Virtual Grid Application Development Software

Partners
Rice University
University of California at San Diego
University of California at Santa Barbara
University of Houston
University of North Carolina at Chapel Hill
University of Southern California Information Sciences Institute
University of Tennessee at Knoxville

Funded By
National Science Foundation

What It Is
Grids hold great promise for researchers who need to connect to remote computers, databases and other resources, however, they can be complex, unreliable, and require a huge time investment for even low-level operations. To keep these problems from impeding the potential of grids and distributed resources, the Virtual Grid Application Development Software (VGrADS) project was developed. VGrADS attacks a fundamental part of the grid usability problem: how to more effectively program these highly complex and dynamic systems. VGrADS is developing software tools that simplify and accelerate the development of grid applications and services, while delivering high levels of performance and resource efficiency. VGrADS is based on the earlier GRADS project.

Global Distributed Problem Solving

- **Vision:** Transparent Grid computing
  - Easily accessible to different application domains such as weather forecasting, biomedical modeling, etc.
- **Reality:** Low-level programming
  - Programmer effort required to manage resources
  - Hard to guarantee performance and reliability
- **VGrADS Proposed Solution**
  - Separate application development from resource management
  - Provide tools to enable application scientists

LEAD: Adaptive Weather Prediction

- **Linked Environments for Atmospheric Discovery (LEAD):**
  - Move from static configurations to dynamic adaptive, on-demand systems
- **Adaptivity:**
  - Changes in response to weather
  - Responds to user inputs
  - S雪花 remote observing technologies
- **Challenges:**
  - Provide scalability, adaptability and real-time response to weather

LEAD-VGrADS collaboration scenario: There is a storm observed in a certain region of the Continental US. Results must be obtained in an hour.
- Goal: Schedule towards the workflow deadline
- Procure resources for the workflow, minimizing wait times in batch queues, scheduling to optimize running time and data movement costs