



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 Free BSD and Globus 3.0.2.



CSELinux: Development Environment

Staging Server

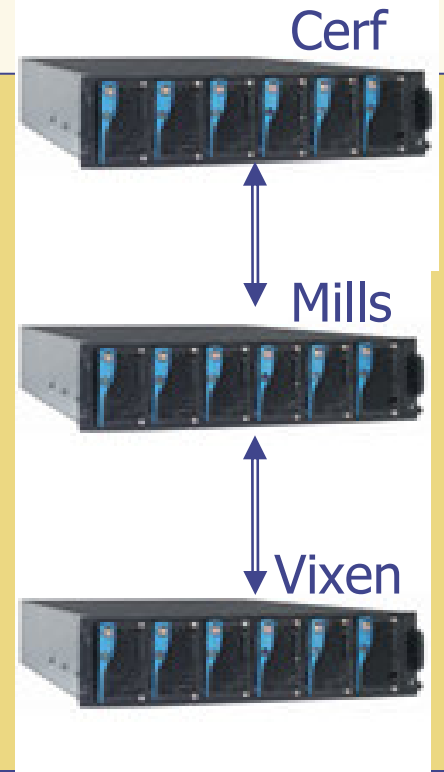


OS: Solaris 8.0
 Grid: Globus 3.0.2
 Function:
 Debug and test services

Production Server



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



OS: Red Hat Linux 9.2
 Grid: Globus3.0.2
 Function: Deploy services

7/13/2005

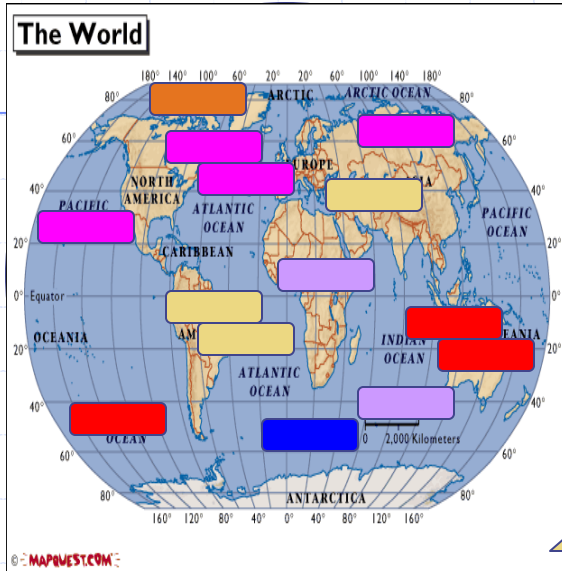


UB Infrastructure(2): CSECCR Grid

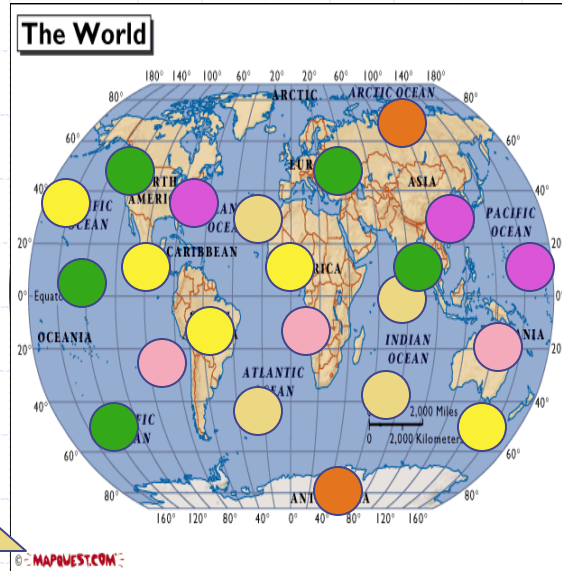
- ◆ Goal: To run jobs submitted in a distributed manner on a Condor-based computational cluster Condor.
- ◆ Composed of 50 Sun recycled used Sparc4 machines, which form computational nodes, headed by a front-end Sun server.
- ◆ The installation scripts are custom-written facilitating running of jobs in a distributed manner.
- ◆ Partially supported by Center for Computational Research (CCR).



