



**Barcelona
Supercomputing
Center**

Centro Nacional de Supercomputación



Supercomputing Resources in BSC, RES and PRACE

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Barcelona, 23 Septiembre 2015



ICTS 2014, un paso adelante para la RES



Past RES members and resources

BSC-CNS (MareNostrum)

Processor: 6.112 8-core Intel SandyBridge
EP E5-2670/1600 20M 2.6GHz
84 Xeon Phi 5110 P
Memory: 100,8 TB
Disk: 2000 TB
Network: Infiniband FDR10

BSC-CNS (MinoTauro)

Processor: 256 M2090 NVIDIA GPU
256 Intel E5649 2,53 GHz 6-core
Memory: 3 TB
Network: infiniband QDR

BSC-CNS (Altix)

Processor: SMP 128 cores
Memory: 1,5 TB

UPM (Magerit II)

Processor: 3.920 (245x16) Power7 3.3GHz
Memory: 8700 GB
Disk: 190 TB
Network: Infiniband QDR

Universidad de Cantabria (Altamira II)

Processor: 316 Intel Xeon CPU E5-2670 2.6GHz
Memory: 10 TB
Disk: 14 TB
Network: Infiniband

IAC (LaPalma II)

Processor: 1.024 IBM PowerPC 970 2.3GHz
Memory: 2 TB
Disk: 14 + 10 TB
Network: Myrinet

Universitat de València (Tirant II)

Processor: 2.048 IBM PowerPC 970 2.3GHz
Memory: 2 TB
Disk: 56 + 40 TB
Network: Myrinet

Gobierno de Islas Canarias - ITC (Atlante)

Processor: 336 PowerPC 970 2.3GHz
Memory: 672 GB
Disk: 3 + 90 TB
Network: Myrinet

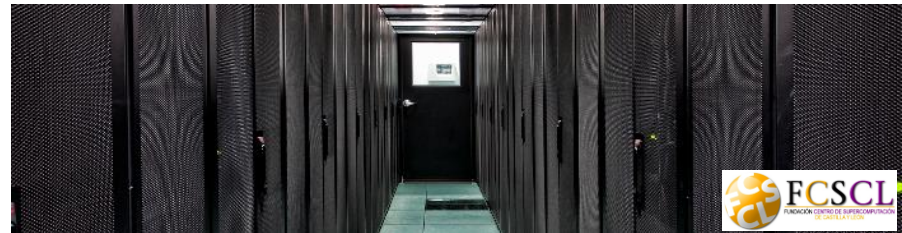
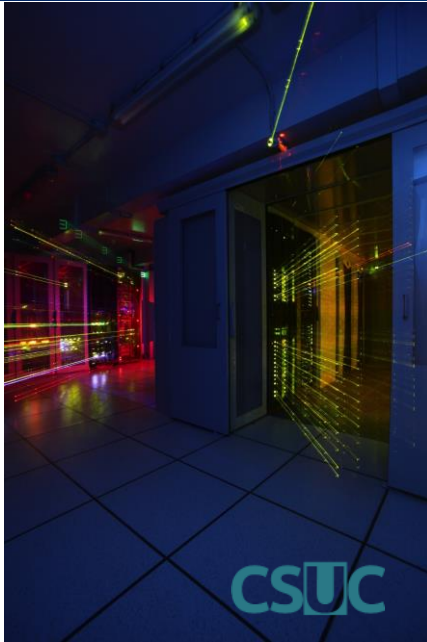
Universidad de Málaga (Picasso)

Processor: 82 AMD Opteron 6176 96 Intel E5-2670
56 Intel E7-4870
32 GPUS Nvidia Tesla M2075
Memory: 21 TB
Disk: 600 TB Lustre + 260 TB
Network: Infiniband

Universidad de Zaragoza (Caesaraugustall)

Processor: 3072 AMD Opteron 6272 2.1GHz
Memory: 12,5 TB
Disk: 36 TB
Network: Infiniband

New nodes



New RES members and HPC resources

CESGA (FINIS TERRAE II)

Peak Performance: 256 Tflops
Processor: 640 Intel Xeon E5-2660v3 2,6GHz
Memory: 40 TB
Disk: 300 TB
Networks: Infiniband
OS: Scientific Linux

CSUC (Pirineus)

Peak Performance: 14 Tflops
Processor: 224 Intel Xeon X7542
Memory: 6,14 TB
Disk: 112 TB
Networks: NumaLink
OS: Linux SUSE

Computaex (Lusitania)

Peak Performance: 9,1Tflops
Processor: 38 AMD Opteron 6276-AMD, HE-Intel Xeon Quad Core E5630 and E5450, 2 NVIDIA Tesla M20170Q, 128 Intel Itanium2 dual-core Montvale 1,62GHz
Memory: 4 TB
Disk: 48 TB
Networks: 10 GbE
OS: Linux SUSE

