



eXperimental Infrastructures for the Future Internet

1st Training Session Berlin, May 15th, 2014

www.fi-xifi.eu

Fraunhofer
FOKUS

.....

TU
berlin



FUTURE
INTERNET
PPP





A very brief survey of how to use XIFI and FI-OPS

XIFI FOR DEVELOPERS

Agenda

- Introduction
- How to use the FI-LAB portal
- Command Line Interfaces
 - Install the OpenStack command-line clients
 - Managing virtual machine images
 - Working with virtual machines
 - Working with infrastructure monitoring

Introduction

First of all: the XIFI federated infrastructure is online for users only since a few days – so please be careful and watch your steps ;-)



How to use the FI-LAB portal

XIFI FOR DEVELOPERS

The FI-LAB portal



The portal URL is “account.lab.fi-ware.org”

Marketing Material Xifi:Wp7:d72 – XIFI-WIKI Training: FI-XIFI FI-WARE Identity Manager

https://account.lab.fi-ware.org

Most Visited ▾ Airline Seat Maps... Premium Econom... Home – Research... Login – OpenStac... Übersicht der Self... Problem loading ... SIGMA und SIGM... antispameurope... Telephone Interfa... https://etics.res....

Fi-Lab Cloud Store Mashup Account Help&info

Fi-Lab

Fi-Lab is a working instance of FI-WARE 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 FI-WARE Generic Enablers deployed as a Service either globally or by you (as private instance).

[Sign up](#)

[Need Help?](#) Ask a question. [Our GEs](#) See our Catalogue.

[FI-Lab nodes](#) Learn about FI-Ops. [eLearning](#) Train yourself.

Sign in

Email: bernd.bochow@fokus.fraunhofer.de

Password:

Remember me [Sign in](#)

[Sign up](#) [Forgot you password?](#) [Didn't receive confirmation instructions?](#)

Signed out successfully.

The FI-LAB portal

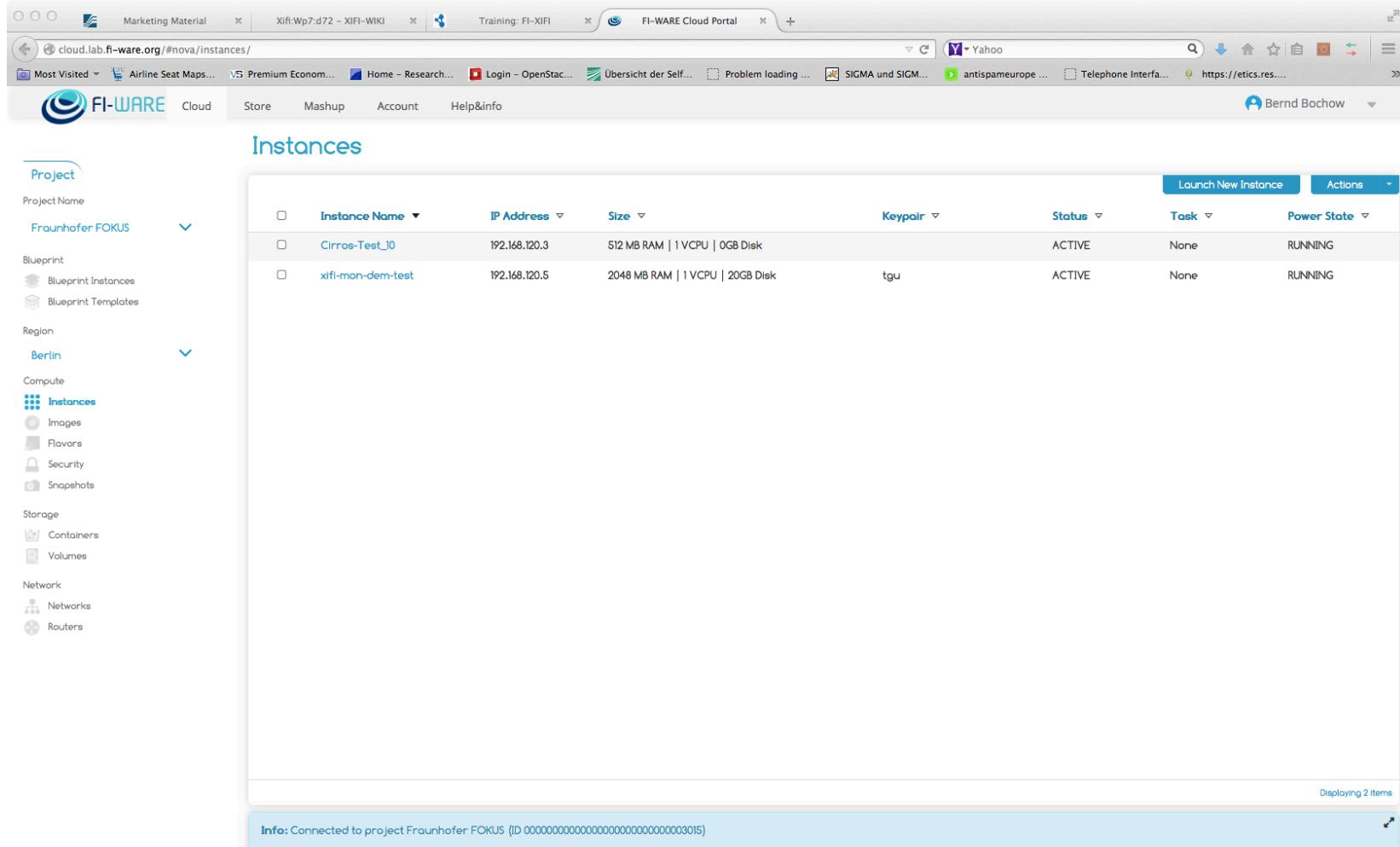


User's roles organizations are associated with tenants.

The screenshot shows the FI-WARE Identity Manager interface. On the left, a sidebar menu includes Home, Organizations, and My Applications. The main content area has two main sections: 'Applications' and 'Organizations'. The 'Applications' section displays a message: 'You don't have any application.' and a link to 'Register Application'. The 'Organizations' section lists two entries: 'Fraunhofer FO...' and 'TrentoNode', each with a small icon. A 'Create' button is located at the top right of the organizations section. At the bottom, a success message 'Signed in successfully.' is displayed in a teal bar.

The FI-LAB portal

The first view is on the user's virtual machine instances.



	Instance Name	IP Address	Size	Keypair	Status	Task	Power State
<input type="checkbox"/>	Cirros-Test_0	192.168.120.3	512 MB RAM 1 VCPU 0GB Disk		ACTIVE	None	RUNNING
<input type="checkbox"/>	xifi-mon-dem-test	192.168.120.5	2048 MB RAM 1 VCPU 20GB Disk	tgu	ACTIVE	None	RUNNING

Info: Connected to project Fraunhofer FOKUS (ID 00000000000000000000000000003015)

The FI-LAB portal



Available images are associated with a tenant.

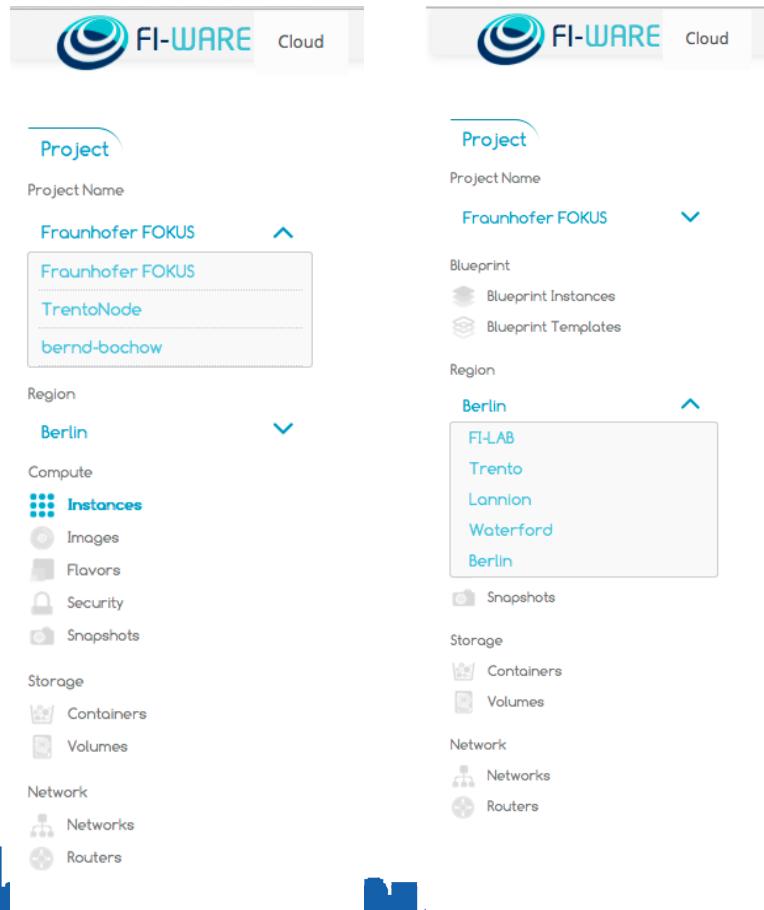
The screenshot shows the FI-WARE Cloud Portal interface. On the left, a sidebar navigation menu is visible under the 'Project' heading, which is currently set to 'Fraunhofer FOKUS'. The menu includes sections for Blueprint, Region (set to Berlin), Compute (with 'Images' selected), Storage, Network, and a general category for Instances, Flavors, Security, and Snapshots. The main content area is titled 'Images' and displays a table of available images. The table has columns for Name, Status, Visibility, Container Format, Disk Format, and Actions (with a 'Launch' button). The listed images are:

Name	Status	Visibility	Container Format	Disk Format	Actions
Cirros 3.2 amd64	active	public	BARE	QCOW2	<button>Launch</button>
Cirros-Snapshot	active	private	BARE	QCOW2	<button>Launch</button>
Ubuntu 12.04 Server CloudImg amd64	active	public	BARE	QCOW2	<button>Launch</button>
xifi-orion-0.6-DT-showcase	active	private	BARE	QCOW2	<button>Launch</button>

At the bottom of the page, there is an info message: 'Info: Connected to project Fraunhofer FOKUS (ID 00000000000000000000000000000015)'. The footer contains the copyright notice: '2014 © FI-WARE. The use of FI-LAB services is subject to the acceptance of the Terms and Conditions and Personal Data Protection Policy'.

The FI-LAB portal

Tenants can be selected through a “Project Name”, nodes through the “Region” name – tenants are valid across all regions.



Project

Project Name

Fraunhofer FOKUS

Fraunhofer FOKUS

TrentoNode

bernd-bochow

Region

Berlin

Compute

Instances

Images

Flavors

Security

Snapshots

Storage

Containers

Volumes

Network

Networks

Routers

Project

Project Name

Fraunhofer FOKUS

Blueprint

Blueprint Instances

Blueprint Templates

Region

Berlin

FI-LAB

Trento

Lannion

Waterford

Berlin

Snapshots

Containers

Volumes

Networks

Routers

The FI-LAB portal



Virtual machines connect to tenant networks.