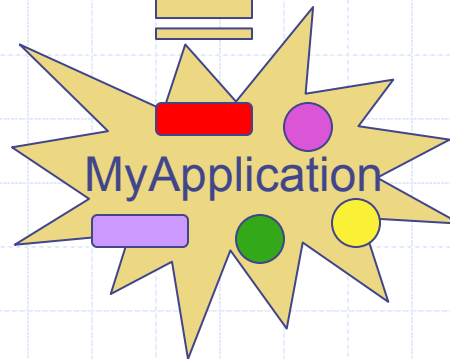
Services and Resources



Services: scientific services, business services and personal services.

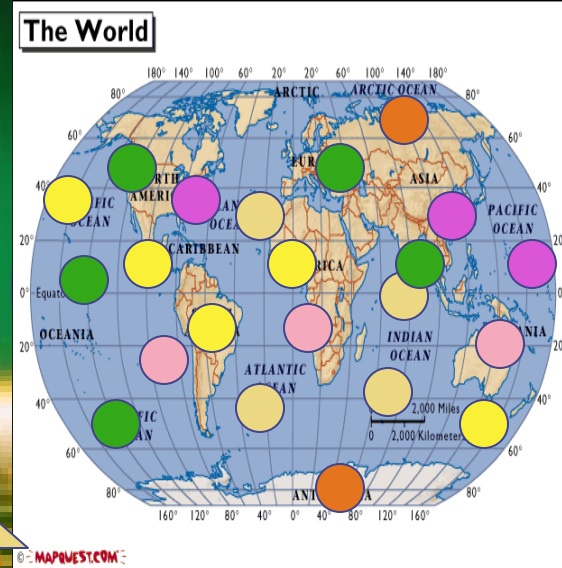
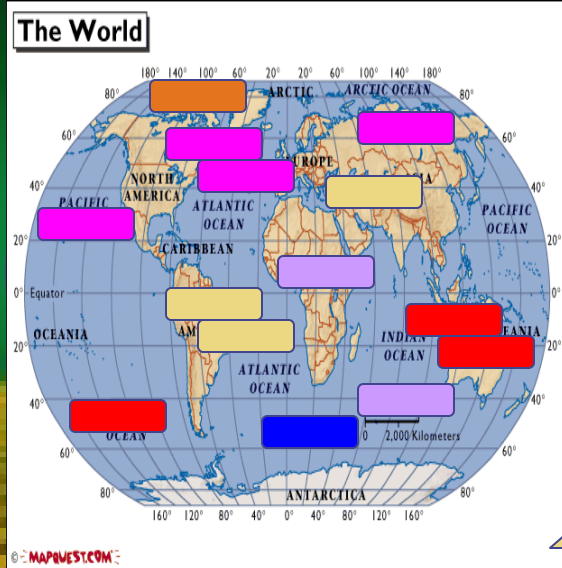


