

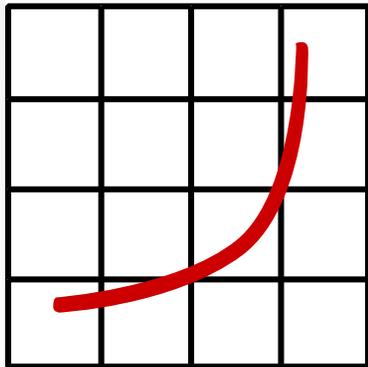
# Server Efficiency Rating Tool™

SERT 1.1.0 and beyond

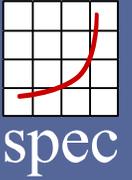
June 2014

Klaus-Dieter Lange

Chair, SPECpower Committee, SPEC



spec



# ENERGY STAR Stakeholder Meeting

Offices of the Information Technology Industry Council (ITIC)

Washington, DC, USA – 23.-24. June 2014

Efficiency Program Use / Regulations

SERT Enhancements

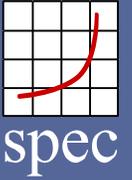
SERT 1.1.0

SERT Future

Q&A

# SPEC's Server Efficiency Rating Tool

## Efficiency Program Use / Regulations



### Execution

- Depending on efficiency program regulations, e.g. Certification Bodies may be required (qualified labs, currently US only)
- Acceptable tuning parameters will be defined by processor manufacturers and must be used for SERT testing

### Reporting

- User must provide a predefined set of information describing the hardware and software used for this report, partly discovered automatically by SERT
- Performance and power data, as defined in the SERT result file, must be sent to efficiency program institutions
- SERT results will be publicly available from efficiency program institutions, the format may vary from the original SERT result file, in addition aggregated data formats may be available

### Metrics

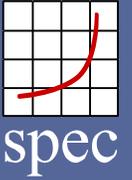
- Will be defined after reporting only phase based on available results, critical mass of results is necessary

### Acceptance criteria for efficiency labels

- Will be defined by efficiency program institutions
- Initial criteria without SERT scores, e.g. reporting only

# SPEC's Server Efficiency Rating Tool

## SERT Enhancements



### SERT Update

- [http://www.spec.org/sert/sert\\_patches/sert-update.html](http://www.spec.org/sert/sert_patches/sert-update.html)

### SPEC PTDaemon

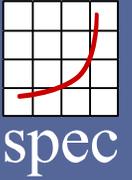
- Additional Power Analyzer
- [http://www.spec.org/power/docs/SPECpower-Device\\_List.html](http://www.spec.org/power/docs/SPECpower-Device_List.html)

### Additional Platform Support

- ARMv7 (SERT 1.0.2), Power8 (via downloadable configuration file)
- [http://www.spec.org/sert/docs/SERT-JVM\\_Options.html](http://www.spec.org/sert/docs/SERT-JVM_Options.html)

# SPEC's Server Efficiency Rating Tool

## SERT 1.1.0 1/2



Possible enhancements for SERT 1.1.0

### **SERT Update**

- [http://www.spec.org/sert/sert\\_patches/sert-update.html](http://www.spec.org/sert/sert_patches/sert-update.html)

### **Additional Platform Support**

- SPARC on Solaris, Power8 on AIX , Windows 2012 RC2 on x86 (AMD and Intel)

### **Further Enhancements**

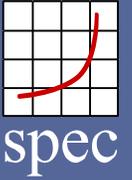
- Automatic Hardware/Software Discovery
- NUMA-Aware Affinity Generator
- Heap-size allocation

### **GUI**

- Add GUI support for handling multi-node environment
- Additional functionality, e.g., automatic range-setting, multi-channel support

# SPEC's Server Efficiency Rating Tool

## SERT 1.1.0 2/2



Possible enhancements for SERT 1.1.0

### **Memory Worklet improvement**

- Lower slope on linear scaling

### **Storage Worklet improvement**

- 100% Target Load stabilization
- Need clarification on shared storage configuration

### **Worklet improvement**

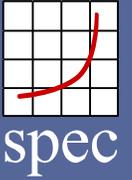
- General improvement for extreme configuration cases

### **SERT Scoring**

- Finalize data analysis and converged on a scoring system

# SPEC's Server Efficiency Rating Tool

## SERT Future 1/3



### Suggested enhancements for SERT Future

#### **SERT Update**

- [http://www.spec.org/sert/sert\\_patches/sert-update.html](http://www.spec.org/sert/sert_patches/sert-update.html)
- Additional Platform Support

