

# La infraestructura de RICAP en la nube para realizar e-Ciencia en Latinoamérica

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TICAL 2018

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- **The Network**
  - Aim & Objectives
  - Partners
  
- **Activities**
  - HPC network
  - HTC (cloud) network
  
- **Impact**
  
- **Conclusions**



- **Red Iberoamericana de Computación de Altas Prestaciones**
  - HPC Ibero American Network
  - Coordinated with other major Latin American initiatives such as SCALAC or RedCLARA
- **Co-funded by the Ibero American Programme on Science and Technology for Developments (CYTED)**
- **Lifetime: 4 years (2017-2020)**



# RICAP: Partners



# RICAP: Collaborative partners



**CADING**

RED CYTED | Computación de Alto Desempeño en Ingeniería



**UBA**  
Universidad de Buenos Aires  
*Argentina virtus robur et studium*

# RICAP: Geographical distribution



# Aim & Objectives

- **Provide the Region with a strategic infrastructure in the supercomputing domain**
  - HPC (periodic access calls)
  - HTC (24x7 cloud infrastructure)
- **Training activities**
  - On site
  - On line
- **Network dissemination**
- **2 MoUs already signed**
  - RedCLARA
  - CADIng

- **The main dissemination resource of the Network is its website**
  - <http://www.red-ricap.org/>
  - Also by email via [ricap@ciemat.es](mailto:ricap@ciemat.es)
- **Available information**
  - Institutional
  - HPC and HTC infrastructure and process for accessing them
  - Events
  - Training material
  - Dissemination material
  - Etc.





## Red Iberoamericana de Computación de Altas Prestaciones

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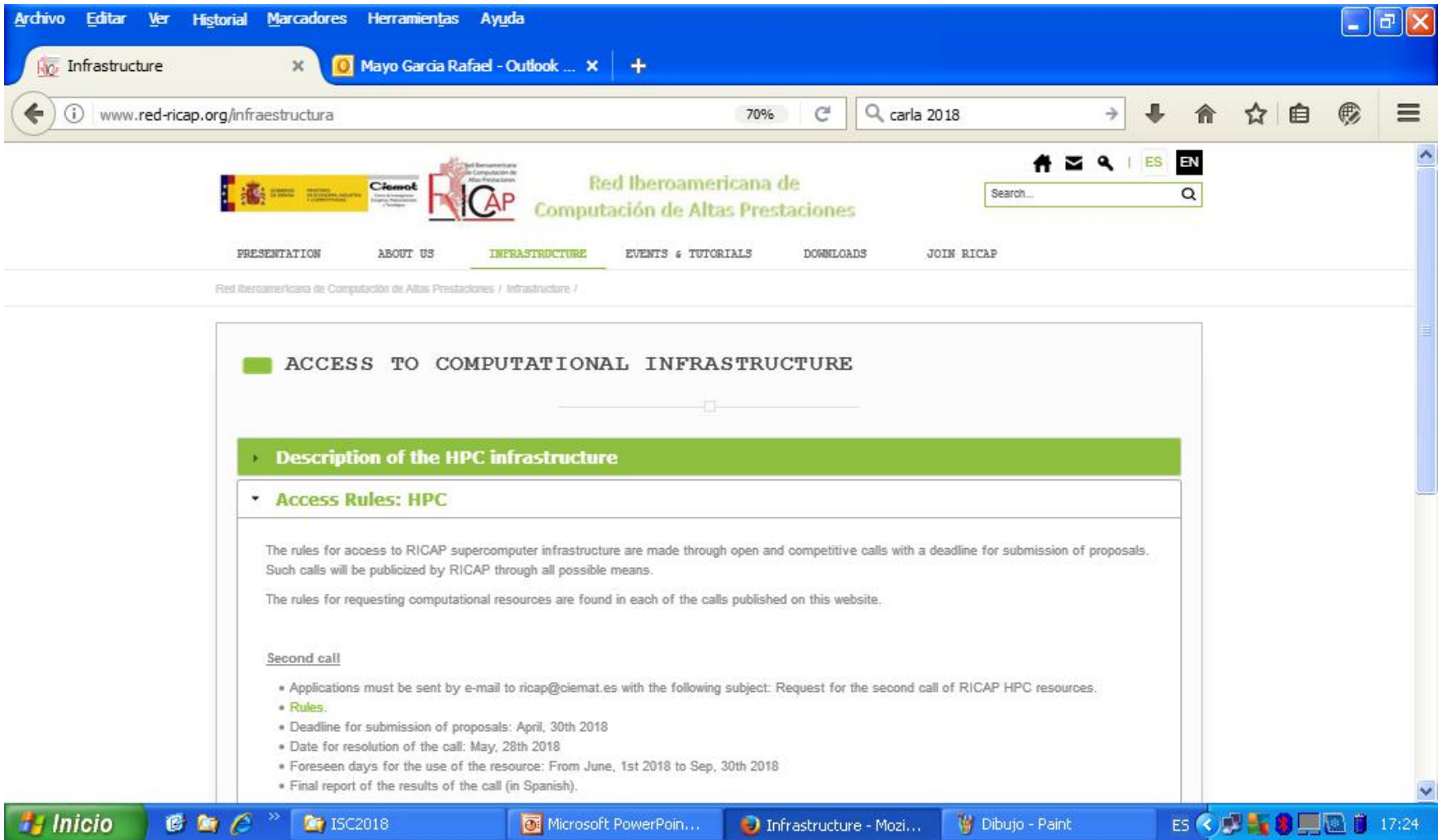