The screenshot shows the FI-WARE Cloud Portal interface. On the left, there is a sidebar with a tree view of project resources under 'Fraunhofer FOKUS'. The main area displays a table of networks with columns for Name, Subnets associated, Shared, Status, and Admin State. The table lists five networks: ext-net-federation, ext-net-public, private-berlin-120, private-berlin-121, and training-berlin-170. A success message at the bottom indicates 'Success: Network training-berlin-170 created.' The status bar at the bottom right shows 'Displaying 5 items'.

Name	Subnets associated	Shared	Status	Admin State
ext-net-federation	ext_net_federation 10.0.16.0/24	Yes	ACT...	UP
ext-net-public	ext_net_public 193.175.132.129/25	Yes	ACT...	UP
private-berlin-120	private_berlin_120 192.168.120.0/24	No	ACT...	UP
private-berlin-121	private_berlin_121 192.168.121.0/24	No	ACT...	UP
training-berlin-170	192.168.170.0/24	No	ACT...	UP

The FI-LAB portal



Tenant networks are private, public or federation-exposed.

Name	Subnets associated	Shared	Status	Admin State
ext-net-federation	ext_net_federation 10.0.16.0/24	Yes	ACT...	UP
ext-net-public	ext_net_public 193.175.132.129/25	Yes	ACT...	UP
private-berlin-120	private_berlin_120 192.168.120.0/24	No	ACT...	UP
private-berlin-121	private_berlin_121 192.168.121.0/24	No	ACT...	UP

Info: Connected to project Fraunhofer FOKUS (ID 00000000000000000000000000003015)

The FI-LAB portal



Networks can be created through the portal.

The screenshot shows a web browser window with multiple tabs open, including 'Training: FI-XIFI'. The main content is the 'FI-WARE Cloud Portal' interface, specifically the 'Networks' section. On the left, there's a sidebar with project details ('Fraunhofer FOKUS'), blueprint and region selection ('Blueprint: Berlin'), and various compute, storage, and network resources like instances, images, flavors, security, snapshots, containers, volumes, and routers. The 'Networks' option under the 'Network' heading is selected. A modal dialog box titled 'Create Network' is centered on the screen. It contains fields for 'Network Name' (set to 'training-berlin-170'), 'Admin State' (checked), 'Subnet Name' (empty), 'Gateway IP' (empty), 'Network Address*' (set to '192.168.170.0/24'), 'DNS Name Servers' (empty), 'Allocation Pools' (<start_ip_address>,<end_ip_address>), 'Host Routes' (<destination_netw>,<nexthop>), and 'Enable DHCP' (checked). At the bottom of the dialog, it says '* Mandatory fields.' and has 'Cancel' and 'Create' buttons. The background shows a list of existing networks with columns for 'Status' and 'Admin State', all of which are 'ACT...' and 'UP'. At the bottom of the page, there's a footer note: '2014 © FI-WARE. The use of FI-LAB services is subject to the acceptance of the Terms and Conditions and Personal Data Protection Policy'.

The FI-LAB portal



Virtual routers determine how to expose a virtual machine.

The FI-LAB portal



Credentials can be generated/deployed through the portal.

The screenshot shows the FI-WARE Cloud Portal interface. On the left, there is a sidebar with navigation links for Project, Blueprint, Region, Compute, Storage, and Network. The 'Security' link under Compute is highlighted. The main content area is titled 'Security' and shows a 'Keypairs' tab selected. It lists two keypairs: 'boc' and 'training'. For each keypair, there is a 'Name' column, a 'Fingerprint' column, and a 'Actions' button. The 'boc' keypair has a fingerprint of 'd1:9d:4e:de:94:74:67:a6:8e:a1:bc:45:a0:49:4c:86'. The 'training' keypair has a fingerprint of 'c6:e1:5c:d1:92:df:b0:f8:97:b2:05:6f:e3:61:0b:04'. At the bottom of the page, a green success message says 'Success: Keypair training created.'

Name	Fingerprint	Actions
boc	d1:9d:4e:de:94:74:67:a6:8e:a1:bc:45:a0:49:4c:86	[Actions]
training	c6:e1:5c:d1:92:df:b0:f8:97:b2:05:6f:e3:61:0b:04	[Actions]

The FI-LAB portal



Security rules are the tenant's firewall per node.

Marketing Material Xifi:Wp7:d72 - XIFI-WIKI Training: FI-XIFI FI-WARE Cloud Portal Publish/Subscribe Broker ... +

cloud.lab.fi-ware.org/#nova/access_and_security/ Yahoo

Most Visited Airline Seat Maps... Premium Econom... Home - Research... Login - OpenStack... Übersicht der Self... Problem loading ... SIGMA und SIGM... antispameurope... Telephone Interfa... https://etics.res... Bernd Bochow

FI-WARE Cloud Store Mashup Account Help&Info

Project

Project Name: Fraunhofer FOKUS

Blueprint

- Blueprint Instances
- Blueprint Templates

Region

Berlin

Compute

- Instances
- Images
- Flavors
- Security
- Snapshots

Storage

- Containers
- Volumes

Network

- Networks
- Routers

Security

Floating IPs Security Groups Keypairs

Create Security Group Actions

Name	Description
default	default
training	Used for Training Session

Displaying 2 items

Success: Security group training created.

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The FI-LAB portal



Security rules can be created through the portal.

The screenshot shows a web browser window with multiple tabs open, including 'Training: FI-XIFI' and 'FI-WARE Cloud Portal'. The main content area displays the FI-WARE Cloud Portal interface. On the left, there is a sidebar with categories like Project, Blueprint, Region, Compute, Storage, and Network. The 'Security' section is selected. In the center, a modal dialog box titled 'Create Security Group' is open. It contains two input fields: 'Name *' with the value 'training' and 'Description' with the value 'Used for Training Session'. Below these fields, a note says '* Mandatory fields.' At the bottom right of the dialog is a blue 'Create Security Group' button. The background of the portal shows a list of floating IP addresses.

The FI-LAB portal



Security rules can be managed through the portal.

The screenshot shows a web browser window with multiple tabs open, including 'Xifi:Wp7:d72 - XIFI-WIKI' and 'Training: FI-XIFI'. The main content is the 'FI-WARE Cloud Portal' showing the 'Security' section. On the left, there's a sidebar with 'Project' (Fraunhofer FOKUS), 'Blueprint' (Blueprint Instances, Blueprint Templates), 'Region' (Berlin), 'Compute' (Instances, Images, Flavors, Security, Snapshots), 'Storage' (Containers, Volumes), and 'Network' (Networks, Routers). The 'Security' tab is selected. A modal dialog titled 'Edit Security Group Rules' is open, showing a table of 'Security Group Rules' and an 'Add Rule' form. The table has columns: IP Protocol, From Port, To Port, Source, and Action. The rules listed are:

IP Protocol	From Port	To Port	Source	Action
ICMP	-1	-1	0.0.0.0/0 (CIDR)	Delete Rule
TCP	1026	1026	0.0.0.0/0 (CIDR)	Delete Rule
TCP	22	22	0.0.0.0/0 (CIDR)	Delete Rule

Below the table, it says 'Displaying 3 items'. At the bottom of the modal, there's an 'Add Rule' form with fields: IP Protocol (TCP), From Port (1026), To Port (1026), Source Group (CIDR), and CIDR (0.0.0.0/0). A note says '* Mandatory fields.' and there are 'Cancel' and 'Add Rule' buttons. A success message at the bottom of the page says 'Success: Security group rule created.'

The FI-LAB portal



The offer depends on tenant and region settings.

The screenshot shows the FI-WARE Cloud Portal interface. On the left, there's a sidebar with a tree view of the project structure under 'TrentoNode'. The main area is titled 'Instances' and displays a table of running virtual machines. The table includes columns for Instance Name, IP Address, Size, Keypair, Status, Task, and Power State. Most instances are in an 'ACTIVE' state, except for one labeled 'test' which is 'ERROR' and 'deleting'. The table shows various configurations like RAM, CPU, and disk space. At the bottom of the table, it says 'Displaying 14 items'. A footer message at the bottom of the page says 'Info: Connected to project TrentoNode (ID 00000000000000000000000000002782)'.

	Instance Name	IP Address	Size	Keypair	Status	Task	Power State
	CEPTEST		512 MB RAM 1 VCPU 0GB Disk	Dem_panos_K	ERROR	deleting	NO STATE
	CEP_GE	192.168.111.26	1024 MB RAM 1 VCPU 10GB Disk	Dem_panos_K	ACTIVE	None	RUNNING
	DEMO_RESP	192.168.111.29 193.205.211.86	2048 MB RAM 2 VCPU 20GB Disk	Dem_panos_K	ACTIVE	None	RUNNING
	DEM_VM2	192.168.111.25	1024 MB RAM 2 VCPU 20GB Disk	Dem_Keypair	ACTIVE	None	RUNNING
	Market		512 MB RAM 1 VCPU 0GB Disk	Dem_panos_K	ERROR	deleting	NO STATE
	RepositoryGE	192.168.111.17	2048 MB RAM 1 VCPU 40GB Disk	SLA-Manager-keypair	ACTIVE	None	RUNNING
	SLA-Manager	192.168.111.10 193.205.211.71	2048 MB RAM 2 VCPU 30GB Disk	SLA-Manager-keypair	ACTIVE	None	RUNNING
	autoregistration	192.168.111.21 193.205.211.84	1024 MB RAM 1 VCPU 10GB Disk	crl_keypair	ACTIVE	None	RUNNING
	cyril-vm	192.168.111.16 193.205.211.74	4096 MB RAM 1 VCPU 10GB Disk	cyril_keypair	ACTIVE	None	RUNNING
	reverse-proxy	192.168.111.1 193.205.211.78	1024 MB RAM 1 VCPU 10GB Disk	trento-key	ACTIVE	None	RUNNING
	test		512 MB RAM 1 VCPU 0GB Disk		ERROR	deleting	NO STATE
	test_giuseppe	192.168.111.30 193.205.211.80	512 MB RAM 1 VCPU 0GB Disk		ACTIVE	None	RUNNING
	test_vm667		512 MB RAM 1 VCPU 0GB Disk		ERROR	None	NO STATE
	ubuntu_12.04_mod	192.168.111.31 193.205.211.75	1024 MB RAM 1 VCPU 10GB Disk	crl_keypair	ACTIVE	None	RUNNING

The FI-LAB portal



By clicking on an element the offer can be explored.

