BeoSim: Computational Grid Scheduling

BeoSim is a multi-cluster computational grid simulator for parallel job scheduling research. It is used to explore the effectiveness of multi-site scheduling algorithms under a variety of workload characterizations and grid configurations.

BeoSim addresses the contention for bandwidth that simultaneously co-allocated jobs create within a grid's interconnection network. It is being used to design and study bandwidth-aware scheduling algorithms that improve job turnaround time by addressing degraded job run-time performance due to intercluster network bandwidth utilization.

Current research directions include modeling a wider range of job communication access patterns and network topologies.

http://www.parl.clemson.edu/beosim

Top Figure: Jobs that are mapped across cluster boundaries can saturate the shared intercluster network links, leading to degraded job run-time performance.

Middle Figure: The scheduler must determine which nodes are candidates for potential job co-allocation based on several factors, including network congestion.

Bottom Figure: Scheduling effectiveness must be evaluated across a range of job characteristics and scheduling parameters.