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

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CSC / Tieteen tietotekniikan keskus

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...

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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 – pier solidarity, personal relations
- centaralized 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 challanges 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, llsubmit, etc.

- Grid-jobs

  ▷ desribed 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)

  ▷ ngsub

  ▷ Grid middleware transfers the Grid-job to a local batch job