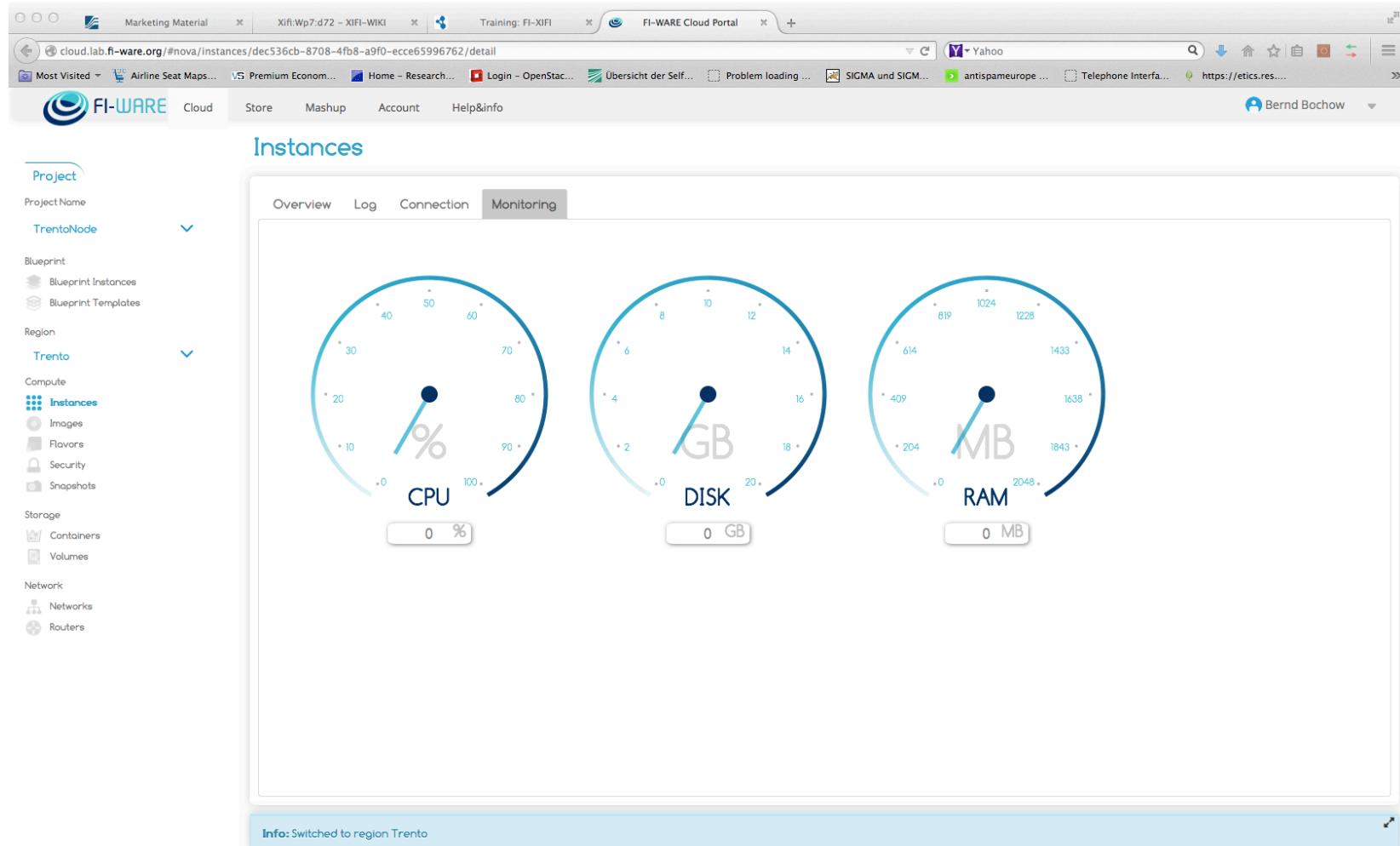
The screenshot shows the FI-WARE Cloud Portal interface. The left sidebar is titled 'Project' and lists 'TrentoNode' under 'Blueprint' and 'Region' under 'Trento'. The main content area is titled 'Instances' and shows a detailed view of a specific instance. The instance details are as follows:

Info		Specs	IP Addresses
Name: ubuntu_12.04_mod	ID: 3759098b-930b-4b16-9e98-c1fc312b7160	RAM: 1024MB VCPU: 1 VCPU Disk: 10GB	192.168.111.31 193.205.211.75
Security Groups		Meta	Volumes
		Key name: cri_keypair Image Name: ubuntu_12.04.04_new	No volumes attached.
Installed Software			
Image ubuntu_12.04.04_new does not allow Software Management with SDC.			

At the bottom of the page, a footer note states: 'Info: Connected to project TrentoNode [ID 000000000000000000000000000000002782]'

The FI-LAB portal

A virtual machine instance can be monitored.



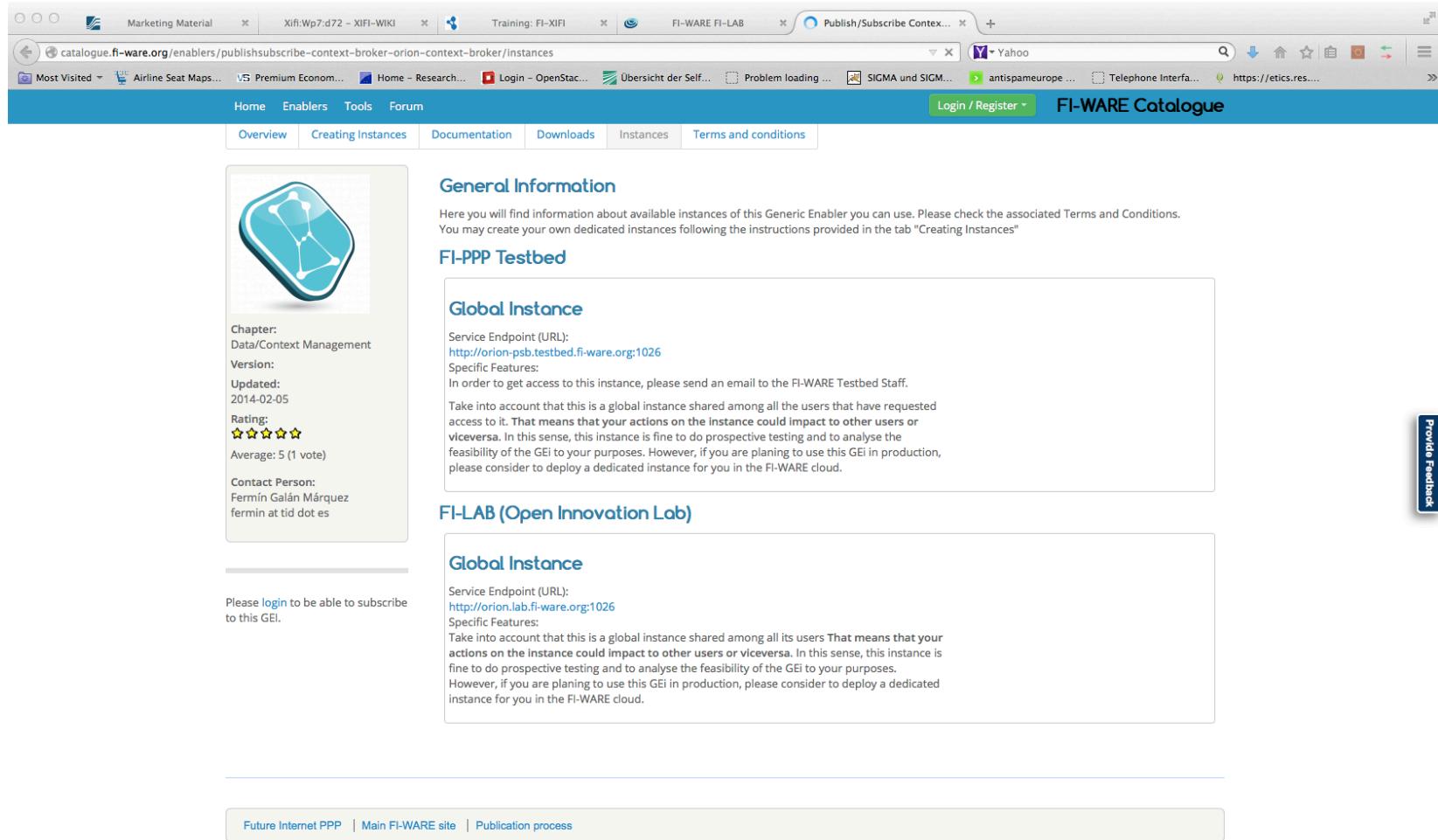
The screenshot shows the FI-WARE Cloud Portal interface for monitoring a virtual machine instance. The left sidebar navigation includes Project (selected), Project Name (TrentoNode), Blueprint (Blueprint Instances, Blueprint Templates), Region (Trento), Compute (Instances, Images, Flavors, Security, Snapshots), Storage (Containers, Volumes), and Network (Networks, Routers). The main content area displays three circular gauges under the Monitoring tab:

- CPU:** Current usage is 0 %, with a scale from 0 to 100.
- DISK:** Current usage is 0 GB, with a scale from 0 to 20.
- RAM:** Current usage is 0 MB, with a scale from 0 to 2048.

At the bottom, a message says "Info: Switched to region Trento".

Using the FI-LAB portal

- But look first if there is already a solution offered.



The screenshot shows a web browser window with multiple tabs open. The active tab is titled "catalogue.fi-ware.org/enablers/publishsubscribe-context-broker-orion-context-broker/instances". The browser's address bar also displays this URL. The main content area is the "FI-WARE Catalogue", specifically the "Instances" section. It lists two entries:

- FI-PPP Testbed**:
 - General Information**: Describes it as a "Generic Enabler" with a service endpoint at <http://orion-psb.testbed.fi-ware.org:1026>. It has a rating of 5 stars based on 1 vote.
 - Global Instance**: Provides details about the instance, including its service endpoint (<http://orion-psb.testbed.fi-ware.org:1026>) and specific features. It notes that it is a global instance shared among users and advises users to send an email to the staff if they want to access it.
- FI-LAB (Open Innovation Lab)**:
 - Global Instance**: Provides details about the instance, including its service endpoint (<http://orion.lab.fi-ware.org:1026>) and specific features. It notes that it is a global instance shared among users and advises users to consider deploying a dedicated instance for their purposes.

At the bottom of the page, there are links to "Future Internet PPP", "Main FI-WARE site", and "Publication process". A small status bar at the bottom left says "Connecting to catalogue.fi-ware.org...".



Install the OpenStack command-line clients

XIFI FOR DEVELOPERS

Available command-line clients



Use the following clients to access the XIFI infrastructures

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

Install CLI client packages



In order to access XIFI/OpenStack services by CLI Python packages has to be installed.

- Install of Python Package Index

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

- Installation of supported client packages

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

http://docs.openstack.org/user-guide/content/install_clients.html

Setting environment variables



Before you can run client commands, you must create and source environment variables.

Example:

```
export OS_TENANT_NAME="00000000000000000000000000003015"  
export OS_USERNAME=xifi-user@mailprovider.com  
export OS_PASSWORD=sf4365k1jrt  
export OS_AUTH_URL=http://cloud.lab.fi-ware.org:4730/v2.0  
export OS_REGION_NAME=Berlin //optional
```



Managing virtual machine images

XIFI FOR DEVELOPERS

Accessing image repositories

OpenStack glance is needed to manage virtual machine images by command line whenever the portal does not provide a specific command or option.

```
# 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

Creating virtual machine images

Importing a virtual machine image is currently not supported by the portal.