### PROYECTO RICAP

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# Computational offer: HPC

- **Heterogeneous infrastructure formed by different processors**
- **Distributed in 11 sites**
- **Different architectures**
  - ~183.000 CPU cores
  - ~350 GPU cards
  - ~1.800 Xeon Phi cards
- **Around 15-20% of the resources are available per Call, though this is not a fixed rate**



Archivo Editar Ver Historial Marcadores Herramientas Ayuda

Infrastructure x Mayo García Rafael - Outlook ... x +

www.red-ricap.org/infraestructura 70% carla 2018

Red Iberoamericana de Computación de Altas Prestaciones

PRESENTATION ABOUT US **INFRASTRUCTURE** EVENTS & TUTORIALS DOWNLOADS JOIN RICAP

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## ACCESS TO COMPUTATIONAL INFRASTRUCTURE

### Description of the HPC infrastructure

#### Access Rules: HPC

The rules for access to RICAP supercomputer infrastructure are made through open and competitive calls with a deadline for submission of proposals. Such calls will be publicized by RICAP through all possible means.

The rules for requesting computational resources are found in each of the calls published on this website.

Second call

- Applications must be sent by e-mail to ricap@ciemat.es with the following subject: Request for the second call of RICAP HPC resources.
- **Rules:**
- Deadline for submission of proposals: April, 30th 2018
- Date for resolution of the call: May, 28th 2018
- Foreseen days for the use of the resource: From June, 1st 2018 to Sep, 30th 2018
- Final report of the results of the call (in Spanish).

Inicio ISC2018 Microsoft PowerPoin... Infrastructure - Mozi... Dibujo - Paint ES 17:24

# Computational offer: HPC

- **Two annual Calls have been launched**
  - Published at the website and social networks
    - Rules and evaluation process
- **2017**
  - 6 research groups
  - ~210.000 CPU hours
  - There is a report available at the website
- **2018**
  - Closed on 30 April 2018
  - 9 research groups
  - ~1,000.000 CPU hours + 10,000,000 GPU hours (awarded)
- **In 2019 and 2020, Calls will be every 6 months**

# Computational offer: HTC

- **Heterogeneous Infrastructure-as-a-Service (IaaS) formed by different processors**
  - “Independent” sites → higher elasticity and admin capacities
  - Easy access and use via a web interface
- **Distributed in 5 sites**
  - Open Nebula y KVM
    - But not 100% Open Nebula compliant as a unique IaaS
  - SQLite
    - Users, tokens, etc. are shared between sites (acting as federated IaaS)

# Computational offer: HTC

- **Current offer**

g r u p o - país	institución- sitio	Recursos
ricap-ar	C S C - CONICET	4 nodos (64GB RAM, 16 cores): 64 cores, 256GB Almacenamiento: 30TB
ricap-br	UFRGS	5 nodos (16 cores, 24 GB RAM ): 80 cores, 280GB.
ricap-co	UIS	1 nodo (24 cores, 104GB RAM) y 8 Tesla M2075.
ricap-es	CIEMAT	40 nodos (8GB RAM, 4 cores): 160 cores, 320GB. Almacenamiento 20TB.
ricap-mx	CINVESTAV	1 nodo (20 cores)

