# The iTHEPHY project and its software platform

Enhancing remote teacher-student collaboration

CNAF Bologna

# Agenda

**01** **iTHEPHY EU funded Project**
Originating idea and project development

**02** **ISHEP Cargese school and TANDEM Project**
Practical implementation

**03** **IaaS ICT e-learning platform**
ICT infrastructure

**04** **PaaS migration and software maintenance**
New ideas for next steps

Project funded by the European Community / AGENZIA NAZIONALE INDIRE
Budget: 368990 euro - Coordinator: UNIBO - PI: Angelo Carbone

Who is funded?
universities
research Institutions
industries

Aim?
improve the teaching quality
increase the collaboration among European institutions
promote the usage of information technologies tools
ensure education and research are mutually reinforcing
promote internationalization and mobility

KA2 - Cooperation for Innovation and the Exchange of Good Practices
KA203 - Strategic Partnerships for Higher Education

CNAF Bologna

The idea to apply for this project started after 3 years of collaboration between Bologna, the University of Dortmund and the University of Clermont-Auvergne

Three editions (2015/16/17) of the ISHEP spring school (Cargese, Corsica) for students enrolled in the master degree of the three universities (and PhD students)

We also received funding for 15k euro from the Franco-German University for the Spring School and for the 2017 and 2018 editions
The project is also co-funded (about 20k euro) by the University of Bologna to include non-EU students



The consortium: a synergy between Universities and research institutions

# iTHEPHY project

Main idea:

Team of students (2nd year of master degree) from each university to work together to a real research project

Each team will be supervised by a teacher/researcher from the consortium

Goal:

Increase the internationalization level of the master degree

Give to the students team-work skills

Promote international mobility

The project foresees 3 Intellectual Outputs:

Guided exercises with solution to be implemented on e-learning platform

**exercise with full and partial solutions**

A web-based platform to support the team during the project

**Video web-conference plugin**

**Chat room**

**Shared area**

**Scheduler/agenda for planning meetings between teachers and students and between students**

**A project management tool for tracking projects, assigning sub-tasks and tracking their progress…**

A final document that reports the experience with the aim of replicability of the project in other master degrees (not only in physics)

# Summer/Spring Schools
# (Cargese, Corsica)

iTHEPHY
Innovative Team Teaching
for Physics

We received funds for the orgaizazion of two editions of the International School of High Energy Physics (ISHEP)

2018-edition focused on testing the new e-learning materials developed and the new web-based platform

2019-edition dedicated to present results of the teams (tandem).  Students and supervisor meet in person to develop the project

Both schools included lectures and seminars
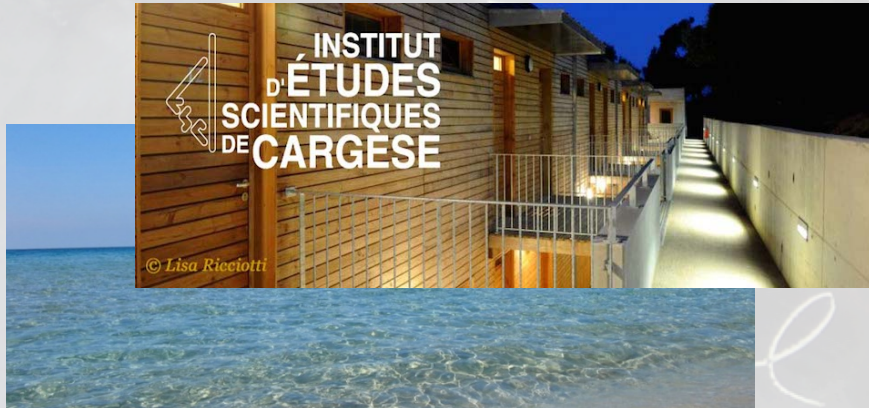
# Summer/Spring Schools: new models for physics teaching



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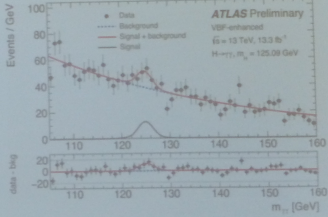
# TANDEM: What's all this about?