```
# 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

Exploring image metadata

Exploring the properties of a virtual machine image

```
# glance image-show 074766de-1fee-4361-bdcf-60efbaef8665
```

Property	Value
checksum	3616895820e33cda3ad8f99223e58ac9
container_format	bare
created_at	2014-05-09T08:36:40
deleted	False
disk_format	qcow2
id	074766de-1fee-4361-bdcf-60efbaef8665
is_public	True
min_disk	0
min_ram	0
name	Ubuntu 12.04 Server CloudImg amd64
owner	000000000000000000000000000000003015
protected	False
size	260309504
status	active
updated_at	2014-05-09T08:36:45

Delete a virtual machine image

```
# glance image-delete 0973cdbe-1585-45e2-bf76-e8df0fd658f
```

Update image metadata

```
# glance update 4319f871-6d9b-47ab-b1b2-86fc702598b is_public=True  
protected=False nid=344
```

Export image

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



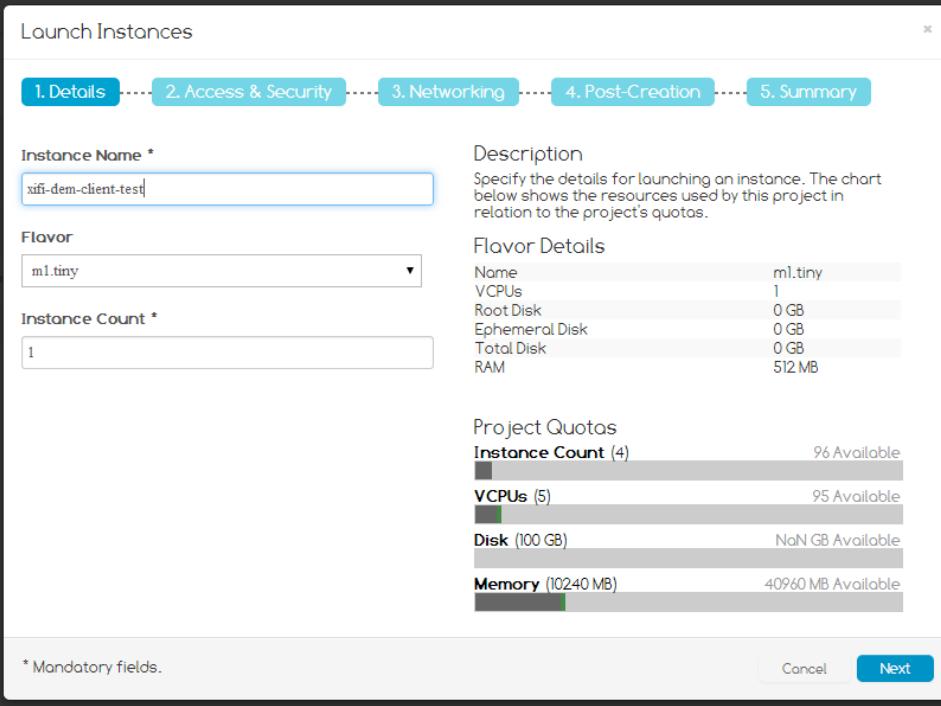


Working with virtual machines

XIFI FOR DEVELOPERS

Launching a virtual machine

Images



Launch Instances

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

Instance Name *

Flavor

Instance Count *

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
VCPU	1
Root Disk	0 GB
Ephemeral Disk	0 GB
Total Disk	0 GB
RAM	512 MB

Project Quotas

Resource	Used	Available
Instance Count (4)	1	96 Available
VCPU (5)	1	95 Available
Disk (100 GB)	0	NoN GB Available
Memory (10240 MB)	512	40960 MB Available

* Mandatory fields.

Cancel Next

Disk Format	Actions
QCOW2	<button>Launch</button>

Launching a virtual machine



Launch Instances

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

Keypair
tgu

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

Security Groups

default
 training

* Mandatory fields.

Back **Next**



Launching a virtual machine



Launch Instances

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

Keypair
tgu

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

Security Groups

default
 training

* Mandatory fields.

Back **Next**



Launching a virtual machine



Launch Instances

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

Selected Networks

nic:1 private-berlin-120

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

Available Networks

training-berlin-170
ext-net-federation
ext-net-public
private-berlin-121

* Mandatory fields.

Back Next



Launching a virtual machine



Launch Instances

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

Customization Script

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.

Back Next



Launching a virtual machine



Launch Instances

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

Instance Name: xifi-dem-client-test
Image: DEM-Client
Flavor: m1.tiny
Instance Count: 1
Keypair: tgu

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



Launching a virtual machine



Instances

	Instance Name	IP Address	Size	Keypair	Status	Task	Power State	Launch New Instance	Actions
<input type="checkbox"/>	FirstVM-03a77236-l2a8-4231-a3d9...	192.168.120.7 192.168.121.6	2048 MB RAM 1 VCPU 20GB Disk	tgu	ACTIVE	None	RUNNING	Launch	Edit
<input type="checkbox"/>	FirstVM-4e41e91a-eb29-4598-8a4...	192.168.120.8 192.168.121.7	2048 MB RAM 1 VCPU 20GB Disk	tgu	ACTIVE	None	RUNNING	Launch	Edit
<input type="checkbox"/>	FirstVM-9bc900c0-5bb7-4979-a47...	192.168.120.3 192.168.121.3 10.0.16.131	2048 MB RAM 1 VCPU 20GB Disk	tgu	ACTIVE	None	RUNNING	Launch	Edit
<input type="checkbox"/>	xifi-DT-showcase	192.168.120.5	4096 MB RAM 2 VCPU 40GB Disk	tgu	ACTIVE	None	RUNNING	Launch	Edit
<input type="checkbox"/>	xifi-dem-client-test	192.168.120.4	512 MB RAM 1 VCPU 0GB Disk	tgu	BUILD	spawning	NO STATE	Launch	Edit



Allocate floating IPs



Allocate Floating IP

Pool

ext-net-federation

Description

Allocate a floating IP from a given floating ip pool.

Project Quotas

Floating IP (6) 94 Available

Cancel Allocate IP



Assigning floating IPs



Security

	Floating IPs	Security Groups	Keypairs		
				Allocate IP to Project	Actions
	IP Address ▾	Instance ▾		Floating IP Pool ▾	
<input type="checkbox"/>	10.0.16.131	FirstVM-9bc900c0-5bb7-4979-a476-d0956bc2e0ca		ext-net-federation	
<input type="checkbox"/>	10.0.16.132	-		ext-net-federation	
<input type="checkbox"/>	10.0.16.133	-		ext-net-federation	
<input checked="" type="checkbox"/>	193.175.132.215	-		ext-net-public	
<input type="checkbox"/>	193.175.132.216	-		ext-net-public	
<input type="checkbox"/>	193.175.132.217	-		ext-net-public	



Assigning floating IPs



Security

Floating IPs	Security Groups	Keypairs	Allocate IP to Project	Actions
IP Address	Instance	Floating IP Pool		
<input type="checkbox"/> 10.0.16.131	FirstVM-9bc900c0-5bb7-4979-a476-d0956bc2e0ca	ext-net-federation		
<input type="checkbox"/> 10.0.16.132	-	ext-net-federation		
<input type="checkbox"/> 10.0.16.133	-	ext-net-federation		
<input checked="" type="checkbox"/> 193.175.132.215	-	ext-net-public		
<input type="checkbox"/> 193.175.132.216	-	ext-net-public		
<input type="checkbox"/> 193.175.132.217	-	ext-net-public		

Assigning floating IPs

Associate Floating IP

Floating IP
193.175.132.215

Description
Associate a floating ip with an instance.

Instance
Select an instance ▾

Cancel **Associate IP**

Assigning floating IPs



Security

	IP Address ▾	Instance ▾	Floating IP Pool ▾
<input type="checkbox"/>	10.0.16.131	FirstVM-9bc900c0-5bb7-4979-a476-d0956bc2e0ca	ext-net-federation
<input type="checkbox"/>	10.0.16.132	-	ext-net-federation
<input type="checkbox"/>	10.0.16.133	-	ext-net-federation
<input checked="" type="checkbox"/>	193.175.132.215	xifi-dem-client-test	ext-net-public
<input type="checkbox"/>	193.175.132.216	-	ext-net-public
<input type="checkbox"/>	193.175.132.217	-	ext-net-public



Accessing virtual machines



Accessing a virtual machine through the portal (VNC).

Instances

Overview Log **Connection** Monitoring

Connect using a SSH client

You need to associate a Floating IP to this Instance in order to connect via SSH.

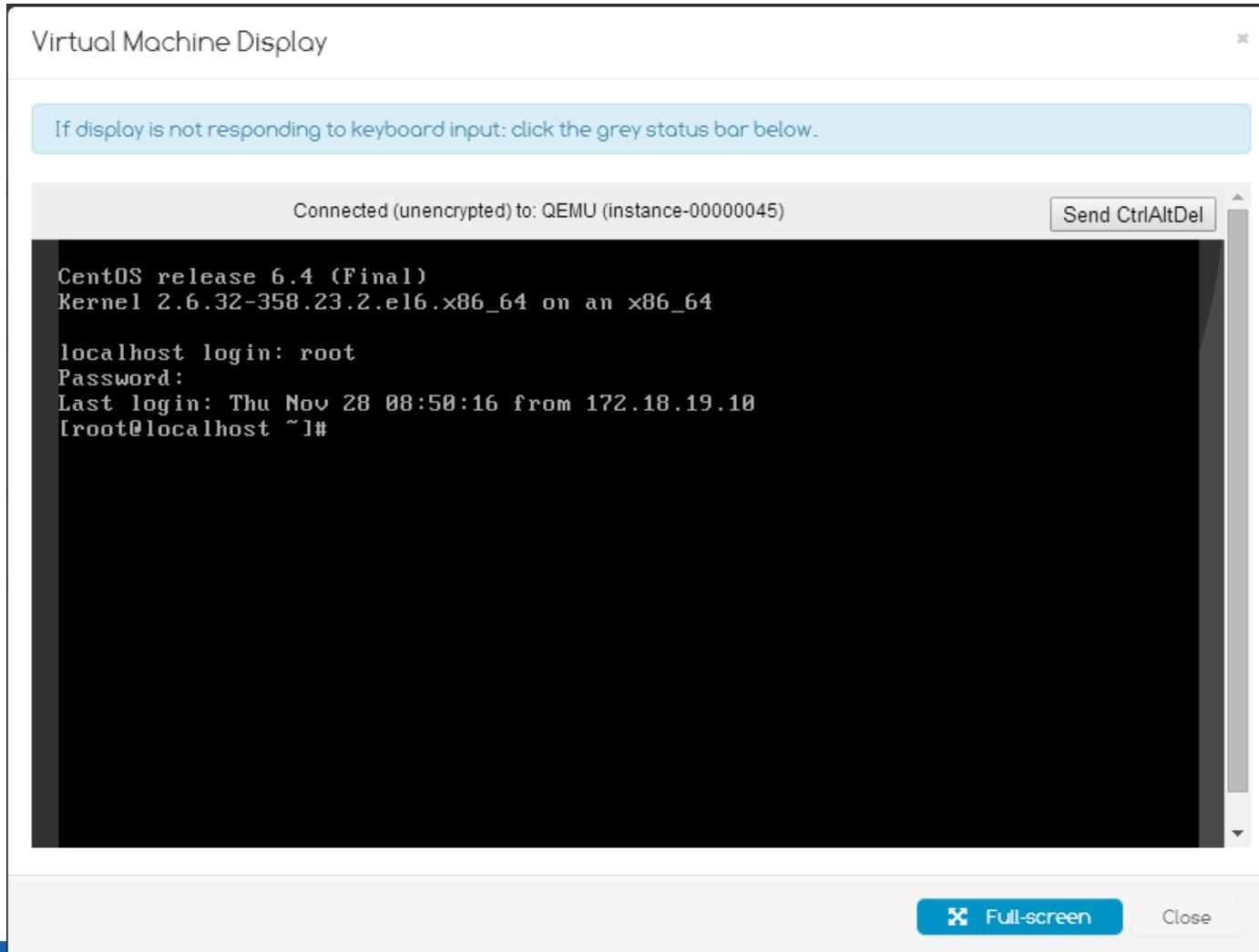
1. Go to Security -> Floating IPs
2. If you have not any Floating IP available, allocate a new one to the project.
3. Associate a Floating IP to this Instance.

