Welcome by Local Host



Jan Martinovič

Head of Advanced Data Analysis and Simulations Lab, IT4I

10 YEARS EUDAT

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

EUDAT CONFERENCE 2026 / 25–27 NOVEMBER

Welcome to Prague



Prague · Pierre-Selim Huard · CC BY 4.0







Jan Martinovič · IT4Innovations

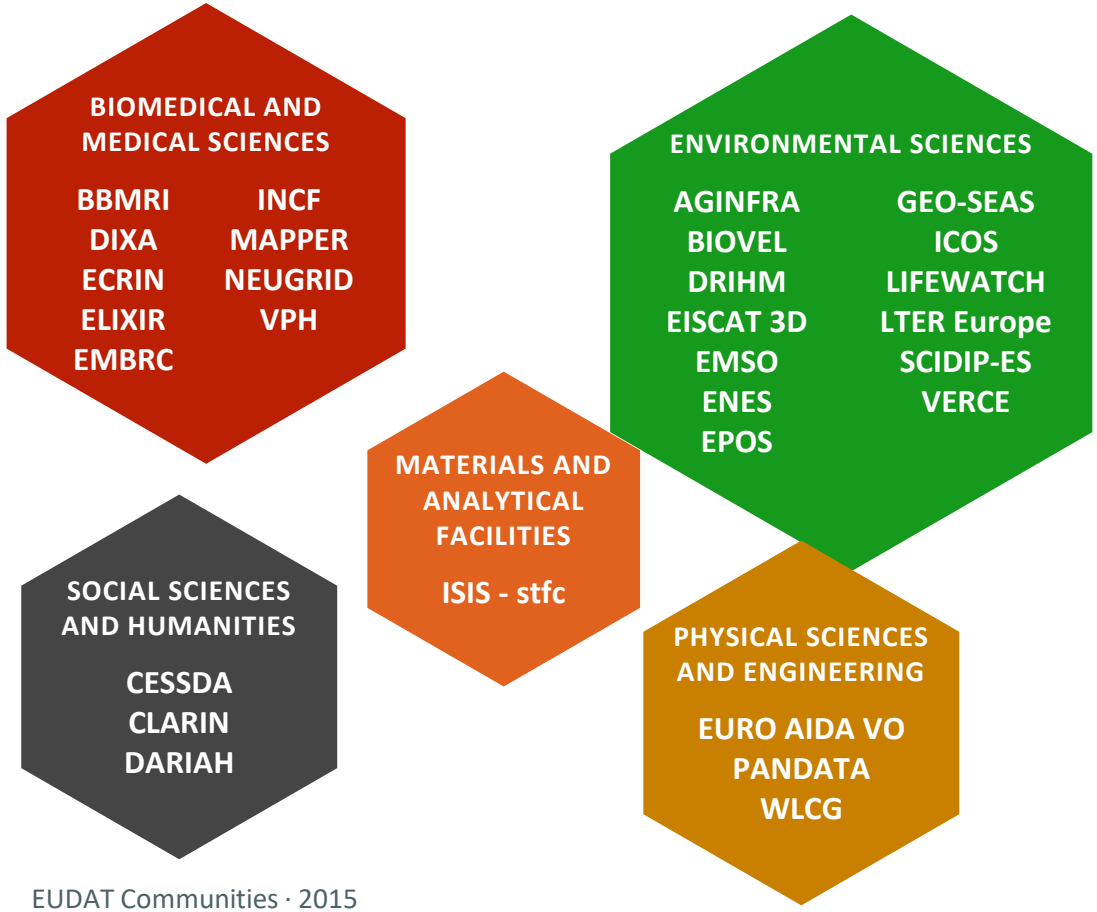
THE EUDAT COMMUNITY

THANK YOU TO THE ORGANISERS

Researchers

Data specialists

Research infrastructures



EUDAT Communities · 2015

10 years of EUDAT

Renewed for the next decade

Sustaining the next decade of Europe's research data ecosystem



DISCOVER PRAGUE

A THOUSAND YEARS OF HISTORY / THE CASTLE AND THE RIVER



Charles Bridge
1357 · 9 · 7 · 5:31



St. Vitus Cathedral
Prague Castle · 1344–1929



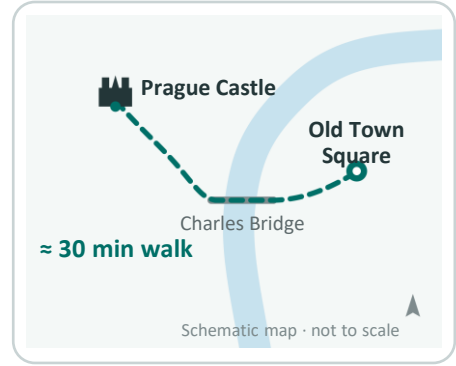
The Vltava
Bridges seen from Letná

Photos · Charles Bridge: A.Savin (FAL) · St. Vitus Cathedral: “Praha, Katedrála, JV 01” · Vltava: Dmitry A. Mottl (CC BY-SA) · all via Wikimedia Commons, cropped

THE OLD TOWN AND BEYOND

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

