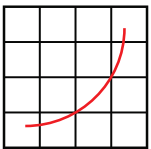


THE ASIAN SPEC SYMPOSIUM'16

**SPEC
SYMPOSIUM'16
PROGRAM**

**OCTOBER 27-28, 2016
BEIJING, CHINA**

Server Efficiency



spec[®] STANDARD PERFORMANCE EVALUATION CORPORATION

Welcome

Dear members of the Computing Industry and Server Efficiency Community,

We are delighted to welcome you to the SPEC Symposium'16 in Beijing, China. It is the first SPEC Symposium in Asia, which is considered the world's largest market for vendors and consumers of computer products and services.

SPEC has taken this excellent opportunity to bring together computing researchers, policy makers, government agencies, industry practitioners and others interested in performance and server efficiency evaluation to learn about SPEC, share ideas, discuss challenges and present results. The Symposium will show an overview of SPEC initiatives across a wide range of performance evaluation areas, and includes a more in-depth look at global server efficiency efforts.

The Organizing Committee has been invaluable in the smooth running of this event, and in particular we acknowledge the efforts of Arthur Kang, Juno Shi, and Lily Yu from Inspur, as well as Dianne Rice, Diana Cercy, and Bob Cramblitt from SPEC.

On behalf of the Organizing Committee we welcome you to Beijing and looking forward to fascinating presentations and stimulating discussion at the first SPEC Symposium in Asia.

Sincerely,

Walter Bays
SPEC President

Klaus-Dieter Lange
SPEC Symposium'16 - General Chair

- 8:30 **Registration**
- 9:00 **Welcome to the SPEC Symposium'16**
Walter Bays (Oracle), SPEC President
- 9:10 **Keynote - Server Efficiency in China**
Dr. Li Pengcheng (China National Institute of Standardization)
- 9:35 **SPEC - An Overview**
Steve Realmuto (Oracle), OSG Chair
- 9:55 **Designing a Good Benchmark – Part 1**
Jeremy Arnold (IBM), SPECpower Architect
- 10:20 **Tea Break**
- 10:40 **SPEC Research Group and Big Data**
Xiao Wei Zhang (IBM), SPEC Research Group Member
- 11:00 **Standard Performance Evaluation and Test Requirements for Chinese Server Market**
Leijun Hu (Inspur), Chief Scientist
- 11:20 **China Telecom SPECpower_ssj2008 Application & Practice**
Xianxu Li (China Telecom BSS/OSS Test Center), Director
- 11:40 **Three Point on Server Testing**
Jianghua Lu (CMCC Testing Research Institute), Manager
- 12:00 **Lunch**
- 13:00 **Welcome to the SPEC Symposium'16 on Server Efficiency**
Klaus-Dieter Lange (HPE), SPECpower Chair
- 13:20 **Designing a Good Benchmark – Part 2**
Jeremy Arnold (IBM), SPECpower Architect
- 14:00 **Server Efficiency Rating Tool (SERT) Overview (Design, Metric)**
Klaus-Dieter Lange (HPE), SPECpower Chair
Sanjay Sharma (Intel), SPECpower Vice-Chair
- 15:00 **Tea Break**
- 15:30 **ISO and Global Government Programs**
Henry Wong (ISO)
- 16:00 **Trends in Server Efficiency and Power Usage in Data Centers**
Sanjay Sharma (Intel), SPECpower Vice-Chair
- 16:30 **The Future of Server Efficiency and how it will be measured**
Klaus-Dieter Lange (HPE/SPEC), Henry Wong (ISO), David Reiner (AMD/TGG), and
Sanjay Sharma (Intel)
- 17:30 **Closing Remarks**

9:00 **Welcome to the Round Table and Information Sessions**

Klaus-Dieter Lange (HPE / SPEC Director)

9:10 **Benchmark of Enterprise HDD&SSD in China**

Liang Guo (Chair of Open Data Center Commit (ODCC))

9:40 **China SPEC Measures and the needs of the Chinese Market**

Chunyu Jiang (CAICT), David Reiner (AMD / SPEC GWPG), Arthur Kang (Inspur), and Mathew Colgrove (NVIDIA / SPEC HPG)

10:20 **SPEC CPU2006: A guide to what they are and how to use them**

Jeff Reilly (Intel / SPEC CPU Chair)

11:10 **Cloud Computing Trends**

Jeremy Arnold (IBM / SPECpower Architect)

Steve Realmuto (Oracle / OSG Chair)

12:00 **Lunch**

13:00 **The next Generation of the SPEC CPU benchmark – A practical Guide**

Jeff Reilly (Intel / SPEC CPU Chair)

13:50 **Big Data Trends**

Hui Lin (IBM / SPEC Research Group)

14:10 **Server Efficiency Rating Tool (SERT) Live Demonstration**

John Beckett (Dell / SPECpower Member)

15:00 **Closing Remarks**

Silver Sponsors:



Co-Host:



Gold Sponsor:



Standard Performance Evaluation Corporation

Overview

- Welcomes organizations to join and participate in our work
- A global non-profit consortium formed in 1988 to establish, maintain and endorse a standardized set of relevant benchmarks that can be applied to the newest generation of high-performance computers
- Development of benchmark suites, review and publication of submitted results
- 120+ computer hardware and software vendors, educational institutions, and government agencies
- Large repository of well documented, peer reviewed, benchmark results
- Understanding of workloads, benchmark code, fair comparisons across different platforms
- Stands ready to offer guidance on workloads and benchmark development

