

# MetaCentrum—e-Infrastructure for Computational and Data Challenges

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## Czech National Grid Initiative (NGI)

Czech National Grid Initiative (NGI) is currently being formed through a transformation of the current Czech national grid environment. Nowadays, the Czech NGI (CESNET in the MetaCentrum project) has two natural roles:

- coordinator of resource owners, national level services and activities,
- resource provider, resources are fully incorporated into the national grid.

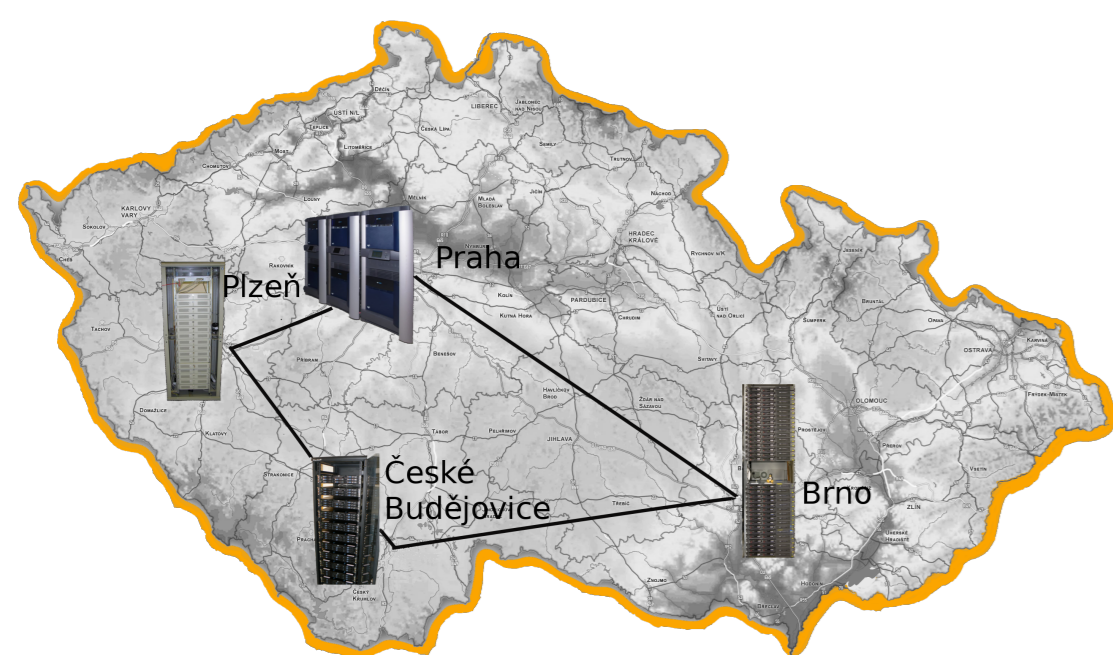
NGI provides and unifies access to hardware, software, and services.

## NGI User and Resource Owner Membership

- membership is free, available for researchers and students of academic institutions
  - scientific results → better access to resources
- resource owners are welcome to join the infrastructure

## NGI Hardware Resources

- about 3000 CPU cores (x86, AMD64, ...)
- 200 TB disk storage
- more than 400 TB of tape space for archiving and backups
- up to 20 Gbit/s Infiniband network on selected clusters
- major sites connected with 10GE network



Resources are owned by Masaryk University (Brno), Charles University (Prague), University of West Bohemia (Pilsen), University of South Bohemia (České Budějovice), CESNET, and other organisations.