FCSCCL (Caléndula)

Peak Performance: 27,65 TFLOPS
Processor: 576 Intel Xeon E5450
Memory: 4609 GB
Disk: 6 TB
Networks: Infiniband
OS: Scientific Linux

UAM (Cibeles)

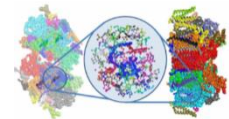
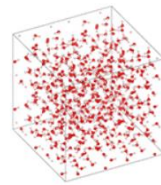
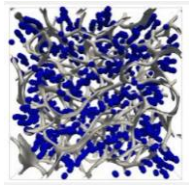
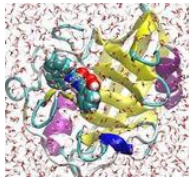
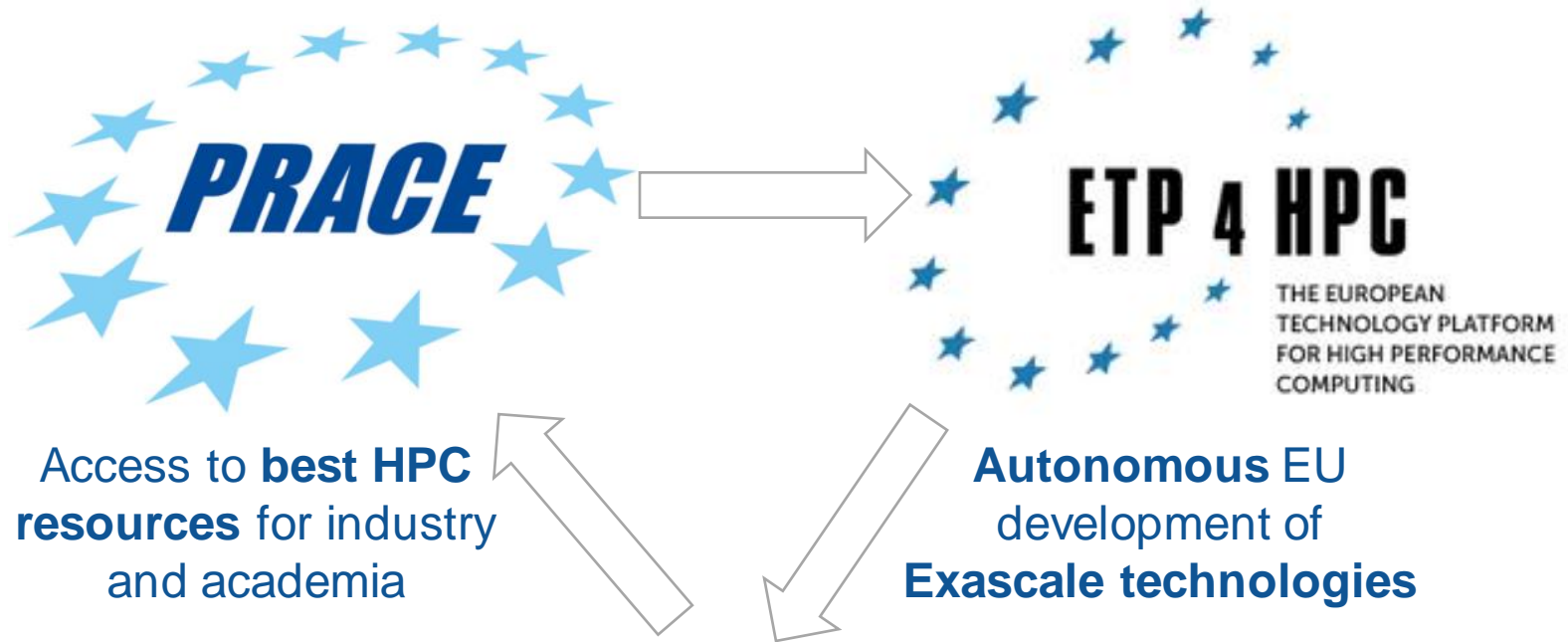
Peak Performance: 17,2 TFLOPS
Processor: 56 Intel Xeon E5-2630v3 8C/16T 2,40GHz
Memory: 896 GB
Disk: 155,7 TB
Networks: Infiniband
OS: Cent OS

RES Activities 2015-16

- Technical workshops
 - Training technical staff
- Scientific seminars
 - Specific user communities, HPC building
- Working groups
 - Prepare RES strategy
- RDA España
- Jornada de usuarios, September 2016
 - Parador San Marcos, León
 - Poster session
 - Parallel sessions

