A STATISTIC ANALYSIS OF NQS PARAMETER EFFECTIVENESS FOR THE RESOURCE USAGE IN THE SYSTEM

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Abstract. *The use of PC cluster systems composed of many PCs is largely spread in these days. It is important to improve system usage keeping proper fair-share policy. Job scheduling is a function that dynamically allocates submitted jobs to hardware resource in user program execution units. This optimization problem is difficult to solve because many parameter are connected. In scheduler software, there are many parameters and the effectiveness of many parameters is related with each other complicatedly. Therefore it is more difficult to find optimal parameter configuration to improve the system usage efficiency. So in this paper, we performed various analyses of those parameters and report the results.*
Keyword: NQS, Job scheduler, Simulator, Correlation, ANOVA, PC clusters parameter, Optimization

1. **Introduction.** The use of PC cluster systems composed of many PCs is largely spread and the advanced grid computing technology came to be of practical use by a network performance progress in these days. For system administrators of such a distributed system, the improvement of usage efficiency of system resource is one of the biggest themes, because it increases the value of the system.

Generally speaking, distributed systems as PC cluster or grid computing, are shared by a large number of users. So it is also important to build a proper fair-share policy for users. Each user has specific and unique needs, and this can lead to competition between the users for system resource. On the other hand, from system management standpoint, a necessity exists to actively endeavor towards an improvement in usage efficiency because the usage efficiency improvement shows not only how the supercomputer system is managed well but also shows how it contributes to the research activities in broad perspective.

In the Institute of Physical and Chemical Research (RIKEN), RIKEN Super Combined Cluster (RSCC), a large scale PC cluster of approximately 2000 CPUs successfully got in production as a supercomputer system in March 2003. Along with the increase of CPUs, the system usage optimization has been getting an even more difficult theme. The technology to help to solve this problem is a function called "job scheduling". It is offered as one function of system management software and is referred to as a scheduler. There are some schedulers commercially available, and NQS (Network Queuing System – Fujitsu Limited) is famous. Each of these products has their own unique characteristics. Currently the RIKEN uses NQS in RSCC.

Job scheduling is a function that dynamically allocates submitted jobs to hardware resource in user program execution (job) units. A scheduler receives job from users and executes jobs sequentially based on rules (policies). The rules are configured with an array