A SHORT WALK / ABOUT 30 MINUTES ON FOOT FROM THE CASTLE

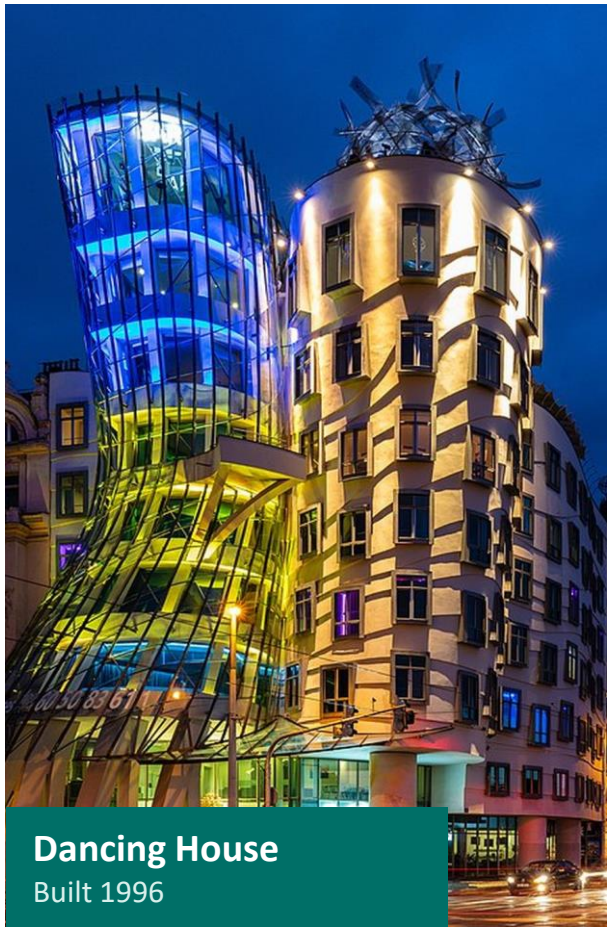




Old Town Square
Týn Church · 14th century



Astronomical Clock
Since 1410



Dancing House
Built 1996

Photos · Old Town: Jiuguang Wang (CC BY-SA) · Astronomical Clock: Steve Collis (CC BY) · Dancing House: Diego Delso (CC BY-SA) · all via Wikimedia Commons, cropped



FROM PRAGUE TO OSTRAVA

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

FROM THE CONFERENCE CITY / TO THE HOME OF IT4INNOVATIONS



Prague
Old Town Square

≈ 350 km

about 3 h
by train



Ostrava
New City Hall



Bolt Tower



Landek

Ostrava: from coal and steel to supercomputers

Third-largest Czech city · home of VSB – Technical University of Ostrava and IT4Innovations

Photos · Prague: A.Savin (FAL), via Wikimedia Commons, cropped · Ostrava: Dreamstime.com (ID 452259683, ID 128490040, ID 99698693)

INTRODUCING IT4INNOVATIONS

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

Established in 2011 within ESI Funds project

5 partners led by VSB-Technical University
of Ostrava to build national supercomputing center



