

Development and supporting activities on EuroHPC Vega

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The acquisition and operation of HPC Vega is funded jointly by the EuroHPC Joint Undertaking, through the European Union's Connecting Europe Facility and the Horizon 2020 research and innovation program, as well as the Participating State Slovenia. The operation HPC RIVR is partly co-funded by the European Union through the European Regional Development Fund and by the Ministry for Science, Education and Sport of the Republic of Slovenia. The operation is carried out within main priority axis no. 1: »International competitiveness of research, innovation and technological development in line with smart specialization for enhanced competitiveness and greening of the economy«, priority investment 1.1 »Enhancing research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting Centres of competence, in particular those of European interest«, specific objective 1.1.1 »Efficient use of the research infrastructure and development of knowledge/competences to improve national and international collaboration in the knowledge triangle« within the Operational Program for the Implementation of the EU Cohesion Policy 2014-2020.



Quick Facts

- 1st operational EuroHPC JU system
- In production since April 2021
- Performance 6.9 PFLOPS
- Atos Sequana XH2000
- 1020 Compute nodes, Infiniband 100Gb/s
- 18 PB Large Capacity Storage Ceph
- 1 PB High Performance Storage Lustre
- Power consumption < 1MW
- Power Usage Efficiency, PUE < 1.15
- Hyper-Connected 600 Gb/s



June 2024



Rank	System	Cores	Rmax (PFlop/s)	Rpeak (PFlop/s)	Power (kW)
226	VEGA HPC CPU - BullSequana XH2000, AMD EPYC 7H12 64C 2.6GHz, Mellanox InfiniBand HDR100, EVIDEN IZUM Slovenia	122,880	3.82	5.37	
302	VEGA HPC GPU - BullSequana XH2000, AMD EPYC 7H12 64C 2.6GHz, NVIDIA A100, Infiniband HDR, EVIDEN IZUM Slovenia	33,600	3.10	4.68	



EuroHPC
Joint Undertaking



REPUBLIC OF SLOVENIA
**MINISTRY OF EDUCATION,
SCIENCE AND SPORT**



EUROPEAN UNION
COHESION FUND



- HPC Infrastructure 17 MIO EUR
- Operation est. costs 30 MIO EUR in 8 years

Recent activities on HPC Vega

- Regular System Maintenance, May 2024.
- Upgrades on:
 - Switches.
 - Ceph Quincy (17) → Reef (18.2)
 - DDN Exascaler (5 → 6) / DDN Insight (RHEL 8.4 → 8.8)
 - Virtualisation Proxmox 7.x → 8.x (local Ceph 18.2; MLNX OFED)
 - Slurm 22.06 → 23.11
 - GPU partition (NVIDIA Drivers 550.54.15 / CUDA Toolkit 12.4)
 - Critical security patches and bug fixes.
 - Software stack (commonly used).