Resources: data, storage bandwidth





Grid Application using the services and resources



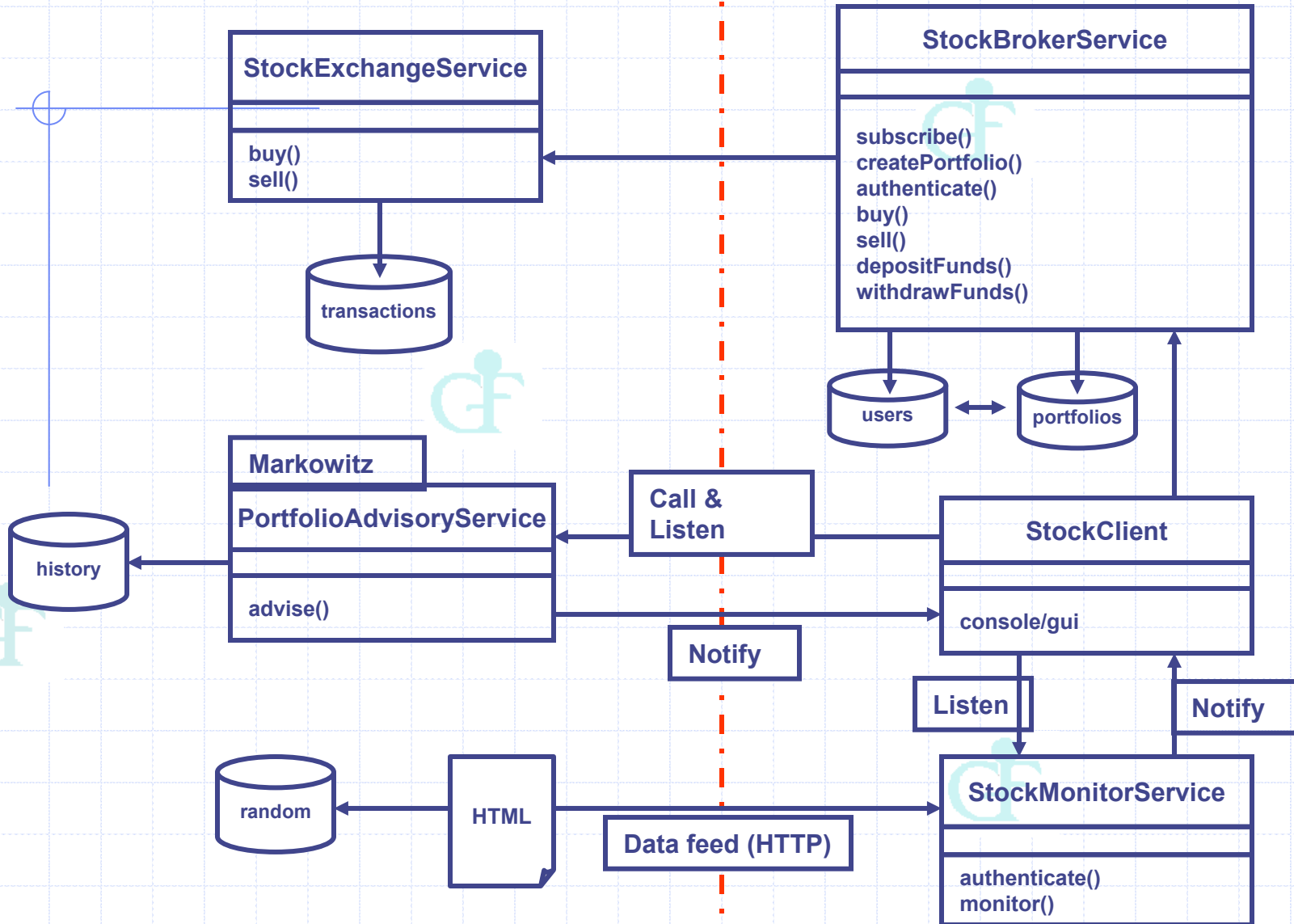
