An Introduction to Grid Computing

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UB Infrastructure(1): CSELinux Grid

- **Goal:** To facilitate development of service-oriented applications for the grid.
- **Two major components:** Staging server and Production grid server.
- **Grid application** are developed and tested on staging server and deployed on a production server.
- **Production grid server:**
  - Three compute nodes with Red Hat Linux and Globus 3.0.2 instance.
  - One utility gateway node with FreeBSD and Globus 3.0.2.
CSELinux: Development Environment

Staging Server

- OS: Solaris 8.0
- Grid: Globus 3.0.2
- Function: Debug and test services

Production Server

- Cerf
  - OS: FreeBSD
  - Grid: Globus 3.0.2
  - Function: fileserver, firewall

- Mills
  - OS: FreeBSD
  - Grid: Globus 3.0.2
  - Function: fileserver, firewall

- Vixen
  - OS: FreeBSD
  - Grid: Globus 3.0.2
  - Function: fileserver, firewall

- Postel
  - OS: FreeBSD
  - Grid: Globus 3.0.2
  - Function: fileserver, firewall

- OS: Red Hat Linux 9.2
- Grid: Globus 3.0.2
- Function: Deploy services

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UB Infrastructure (2): CSECCR Grid

Goal: To run jobs submitted in a distributed manner on a Condor-based computational cluster Condor.

Composed of 50 Sun recycled used Sparc4 machines, which form computational nodes, headed by a front-end Sun server.

The installation scripts are custom-written facilitating running of jobs in a distributed manner.

Partially supported by Center for Computational Research (CCR).
Services and Resources

Services: scientific services, business services and personal services.

Resources: data, storage bandwidth

MyApplication

7/13/2005 TCIE Seminar
Grid Application using the services and resources

Services: scientific services, business services and personal services.

Resources: data, storage bandwidth

MyApplication
Grid-based Stock Portfolio Building Application: Design Diagram By Faramawi, a Student in CSE4/586 Course

StockExchangeService
- buy()
- sell()

transactions

Markowitz
PortfolioAdvisoryService
- advise()

Call & Listen

Notify

history

random

HTML

Data feed (HTTP)

random

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Grid-based Stock Portfolio Building Application: Design Diagram By Faramawi, a Student in CSE4/586 Course

- **StockExchangeService**
  - buy()
  - sell()

- **transactions**

- **StockBrokerService**
  - subscribe()
  - createPortfolio()
  - authenticate()
  - buy()
  - sell()
  - depositFunds()
  - withdrawFunds()

- **users**

- **portfolios**

- **Markowitz**

- **PortfolioAdvisoryService**
  - advise()

- **Call & Listen**

- **Notify**

- **StockClient**
  - console/gui

- **StockMonitorService**
  - authenticate()
  - monitor()

- **HTML**

- **Data feed (HTTP)**

- **random**

- **history**
The Grid Conundrum

Where are the opportunities for CSE educators and students?

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Getting to know the grid?

- Start with reading the literature on Condor and Globus grid.
  - [http://www.globus.org/research/papers/papers.html](http://www.globus.org/research/papers/papers.html)
- Try out the grid tutorials and reference implementations.
- Explore newer businesses and business models.
  - Example: storage service, personal database service (personal identity management)
  - Work on a reference implementation of grid specification.
  - [http://www.extreme.indiana.edu/swf-survey/](http://www.extreme.indiana.edu/swf-survey/)