



## **Complete Research Report**

### **Impact of Fair Share on Parallel Job Scheduler**

**Researcher Dr. Sangsuree Vasupongayya**

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## Abstract

To better understand the impact and how to configure fair share used on production parallel job schedulers, the performance impact of fair share policies and its configurations are studied. The scheduling performance of fair share policies supported in four well-known production job schedulers are studied in comparison with FCFS-backfill and LXF-backfill policies, commonly used in many production supercomputing centers. All policies are evaluated by an event-driven simulator. A real workload trace is used as an input to the simulator. Both scheduling performance and fair share performance of all policies are studied and analyzed. The experimental results show that fair share policies, studied in this research have little impact on the average performance measures but they have a significant impact on the maximum wait time and individual users. More detail analysis shows that the fair share is fairer that is the heavy-demand users are not allowed to dominate the system resources. However, users with mixture of jobs may suffer poor performance which is the main problem caused by fair share policies implemented by using the priority mechanism. In addition, the fair share window size,  $fw$ , has a significant impact on the performance, in that a large fair share window size has the potential to starve heavy-demand users, but a small fair share window size could penalize light-demand users.