Connect to VM display

Connect directly to the Virtual Machine display

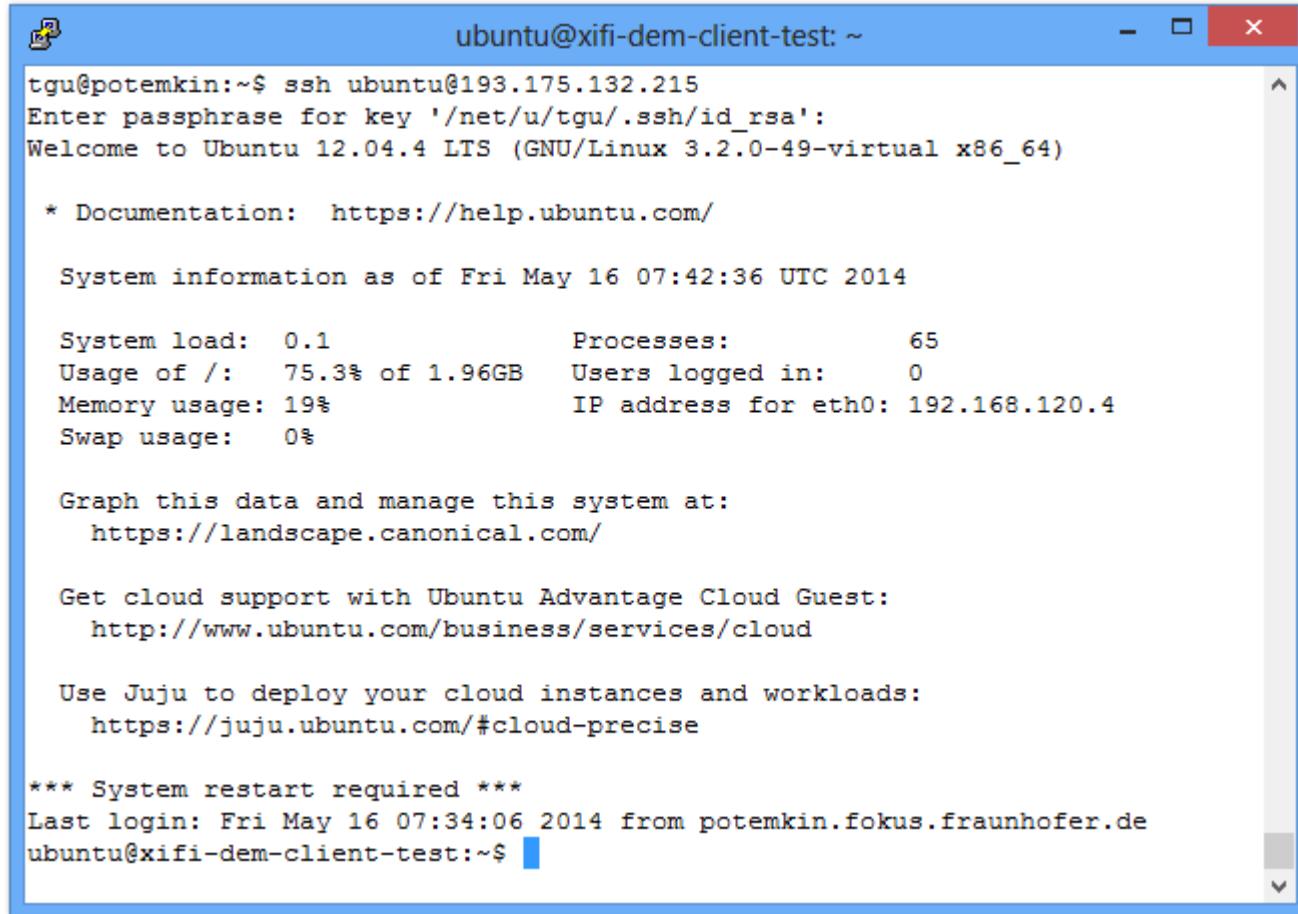
[View display](#)

Accessing virtual machines



Accessing virtual machines

Accessing a virtual machine by a remote terminal (SSH).



```
ubuntu@xifi-dem-client-test: ~
tgu@potemkin:~$ ssh ubuntu@193.175.132.215
Enter passphrase for key '/net/u/tgu/.ssh/id_rsa':
Welcome to Ubuntu 12.04.4 LTS (GNU/Linux 3.2.0-49-virtual x86_64)

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

 System information as of Fri May 16 07:42:36 UTC 2014

 System load:  0.1          Processes:           65
 Usage of /:   75.3% of 1.96GB  Users logged in:     0
 Memory usage: 19%          IP address for eth0: 192.168.120.4
 Swap usage:   0%

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

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

 Use Juju to deploy your cloud instances and workloads:
   https://juju.ubuntu.com/#cloud-precise

*** System restart required ***
Last login: Fri May 16 07:34:06 2014 from potemkin.fokus.fraunhofer.de
ubuntu@xifi-dem-client-test:~$
```