VSB TUO

Unit of the VSB – Technical University of Ostrava

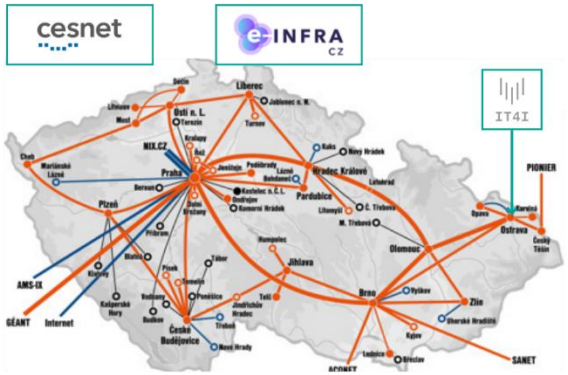
200+

More than 230 employees

Supercomputing services (12%)
5 research laboratories (64% in ADAS, INFRA, PAR, NANO, QC)
Management and administration (24%)

Member of e-INFRA CZ

a strategic large research infrastructure of Czechia
Networking / Computing/ Data technologies
and services HPC / HPDA / AI / QC at IT4I



Member of many international infrastructures, associations, and initiatives

ETP 4 HPC | BDV BIG DATA VALUE ASSOCIATION | EUDAT | iRODS | WHPC WOMEN IN HIGH PERFORMANCE COMPUTING | eosc | VI-HPS | PRACE



