The Grid Concept

"Resource sharing & coordinated problem solving in dynamic, multi-institutional virtual organizations"

- On-demand, ubiquitous access to computing, data, and services
- New capabilities constructed dynamically and transparently from distributed services

"When the network is as fast as the computer's internal links, the machine disintegrates across the net into a set of special purpose appliances"

(George Gilder)

The Grid World: Current Status

- Dozens of major Grid projects in scientific & technical computing/research & education
  - www.mcs.anl.gov/~foster/grid-projects
- Deep understanding of technical issues
  - Important differentiator (relative to Web) = distributed state and resource management
- Considerable consensus on technologies
  - Open source Globus Toolkit™ a de facto standard for major protocols & services
- Industrial interest emerging rapidly
  - IBM, Platform, Microsoft, Sun, Compaq, …

Current Focus: Open Grid Services Architecture

- Service orientation to virtualize resources
  - ⇒ Adopt Web services standards as a basis for definition of service interfaces etc.
- Define fundamental Grid service behaviors
  - ⇒ Service semantics, reliability, security, lifecycle management, discovery, etc.
- Delivery via open source Globus Toolkit
  - ⇒ International community development
- Global Grid Forum current center of activity
  - ⇒ Desire to engage with W3C in areas where Grids may motivate Web services extensions

Programs and Computations as Community Resources: The Chimera "Virtual Data" System