Academic Computer Centre
CYFRONET AGH

Cyfronet site report

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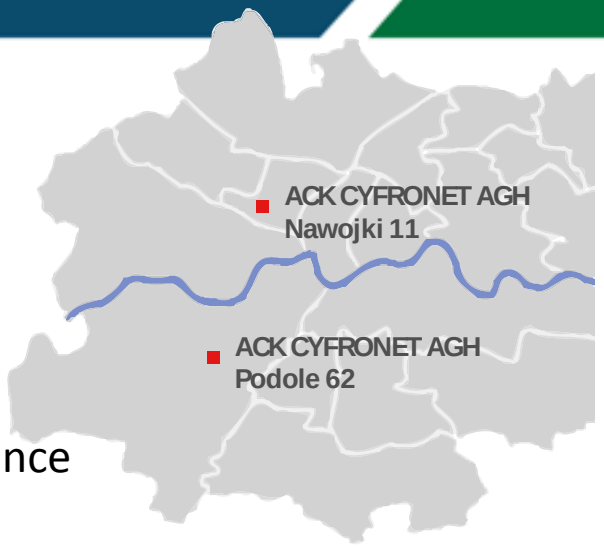
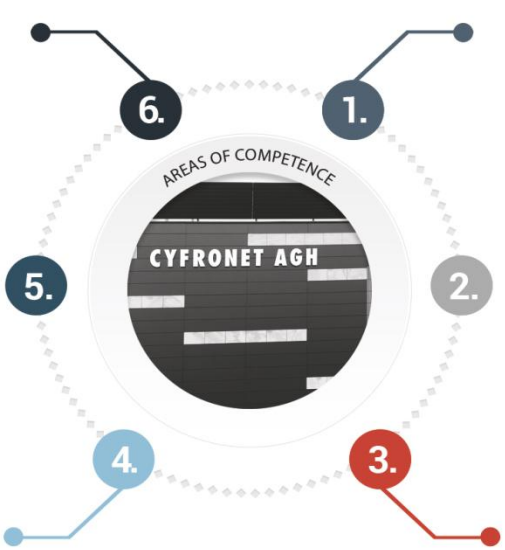
ACC Cyfronet AGH – key facts

- The biggest Polish Academic **Computer Centre**
  - **Over 45 years of experience** in IT provision
- Legal status: an **autonomous** within AGH UST
- Staff: > 150 , ca. 60+ in R&D
- Leader of **PLGrid**: Polish Grid and Cloud Infrastructure for Science
- Polish NGI Coordination in **EGI e-Infrastructure**
- **EuroHPC** coordination in Poland & LUMI Partner





Metropolitan Area Network (MAN)

Develops new and manages existing network services of Krakow region.

Supercomputers

Provides computing and storage resources for scientists.

Software Resources

Provides domain specific software for supercomputers' users.

Science Research

Cyfronet takes an active role in many research projects both national and international.

eLearning

Provides eLearning services for scientific communites.

National and International conferences

Hosts and organizes scientific conferences.

Academic Computer Centre Cyfronet AGH

Prometheus

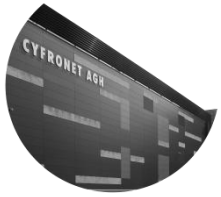
- 2.4 PFLOPS
- 53 568 cores
- 1st HPC system in Poland (241st on TOP500, 38th in 2015)

Zeus

- 374 TFLOPS
- 25 468 cores
- 1st HPC system in Poland, 2009-2015 (TOP500 – 81st in 2011)

Storage

- > 49 PB
- > 20 PB HDD incl.
- hierarchical data management



Computing portals and frameworks

- OneData
- PLG-Data
- DataNet
- Rimrock
- InSilicoLab

Research & Development

- distributed computing environments
- computing acceleration
- machine learning
- software development & optimization
- distributed storage management