Philosophy

- Ensure that the marketplace has a fair and useful set of metrics to differentiate systems
- Provide a standardized suite of code that has already been ported to a wide variety of platforms

Advantages

- Costs of benchmarking are kept down since:
- Benchmarks are applicable to a range of platforms from single processor systems to clusters
- Benchmark code, drivers, and detailed run and reporting rules are provided by SPEC
- Peer review saves over 3rd party audits
- Benchmarks are retired and replaced every 3-7 years to keep pace with technology
- New benchmarks can be created whenever there is sufficient interest

Membership benefits

- Access to the cutting edge benchmark development
- Access to all benchmarks of a specific group
- Participation in development meetings
- Contribute their ideas - get information on the latest thinking in commercial engineering
- Real world experience for grad students aiding in dissertation research and job searches
- Connect with dozens of leading universities globally for research collaboration
- Participate in ICPE conference

Building A Great Benchmark

What is a benchmark?

A program (or suite of programs) used to assess the performance characteristics of one or more computer systems

Why do we need benchmarks?

Measure and study the behavior of a class of applications (or systems) in a practical and repeatable way

What are they used for?

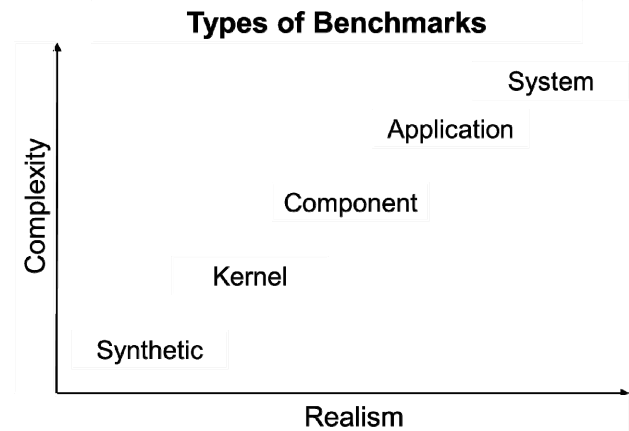
- Marketing
- Product development
- Quality assurance
- Environmental verification
- Research

What characteristics should they share?

- **Relevance**
They should mimic the behavior of some class of real applications, without being tied to or based on just one
- **Reproducibility**
They should produce results that can be reproduced by others deterministically given the same hardware
- **Fairness**
They enable competition between systems without imposing artificial constraints or bias
- **Verifiability**
All results produced can be verified to be accurate
- **Usability**
Ease of use encourages greater use, leading to more results and better accuracy

What components should they include?

- **Workload(s)**
- **Harness:** hosts the workloads and handles environment-specific configuration and UI
- **Reporting:** human and / or machine-readable
- **Documentation**
- **Run rules:** how should the benchmark be use
- **Peer review:** All results should be available for review by competitors and customers
- **Fair Use guidelines:** Rules on how to use or share results



The SPECpower Research Working Group

Mission Statement

Foster interaction between industry and academia by contributing research that enhances and promotes methods and tools for energy efficiency evaluation.

Group Focus

Power Metrics, Methodologies, and Workloads

Specific Goals

- Creation and enhancement of power measurement methodologies, with research focus
- Promotion of existing and modified SPEC tools through their use in research
- Creation of novel workloads for potential use in future SPEC products
- Conduct analysis of power-related methodologies, systems, and metrics
- Enable transfer of power-related research results between industry and academia

Industry – Research Collaboration Goals

- Utilize current industry challenges of OSG Power as inspiration to direct research
- Enhance OSG Power tools (such as Chauffeur WDK) according to needs of the research community

Topics of Interest

- **Measurement Methodology**
Deployment and measurement of advanced workloads
- **Workloads**
Create workloads for the evaluation of new device types (e.g., Accelerators, Networking)
Transfer new and popular workload types to industry standard benchmarks
Training and Validation of Power Models
- **Metrics**
Create and evaluate energy efficiency metrics
- **Methodology Verification**
Analyze existing measurement methodologies, workloads, and metrics

Glossary

Standard Performance Evaluation Corporation (SPEC)

SPEC is a non-profit corporation formed to establish, maintain and endorse a standardized set of relevant benchmarks and tools that can be applied to the newest generation of high-performance computers.

<http://www.spec.org/>

Server Efficiency Rating Tool (SERT)

The SERT suite measures the server energy efficiency and is designed to be simple to configure and use via a comprehensive graphical user interface.

<http://www.spec.org/sert/>

SPEC Power and Performance Benchmark Methodology

The document serves as an introduction to those who need to understand the relationship between power and performance metrics in computer systems benchmarks.

http://www.spec.org/power/docs/SPEC-Power_and_Performance_Methodology.pdf

SPEC PTDaemon

SPEC's power temperature daemon (also known as PTDaemon) is used by benchmarks to offload the work of controlling a power analyzer or temperature sensor during measurement intervals to a system other than the SUT.

http://www.spec.org/power/docs/SPECpower-Device_List.html

SPECpower_ssj2008 (aka power_ssj, or ssj)

The SPECpower_ssj2008 benchmark is the first industry-standard benchmark that evaluates the power and performance characteristics of single server and multi-node environment.

http://www.spec.org/power_ssj2008/

SPEC Chauffeur WDK

The Chauffeur Worklet Development Kit (WDK) was designed to simplify the development of workloads for measuring both performance and energy efficiency.

<http://www.spec.org/chauffeur-wdk/>

International Conference on Performance Engineering (ICPE)

This annual conference provides a forum for the integration of theory and practice in the field of performance engineering.

<https://icpe2017.spec.org/>