The idea of the whole project is to allow students to "emulate" what researchers do in their activity *in an international context*

What are the ingredients to perform a research program?

Project: an idea which will be developed and transformed in something "real"

Target: a starting date and a completion date

Timeline: organize a calendar, considering all the intermediate steps, indicating when it's time to show preliminary results to other colleagues, to your supervisors etc

Document: product where you describe the details of your method, what you did and what you obtained

Present final results to an international conference: the students have this possibility.

It will be the ISHEP school in Cargese…

# Tandem project in practice

But the students are not (yet) real researchers! They are (still) students… and by the way this a teaching activity, not a real research, so they need:

Supervisors, which will guide them in the various steps of the project

Tools, which will allow them to communicate, exchange files, material, documents… ideas

They will not see results published on Nature, but they will see results transformed in ECTS credits, after a formal examination

Last year 16+2 students were on board:

10 from Unibo, 4 from CF, 2 from TUD

1 from Colombia and 1 from Russia

2019/2020 is starting right now

Section 3-4

IaaS and PaaS platform

https://moodle.ithephy.eu

https://bbb.ithephy.eu

Moodle

Moodle-test

BBB

https://moodle-test.ithephy.eu
https://www.ithephy.eu

https://iam.ithephy.eu

Redmine

IAM

INDIGO - DataCloud

https://jitsi.ithephy.eu

https://redmine.ithephy.eu

sharelatex

RocketChat

Jitsi

http://sharelatex-test-ithephy.in2p3.fr/login
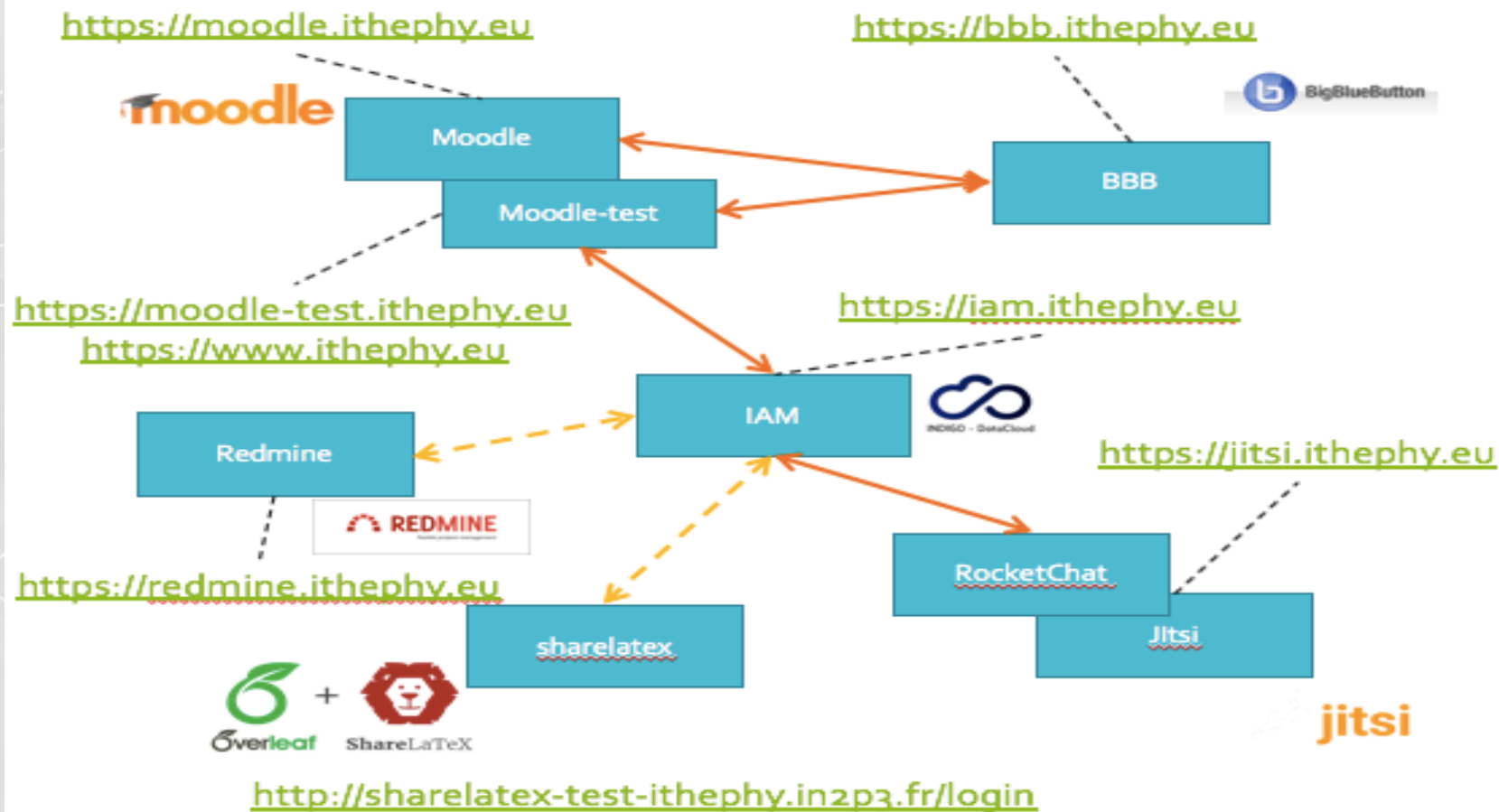
# iTHEPHY IO1

