

Grid-environment compared to local computation resource - practical aspects for users

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Overview

This presentation uses NorduGrid as an example of a computation Grid, which can in some respects be viewed as an extended batch queue system. Of course NorduGrid is much more, but we have to start from somewhere...

Authentication

- local resource
 - ▷ user name and password
 - ▷ “login” authenticates and also usually authorises to use local resources
- Grid-environment
 - ▷ public-key encryption techniques
 - ▷ third trusted party, Certificate Authority (CA), grants certificates
 - ▷ proxy

Authorization in Grid

- users form user groups, called Virtual Organizations (VOs), based on common research area, nationality, funding agency or project
- resource providers grant access to VOs

Resource sharing

Many different models are in use depending on the size of the services and organizations:

- anarchy, for example local resources at laboratories – peer solidarity, personal relations
- centralized resource allocation, for example CSC resource allocation group or SNIC – organization-level agreements
- free cycles are given away, local jobs have higher priority – model in use in many of the NorduGrid clusters at the moment

Some challenges of the resource allocation and sharing:

- user friendliness
- maximal resource utilization rate
- technical implementation – the lack of standard tools
(or a horde of them)

Lot's of work is going on in this area.

Describing and submitting a job

- local batch jobs
 - ▶ batch-queue-system options specifying requirements etc. are usually written to a small scripts, defining also directory paths, file transfers, etc.
 - ▶ qsub, lsubmit, etc.
- Grid-jobs
 - ▶ described using (extended) Resource Specification Language (xRSL)
 - ▶ Runtime Environments (REs)

- Grid-jobs (cont.)
 - ▶ file transfers from the submitting machine or separate file servers on the grid (Storage Elements, SEs)
 - ▶ ngsu
 - ▶ Grid middleware transfers the Grid-job to a local batch job