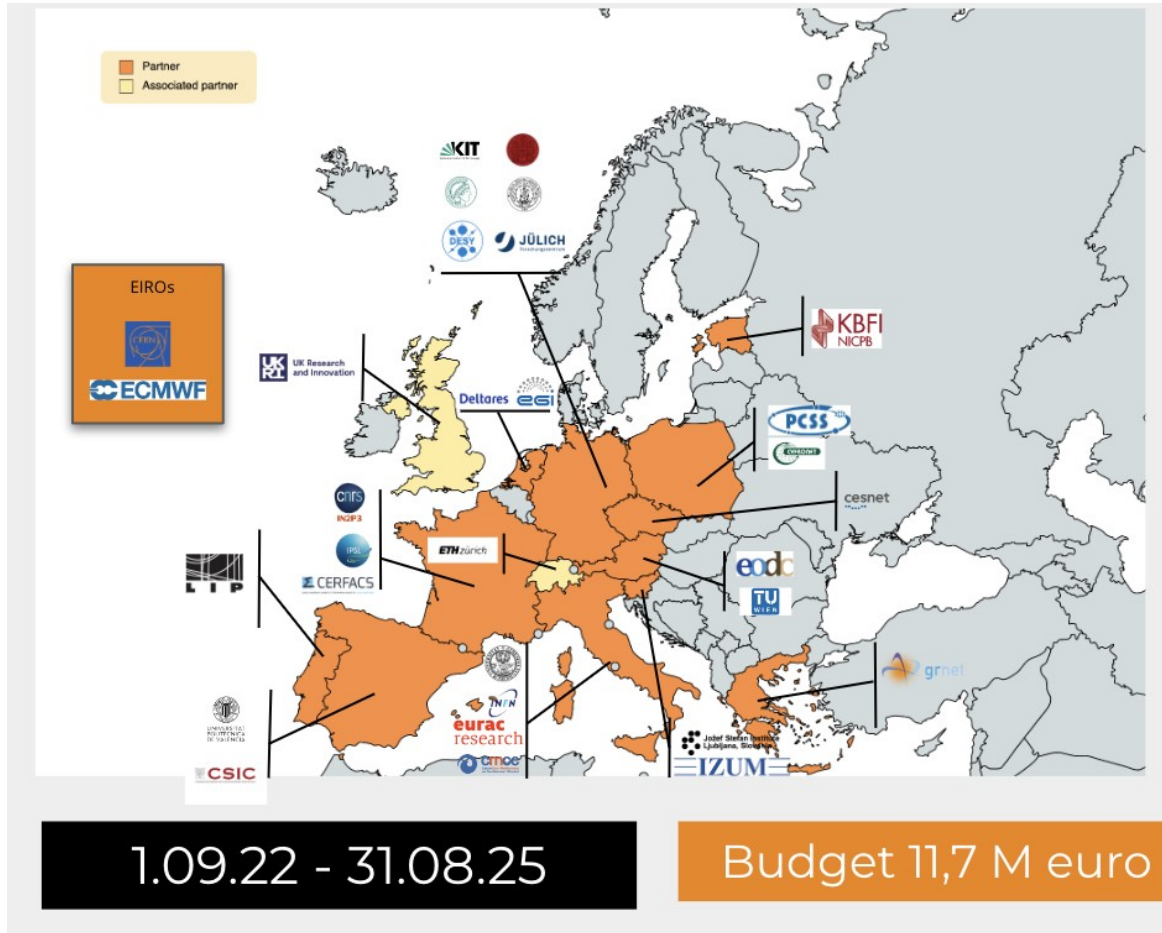
.. in the past 6 months, we got two new colleagues :)

Supporting Projects (funded)



- interTwin (JSI, IZUM)
- EPICURE
 - 2 FTEs (1 IZUM, 1 JSI)
- SMASH (MCSA COFUND)
 - On-boarding first batch of Postdocs
- EUMaster4HPC:
 - Internship at IZUM (HPC Vega)





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Participants, including 1 affiliated entity and 2 associated partners

