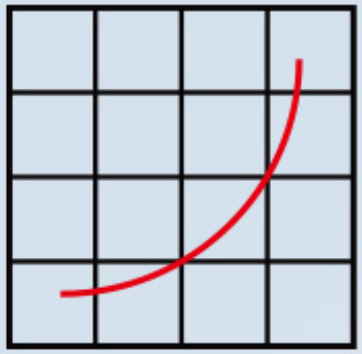

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SPEC CPU Benchmark Development

Jeff Reilly
SPEC CPU Committee Chair

Purpose and agenda

Purpose: Discuss how SPEC develops benchmarks and how SPEC CPU is likely to evolve.

Agenda:

- Information about the SPEC CPU development process
- Current expectations for the next SPEC CPU suite
- Questions and answers/feedback

Background: SPEC Organization

SPEC is an industry consortium cooperating to develop benchmarks.

- Members include HW manufacturers, SW vendors, academic institutions, end users.
- CPU benchmarks are developed by the CPU subcommittee of the SPEC Open Systems Group (OSG).

Current (as of Oct 2016) members of the SPEC OSG CPU subcommittee are: AMD, ARM, Dell, Fujitsu, HPE, IBM, Inspur, Intel, Nvidia, Oracle

Background: SPEC CPU subcommittee

Charter: To develop and maintain a cross platform and cross architecture benchmark suite allowing comparison of client, workstation and server systems on compute intensive tasks (measuring processor, memory and compiler).

Decision making is meant to be by consensus; voting sets directions and is required for final release.

SPEC benchmark development is a team effort.

Background: SPEC CPU

SPEC has released 5 CPU suites to date:

- CPU89, CPU92, CPU95, CPU2000, CPU2006

Why update?

- Technology evolves
- Usage models/applications evolve

CPU2006: Continues to be popular and used

An often overlooked fact is that benchmarks need to evolve with TIME…
Or
yesterday's 'good' benchmark may NOT be today's 'good' benchmark.

Example: Application considerations for SPEC CPU suite

Source code needs to be available to SPEC to distribute

Have the ability to create several workloads for the application. Meet SPEC's requirements for runtime and memory footprint.

Portable across platforms covered by subcommittee. Be "reasonably" language standard compliant.

Spend more than 95% of its time in the application code. Be bound by CPU, memory, compiler.

Have a reasonable profile.

Have output that is verifiable.

General considerations for a new CPU suite

Same general paradigm as CPU2006

- Enable cross platform/architecture comparisons
- Compute intensive (CPU(s), memory, compiler)
- Application based
- Integer and floating point metrics
- Speed and rate metrics
- Base and peak metrics
- Similar but updated platform coverage and tool sets

Areas SPEC is considering evolving

Update/evolve/add new applications

Re-evaluate runtime and memory requirements

Consider how technology has evolved:

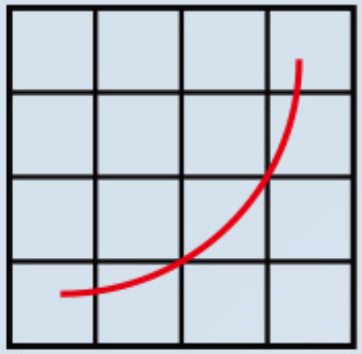
- parallelism, growth in core/thread count
- power considerations

What are your thoughts? What could SPEC do to make it more useful to you?

Final thoughts

SPEC is close to completing work on the next CPU suite.

People/organization interested in contributing to the development and maintenance of the suite should consider joining SPEC



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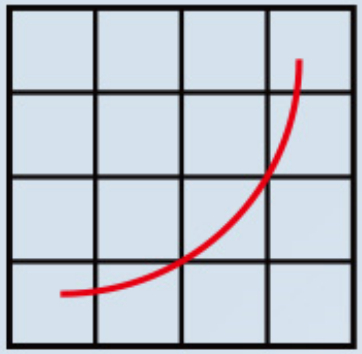
Q&A



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Thank you!

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