



SRCE Advanced Computing: HPC Infrastructure Security

Emir Imamagić

University of Zagreb University Computing Centre SRCE
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SRCE for Research and Open Science



AAI@EduHr

DATA, REPOSITORY AND OPEN SCIENCE

INFRASTRUCTURE

Dabar | Hrčak | Puh
Support to Open Science



Dabar



Hrčak



Puh



File
Sender

CROatian Research Information System



CroRIS

**EDUCATION AND PROVISION OF
SPECIALIZED SUPPORT** in the use of digital
resources and services



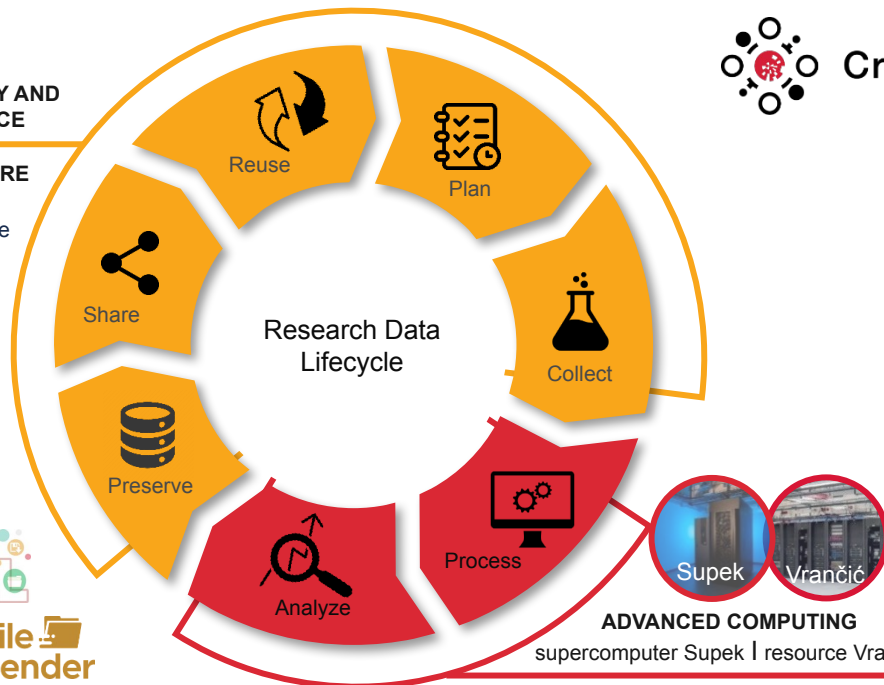
**CROATIAN
COMPETENCE
CENTRE FOR HPC**



SRCE Academy



Platforms, tools and good practices
throughout the research lifecycle



ADVANCED COMPUTING

supercomputer Supek | resource Vrančić



ACQUIRING HPC COMPETENCE AND CONSULTING

Croatian Competence Centre for HPC



Supercomputer Supek



- Croatian Tier-1 HPC resource
- Advanced computing environment with a power of 1.25 PFLOPS with a total of:
 - 8384 processor cores
 - 80 GPUs
 - 32 TB of working memory
- HPE Cray EX
 - Direct Liquid Cooling
 - 200 Gbit/s Slingshot interconnect
 - 580 TB all-flash Lustre storage



Terms of Use

- Emphasize responsibilities of service provider and project manager and users
 - Licenses, data, legal regulations, etc.
 - Resource MUST be used for purposes described in the request
- Explicitly prohibit account sharing
- Service providers rights
 - Incidents – allow access to data and restriction of access to resource
 - Security and performance monitoring
 - Right to periodically report resource usage stats
- Personal data protection



Access

- Web application <https://computing.srce.hr>
- Terms of Use grant access for the purposes of:
 - Research projects financed from public sources
 - Preparation of bachelor's, master's and final specialist theses and PhD dissertations
 - Conducting practical classes and workshops
- Application also provides insight into resource usage



Access

- Authentication
 - [AAI@EduHr](#) – national research and education identities
 - [eduGAIN](#) – global access relying on national identities
 - Local accounts – for users outside of research and education community
- Authorization
 - [CroRIS](#) – Croatian Research Information System
 - [Merlin](#) – Virtual Learning Environment
- Access to HPC frontends
 - SSH keys registered in web application



Data & Batching System Permissions

- Users gain access through individual projects
- Storage
 - Individual home directories provided
 - Project directory – all users from a given project can access it
 - Data protection is provided on a Linux level
- Batching system
 - User's job is automatically associated to the project
 - Fair-share policy on a project level defines priority
 - Users participating in more projects can cherry-pick project for individual jobs



Jobs

- PBS Professional
 - Jobs processes separated in cgroups
 - Further limitations – default runtime 2 days, users can request up to 7 days
- Frontend load
 - Users sometime run heavy loads directly – OOMs or kill -9 & mail warnings
 - Further interactive jobs instructions



Networking Restrictions

- Only frontend boxes are available from outside
- Access to Internet
 - Available on frontend boxes
 - From nodes – available through Squid proxy, logs collected
 - We enable additional Haproxy services for TCP port forwarding (licenses)
- Monthly security scanning
- Security logs monitoring (Wazuh)



Conclusion

- HPC resources are increasingly expensive and very appealing for attackers
- By design HPC resources are closed environments with SSH access to frontends
- As always the biggest issue are users and how they approach security and usage 😊



Thank you! Questions?

Contact:

computing@srce.hr hpc-cc@srce.hr
<https://www.srce.unizg.hr/en/advanced-computing>
<https://www.hpc-cc.hr/>



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