Consortium at a glance

10 Providers
cloud, HTC , HPC resources and access to Quantum systems

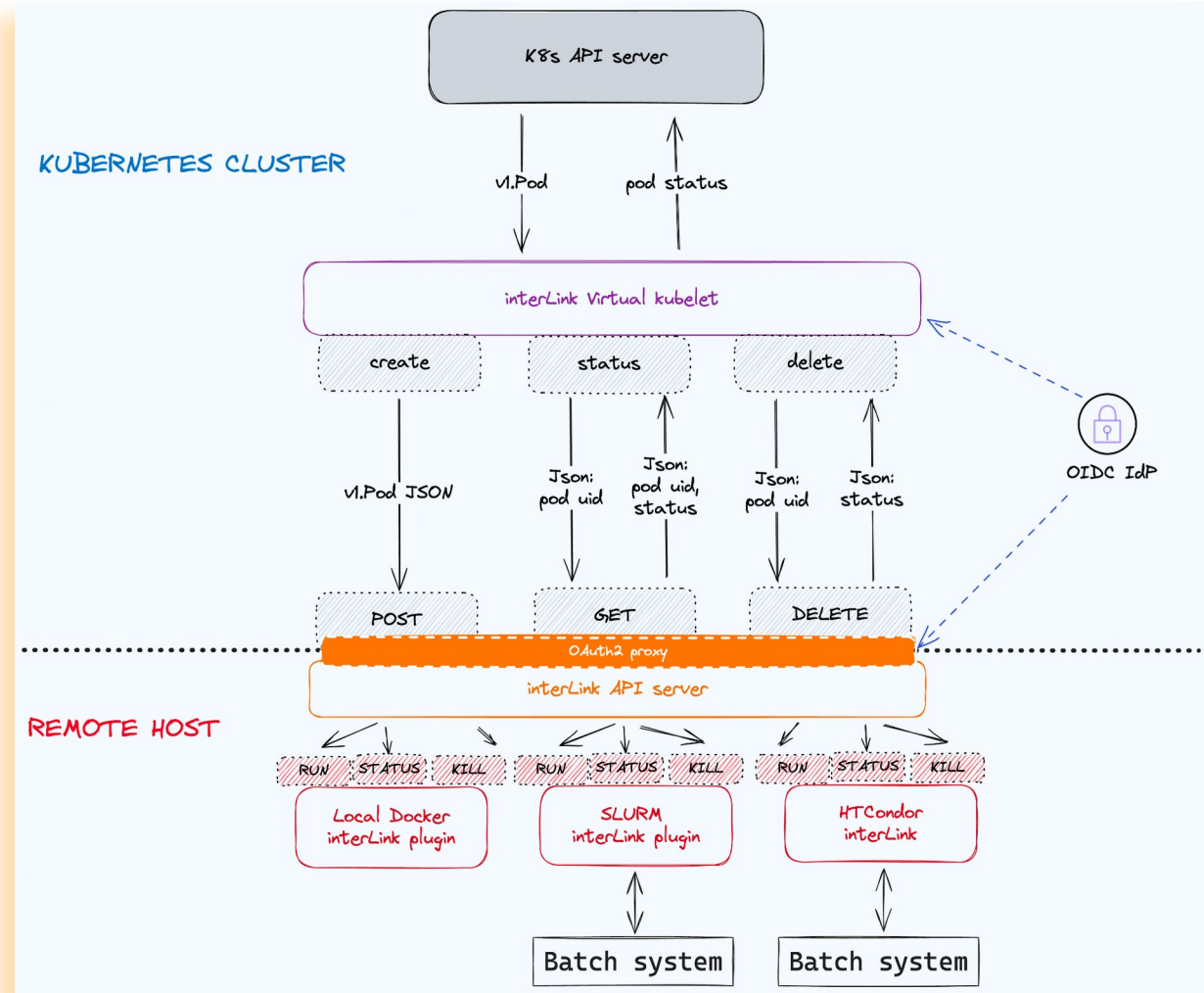
11 Technology providers
delivering the DTE infrastructure and horizontal capabilities

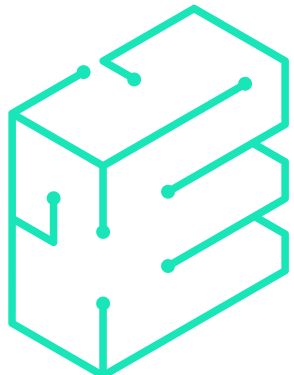
14 Community representants
from 5 scientific areas; requirements and developing DT applications and thematic modules

Based on open source and open standards.

Providing resources on HPC Vega:

- Exploitation of HPC Vega environment.
- Edge VM for interLink deployment.
- Providing support (JSI and IZUM).
- More at <https://intertwin-eu.github.io/interLink>





EPICURE

Unlocking European-level HPC Support



Consortium consists of 16 partners from 14 countries (IZUM & IJS).

Project budget of €10 million, with a contribution of € 5 million (50%) from the EuroHPC JU.

Duration of project is 4 years.

Kick-off Meeting in February 2024, Porto.

Establish distributed Application Support Teams (ASTs) in current and future EuroHPC Hosting Entities.

Aims to improve user support services (2nd and 3rd level).

Porting, optimisation and execution of applications on EuroHPC JU systems.

Involvement on all Work Package's (1, 2, 3, 4, 5 and 6).

First project for level 2 support; collaboration with Jülich.

Other activities:

EuroHPC Application support portal for private and public sector.

Events organized by the consortium.

Training activities.

Collaboration with EuroHPC JU and CoEs.

Best practices in HPC.

Success stories with the users.

How to apply?

<https://pracecalls.eu/>

This project has received funding from the High-Performance Computing Joint Undertaking under grant agreement No.101139786.