## e-learning and collaborative platform
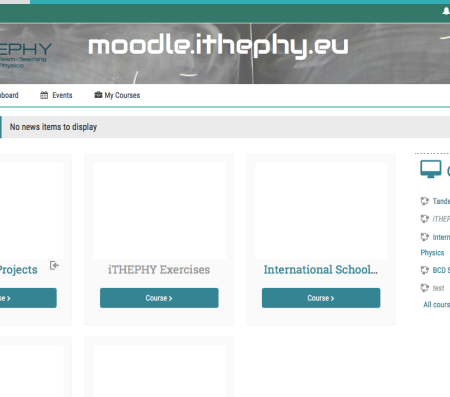


**moodle**

https://docs.moodle.org/35/en/Installation_quick_guide

*Moodle is a free, online Learning Management System with a big community*
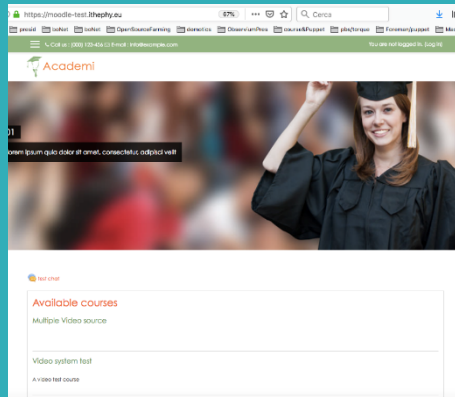


**moodle-test**

https://docs.moodle.org/37/en/Installation_quick_guide

Latest stable for developing and course testing purpose
New theme and innovative plugins



**BigBlueButton**

http://docs.bigbluebutton.org/2.2/install.html
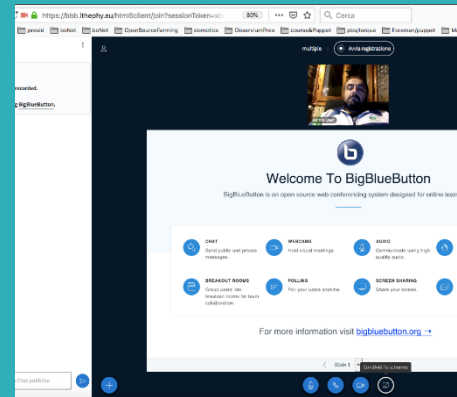
A video lesson tool with interactive collaboration whiteboard, online chat module and video recrding session