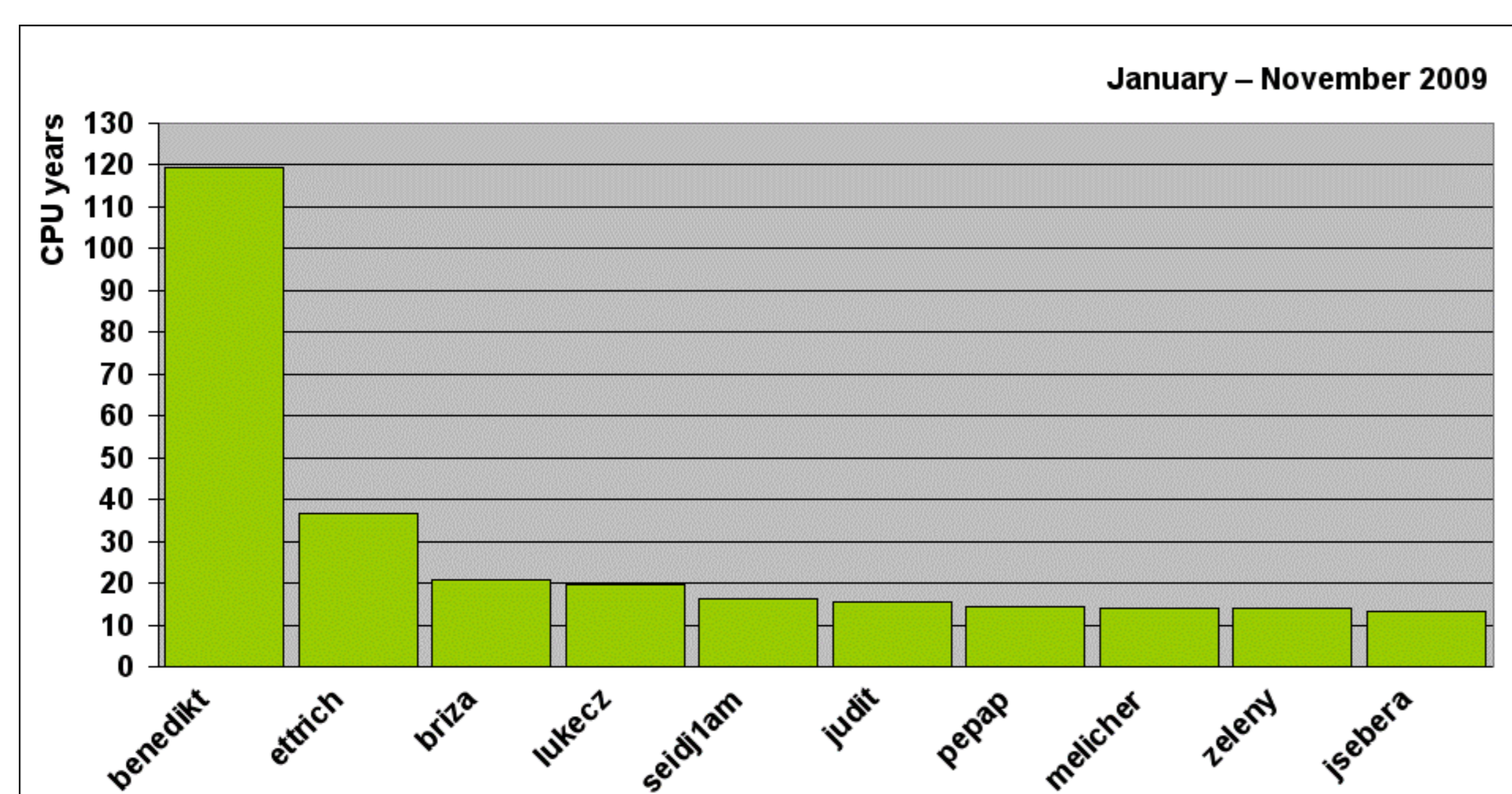
## CERIT

<http://www.cerit.cz>

The Supercomputing Center of the Center for Education, research, and Innovation in communication and information technologies (CERIT) is expected to be the key resource provider for the infrastructure. CERIT-SC is planned to deliver more than 10,000 CPU cores and petabytes of storage. CERIT-SC is based on the tradition of current Supercomputing Center Brno (SCB) at the Masaryk University.

## NGI Software Installed

- preinstalled packages for biology and chemistry, physics, technical computations, mathematics, statistics, ...
  - Amber, Gaussian, Gromacs, Fluent, Matlab, Maple, ...
- development tools → user-developed software
- generally used packages supplied by MetaCentrum, more specific packages often obtained in cooperation with the user