More at: https://eurohpc-ju.europa.eu/epicure-new-ri-project-launched-eurohpc-ju-2024-02-07_en

SMASH

machine learning for science and humanities postdoctoral program



About SMASH <https://smash.ung.si/>

Innovative, career-development training program focused on developing cutting-edge **machine learning applications for science and humanities**.

Network of five top-level institutions in Slovenia, and 25 associated partners.

All projects will have access to HPC Vega.

Duration of project is **2023-2028**.

Who can apply?

Holders of a **PhD degree**, postdoctoral researchers from anywhere in the world -

<https://smash.ung.si/research-areas/>

2-year fellowships to 50 talented individuals to harness the potential of **HPC Vega**.

Attractive living conditions in Slovenia, with a monthly gross salary of **€ 5449/4882** (w or w/o family).

How to apply? Applicants apply via an online application platform.



Univerza v Ljubljani



REPUBLIC OF SLOVENIA
MINISTRY OF NATURAL RESOURCES AND SPATIAL PLANNING
SLOVENIAN ENVIRONMENT AGENCY

Call 3 is Opening in Summer 2024!



EUMaster4HPC



European HPC consortium which is leading education activities.

- Applications, Summer School and Research & Industry
- Open internship position at IZUM:
 - hands-on experience with HPC,
 - duration from 2 to 6 months.
- Contribution on demo lab with students at EuroHPC Summit 2023 & 2024.
- More information at: <https://eumaster4hpc.uni.lu/>

Supporting projects and activities (non-funded)



- EuroCC2 - Providing infrastructure for workshops and hackatlons.
- Castiel2 - Supporting CoE's activities (MaX, MultiXscale, CheEESe, EXELERAT, and others through EuroHPC JU Share).

- Leonardo High Level Support (HLS).  DRIVING THE EXASCALE TRANSITION   

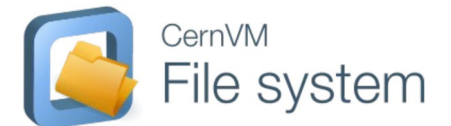
- EuroHPC Container Forum.
- ATLAS, CMS and Belle 2.

- European Digital Infrastructure Consortium (EDIC) – national resources reserved.

- EVEREST (Experiments for Validation and Enhancement of higher REsolution Simulation Tools, “Safety of operating nuclear power plants and research reactors”).

- EGI HPC integration Working Group.

- EESSI + LEXIS via HEAppE Middleware (Proof of Concept with IT4Innovations):



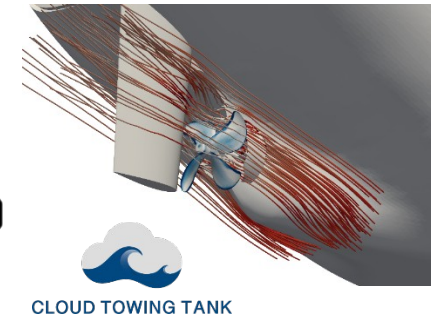
- EESSI is available on EuroHPC Vega (and Karolina) for all users via CernVM-FS.
- Submitting jobs on Vega through the LEXIS platform via HEAppE.