**Rocket.Chat**

https://rocket.chat/docs/installation/docker-containers/
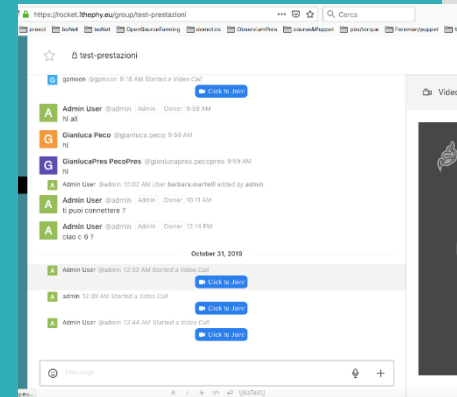
Chat,channel, room, bot, video, audio flexible app

# iTHEPHY IO1

## e-learning and collaborative platform



## JITSI-MEET

https://github.com/jitsi/jitsi-meet/blob/master/doc/manual-install.md
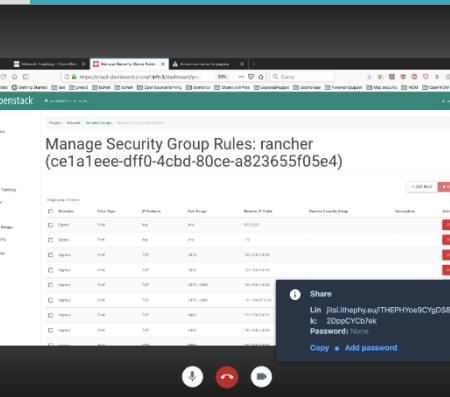
*Jitsi is a set of open-source projects that allows you to easily build and deploy secure videoconferencing solutions*

## SHARELATEX

https://github.com/overleaf/overleaf/wiki/Quick-Start-Guide
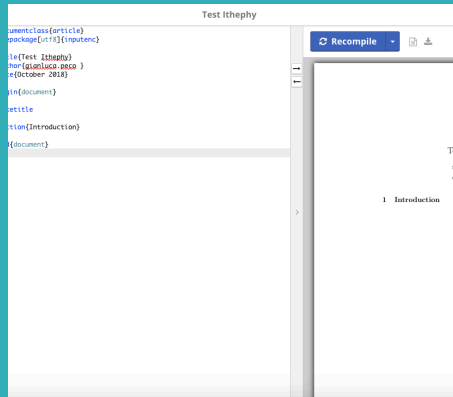
Now overleaf is an online latex collaborative suite. Edit and compile directly on your web browser
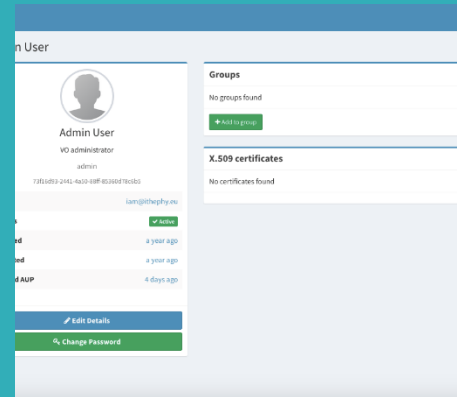
## INDIGO IAM

https://indigo-iam.github.io/docs/v/current/admin-guide/basic_conf.html

A layer where identities, enrollment, group membership and authorization policies can be managed in an homogeneous way

## REDMINE

https://www.redmine.org/projects/redmine/wiki/RedmineInstall
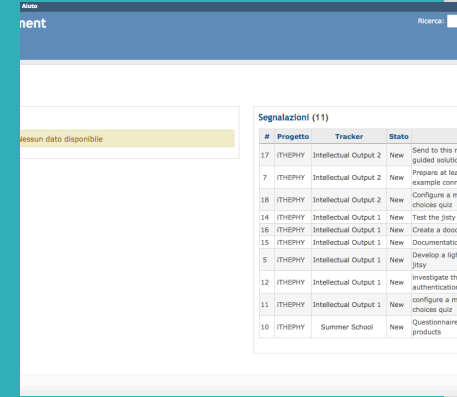
Redmine is a flexible project management web application written using Ruby on Rails framework.

# RedHat Ovirt on-premise HA

Howdy!

