Installation and Evaluation of Grid Tools: Work in Progress

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Testbed: “NorduGrid”

http://www.nordugrid.org

- **Aim:** to create a Grid infrastructure in Nordic countries
- **Powered mainly by ATLAS groups (Lund, Copenhagen, Stockholm, Uppsala, Oslo)**
- **Start:** May 2001, **end:** October 2002
- **Part of the EU DataGrid Testbed**
<table>
<thead>
<tr>
<th>Location</th>
<th>Front-end:</th>
<th>Computing nodes:</th>
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<tbody>
<tr>
<td>Lund</td>
<td>PIII 1GHz 512MB RAM 40&amp;60 GB disks</td>
<td>2xDual PIII 1GHz 512MB RAM 30GB disks, 1 PIII 1GHz 256 MB RAM 16 GB disk</td>
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<tr>
<td>Uppsala</td>
<td>PIII 866MHz 512MB RAM 40&amp;60 GB disks</td>
<td>2xDual PIII 866MHz 512MB RAM 40GB disks</td>
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<tr>
<td>Oslo</td>
<td>PIII 866MHz 128MB RAM 2x40 GB disks</td>
<td>PIII 1GHz &amp; Dual PIII 1GHz, each 256MB RAM 40GB disks</td>
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<td>Copenhagen, Bergen</td>
<td>Similar clusters are being set up (front-end + 2 Dual-CPU computing nodes)</td>
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<tr>
<td>Helsinki, Stockholm</td>
<td>Single nodes with Globus</td>
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Software & Middleware

• OS: Linux (RedHat 7.1, 7.2, Mandrake, Slackware)
• Resource manager: OpenPBS
  – Some sites plan upgrade to PBS Pro
• Grid middleware: Globus 2 beta (either from Globus or from EDG)
• DataGrid Testbed1 tools: everything available is being tested (apart of WP1 so far)
• Nordic Certification Authority
  – Runs at NBI, Copenhagen (responsible: Anders Wäänänen)
  – Issues Globus certificates for Nordic countries (NorduGrid, DKGRID, DataGrid)
    • ATLAS Grid users from Nordic countries (Denmark, Norway, Sweden) should request certificates from the Copenhagen authority
  – Recognized by EU DataGrid (EDG) as a part of the testbed, i.e., the certificates can be accepted by any EDG site
Virtual Organization

• Virtual Organization for user management
  – Includes people with NorduGrid certificates and NorduGrid services (e.g. GDMP, GridFTP)
    • A subset of VO members to be allowed to evaluate EDG Testbed1 (manager: O.S.)
  – Members of EDG VO’s (e.g. @ NIKHEF) are by default allowed to use NorduGrid resources; grid-mapfile is automatically updated 4 times per day
  – VO database server in Lund
  – should be recognized by EDG (work in progress)
• NorduGrid Information Service:
  – Database of resources on a computational grid: current configuration, capabilities, and status
  – Central server in Copenhagen; info available via any LDAP client (mds-vo-name=NorduGrid, o=Grid)
GDMP and Replica Catalog

- GDMP: set of tools to provide replication of either plain data files or Objy
  - “publishing” transfers information about registered files to subscribed GDMP servers and the Globus Replica Catalog
  - File transfer done by GridFTP
  - NorduGrid: servers in Oslo and Uppsala, non-experiment-specific
  - Tests with replication of plain files have been performed
GridFTP

- Servers at each site
- Fast and reliable file transfer using Globus certificates for authentication
- Multi-thread transfer feature allows to reach speeds of up to 70 mbps over a non-dedicated WAN (even faster than a disk write speed)
Applications

• Existing middleware so far allowed only simple executable file submission for a job
  – problems accessing and moving associated data
  – non-existing resource scheduling

• Temporary (non-scalable) solutions are developed; DataGrid tools will hopefully help

• Attempts to run tasks:
  – Lund, Copenhagen: simple PYTHIA runs
  – Oslo: PYTHIA + ATLFAST, using a home-made “wrapper” to transfer output files
ATLAS software

• ATLAS software w/o AFS:
  – Installation attempted in Lund and Oslo (unsuccessful so far)
  – Mirroring takes several days
  – Does not compile “out of the box”; system managers are reluctant to install an older compiler
  – ATLAS Grid Toolkit: the new one still to be tested