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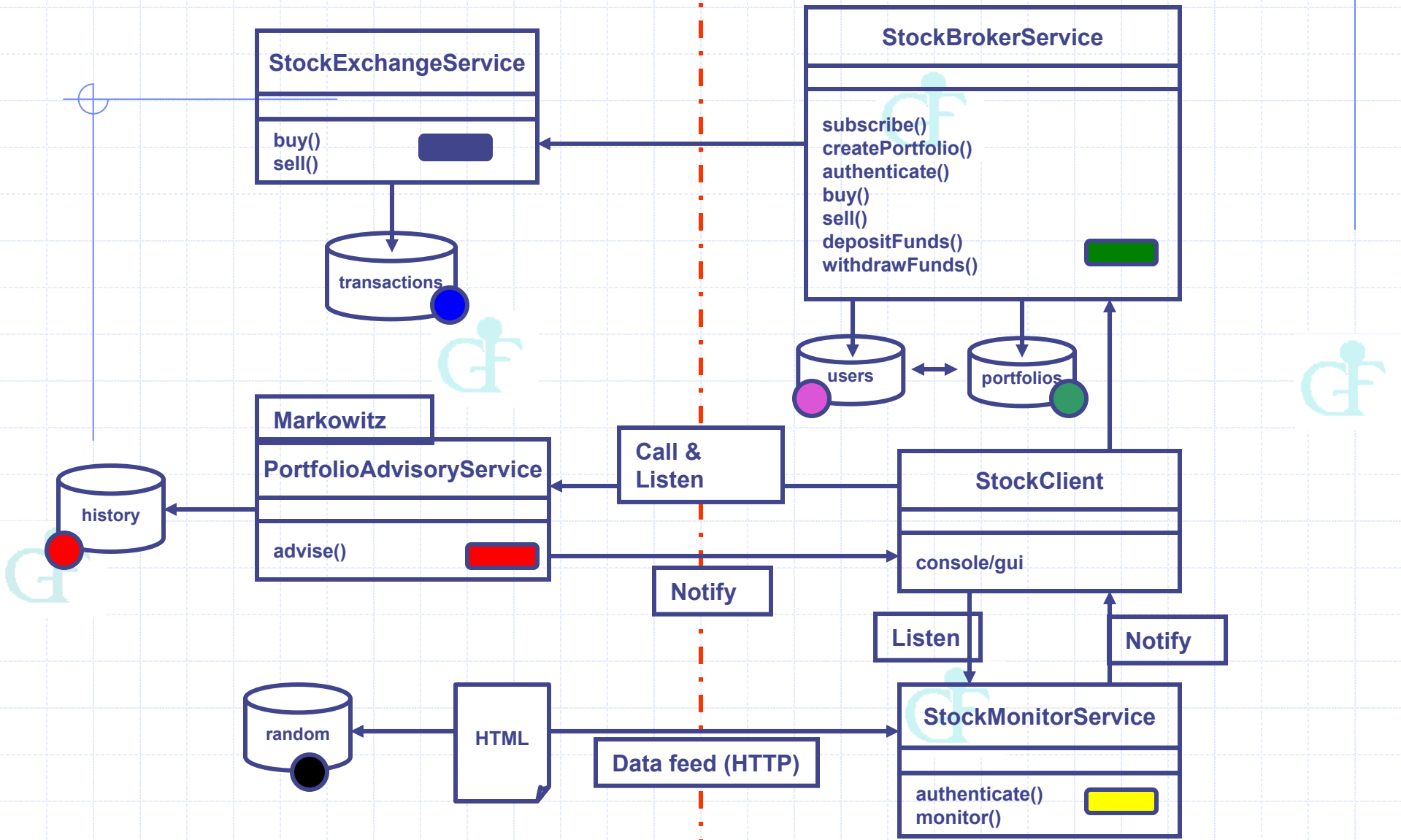


