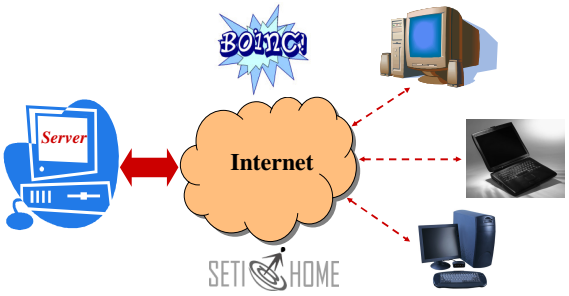
Employing Peer-to-Peer Services for Robust Grid Computing

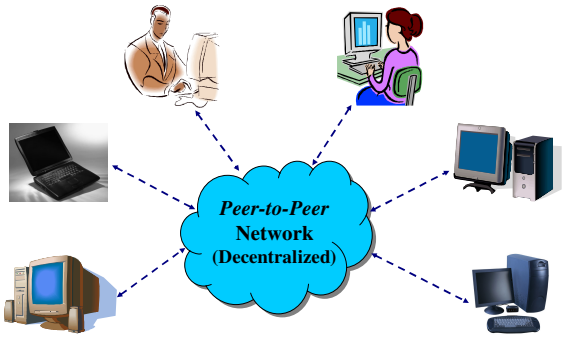
Jik-Soo Kim, University of Maryland

Desktop Grid Computing

- *Opportunistic* sharing to exploit large collections of personal computers and workstations across the Internet



Peer-to-Peer and Grid Computing

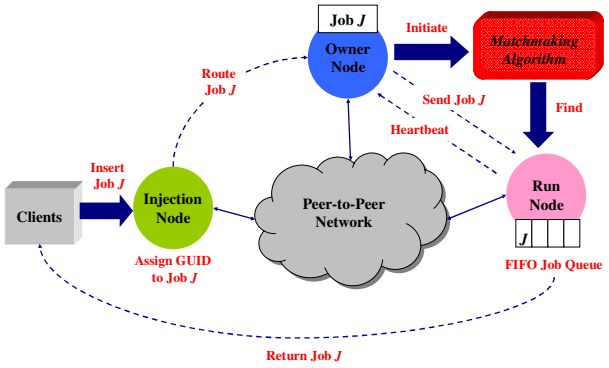


To build a Robust and Scalable System !!

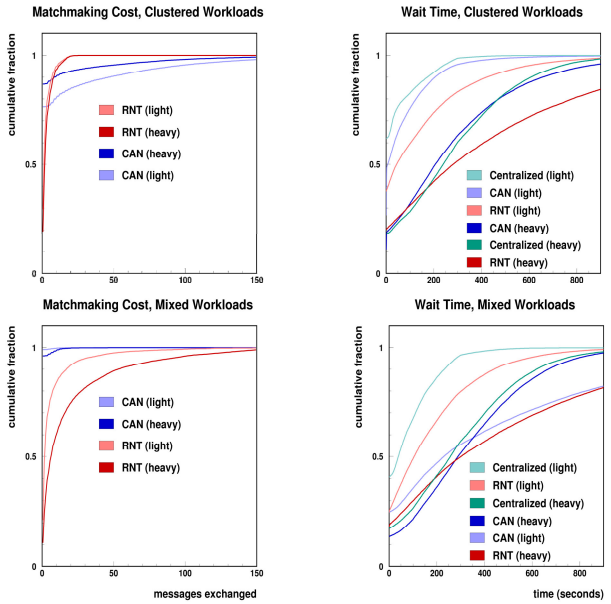
Hard Problems / Issues

- Submitting jobs
- Finding a resource that *meets* the minimum resource requirements of a job
- Load balancing
- Resilience to failure

System Architecture



Simulation Results (from Grid 2006)

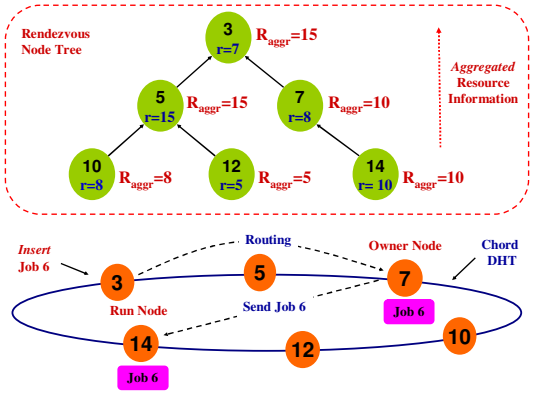


Current Status

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

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*