Progress report

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1 Field of my research and context

My research area is Grid Computing. I focus on Grid scheduling problem, i.e. process of scheduling application tasks over Grid computation resources. There are many multi-round scheduling algorithm in Parallel and Distributed environment, but they are not suitable for Grid because of the heterogeneity, dynamicity of Grid resources. In the sort term, I try to build a scheduling algorithm which have following features:

1. Dynamic
2. Multi-rounds
3. Working with divisible workload

2 Aim of my research

1. A mechanism to dynamically control the scheduling jobs in Grid environment
2. A effective management model for distributed resources in Grid

3 My solution for the scheduling problem

I design my algorithm based on an existing static algorithm: UMR. In order to suitable for the dynamicity of Grid, I add the following features:

1. In UMR (and other static algorithms) the length of round was fixed and was computed based on speed of CPU and bandwidth of processors. These speeds are not constant in Grid, therefore , in my algorithm , the length of each round will be computed at the beginning of that round.

2. The length of next round = the time interval we predict that CPU and bandwidth will not change. For example: after round 1 completed, we predict (by probability or certain method) that on next 5 seconds CPU and bandwidth will be constant, so length of next round = 5 second.

3. The amount of work assign for each processor is computed based on the speed of that processor in future. We obtain this value by probability (or an other method, such as Bast's one) .

4. In order to predict the CPU speed and bandwidth, we need an model of probability of CPU speed, the interval in that bandwidth is constant.

4 The progress of last year

1. At first I have chosen the topic 'Autonomic Database Management System - ADBMS'. After that I understand that I can not setup the experiment environment of this topic, which required many people

2. Now I focus on researching 'Grid computing'. In the short term, I choose Grid scheduling as my topic and I am surveying a new dynamic scheduling algorithm.

3. I have setup the experiment environment by SimGrid software.

4. I am collaborating with Dr. Said Elnaffar - Queens University, Canada

5 Future direction

After finish with present topic, I will research:

1. Scheduling problem with other kind of workload, such as Directed Acyclic Graph

2. The Grid resource management problem

6 My publication

I still have not any paper. I hope I will have an paper in Six International Conference on Parallel and Applied Mathematics (PPAM 2005) in this November.