Empowering Peer-to-Peer Services for Robust Grid Computing

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Desktop Grid Computing
- Opportunistic sharing to exploit large collections of personal computers and workstations across the Internet

Peer-to-Peer and Grid Computing

To build a Robust and Scalable System!!

Hard Problems / Issues
- Submitting jobs
- Finding a resource that meets the minimum resource requirements of a job
- Load balancing
- Resilience to failure

Current Status
- Improving CAN-based matchmaking algorithm
- Prototype CAN-based implementation ongoing
- Characterizing real astronomy workloads

System Architecture

Rendezvous Node Tree
- Implicit tree built on top of P2P network
- Aggregated Resource Information
  - Maximal amount of each resource available at some node in the subtree

Modified Content-Addressable Network
- Formulate the matchmaking problem as a routing problem in CAN space
  - Treat each resource type as a distinct CAN dimension
  - Map nodes and jobs into the CAN space
  - Search for the closest node whose coordinates in all dimensions meet or exceed the job’s requirements