Computational Cloud

- based on OpenStack

Data Centers

- 3 independent data centres
- Dedicated, 100 Gbps backbone links

Cyfronet's Supercomputers on TOP500

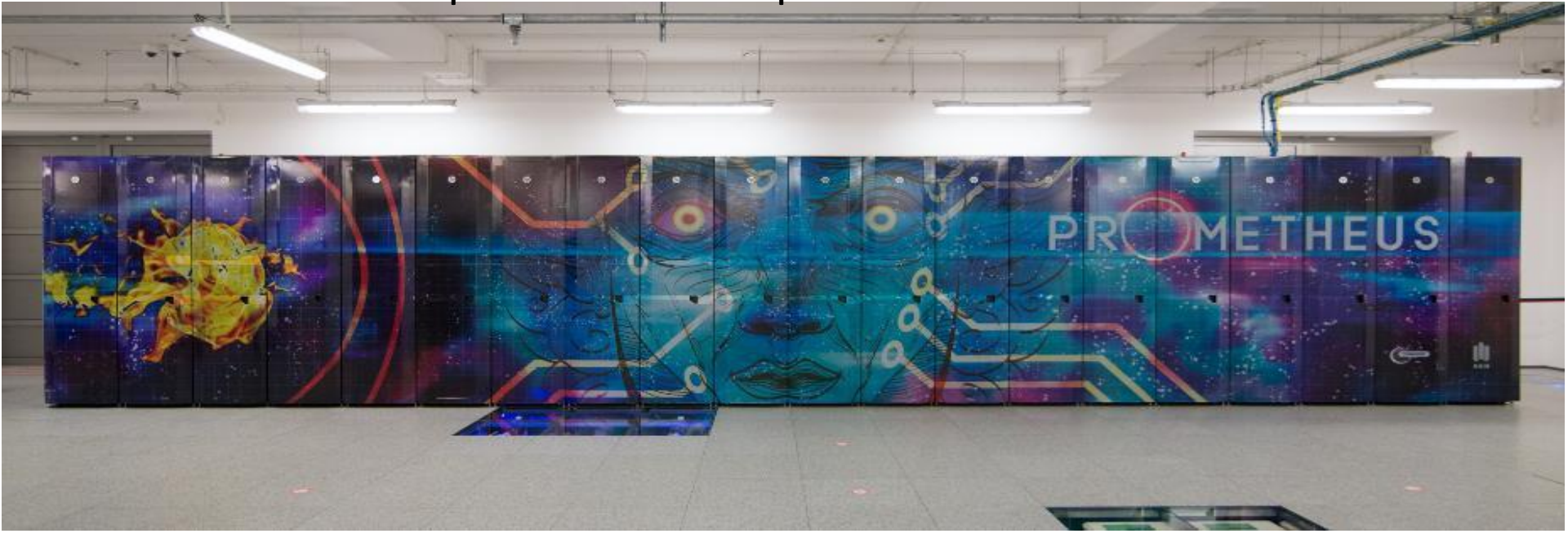
Anna	Zeus	Prometheus
11/1996: **#408**	11/2015: **#386**	11/2019: **#241**
06/1996: **#408**	06/2015: **#268**	06/2019: **#174**
	11/2014: **#210**	11/2018: **#131**
	06/2014: **#176**	06/2018: **#103**
	11/2013: **#145**	11/2017: **#77**
	06/2013: **#113**	06/2017: **#71**
	11/2012: **#106**	11/2016: **#59**
	06/2012: **#89**	06/2016: **#48**
	11/2011: **#88**	11/2015: **#38**
	06/2011: **#81**	06/2015: **#48**
	11/2010: **#85**	
	06/2010: **#161**	
	11/2008: **#311**	

The fastest supercomputer in Poland:

- Installed in Q2 2015 (upgraded in Q4 2015)
- Centos 7 + SLURM
- HP Apollo 8000 – direct warm-water cooling – PUE 1.06
  - 20 racks (4 CDU, 16 compute)
- 2232 nodes, 53 568 CPU cores (Haswell, Xeon E5-2680v3 12C 2.5GHz), 279 TB RAM
  - 2160 regular nodes (2 CPUs, 128 GB RAM)
  - 72 nodes with GPGPUs (2x NVIDIA Tesla K40 XL)
  - 4 islands
- 2.4 PFLOPS total performance (Rpeak)
- < 850 kW power (including cooling)
- **TOP500**: current 241st position, highest: 38th (XI 2015), the only one from Poland

HPC@Cyfronet – Prometheus and Zeus clusters

- 4000+ active users
- 650+ computational grants in 2018 (~3000 since 2012)
- 8.3+ millions of jobs in 2018
- 350 millions of CPUhours spent in 2018
- Biggest users' jobs
  - 24 024 cores
  - 261 152 CPUhours in one job
- 950+ software modules
- Custom users' helper tools developed in-house



- **~7500 active users**
- All 5 Polish Academic HPC centres integrated, 6th since 2019

Computing resources

- 5+ PTFLOPS
- 130 000+ cores

Scientific Software

- 800+ applications, tools, libraries in various versions
- http://apps.plgrid.pl

Storage

- 60+ PB
- fast scratch
- distributed access

Tools for collaboration

- Confluence
- project tracking (JIRA)
- version control (Git)
- teleconferencing (Adobe Connect)

Computational Cloud

(based on OpenStack)

Virgo plans

- Formal
  - Commit the resources
  - Get funds for dedicated resources for Virgo

- Technical
  - Check current integration
    - Zeus (CYFRONET-LCG2) since June 2016
      3 M HS06 hours in 2018, for PyCBC
  - Setup the environment
    - Rucio
    - HTCondor
    - /cvmfs