International Summer School on Grid Computing 2003

Vico Equense (Naples) July, 13-25 2003

Short Summary

by
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School features

- ~ 85 hours of instructions
- Information from “first hands”
  - renowned Grid experts, ideologists of the Grid, middleware developent teams representatives...
    - Carl Kesselman (Univ.of S.California; Globus project)
    - Miron Livny (Univ.of Wisconsin; Condor project leader)
    - ...many others
- Sunshine, sea, lot of fun...

Main Topics

- Toolkits, middleware
  - Globus toolkit 2
  - Condor G
  - Globus Toolkit 3
  - European Data Grid (most of the time)
  - Unicore

Main Topics
(continued)

- Technologies, concepts
  - OGSA-DAI (DataBases & the Grid)
  - VOMS (System for authorization management inside virtual organizations)
  - GLUE Information model
- General information...
  - EDG Applications
  - EDG Future direction
  - EU Grid projects
  - Case Study: CMS Particle Production

Main Topics
(continued)

- General topics (continued)
  - IBM Industrial Grid Applications
  - Grid.it Italian High-performance Grid Project
  - Building Grid Portals
  - Biomedical Applications
  - Virtual Observatory (astronomy)

Practice

- Lab Exercises:
  - EDG 1.4, 2.0
  - GT3
  - CondorG & DAGman
  - UNICORE
  - OGSA-DAI
- Nice tutorials:

http://hep-proj-grid-tutorials.web.cern.ch/hep-proj-grid-tutorials/dry.html

A very brief overview
of some technologies mentioned above that may be quite new to us...

- Details that might be interesting:
  - Unicore
  - GT3

Unicore

yet another approach

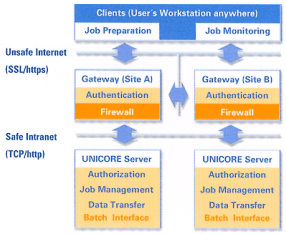
- **Uni**form **I**nterface to **CO**mputing **R**esources
  - provides a science and engineering GRID combining resources of supercomputer centers and making them available through the Internet.
  - “Seamless” computing (platform independent)
- Jobs
  - prepared/modified through the GUI (e.g. Pallas UnicorePro; nice but commercial)
  - contain a number of interdependent tasks
    - currently, execution of scripts, compile, link, execute tasks and data transfer directives are supported
    - tasks are represented in abstract terms and resources – in abstract units. UNICORE servers translate them into platform-specific.

Unicore
(continued)

- Abstract Job Object (collection of classes representing Grid functions; encoded in Java)
- Target system and requirements can be specified for each job
- Security
  - certificate-based

(interoperable with Globus)

  - stronger trust model



Unicore
(continued)

- Some important functions:
  - local, remote and nested task graphs
  - flow control based on task status, time events and file-state events
  - hard/soft fail recovery
  - RB:
    - Multi-site resource check prior to submit
    - estimate of time until execution
    - ticket generation and checking
    - dynamic brokering at execution time
- More info at www.unicore.org

GT3

- Evolution of Globus toolkit
  - Standard protocols -> Services
  - Open Grid Services Architecture (OGSA)
    - Service orientation to virtualize resources and unify resources/services/information (based on Web-services)
    - Standard interfaces & behaviors for distributed system management: the Grid service
  - Open Grid Services Infrastructure (OGSI)
    - Service (component) is implemented as Java-class. Theres' API.
    - Exploits existing WS properties
    - Enhancements to WS:
      - state management, event notofication, referenceable handles, lifecycle management, service data extention..

GT3
(continued)

- GT2 -> GT3
  - Security: Adapting X.509 certs to integrate with emerging WS standards
  - GRIP/LDAP: Abstractions integrated into OGSI as serviceData
  - GRAM: ManagedJobFactory and related service definitions
  - GridFTP: Unchanged in 3.0, but will evolve into OGSI-compliant service in 2004

Useful resources

- Official page:

http://www.dma.unina.it/~murli/SummerSchool/

- EDG Tutorials (handouts, excercises)

http://hep-proj-grid-tutorials.web.cern.ch/hep-proj-grid-tutorials/dry.html

- Page by Oxford guys:

http://ijstokes.paunix.org/ggf/bin/view

  - "Compiled" set of school slides and documents (over 1600 pages, 39 megs!)
  - Photos and other school-related stuff
  - (currently corrupted?)