Commercial projects



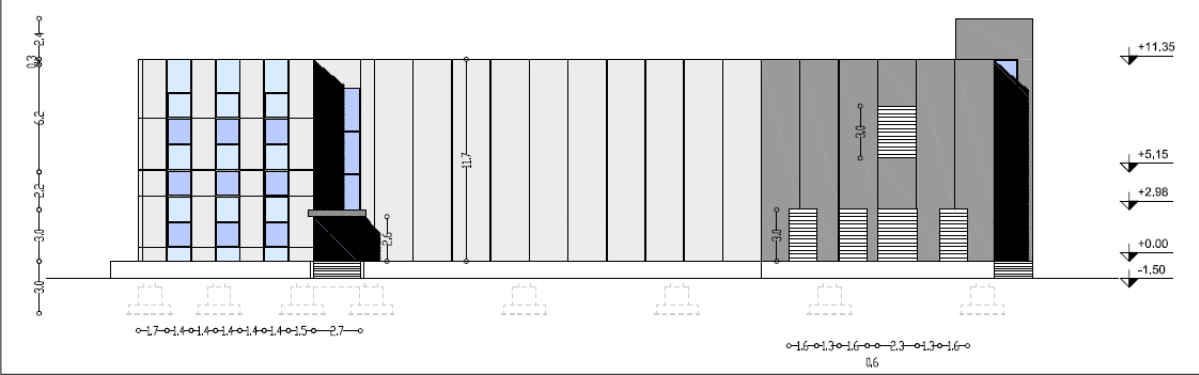
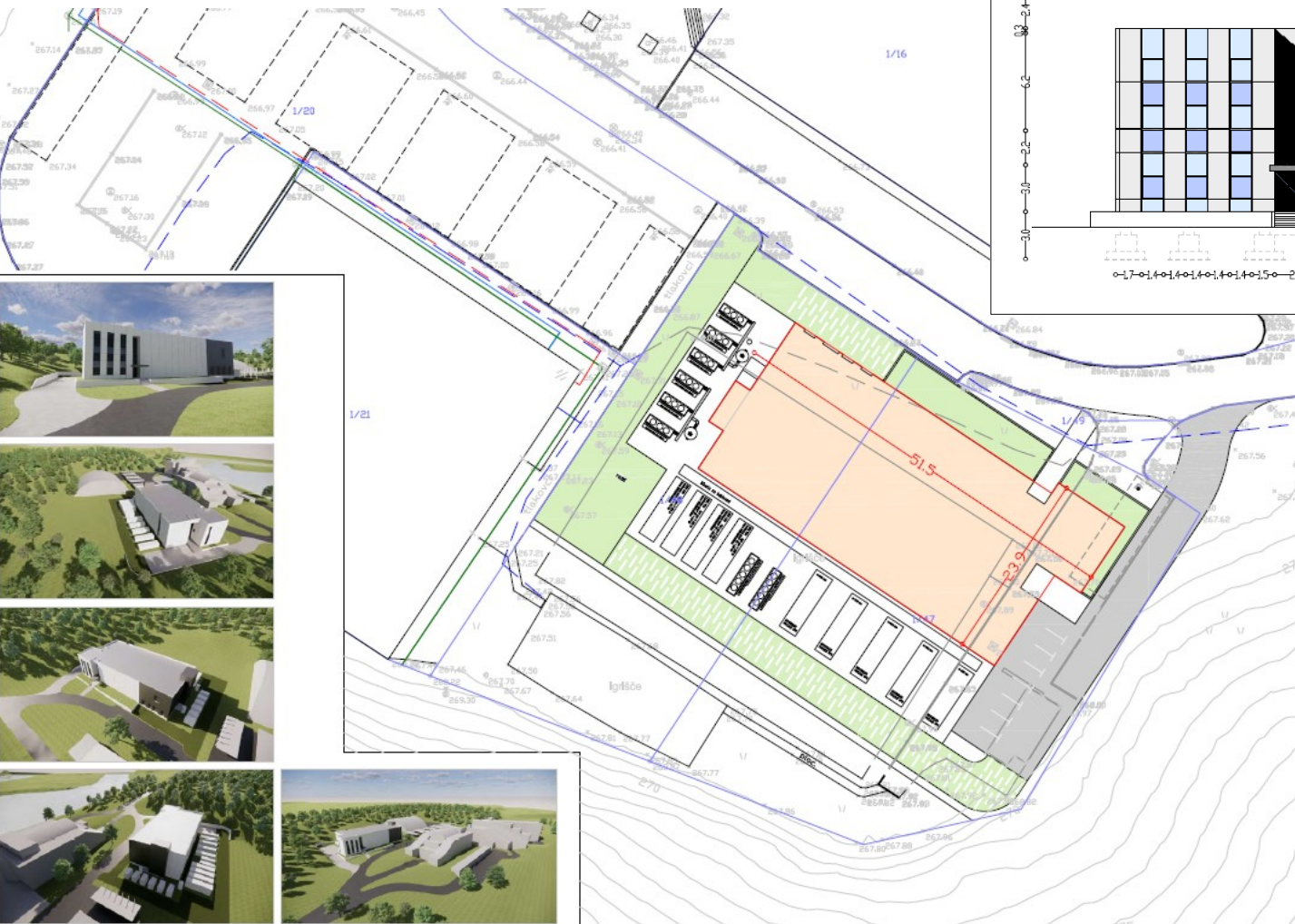
- In silico (Croatia), since the beginning of 2022
- Gorenje – Hisense group (Slovenia) – CFD
- Xlab (Slovenian IT Company) – train AI
- Agenda (Slovenian IT Company) – train AI
- E-DIH (University of Maribor) – voucher for SMEs, 2.000,00 EUR
- Interest is growing.



