The operating system of the future

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Operating-systems research challenges

The last decade has seen a number of disruptive trends that fundamentally change the requirements on operating systems. In this talk, I will outline some of these trends and the challenges they bring about, and I suggest areas of future systems research to help address these challenges. These trends include: ubiquitous multicore computing and parallel computing; virtualization; language runtimes; energy-efficient computing; and accelerators.

In the second part of my talk, I will switch gears and present the Advanced Synchronization Facility (ASF), an experimental AMD64 architecture extension aimed at one of these trends, parallel computing. ASF is designed to make parallel programming easier by supporting two styles of writing parallel programs: lock-free programming and transactional programming.