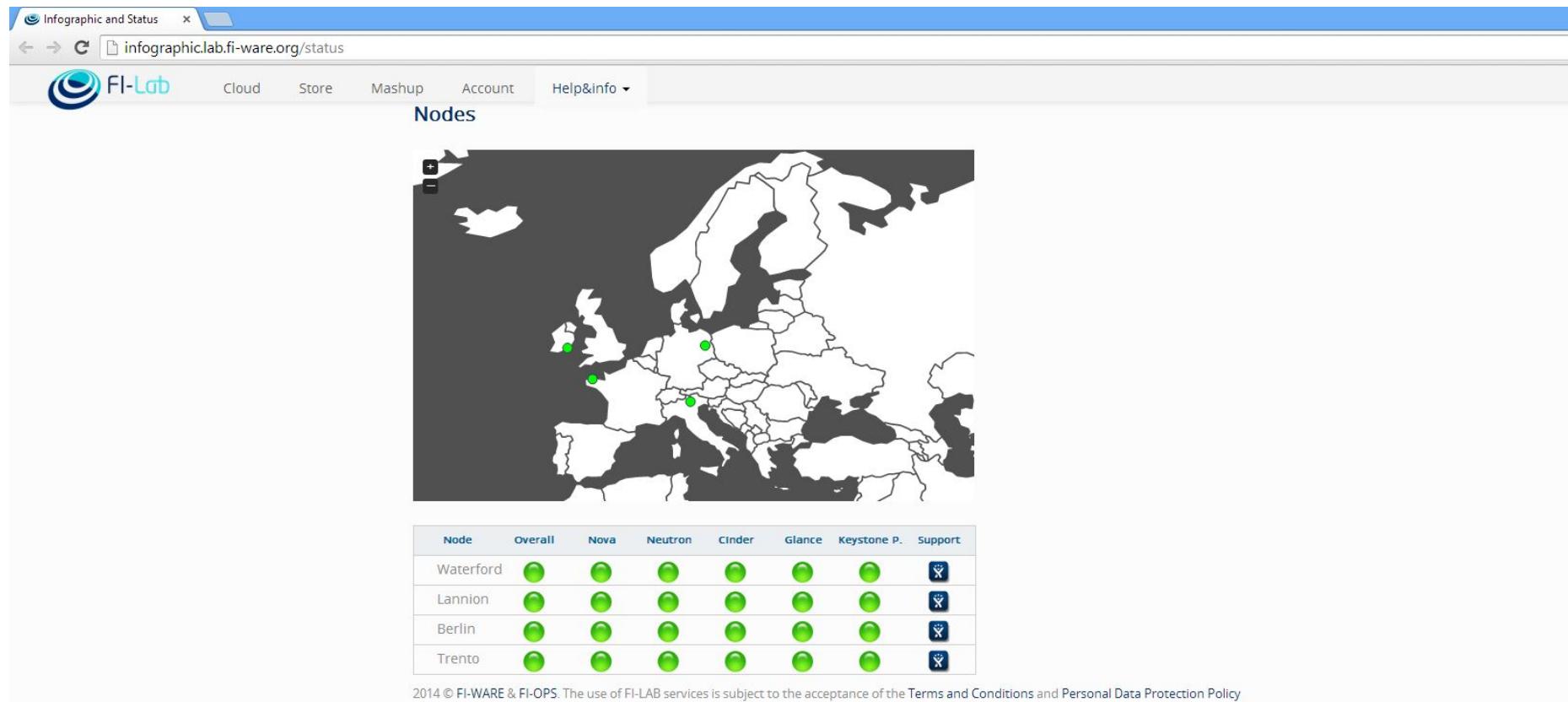


Working with infrastructure monitoring

XIFI FOR DEVELOPERS

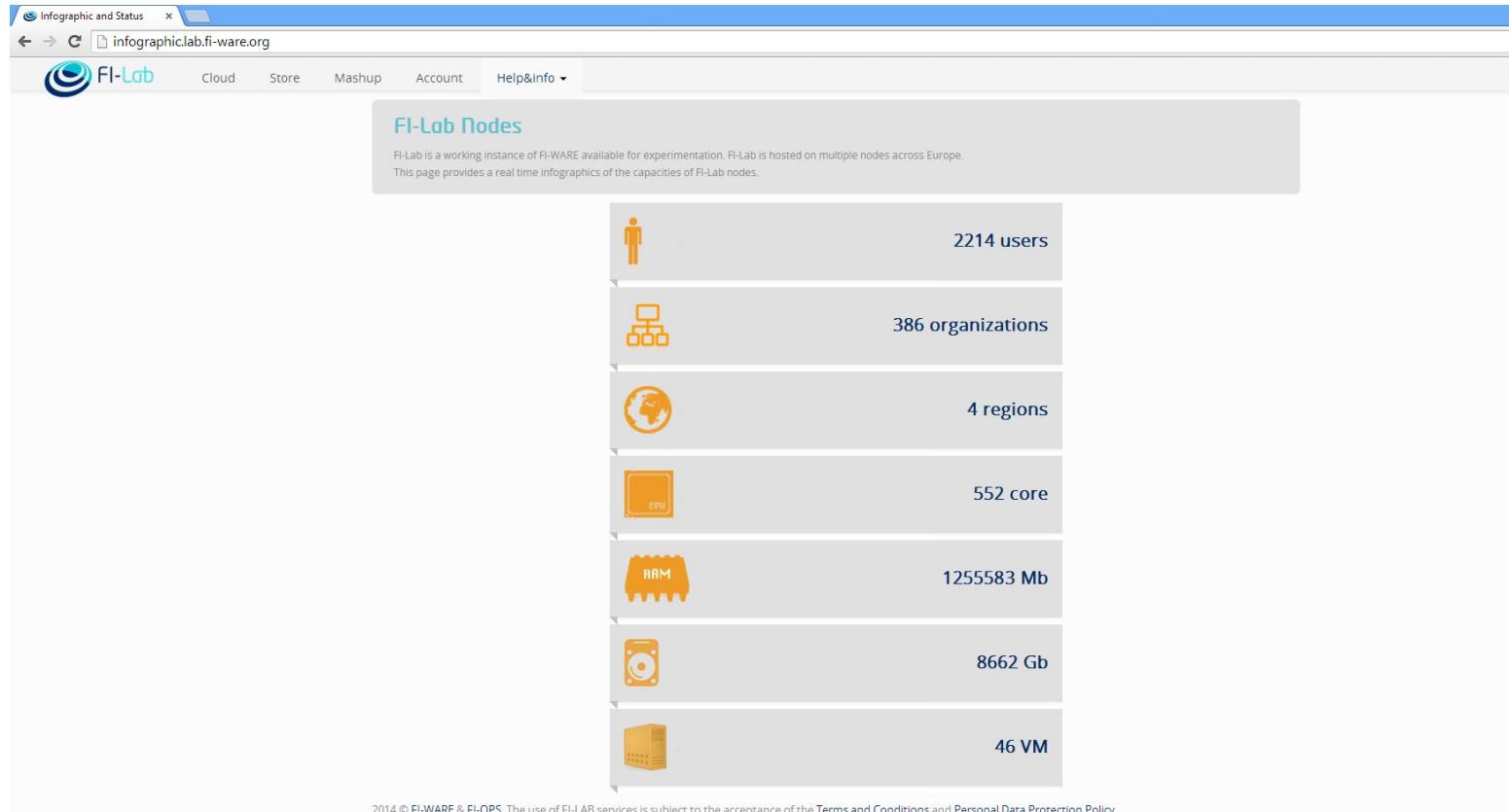
Monitoring infographics

Querying the infrastructure status summary.



Capacity infographics

Querying the status of infrastructure resources.



Monitoring with Nagios



Querying infrastructures via Nagios Host Status Details.

Nagios Core x

193.175.132.211/nagios/

Nagios®

General

- Home
- Documentation

Current Status

- Tactical Overview
- Map
- Hosts
- Services
- Host Groups
- Summary
- Grid

Service Groups

- Summary
- Grid

Host Groups

- Services (Unhandled)
- Hosts (Unhandled)
- Network Outages

Quick Search:

Current Network Status

Last Updated: Wed May 14 17:59:53 CEST 2014
Updated every 90 seconds
Nagios® Core™ 3.4.1 - www.nagios.org
Logged in as **nagiosadmin**

View Service Status Detail For All Host Groups
View Status Overview For All Host Groups
View Status Summary For All Host Groups
View Status Grid For All Host Groups

Host Status Totals

Up	0	Down	0	Unreachable	0	Pending	0
4	0	0	0	0	0	0	0

All Problems All Types

0	4
---	---

Service Status Totals

Ok	44	Warning	0	Unknown	0	Critical	0	Pending	0
44	0	0	0	0	0	0	0	0	0

All Problems All Types

0	44
---	----

Host Status Details For All Host Groups

Host	Status	Last Check	Duration	Status Information
hp3800	UP	05-14-2014 17:55:19	8d 1h 44m 5s	PING OK - Packet loss = 0%, RTA = 0.26 ms
north	UP	05-14-2014 17:56:19	16d 8h 2m 19s	PING OK - Packet loss = 0%, RTA = 2.10 ms
xifi-mon-ximm	UP	05-14-2014 17:59:39	6d 2h 57m 8s	PING OK - Packet loss = 0%, RTA = 0.05 ms
xifi-os-ctrl	UP	05-14-2014 17:56:49	0d 5h 35m 34s	PING OK - Packet loss = 0%, RTA = 0.20 ms

Results 1 - 4 of 4 Matching Hosts

Reports

- Availability
- Trends
- Alerts
- History
- Summary
- Histogram
- Notifications
- Event Log

System

- Comments
- Downtime
- Process Info
- Performance Info
- Scheduling Queue
- Configuration

Monitoring with Nagios

Querying infrastructures via Nagios Service Status Details.

Nagios Core 193.175.132.211/nagios/

General
Home Documentation View History For All hosts View Notifications For All Hosts View Host Status Detail For All Hosts

Current Status
Tactical Overview Map Hosts Services Host Groups Summary Grid Service Groups Summary Grid Problems Services (Unhandled) Hosts (Unhandled) Network Outages Quick Search:

Reports
Availability Trends Alerts History Summary Histogram Notifications Event Log

System
Documents Downtimes Process Info Performance Info Scheduling Queue Configuration

Hosts Limit Results: 100

Host	Service	Status	Last Check	Duration	Attempt	Status Information
hp3800	Port 2 Input Discards	OK	05-14-2014 17:56:26	8d 1h 45m 1s	1/3	SNMP OK - 0
	Port 2 Input Errors	OK	05-14-2014 17:57:28	8d 1h 45m 1s	1/3	SNMP OK - 0
	Port 2 Input Octets	OK	05-14-2014 17:58:30	8d 1h 45m 1s	1/3	SNMP OK - 4219911368
	Port 2 Input Unicast Pakets	OK	05-14-2014 17:59:32	8d 1h 45m 1s	1/3	SNMP OK - 3587662
	Port 2 Link Status	OK	05-14-2014 18:00:34	8d 1h 45m 1s	1/3	SNMP OK - 1
	Port 2 Output Discards	OK	05-14-2014 17:55:58	8d 1h 45m 1s	1/3	SNMP OK - 0
	Port 2 Output Errors	OK	05-14-2014 17:55:58	8d 1h 45m 1s	1/3	SNMP OK - 0
	Port 2 Output Octets	OK	05-14-2014 17:55:58	8d 1h 45m 1s	1/3	SNMP OK - 748975518
	Port 2 Output Unicast Pkts	OK	05-14-2014 17:55:58	8d 1h 45m 1s	1/3	SNMP OK - 1256883
	Port 4 Input Discards	OK	05-14-2014 17:52:06	8d 1h 38m 43s	1/3	SNMP OK - 0
	Port 4 Input Errors	OK	05-14-2014 17:52:53	8d 1h 37m 56s	1/3	SNMP OK - 0
	Port 4 Input Octets	OK	05-14-2014 17:53:41	8d 1h 37m 8s	1/3	SNMP OK - 175431
	Port 4 Input Unicast Pakets	OK	05-14-2014 17:54:28	8d 1h 36m 21s	1/3	SNMP OK - 216
	Port 4 Link Status	OK	05-14-2014 17:55:15	8d 1h 35m 34s	1/3	SNMP OK - 1
	Port 4 Output Discards	OK	05-14-2014 17:56:03	8d 1h 34m 46s	1/3	SNMP OK - 0
	Port 4 Output Errors	OK	05-14-2014 17:56:50	8d 1h 33m 59s	1/3	SNMP OK - 0
	Port 4 Output Octets	OK	05-14-2014 17:57:37	8d 1h 33m 12s	1/3	SNMP OK - 429321100
	Port 4 Output Unicast Pkts	OK	05-14-2014 17:58:25	8d 1h 32m 24s	1/3	SNMP OK - 19778
north	Port 3 Input Discards	OK	05-14-2014 18:00:16	15d 8h 30m 33s	1/3	SNMP OK - 0
	Port 3 Input Errors	OK	05-14-2014 18:00:00	15d 8h 30m 49s	1/3	SNMP OK - 0
	Port 3 Input Octets	OK	05-14-2014 18:00:16	15d 8h 30m 33s	1/3	SNMP OK - 164655776
	Port 3 Input Unicast Pakets	OK	05-14-2014 17:53:38	15d 8h 37m 11s	1/3	SNMP OK - 1499501576
	Port 3 Link Status	OK	05-14-2014 17:54:38	15d 8h 36m 11s	1/3	SNMP OK - 1
	Port 3 Output Discards	OK	05-14-2014 17:55:38	15d 8h 35m 11s	1/3	SNMP OK - 0
	Port 3 Output Errors	OK	05-14-2014 17:55:38	15d 8h 34m 11s	1/3	SNMP OK - 0
	Port 3 Output Octets	OK	05-14-2014 17:55:38	15d 8h 33m 11s	1/3	SNMP OK - 2082361339
	Port 3 Output Unicast Pkts	OK	05-14-2014 17:50:38	15d 8h 32m 11s	1/3	SNMP OK - 1362112271
xif-mon-ximm	DEM-Adapter	OK	05-14-2014 17:56:45	8d 1h 25m 29s	1/3	PROCS OK: 1 process with command name 'java', args 'UpdateService.jar'
	MongoDB	OK	05-14-2014 17:57:40	8d 1h 33m 46s	1/3	PROCS OK: 1 process with command name 'mongod'
	NAM-Adapter	OK	05-14-2014 17:52:34	0d 23h 48m 15s	1/3	PROCS OK: 2 processes with command name 'node', args '/opt/nam_adapter/NAM/adapter.js'
	NGSI-Adapter	OK	05-14-2014 17:55:38	8d 1h 25m 11s	1/3	PROCS OK: 2 processes with command name 'node', args '/opt/ngsi_adapter/adaptor'
	ORION Context Broker	OK	05-14-2014 18:00:23	8d 1h 30m 44s	1/3	PROCS OK: 1 process with command name 'contextBroker'
	ORION Context Broker HTTP	OK	05-14-2014 18:00:23	5d 4h 30m 26s	1/3	HTTP: HTTP/1.1 200 OK - 263 bytes in 0.002 second response time
xif-os-ctrl	cinder-api	OK	05-14-2014 17:58:04	5d 2h 52m 45s	1/3	PROCS OK: 1 process with command name 'cinder-api'
	cinder-scheduler	OK	05-14-2014 17:58:42	0d 10h 2m 7s	1/3	PROCS OK: 1 process with command name 'cinder-scheduler'
	glance-api	OK	05-14-2014 17:53:52	0d 5h 29m 12s	1/3	PROCS OK: 9 processes with command name 'glance-api'
	glance-registry	OK	05-14-2014 17:58:31	5d 2h 52m 18s	1/3	PROCS OK: 2 processes with command name 'glance-registry'
	nova-api	OK	05-14-2014 17:57:26	5d 2h 53m 23s	1/3	PROCS OK: 4 processes with command name 'nova-api'
	nova-cert	OK	05-14-2014 17:58:20	5d 2h 52m 29s	1/3	PROCS OK: 1 process with command name 'nova-cert'
	nova-conductor	OK	05-14-2014 17:57:24	5d 2h 53m 25s	1/3	PROCS OK: 1 process with command name 'nova-conductor'
	nova-consoleauth	OK	05-14-2014 17:57:26	5d 2h 53m 23s	1/3	PROCS OK: 1 process with command name 'nova-consoleauth'
	nova-novncproxy	OK	05-14-2014 17:56:21	0d 5h 34m 28s	1/3	PROCS OK: 1 process with command name 'nova-novncproxy'
	nova-scheduler	OK	05-14-2014 17:57:16	5d 2h 53m 33s	1/3	PROCS OK: 1 process with command name 'nova-scheduler'
	quantum-server	OK	05-14-2014 17:58:11	5d 2h 52m 38s	1/3	PROCS OK: 1 process with command name 'python', args 'quantum-server'

