第 1 讲：Advanced OS Overview

第四节：Tendency of OS – Performance

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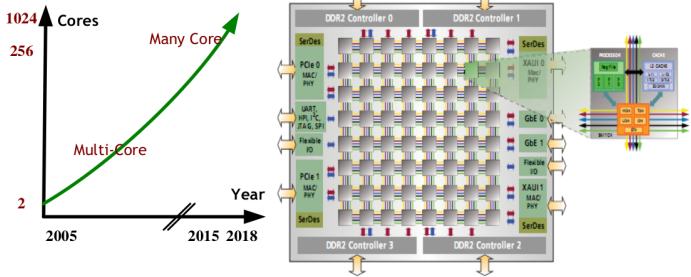
Tendency

- **Performance**
- Reliability
- Correctness

Multi-Core Challenges

- Today's Commodity Multi-Cores
- More cores can be integrated
  - E.g. Intel's 48-core chip & AMD's 64-core chip
  - More cores can be integrated, 1000+ cores (<10years)



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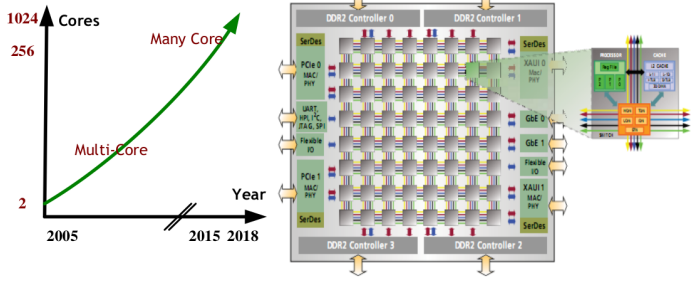

- However, can operating systems and applications use these cores effectively?

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- Solaris
- FreeBSD
- Windows
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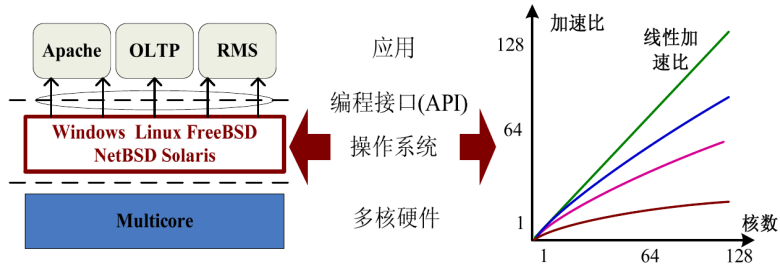

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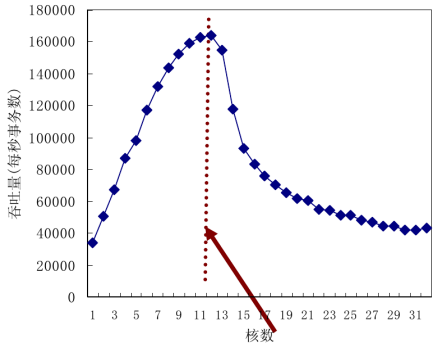

操作系统: Linux

实验平台: AMD 32 cores

测试程序: 文件服务器模拟

文件系统: tmpfs

可扩展性瓶颈: 保护文件描述符表和内存文件系统统计信息的自旋锁竞争

内核锁竞争导致吞吐量下降

Some Conclusions

- No system scales clearly better than another in all aspects for micro-benchmark test
- Linux and Solaris are competitive in application benchmark test, FreeBSD loses both in performance and scalability
- Kernel synchronizations protecting the shared data structure are the main bottlenecks on multi- core platform