EUROHPC AI FACTORIES

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

DEVELOP, TRAIN AND DEPLOY AI / ACROSS EUROPE

19
AI Factories

13
AI Factory Antennas

15
new AI-optimised supercomputers

40+
key industrial sectors

WE ARE PART OF TWO

CZAI Czech AI Factory

Hosted by IT4I · KarolAIna supercomputer

LUMI AI Factory

LUMI-AI · six countries incl. Czechia

FOR STARTUPS · SMEs · INDUSTRY · RESEARCH · PUBLIC SECTOR



EuroHPC Joint Undertaking

Co-funded by the European Union

Ministry of Education, Youth and Sports of the Czech Republic

IT4INNOVATIONS HPC AND QC SYSTEMS

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER



* IT4I

2011

Anselm
0.1 PFlop/s



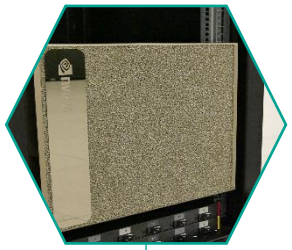
July 2013

July 2015

Salomon
2 PFlop/s, #40



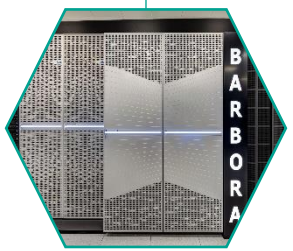
DGX-2
2 PFlop/s AI



March 2019

October 2019

Barbora
0.8 PFlop/s



Karolina
15.7 PFlop/s, #69



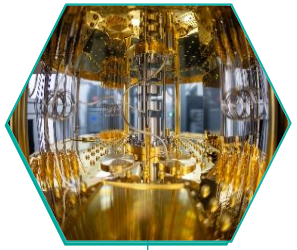
August 2021

Autumn 2021

LUMI
550+ PFlop/s , #3



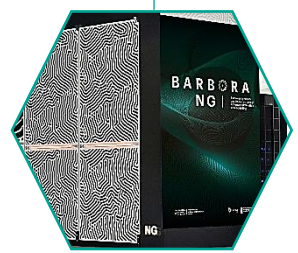
VLQ
Quantum Computer



September 2025

Q2 2026

Barbora NG
1858 TFlop/s



Karolina NG



Q2 2027

CLARA



IT4I STORAGE GREW OVER 60×

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

HISTORICAL CAPACITY MILESTONES

0.46 PB	2.56 PB	16 PB	29 PB
Around 2013	Around 2019	Around 2021	By 2024

NEW SYSTEMS / FAST STORAGE



Barbora NG

500 TB

NVMe scratch

In operation



Karolina NG

2 PB

Scratch storage

Planned for 2027



CLARA

1.33 PB

High-speed disk

Planned for 2027



30+ PB

Total storage today · November 2026

Project storage · object storage · tape archive · cluster storage

Historical figures · IT4Innovations capacity timeline, December 2024

SATELLITE DATA AT SCALE

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

COPERNICUS SATELLITE DATA / DOWNLOADED PER YEAR

2015

≈4 PB

➡

2025

≈130 PB

More than 30× in ten years

All Copernicus Sentinel missions

IT4INNOVATIONS / AI USE CASE

Urban change in Liège



Earlier Later

Red · Model-detected change

Sentinel-1 radar · Sentinel-2 optical

Fig. 15(i) · Zitzlsberger et al. (2023)

Imagery: Google Earth / Maxar Technologies

≈91 PB CDSE online archive 2025

>500 PB ESA Digital EO outlook By 2035 · projection

Sources · CDSE 2025 Annual Report, p. 8 and Fig. 58 · Digital EO project announcement, September 2026

THE COMPUTING CONTINUUM

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

Cloud
Prepare

e-INFRA CZ/IT4I
OpenStack

HPC
Simulate

Karolina NG / Barbora NG
CLARA

Big data
Manage outputs

Project storage · iRODS
+ tape archive

Research data
Experiments · simulations

Industry data
Design files · sensor logs

Transfers · Metadata · Access controls

AI
Train & test

Czech AI Factory
LUMI AI Factory

Quantum
Experiment

VLQ
24 qubits

IT4I examples



IT4I × VALEO.AI

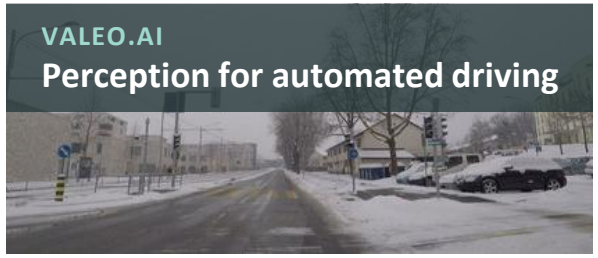
VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

INDUSTRY ON EUROPEAN INFRASTRUCTURE / EXA4MIND PROJECT

EXA4MIND · HORIZON EUROPE

Extreme data analytics, AI and HPC

Coordinated by IT4I



THE CHALLENGE

Huge camera & lidar datasets

Beyond in-house capacity

Vehicle data

Valeo.ai · camera · lidar

DATA TRANSFER

From industry to HPC

Trained perception models

IT4I & LUMI supercomputers

Large-scale training

European research infrastructure is not only for academia — it lets industry do AI research at top scale.

This is exactly the model the AI Factories are building.

Image · Loiseau et al. (valeo.ai), ECCV 2024, Fig. 1 · ACDC dataset



FROM OPEN DATA TO EUROPEAN AI

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

OPEN DATA + TRUSTED ACCESS + COMPUTE

DATA SOURCE	TRUSTED DATA ACCESS	COMPUTE & INNOVATION
Open Web Data	**EUDAT**	**AI Factories**
OpenWebSearch.eu	Collaborative Data Infrastructure	EuroHPC Joint Undertaking
Open Web Index for Europe	USED BY OPENWEBSEARCH.EU: B2ACCESS Identity & Authorisation	AI-optimised supercomputers
Language · licence · quality		Research · startups · industry

OPENWEBSEARCH.EU
Built across Europe

- **Uni Passau** — Coordinator
- **LRZ** — Germany
- **CSC** — Finland
- **CERN** — Geneva
- **IT4I** — Czechia

B2SAFE Replicate Research Data Safely

Access via EUDAT B2ACCESS | **Workflows across centres** | **Data layer on iRODS**

LEXIS Platform

European AI needs not only computing power, but open, findable and legally clean data.
These initiatives complement each other.



VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

EUDAT CONFERENCE 2026

Thank you

Enjoy the conference and Prague.



Old Town Square at Christmas · Pixabay