Future – Data Centers “Project NOO”

- Project "Recuperation and Resilience Plan - NOO)
- Goal: archive facilities for research data, space for the hosting of equipment of Public Research Institutions and Universities, space for future HPC(s)
- Timeline: to be completed in June 2026
- Financial construction: 15,2 M EUR for 2 data centers and the long-lasting storage for research data equipment
- Locations: 1. Dravske elektrarne, Mariborski otok (acquisition of land completed), 2. JSI (nuclear research) reactor, Podgorica
- Utilization: ground floor for HPC, 1st floor for the research data archive, Arnes's and hosted equipment
- Slovenia is going to need a new Supercomputer by the end of 2026, EuroHPC JU co-funding is expected (~50 M / 50%) and this system is not part of this 'Project NOO'

Future - new Data center (DEM)



User documentation and Support

doc.vega.izum.si/eurohpc-access/



HPC Vega - IZUM, Maribor, Slovenia

HPC Vega - IZUM, Maribor, Slovenia

Overview

- Introduction
- Specifications
- Architecture

Instructions

- Summary
- Get Access v
 - Cluster Access
 - [EuroHPC Access](#)
 - SiNET Certificate
- Getting Started >
- SSH Key Management >
- Login information >
- File Management >
- Software >
- Job Submission >

EuroHPC Access

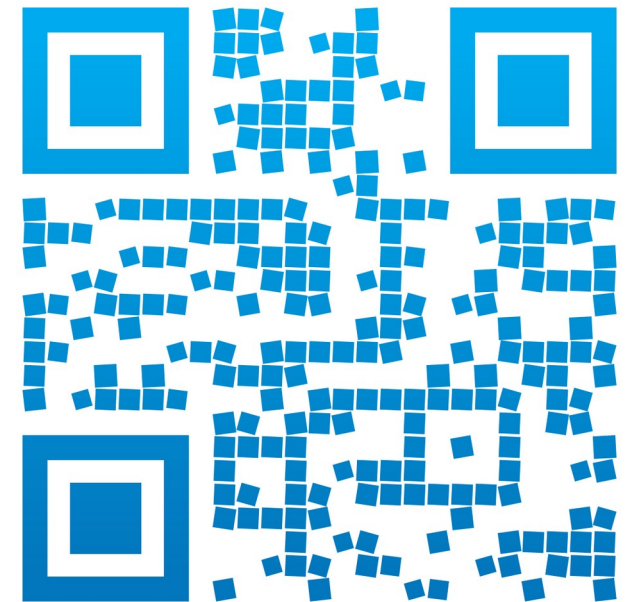
Please refer to [the eurohpc JU Access Policy](#) and [Benchmark and Development calls](#) page for the conditions and criteria applied to the calls.

More informations about getting access (eligibility and assessment criteria) for HPC users are available in the following link: <https://prace-ri.eu/hpc-access/eurohpc-access/>.

Procedure for Access HPC Vega after accepted proposal

After the proposal is technically reviewed and accepted, the applicant will receive a confirmation message from support@sling.si with a request to send his SSH public key to log in to the system. Our support team will then copy applicant's SSH public key to Fido. No Fido Access is granted to EuroHPC applicants. If applicant wants to change his own SSH Public Key, then new public key to support@sling.si should be send.

<https://doc.vega.izum.si/>



support@sling.si

IZUM
REPUBLICA SLOVENIJA
MINISTRSTVO ZA IZOBRAŽEVANJE,
ZNANOST IN ŠPORT

VEGA
H P C

Atos
BullSequana

HPC RIVER

NTR atr.sis

VEGA
H P C

Atos
BullSequana

NTR atr.sis



PUE 1.05
BEST ENERGY EFFICIENCY IN CLASS

NTR atr.sis

360°
VEGA VIRTUAL TOUR

Thank you for your attention.