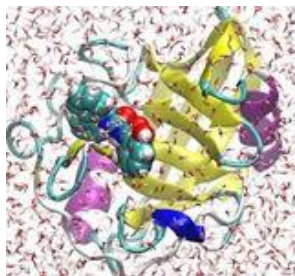


EU HPC Ecosystem Strategy



Centers of Excellence in **HPC applications**

All approved Centers of Excellence in HPC Applications



BioExcel

Centre of Excellence for
Biomolecular Research
(Led by KTH)



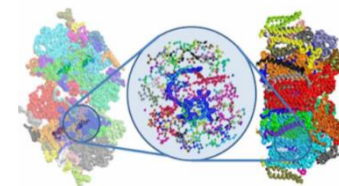
COEGSS

Center of Excellence for
Global Systems Science
(Led by Potsdam Uni)



EoCoE

Energy oriented
Centre of Excellence
(led by CEA)



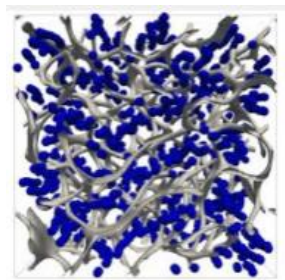
E-CAM

Software, training and
consultancy in simulation
and modelling
(Uni College Dublin)



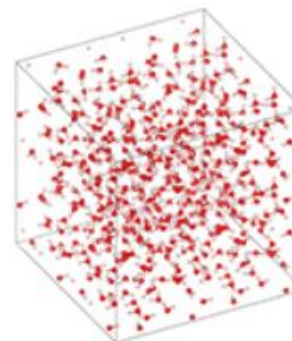
ESiWACE

Excellence in Simulation of
Weather and Climate in Europe
(Led by DKRZ)



MAX

Materials design at
the eXascale
(Led by CNR)



NOMAD

The Novel Materials
Discovery Laboratory
(Led by Max Planck)



PoP

Performance Optimization
and Productivity
(Led by BSC)

Partnership for Advanced Computing in Europe

- ❧ **International not-for-profit association** under Belgian law, with its seat in Brussels.
- ❧ **25 members and 2 observers.**
- ❧ **Hosting Members** : France, Germany, Italy and Spain.
- ❧ Governed by the **PRACE Council** in which each member has a seat. The daily management of the association is delegated to the Board of Directors.
- ❧ Funded by its **members** as well as through a series of **implementation projects** supported by the European Commission.



PRACE's achievements in 5 years



412 scientific projects **enabled**



10.7 thousand million core hours awarded since 2010 with peer review, main criterion is **scientific excellence**. **Open R&D** access for **industrial users** with **>50 companies** supported



~5000 people trained by **6 PRACE Advanced Training Centers** and others events



18 Pflop/s of peak performance on **6 world-class systems**



530 M€ of funding for **2010-2015**, access **free at the point of usage**



25 members, including **4 Hosting Members**
(France, Germany, Italy, Spain with a global funding of 400M€)

PRACE resources



MareNostrum: IBM
BSC, Barcelona,
Spain



CURIE: Bull Bullx
GENCI/CEA
Bruyères-le-
Châtel, France

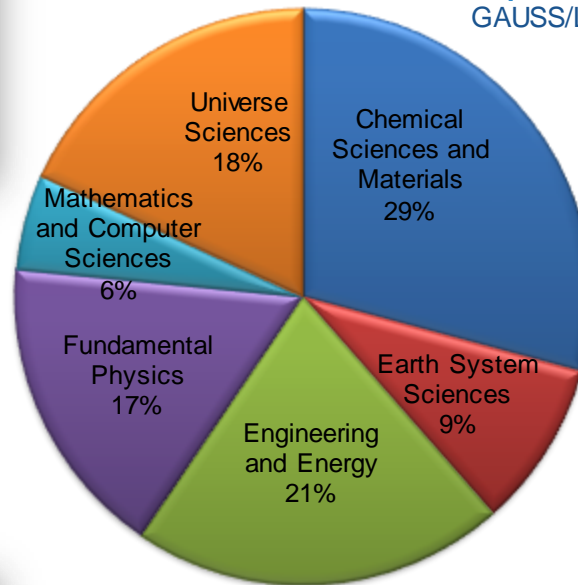
HORNET: Cray
GAUSS/HLRS, Stuttgart,
Germany



SuperMUC: IBM
GAUSS/LRZ Garching, Germany



JUQUEEN: IBM BlueGene/Q
GAUSS/FZJ Jülich, Germany



FERMI: IBM BlueGene/Q
CINECA , Bologna, Italy



Access through PRACE Peer-Review



Free-of-charge required to **publish results** at the end of the award period



Preparatory Access (2 or 6 months)



SHAPE Programme (2 or 6 months)



Project Access (12, 24 or 36 months)



Centers of Excellence, 0,5 % of the total resources available



Data storage for 2-3 years after end of allocation (pilot)

**Criterion:
Scientific
Excellence**



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Gracias!