Cineca: site update

April 11st - Cambridge IXPUG Meeting 2017

Fabio Affinito
f.affinito@cineca.it
Cineca in a nutshell

Cineca is a no-profit consortium composed by 70 italian universities, research institutions and the ministry of research.

Cineca provides IT services and it is the largest italian supercomputing facility

Cineca headquarters are in Bologna (selected for the new ECMWF datacenter) and it has offices in Rome and Milan.
SCAI department at Cineca

Being the Italian HPC reference and staying competitive in the world

- 2286 active users
- 1140 projects supported
- 860M core hours consumed

- Directly involved in:
  - 31 EU research projects
  - 40 research agreements with relevant national institutions
  - 12 applied research projects with industrial partners
SCAI mission

To support Italian researchers to face global scientific challenges

- Computational Chemistry
- Computational Fluid Dynamics
- Condensed Matter Physics
- Computational Engineering
- Astrophysics and Plasma Physics
- Earth and Climate Science
- Life Science

Big data and Machine Learning

The backbone

CPI hours for scientific area of Marconi and Galileo, on a monthly base:

- Particle Physics 23%
- Computational Chemistry 16%
- Condensed Matter Physics 16%
- Astrophysics and Plasma Physics 10%
- Other 5%
- Life Sciences: medicinal biology and bioinformatics 8%
- Computational Engineering 7%
- Computational Fluid Dynamics 7%
- Earth and Climate Science 7%
The Cineca ecosystem

Cineca acts as a hub for innovation and research contributing to many scientifical and R&D projects on italian and european basis.

In particular, Cineca is a PRACE hosting member and a member of EUDAT.
Marconi is the new Tier-0 system that replaced the FERMI BG/Q.

Marconi is planned in two technological stages in a 5 years programme with the objective to reach a 50 Pflop/s system by the year 2019-2020.

Marconi is a Lenovo NextScale system equipped with Intel Xeon and Intel Xeon Phi processors with an Intel OmniPath network.

The first stage of MARCONI is made of 3 different partitions (A1, A2 and A3) whose installation started in 2016.

Marconi is part of the infrastructure provided by Cineca to the EUROFUSION project.
MARCONI A1 : Intel Broadwell

- Started in April 2016 and opened to production in July 2016
- 1512 compute nodes
- 2 sockets E-2697v4 (18 cores) @2.30 GHz
- 128GB RAM per node
- TPP: 2 PFlop/s
MARCONI A2: Intel KNL

- Opened to production at the end of 2016
- 3600 compute nodes
- Intel Xeon Phi 7250 (68 cores) @1.40 GHz
- 128GB RAM per node
- Default configuration: Cache/Quadrant
- TPP: 11 PFlop/s
MARCONI’s outlook

In 2017 MARCONI will evolve with the installation of the A3 partition and the final configuration will have:

- 3024 Intel Skylake nodes (approx. 120960 cores)
- 3600 Intel Knights Landing (approx. 244800 cores)
- Peak performance: about 20 PFlop/s
- Internal network: Intel OPA

In 2019 we expect the convergence of the HPDA infrastructure and the HPC infrastructure towards the target of 50 PFlop/s
Thanks for your attention

You can download the Cineca annual report 2016 from: https://goo.gl/0zSwQ9