Welcome to Rancher

🌐 English ⌄
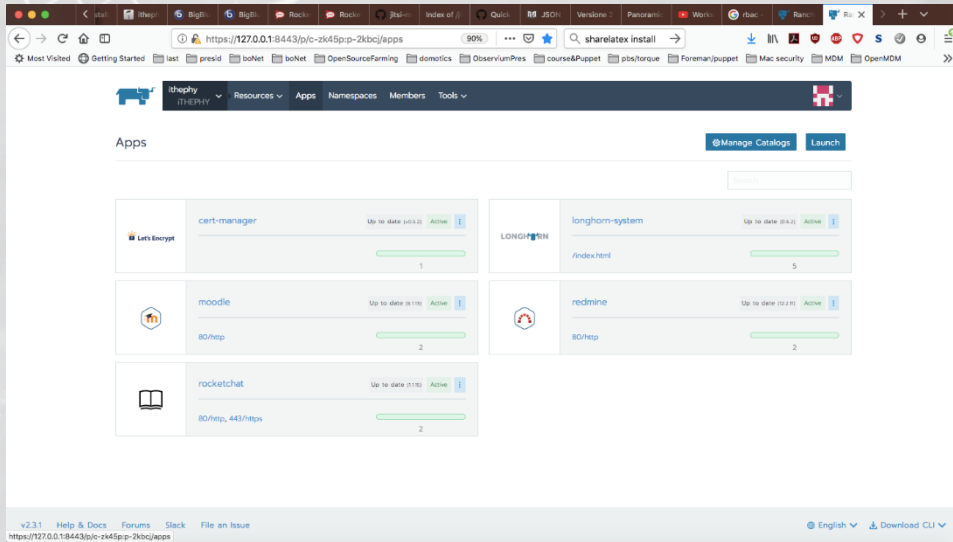
Username            Remember ☑
admin

Password
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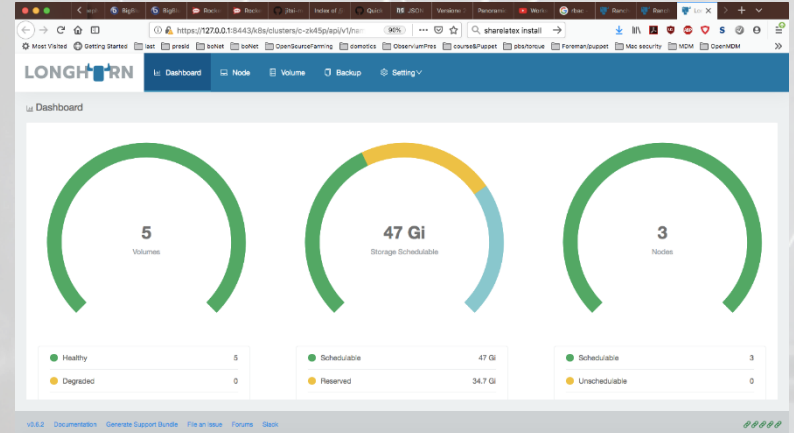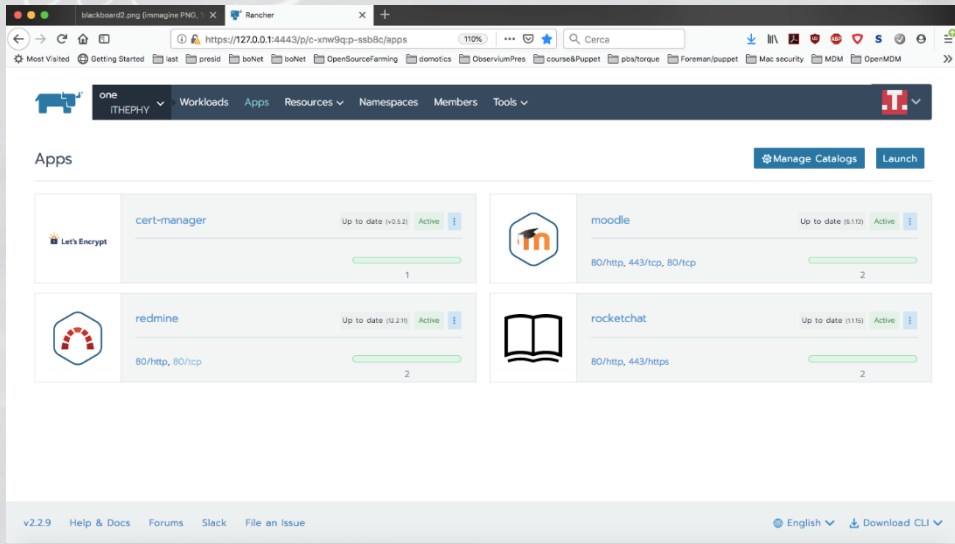
Log In