#### **Reporter**

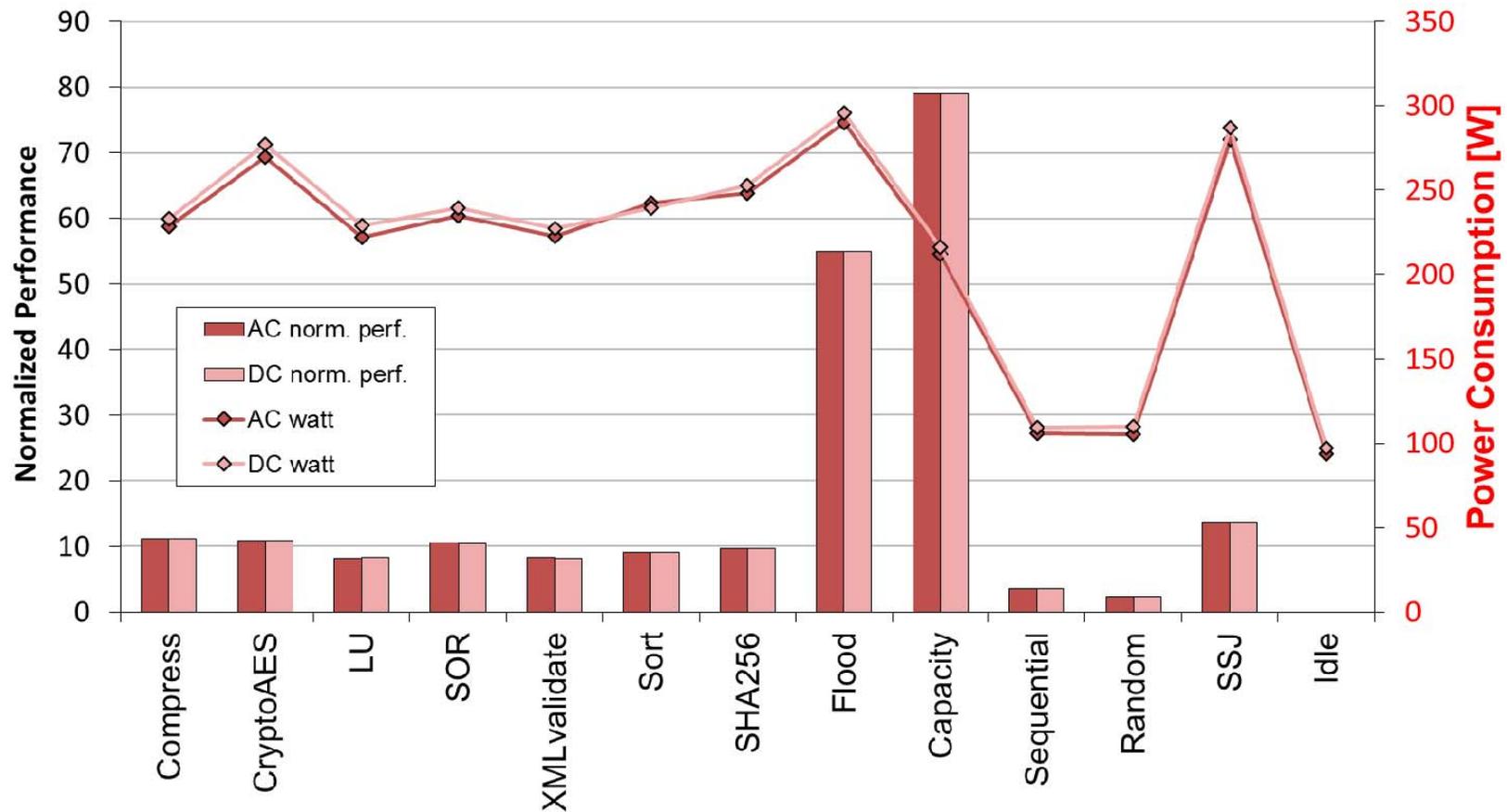
- Customized output-file for different energy efficiency programs

#### **Added Functionality**

- DC Support

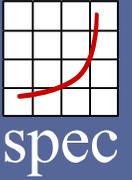


### AC (230V) - DC (48V) comparison



# SPEC's Server Efficiency Rating Tool

## SERT Future 3/3: New Worklets

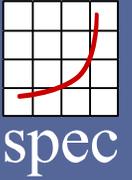


Suggested enhancements for SERT Future

### **Chauffeur Worklet Development Kit (WDK)**

- Chauffeur was designed to simplify the development of workloads for measuring both performance and energy efficiency.  
03/18/2014: SPEC released Chauffeur-WDK, designed for use in developing new SERT worklets.
- <http://www.spec.org/chauffeur-wdk/>

### **Closer Look at HW Accelerators**



### Resources

#### **Server Efficiency Rating Tool home page**

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

#### **SERT Design Document**

- <http://www.spec.org/sert/docs/designdocument.pdf>

#### **Chauffeur Worklet Development Kit (WDK)**

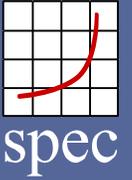
- <http://www.spec.org/chauffeur-wdk/>

#### **SPEC PTDaemon**

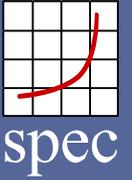
- [http://www.spec.org/power/docs/SPECpower-Device\\_List.html](http://www.spec.org/power/docs/SPECpower-Device_List.html)

#### **SPEC Benchmark Methodology**

- [http://www.spec.org/power/docs/SPEC-Power\\_and\\_Performance\\_Methodology.pdf](http://www.spec.org/power/docs/SPEC-Power_and_Performance_Methodology.pdf)



Thank you!



SPEC would like to acknowledge the people who have contributed to the design, development, testing and overall success of the SERT.

### **Development Team (current and past)**

- Ashok Emani, Christian Koopman, Cloyce Spradling, David Ott, Greg Darnell, Hansfried Block, Jeremy Arnold, John Beckett, Karin Wulf, Jeff Underhill, Klaus Lange, Mike Tricker, Nathan Totura, Sanjay Sharma, Karl Huppler, and Van Smith

### **Development Support (current and past)**

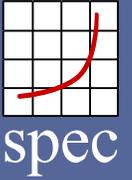
- Charles Pogue, David Mulnix, Peter Klassen, Shreeharsha G. Neelakantachar, and Thomas Brand

### **Administrative Support**

- Bob Cramblitt, Cathy Sandifer, Charles McKay, Dianne Rice, Elden Sodowsky, and Jason Glick

### **Corporate Support**

- ARM, AMD, Dell, Fujitsu, HP, Intel, IBM, Microsoft, and Oracle



## Backup Slide(s)

# SPEC's Server Efficiency Rating Tool

## Hardware and Software Configuration



### Controller and SUT