Grid-based Stock Portfolio Building Application: Design Diagram By Faramawi, a Student in CSE4/586 Course





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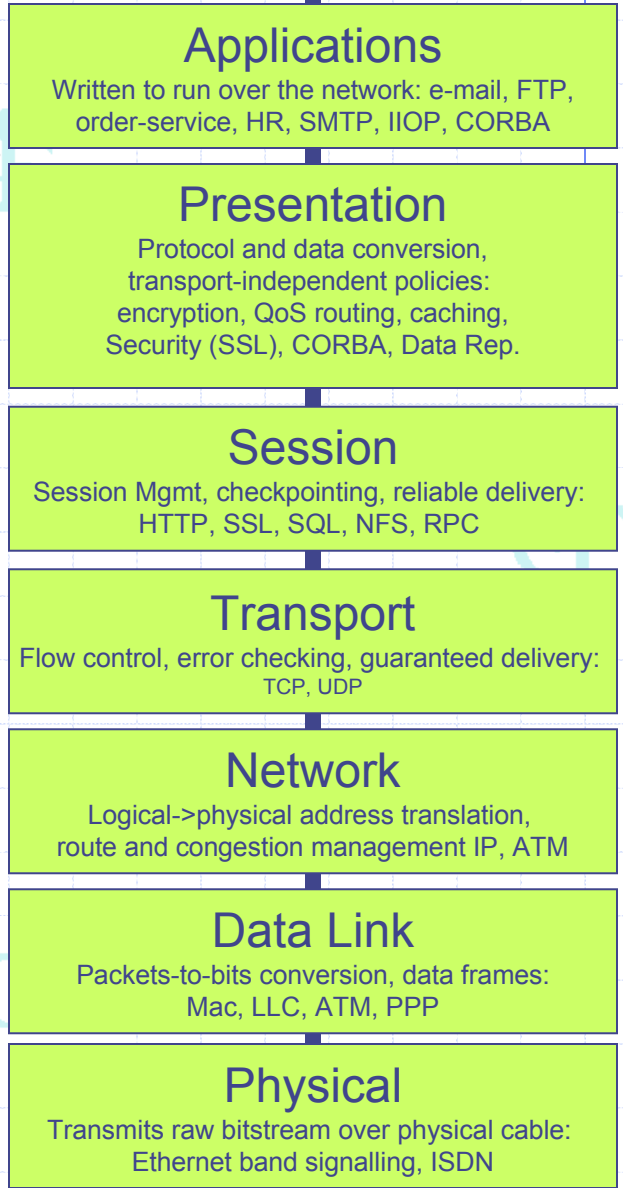
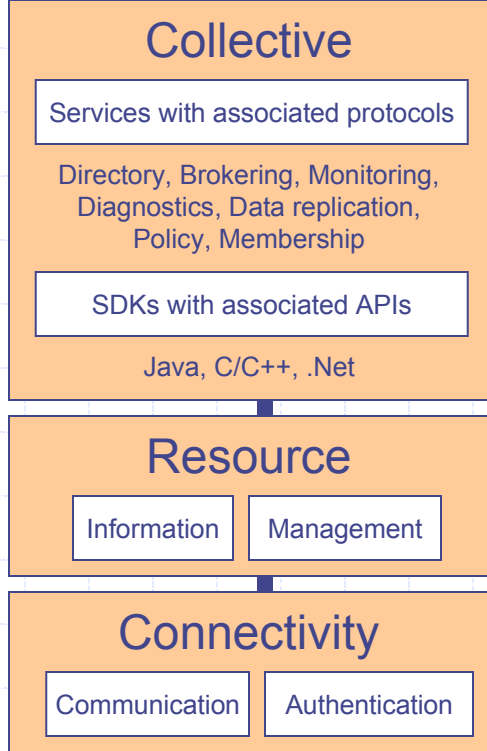
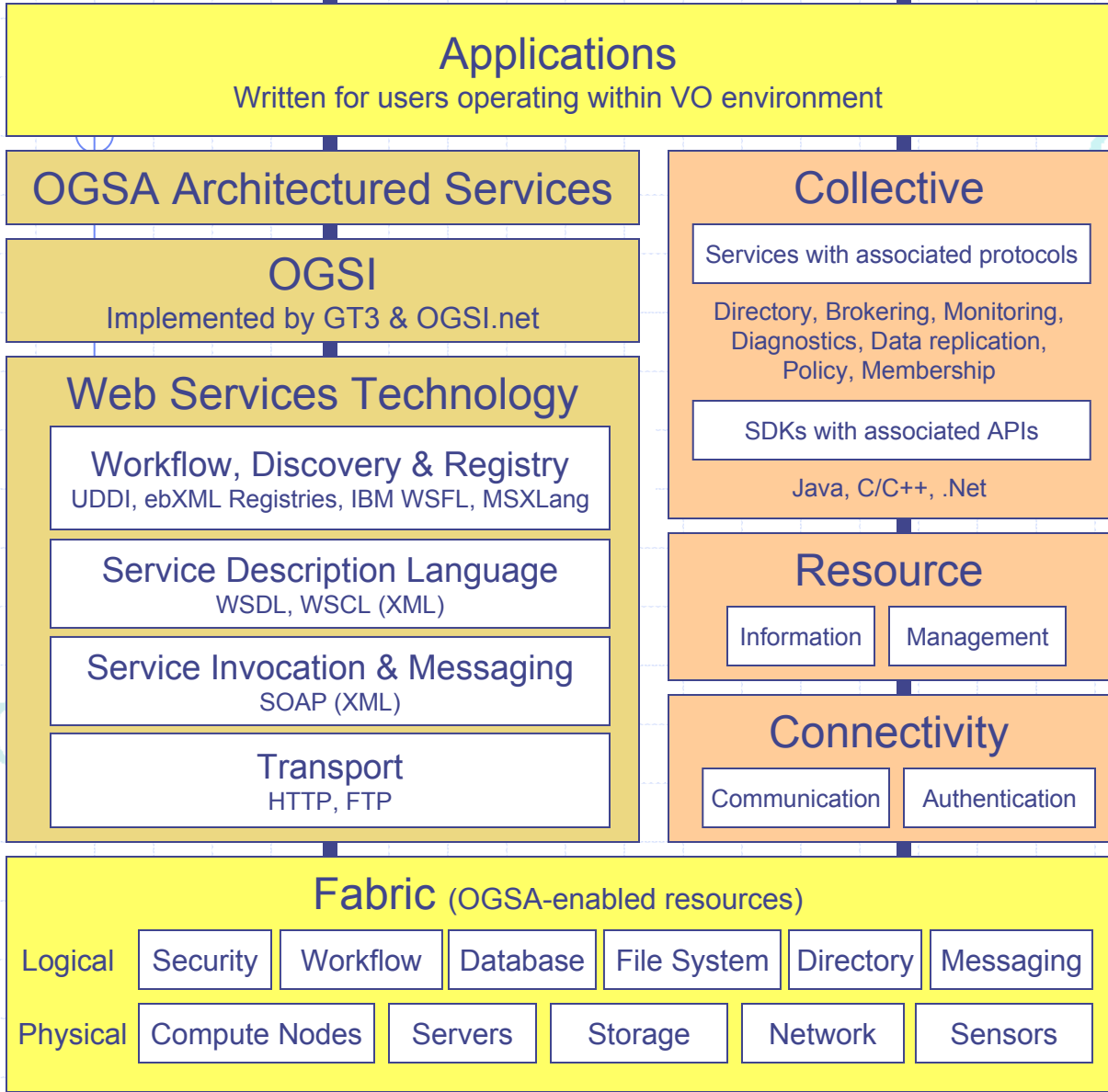