# Rancher on Cloud@CNAF



# Rancher 2.3.1

Openstack resources manually provisioned

Persistent storage with Longhorn software hyperconverged block device using hosts available resources. Necessity of manual configuration of L4 load balancer ad security groups on Openstack. Integration of moodle,redmine and rocket.chat with public jitsi. Rancher server run in a cluster node
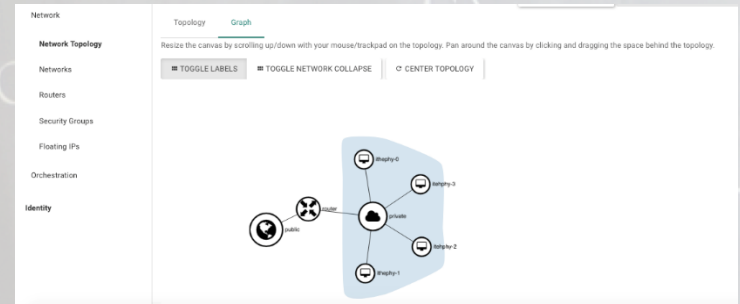
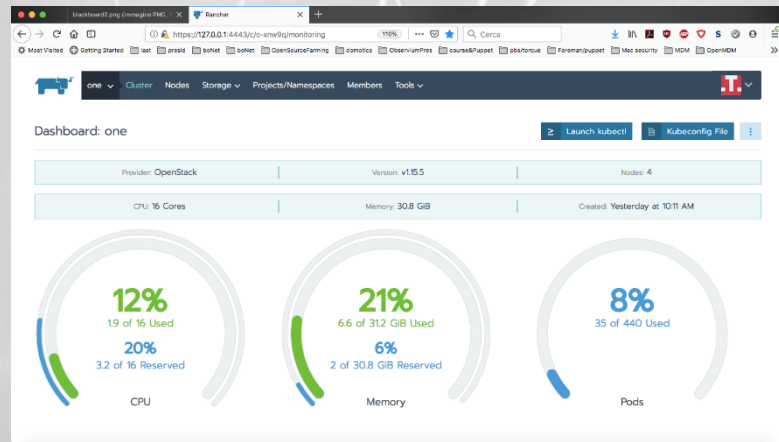# Rancher on INFN Corporate Cloud