# Computational offer: HTC

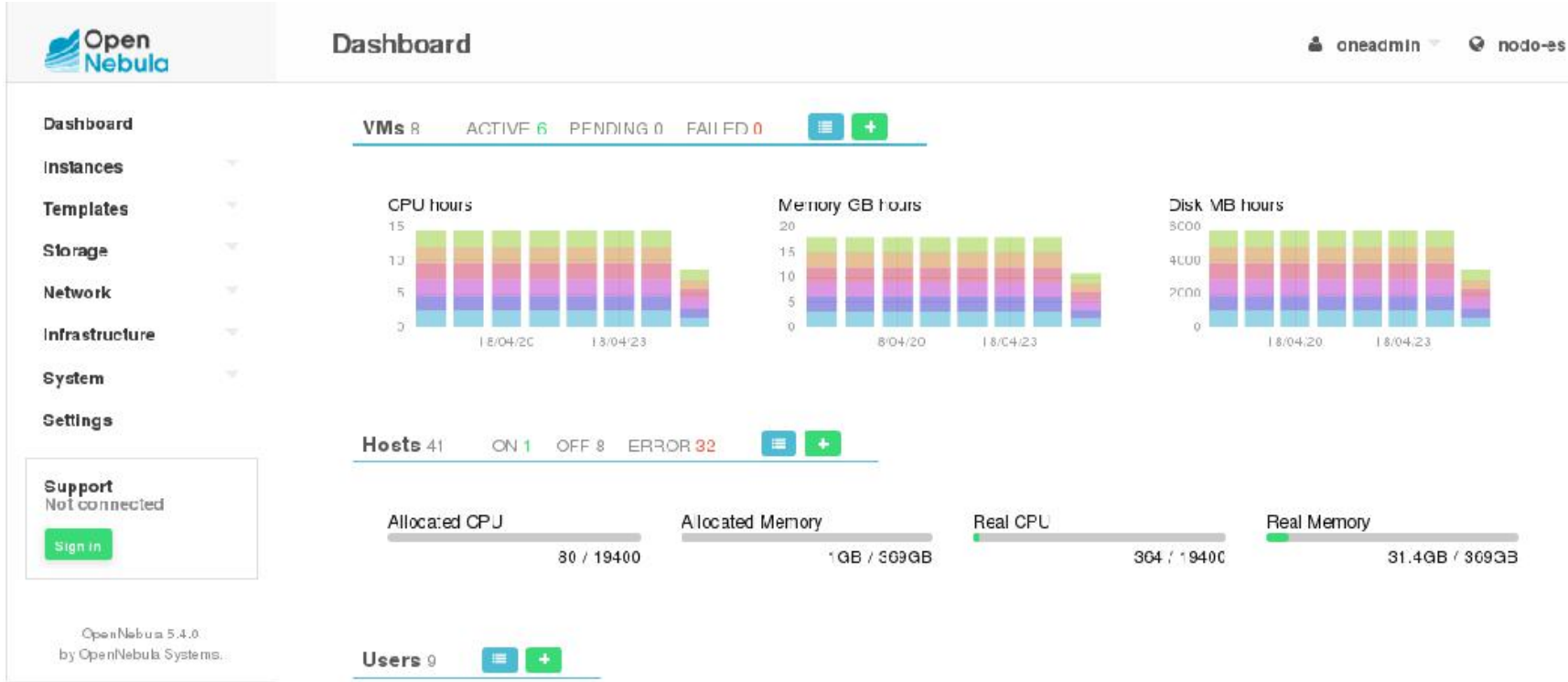
<http://one01.ciemat.es:8888/ricap.html>



## ACCESO A LOS NODOS DE LA INFRAESTRUCTURA EN LA NUBE RICAP



# Computational offer: HTC



**Open Nebula** Dashboard oneadmin nodo-es

**VMs 8** ACTIVE 6 PENDING 0 FAILED 0

**CPU hours** **Memory GB hours** **Disk MB hours**

**Hosts 41** ON 1 OFF 8 ERROR 32

**Allocated CPU** 80 / 19400 **Allocated Memory** 1GB / 369GB **Real CPU** 304 / 19400 **Real Memory** 31.4GB / 369GB

**Users 0**

**CPU hours** **Memory GB hours** **Disk MB hours**

Support Not connected [Sign in](#)

OpenNebula 5.4.0 by OpenNebula Systems.



# Computational offer: HTC demo

- Please attend this afternoon RICAP's tutorial
  - <https://eventos.redclara.net/indico/event/903/overview>
  - A demo about how to use the cloud infrastructure will be carried out
    - Introducción de RICAP y acceso HPC
    - Infraestructura en la nube de RICAP
    - Preparación y adaptación de Códigos Científicos para su Ejecución paralela
    - Visualización de Datos Científicos con R
    - Integración de un clúster de producción con uso oportunista para extender capacidades de investigación
    - Aceleración de Aplicaciones Científicas usando NVIDIA CUDA y OpenACC

# Dissemination and training activities

- **Training material already available (+50 entries)**
  - Theoretical and Hands-on courses, videos
    - Libraries (MPI, OpenMP, Python, profiling tools, etc.)
    - Computer science (Scheduling, migration, etc.)
    - Artificial intelligence
- **Dissemination material**
  - Reports, presentations, acknowledged articles, templates, etc.
- **News**
  - RICAP activities, external events, etc.
- **RICAP has supported 6+2 HPC schools**
  - ECAR (Ar), HPC summer school (Cr), Cloud tutorial (Es), CLARA Virtual Day, HPC school (Co), TICAL 2018
  - CARLA 2018, TICEC 2018

## Internal impact

- Potential collaborations between the groups who access the infrastructure and the ones that provide it
- Partnership in new projects with larger funding
- Short term scientific missions among RICAP partners
  - Long term collaborations
- Support for attending conferences

## External impact (and Conclusions)

- **Access to computational infrastructure by groups who have scarce and/or limited resources**
  - New science
- **Training in a multidisciplinary field as supercomputing is**
  - Different skill levels
- **Collaborations with larger, more powerful, and more consolidated HPC initiatives**
  - “Training” for accessing them
- **RICAP is willing to integrate new partners and sites**

# THANK YOU!!!

**Red Iberoamericana de Computación de Altas  
Prestaciones (RICAP)**

<http://www.red-ricap.org>

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