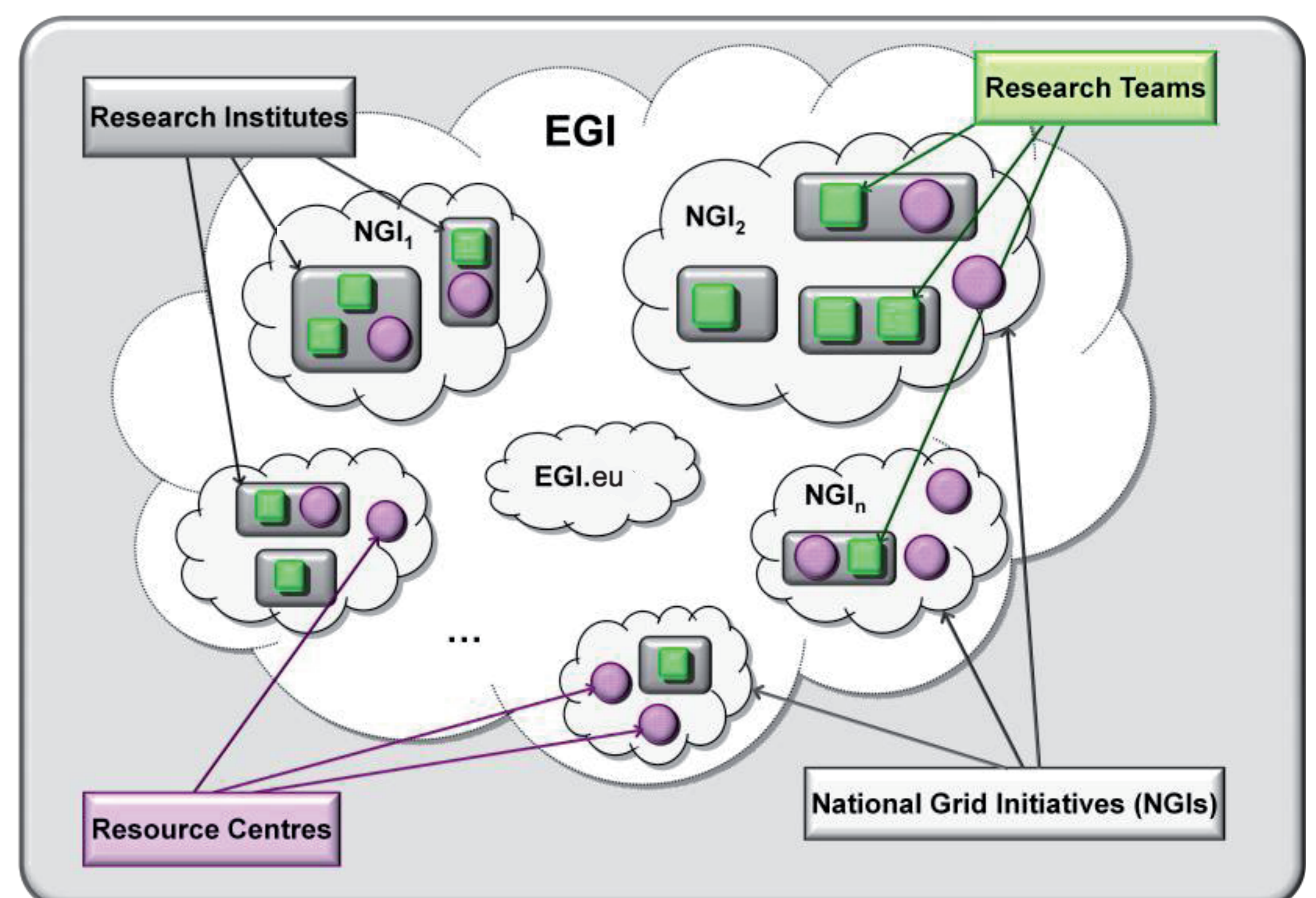
Top Users: CPU Years Consumed in 2009

## NGI Services and Benefits

- computation services in many scientific areas
- data storage for archiving and backup of results
- environment for individual cooperating teams collaboration
- infrastructure shared with international partners
- fully unified
  - single registration
  - single sign-on to access resources
  - single job submission system
- jobs are monitored, accounting information is user accessible
- various access policies ranging from unrestricted access for all infrastructure users to exclusive access for resource owners
- cooperation with the European Grid Initiative

## European Grid Initiative

The European Grid Initiative (EGI) is a partnership between National Grid Initiatives (NGIs) and a coordinating body, the EGI Organisation (EGI.eu, <http://www.egi.eu>). Within the EGI partnership, NGIs and EGI.eu will work together to operate and further develop a sustainable pan-European grid infrastructure, enabling optimal sharing of computing and data resources.



Source: EGI\_DS Blueprint, <http://web.eu-egi.eu>

National Grid Initiatives are the main actors within EGI. NGIs are autonomous, officially-recognised bodies that ensure the operation of the grid infrastructures in the country, and an effective and transparent representation of the needs and wishes of their scientific communities (research teams), resource providers (resource centres) and e-Infrastructure-related institutions.

## MetaCentrum

<http://meta.cesnet.cz>

The MetaCentrum project, an activity of the CESNET association, covers majority of activities concerning Grids, super-, cluster- and grid computing and/or high performance computing in general in the Czech Republic.

MetaCentrum is responsible for building the National Grid and its integration to related international activities, especially in the European Union. It is actively involved in many international Grid projects such as EGEE, EGI, EUAsiaGRID.