DINH DUY KHA
2019712308

An Analysis of Linux Scalability to Many Cores

Summary

This paper provides a study on scalability of seven common system applications running on a 48-core Linux system. It is discovered that six of out seven of the applications trigger a scalability bottleneck. From the findings, the authors propose a new technique to remove those bottleneck using parallel programming techniques, called *sloppy counters*.

Strengths

The authors are able to identify bottlenecks within the implementation of the kernel and provide fixes to remove them. These fixes greatly improve scalability to many cores of benchmarking applications.

A scalability benchmarking suit, MOSBENCH, is introduced consists of applications previously known not to scale well and applications designed for parallel execution. This can be a valuable tool for researchers and system designers to identify bottlenecks and design more scalable system.

The authors directly attack the current trend in operating system to move away from traditional kernel designs because the lack of scalability. This paper shows that traditional kernel designs could achieve scalability if implemented correctly.

Weaknesses

A modification to the kernel or the applications is required to apply the fixes, which might induce instability and bugs.

Fixes to the kernel might not be enough to remove the scalability issues, as real-life applications may have I/O bottlenecks.