MetaCentrum — the Czech NGI Status and Plans

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Czech National Grid Initiative (NGI) is currently being formed through a transformation of the current Czech national grid environment. Nowadays, the Czech NGI has two natural roles. Primarily, it serves as the national coordinator of resource owners and the top level national services and activities. In this role MetaCentrum is already providing all the standard grid services, is a part of the international grids and thus already serves as the true Czech NGI.

Secondarily, the Czech NGI is also a resource provider, managing its own resources that are fully incorporated in the national grid infrastructure. In this role it provides several hundreds of CPUs and most of the storage and archiving capacities of the Czech NGI, being thus one of the largest national resource providers.

The most important resource providers are Supercomputing Centre Brno at Masaryk University, Institute of Computer Science at Charles University, Computing Center of West Bohemia University and CESNET, again through MetaCentrum, but this time as the resource provider.

In addition, the Institute of Physics from Academy of Sciences (FU) creates an example of incorporated resources with partially restricted access. In general, MetaCentrum services are independent from application domains and thus MetaCentrum is fully multidisciplinary infrastructure (Fig 3).

The most important service providers are CESNET, association of legal entities, was held in 1996 by all universities of the Czech Republic and the Czech Academy of Sciences currently functioning as Czech NREN and Czech NGI. Its primary goals is to form and provide underlying communication infrastructure (Fig 2).

Concerning the NGI CESNET represents a resource provider with not only hundreds of CPU/cores but more importantly providing more than 100 TB disc capacity and tape libraries for data archiving. In near future CESNET does not expect substantial increase of computational resources however there is a non-trivial increase of storage capacities (up to tens of PB range) planned.

Major scientific areas using resources connected into the Czech grid infrastructure

- Computational chemistry
- High energy physics
- Material and structural simulations
- Computational chemistry
- Speech recognition and generation
- Distributed processing of video sequences
- Bioinformatics and drug design

Unrestricted access
Resource owners do not impose any a priori restriction on scientific areas that could use the resources. Typical example are CESNET own resources or resources provided by university computing centers (including SCB/CERIT-SC).

Partially restricted access
Resource owners does have a priori specific restrictions which scientific areas are being supported. The typical example are resources from the Institute of Physics, that are available only for HEP and astrophysics

Exclusive access
Usually smaller clusters belonging to a specific group that outsourced the cluster management to MetaCentrum but keeps very restrictive access policy only to group members.

Fig 2 CESNET academic network topology valid since June 2009

Fig 3 Illustrative plot showing composition of the MetaCentrum application portfolio based on 2009 accounting information

Conclusions

MetaCentrum already serves as a highly successful example of production grid infrastructure, attracting many partners and resource owners. The MetaCentrum and its principal contributors are currently preparing a new qualitative as well as quantitative transformation, to become part of a national complex e-infrastructure, where much more resources will be available to national and international teams, especially those participating on ESFRI and similar large scale international projects.