Results 1 - 44 of 44 Matching Services



Monitoring with Nagios

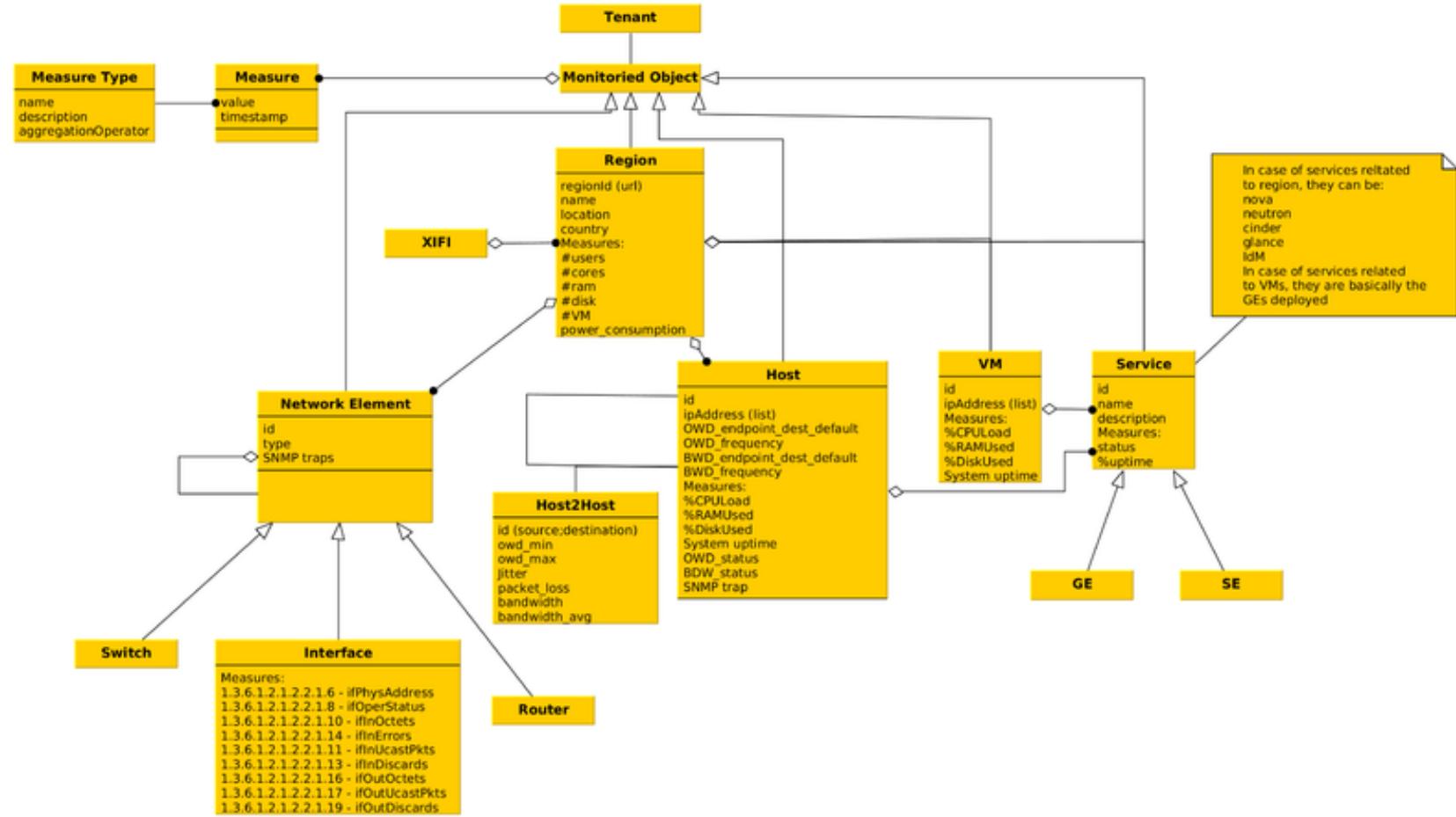
Querying infrastructures via Nagios Service Status Details.

north	Port 3 Input Discards	OK	05-14-2014 18:30:16	15d 9h 8m 44s	1/3	SNMP OK - 0
	Port 3 Input Errors	OK	05-14-2014 18:30:00	15d 9h 9m 0s	1/3	SNMP OK - 0
	Port 3 Input Octets	OK	05-14-2014 18:30:16	15d 9h 8m 44s	1/3	SNMP OK - 232942939
	Port 3 Input Unicast Pakets	OK	05-14-2014 18:33:38	15d 9h 15m 22s	1/3	SNMP OK - 1499866726
	Port 3 Link Status	OK	05-14-2014 18:34:38	15d 9h 14m 22s	1/3	SNMP OK - 1
	Port 3 Output Discards	OK	05-14-2014 18:35:38	15d 9h 13m 22s	1/3	SNMP OK - 0
	Port 3 Output Errors	OK	05-14-2014 18:36:38	15d 9h 12m 22s	1/3	SNMP OK - 0
	Port 3 Output Octets	OK	05-14-2014 18:38:04	15d 9h 11m 22s	1/3	SNMP OK - 19333979
	Port 3 Output Unicast Pkts	OK	05-14-2014 18:38:38	15d 9h 10m 22s	1/3	SNMP OK - 1363801991
xifi-mon-ximm	DEM-Adapter	OK	05-14-2014 18:36:45	6d 2h 3m 40s	1/3	PROCS OK: 1 process with command name 'java', args 'UpdateService.jar'
	MongoDB	OK	05-14-2014 18:37:40	6d 2h 11m 57s	1/3	PROCS OK: 1 process with command name 'mongod'
	NAM-Adapter	OK	05-14-2014 18:32:34	1d 0h 26m 26s	1/3	PROCS OK: 2 processes with command name 'node', args '/opt/nam_adapter/NAMadapter.js'
	NGSI-Adapter	OK	05-14-2014 18:35:38	6d 2h 3m 22s	1/3	PROCS OK: 2 processes with command name 'node', args '/opt/ngsi_adapter/adapter'
	ORION Context Broker	OK	05-14-2014 18:30:23	6d 2h 8m 55s	1/3	PROCS OK: 1 process with command name 'contextBroker'
	ORION Context Broker HTTP	OK	05-14-2014 18:30:23	5d 5h 8m 37s	1/3	HTTP OK: HTTP/1.1 200 OK - 263 bytes in 0.002 second response time
xifi-os-ctrl	cinder-api	OK	05-14-2014 18:38:04	5d 3h 30m 56s	1/3	PROCS OK: 1 process with command name 'cinder-api'
	cinder-scheduler	OK	05-14-2014 18:38:42	0d 10h 40m 18s	1/3	PROCS OK: 1 process with command name 'cinder-schedule'
	glance-api	OK	05-14-2014 18:33:52	0d 6h 7m 23s	1/3	PROCS OK: 9 processes with command name 'glance-api'
	glance-registry	OK	05-14-2014 18:38:31	5d 3h 30m 29s	1/3	PROCS OK: 2 processes with command name 'glance-registry'
	nova-api	OK	05-14-2014 18:37:26	5d 3h 31m 34s	1/3	PROCS OK: 4 processes with command name 'nova-api'
	nova-cert	OK	05-14-2014 18:38:20	5d 3h 30m 40s	1/3	PROCS OK: 1 process with command name 'nova-cert'
	nova-conductor	OK	05-14-2014 18:37:24	5d 3h 31m 36s	1/3	PROCS OK: 1 process with command name 'nova-conductor'
	nova-consoleauth	OK	05-14-2014 18:37:26	5d 3h 31m 34s	1/3	PROCS OK: 1 process with command name 'nova-consoleaut'
	nova-novncproxy	OK	05-14-2014 18:36:21	0d 6h 12m 39s	1/3	PROCS OK: 1 process with command name 'nova-novncproxy'
	nova-scheduler	OK	05-14-2014 18:37:16	5d 3h 31m 44s	1/3	PROCS OK: 1 process with command name 'nova-scheduler'
	quantum-server	OK	05-14-2014 18:38:11	5d 3h 30m 49s	1/3	PROCS OK: 1 process with command name 'python', args 'quantum-server'



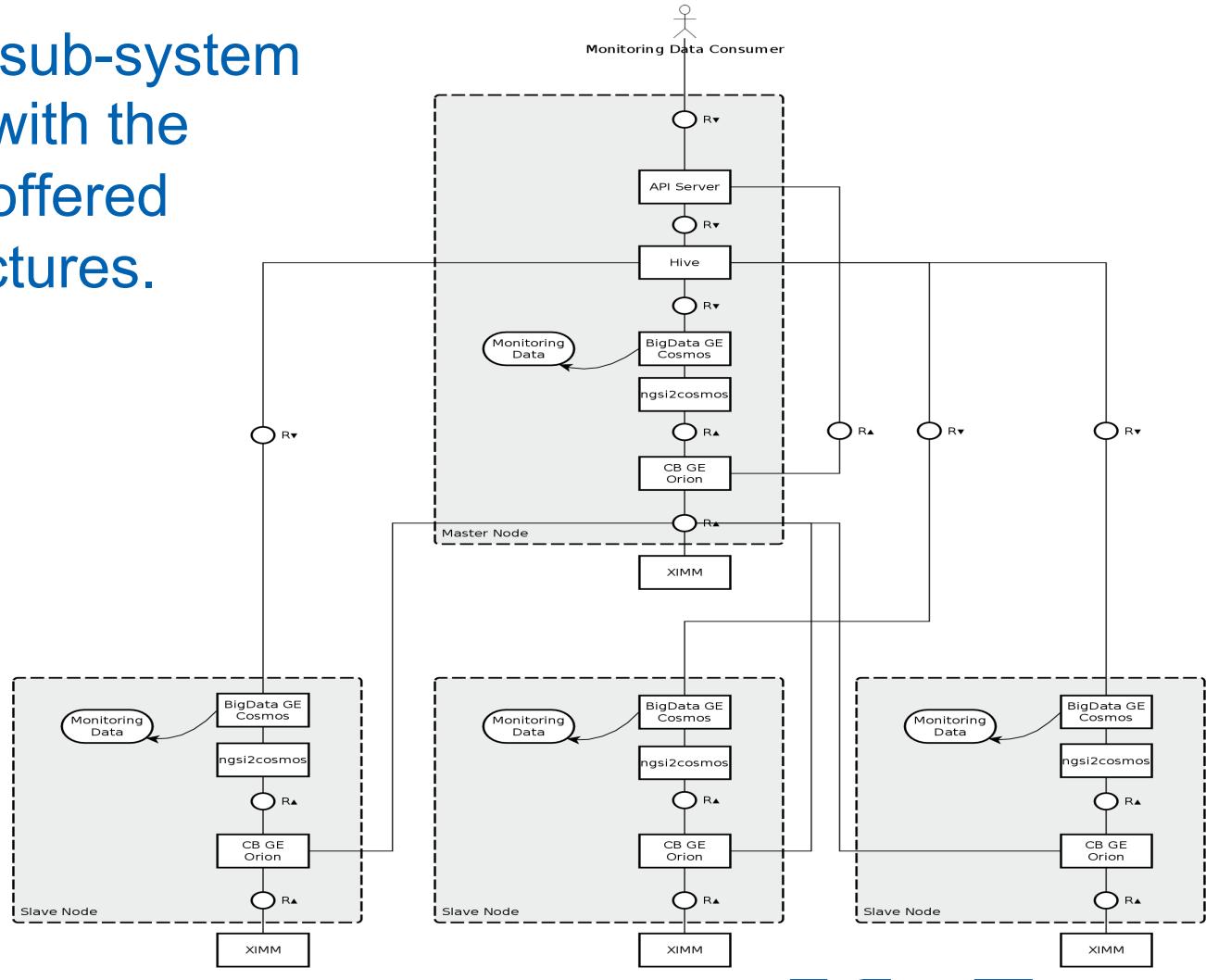
Monitoring data model

The monitoring service delivers data according to this model.



