availability_zone	nova
bootable	false
created_at	2014-10-17T10:41:21.000000
display_description	This virtual disk is allocated for storing the XIFI sub-system software packages
display_name	XIFI Software Repository
id	1ff4f5a8-2d07-4f4e-b9f4-f053f846c192
metadata	{}
os-vol-host-attr:host	node-1
os-vol-tenant-attr:tenant_id	00000000000000000000000000003015
size	200
snapshot_id	None
source_volid	None
status	available
volume_type	None

XIFI FOR DEVELOPERS

FUTURE INTERNET PPP

SEVENTH FRAMEWORK PROGRAMME