## Rancher 2.2.9

Openstack istance automatic provision

After the rancher plugin for openstack configuration, every necessary resource from compute node to L4 load balancer and persistent storage resource are automatically provisioned.Resource monitoring and application logging are enbedded in rancher resource and service configuration. Rancher server run in a dedicated node
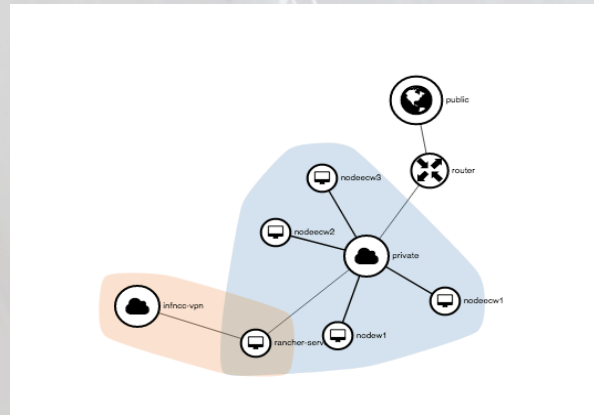
# Rancher on INFN Corporate Cloud
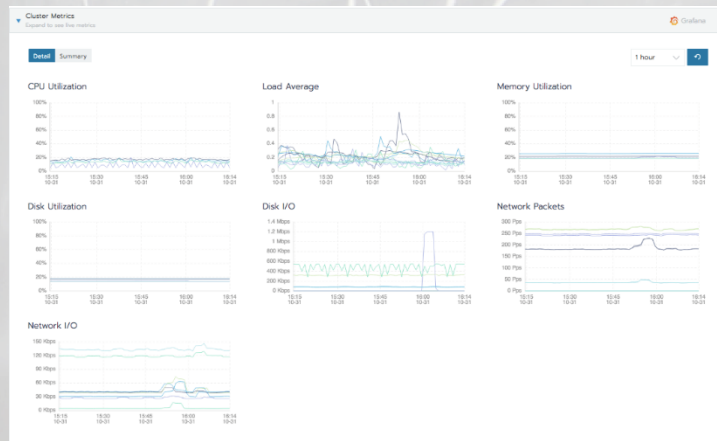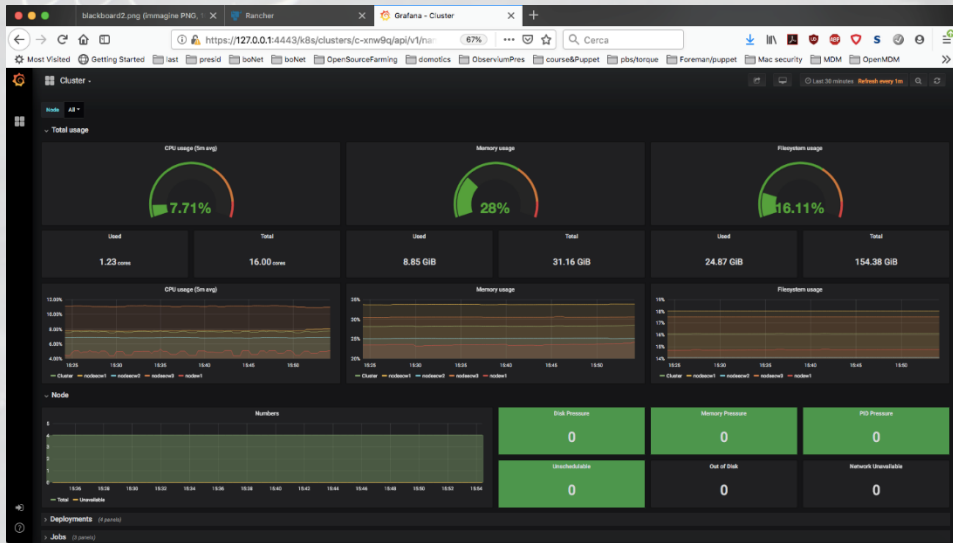


## Monitor & YAML conf

Enabled monitor with Prometheus and Grafana

Some configuration file necessary to plugin configuration

# Next Steps (beyond the iTHEPHY IO1)

- Develop and distribute a rancher (k8s too) receipt for every platform deployment

- Consolidate a service for the automatic provisioning of iTHEPHY (iTHEPHY as a Service)

- R&D of new functionalities based on FOSS software (interesting inputs form MALT experience)

- R&D on the new security paradigm applied to k8s and Rancher PaaS/KaaS solution

# Conclusions

- ✓ The iTHEPHY project proposes an innovative and an unconventional approach to teaching
  - ✓ Based on project-working teaching
  - ✓ Complementary to frontal lectures
- ✓ The iTHEPHY promotes internationalization
- ✓ European and non-EU students are involved
- ✓ FOSS software ecosystem
- ✓ Structure IO1 based on virtualization easily to reproduce in house
- ✓ Evolution based on containerization easily interoperable with various private/public provisioning from bare-metal to KaaS
- ✓ If you are interested in replicating this activity in your institute feel free to contact us

https://www.facebook.com/Ithephy

https://twitter.com/IThephy

https://www.ithephy.eu/

https://iam.ithephy.eu/register

# Thank you

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