



VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

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IT4INNOVATIONS

OUR SUPERCOMPUTERS SUPPORT SCIENCE, INDUSTRY AND SOCIETY

IT4Innovations is a proud member of

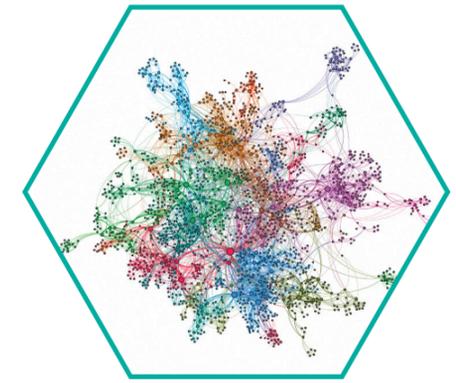
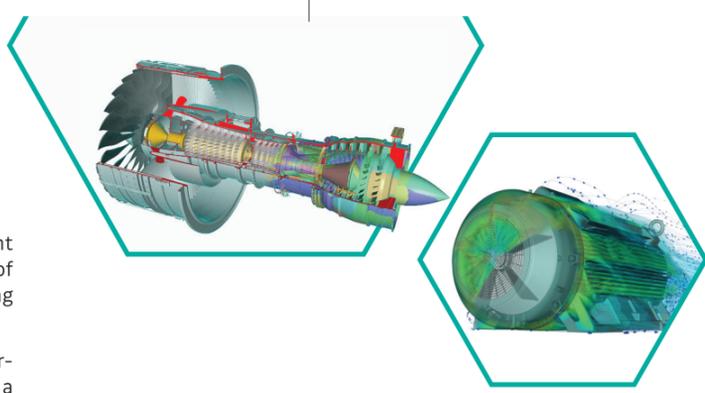


IT4Innovations National Supercomputing Center at VSB – Technical University of Ostrava represents a strategic large research infrastructure, and together with two other infrastructures, CESNET and CERIT-SC, constitutes the E-infrastructure of the Czech Republic.

IT4Innovations provides state-of-the-art supercomputing technology and services to both Czech and foreign research teams from academia and industry and conducts excellent research in the field of High Performance Computing (HPC), High Performance Data Analysis (HDPA), and Artificial Intelligence (AI). Core IT4Innovations research topics are advanced data processing and

analysis, machine learning, the development of parallel scalable algorithms, the solution of demanding engineering tasks, and modelling for nanotechnology.

Currently, IT4Innovations runs four supercomputers – Anselm, Salomon, Barbora and a special system for AI calculation NVIDIA DGX-2. A petascale system EURO_IT4I will be installed in IT4Innovations as a part of EuroHPC project in 2020.



SUPERCOMPUTERS

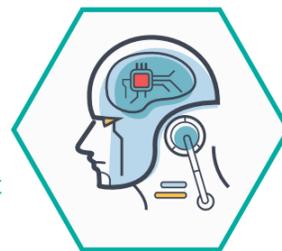
RESEARCH LABS

HISTORY

	Salomon	NVIDIA DGX-2	Barbora
Put into operation	Summer 2015	Spring 2019	Autumn 2019
Theoretical peak performance	2,011 TFlop/s	133 TFlop/s / 2,000 TFlop/s in AI FP16	849 TFlop/s
Compute nodes	1,008	1	201
CPU	2x Intel Haswell, 12 cores, 2.5 GHz, 24,192 cores in total	2 x Intel Xeon Platinum, 24 cores, 48 cores in total	2 x Intel Cascade Lake, 18 cores, 2.6 GHz
GPU accelerators	N/A	16 x NVIDIA Tesla V100 32GB HBM2	32x NVIDIA Tesla V100
MIC accelerators	864x Intel Xeon Phi 7120P, 61 cores each, 52,704 cores in total	N/A	N/A

LAB (in 2018)	FTE
Parallel Algorithms Research Lab	22.25
Advanced Data Analysis and Simulations Lab	35.43
Modelling for Nanotechnologies Lab	20.13
Big Data Analysis Lab	6.34
Infrastructure Research Lab	14.40

- 2011 – The foundation of IT4Innovations
– Became a Member of PRACE (Partnership for Advanced Computing in Europe)
- 2013 – The supercomputer Anselm installed in temporary containers
- 2014 – Opening of the IT4Innovations building
- 2015 – Launching of the supercomputer Salomon
- 2016 – Became a Member of ETP4HPC (European Technology Platform in the area of High-Performance Computing)
- 2018 – Became a Member of EuroHPC (building a European exascale supercomputer)
- 2019 – Launching of the NVIDIA DGX-2 system for AI research and supercomputer Barbora



Research and Development

- Computationally demanding numerical simulations
- Extensive data analysis
- Artificial intelligence tools
- Development of parallel algorithms
- Modelling for nanotechnologies
- Visualization and virtual reality

Research Flagships

- ESPRESO, a highly parallel solver library for engineering applications
- Materials design – closer to reality using exascale computing
- HPC platforms for scientific workflow execution

e-INFRA CZ

- Unique e-infrastructure for research and development in the Czech Republic
- Partners CESNET / CERIT-SC / IT4Innovations

Digital Innovation Hub

- Fostering the uptake of digital innovation in businesses and society

Education and training Activities

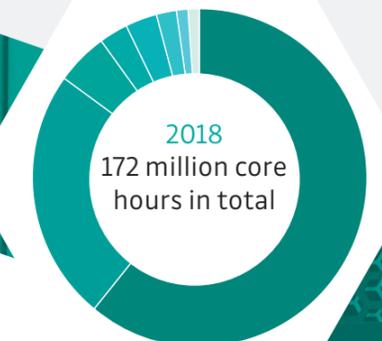
- PRACE Training Center
- Doctoral School for Education in Mathematical Methods and Tools in HPC
- Operation of an HPC oriented doctoral study program
- Computational Sciences
- Innovative Training Network project EXPERTISE for PhD students within Horizon 2020
- NVIDIA Deep Learning Institute

Employees

- As of 31 December 2018, a total of 256 persons are employed at IT4Innovations, of which:
- **21 %** are Management and Administration
 - **69 %** are Research and Development
 - **10 %** are Supercomputing Services

Certification

- ISO 9001 Quality Management System
- ISO 27001 Information Security Management System



Computational resources allocated by scientific discipline within the Open Access Grant Competitions in 2018

- 61 % Material sciences (48 projects)
- 24 % Biosciences (32 projects)
- 5 % Engineering (25 projects)
- 3 % Physics (9 projects)
- 3 % Earth sciences (20 projects)
- 2 % Applied mathematics (16 projects)
- 1 % Computational sciences (8 projects)
- 1 % Astrophysics (6 projects)