OGSA

Grid

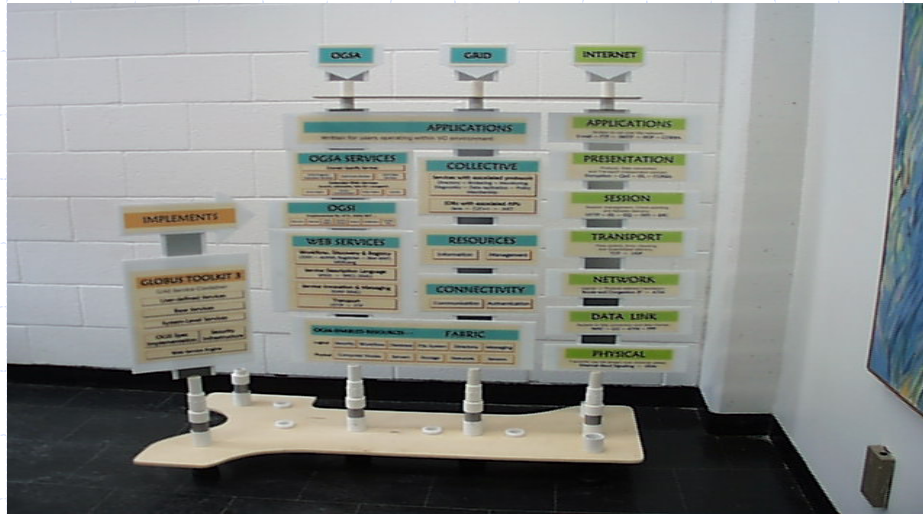
Internet (OSI)

← Mappings →





The Grid Conundrum



Grid

Flux

Technology

State of the technology

Internet

Solid

System level operation

Protocol level operation

Where are the opportunities for CSE educators and students?



Getting to know the grid?

- ◆ Start with reading the literature on Condor and Globus grid.
- ◆ <http://www.globus.org/research/papers/anatomy.pdf>
- ◆ <http://www.globus.org/research/papers/ogsa.pdf>
- ◆ <http://www.globus.org/research/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/>