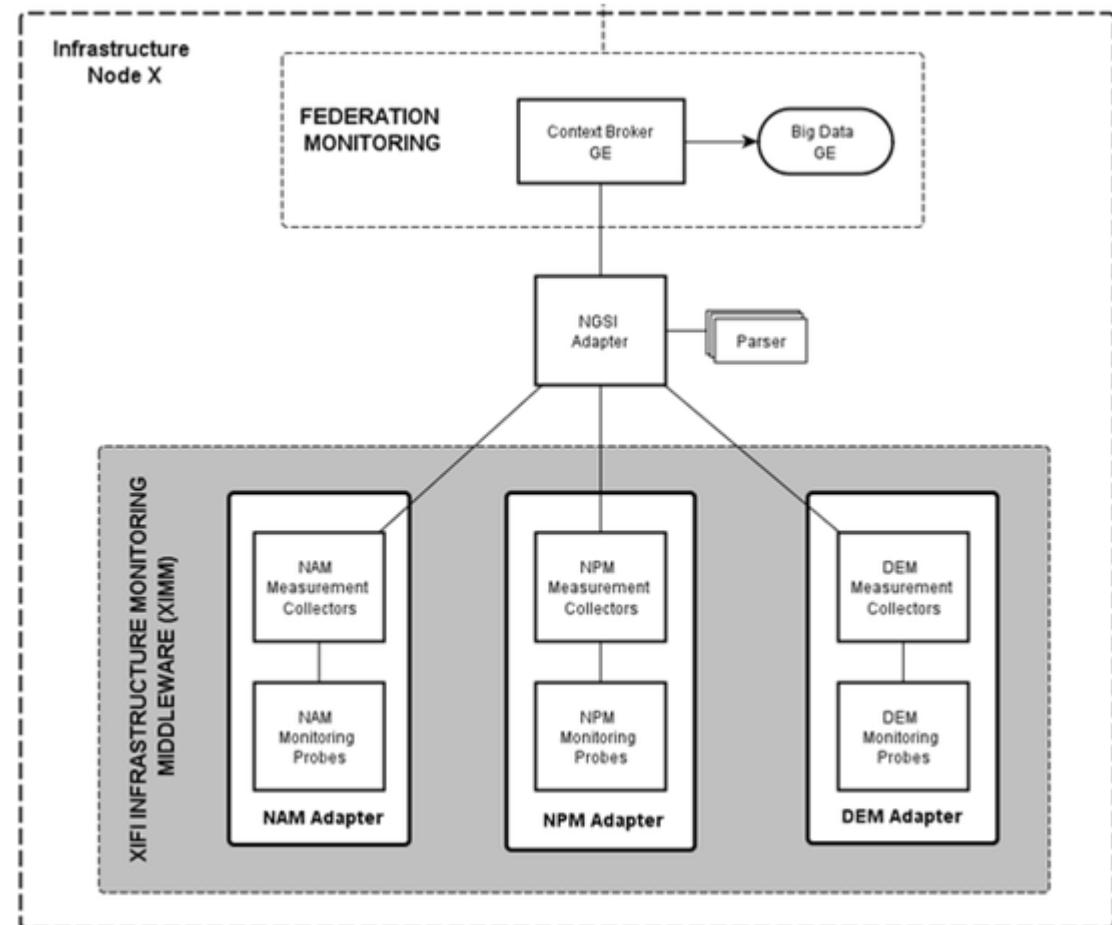
Monitoring architecture

The monitoring sub-system fully integrates with the FI-WARE GEs offered by the infrastructures.



Monitoring – XIMM architecture

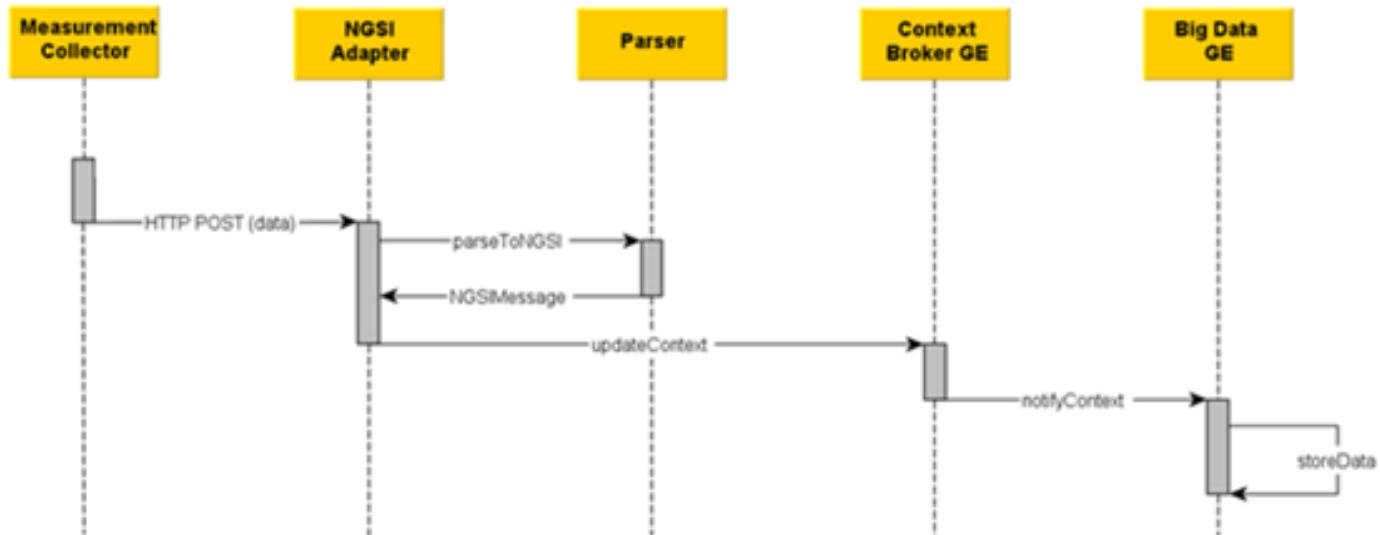
The XIFI monitoring sub-system utilizes adaptors for active, passive and virtual appliance monitoring.



Monitoring – XIMM workflow

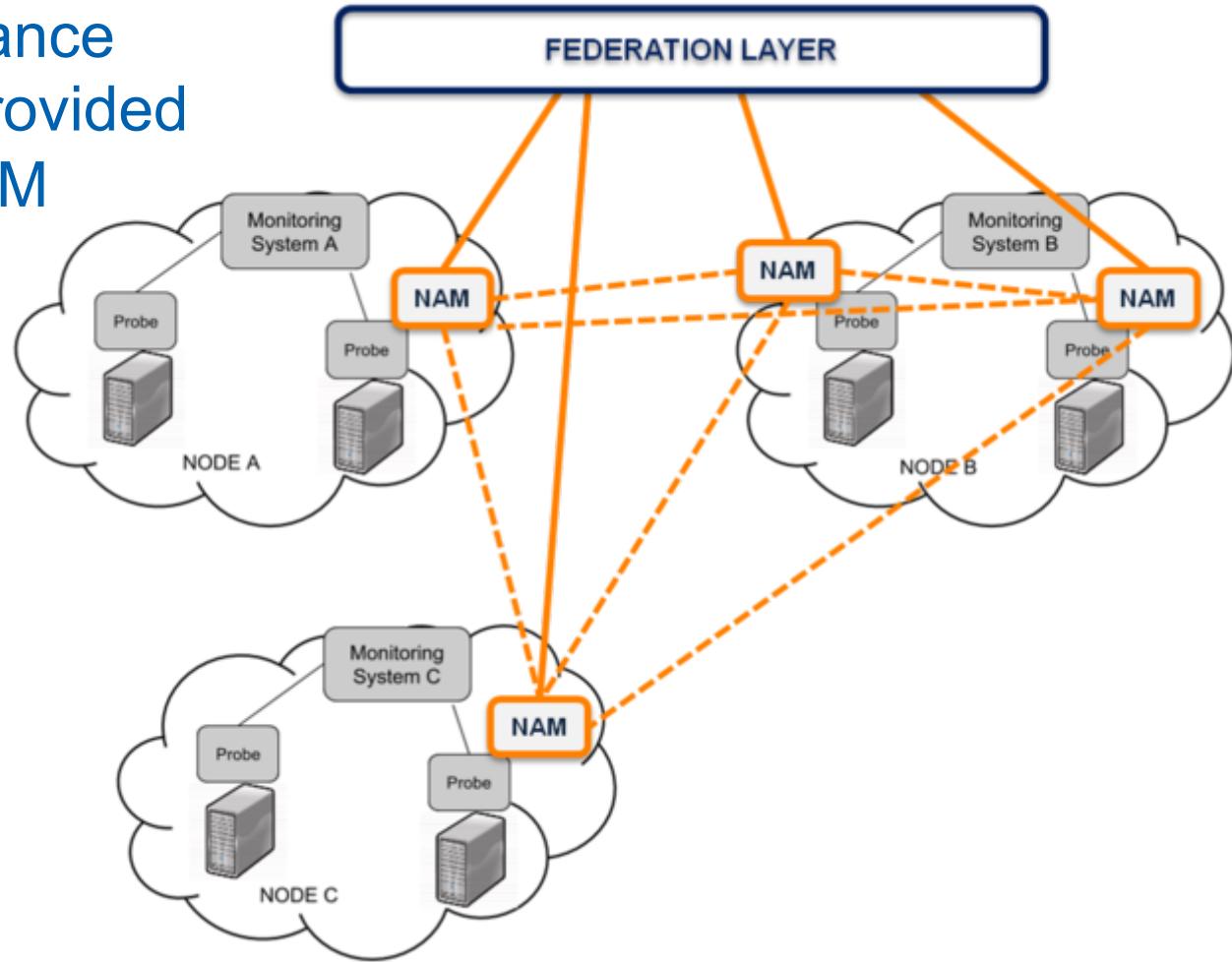
Adaptors report to a context broker.

Monitoring events are captured, converted and stored to allow for both real-time and past event analysis.



Monitoring – active monitoring

Active performance monitoring is provided through the NAM adapter.



Monitoring – status monitors

- Passive monitoring – NPM adapter.
 - Provide the SNMP data collection from the GE network resources and the adaptation layer between the monitoring lowest-layer and the XIFI federation layer.
- Monitoring virtual machines – DEM adapter
 - Monitoring of several resources from virtual machines collected by heterogeneous cloud environments.

Thank you for your attention!

Find us at www.fi-xifi.eu

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