

Peerapach Varalertsakul 2009: The Development of a Resources Sufficiency based Scheduling Algorithm. Master of Engineering (Computer Engineering), Major Field: Computer Engineering, Department of Computer Engineering. Thesis Advisor: Assistant Professor Putchong Uthayopas, Ph.D. 101 pages.

Currently, the large scale cluster systems have been employed to service many important science and engineering applications. However, large scale clusters usually consume a lot of power which is the cause of the high operation cost.

This thesis proposes an algorithm called Resources Sufficiency based Scheduling Algorithm. The objective is to reduce the power consumption in high performance large scale cluster. The approach is to turn on only a part of the system based on the dynamic demand of the applications. Moreover, the job delay is kept to a certain acceptable level agreed upon by users. This approach enables an energy efficient operation of the systems. In addition, this thesis is also study a behavior of the system when jobs with service level agreement (jobs that can not be delayed) are supported.

The results from the simulation clearly show that the proposed algorithm helps reduce the power consumption as much as 29% in some cases. In addition, the algorithm is still help reduce the power consumption in the presence of jobs with service level agreement. Finally, this algorithm can be used to design a job scheduling system for large scale clusters that can utilize the computing resources effectively.

Student's signature

Thesis Advisor's signature

____ / ____ / ____