



# SPEC<sup>®</sup> CFP2006 Result

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## Huawei

SPECfp<sup>®</sup>2006 = **51.1**

Huawei RH2288A V2 (Intel Xeon E5-2603 v2)

SPECfp\_base2006 = **49.7**

CPU2006 license: 3175

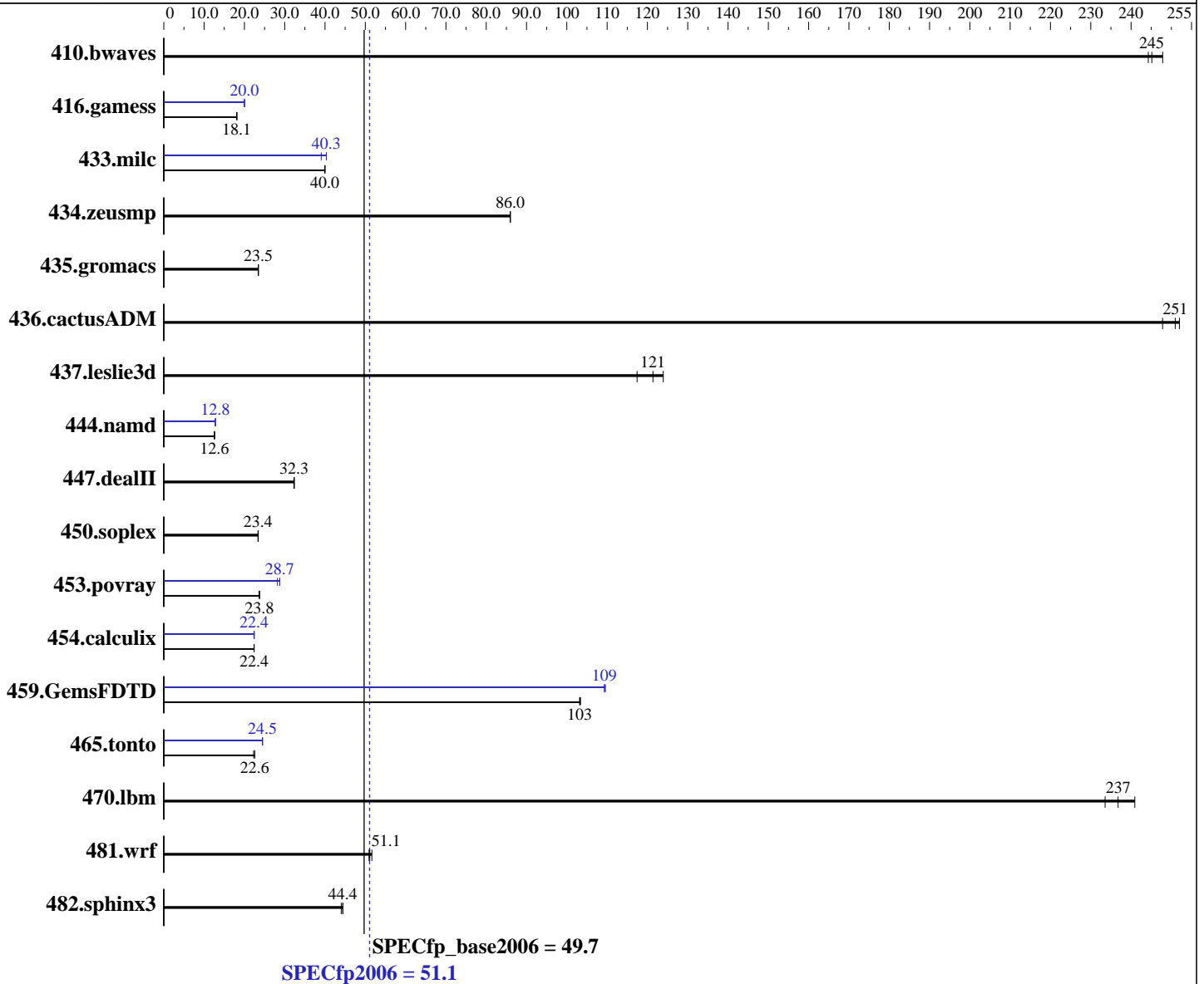
Test date: Aug-2014

Test sponsor: Huawei

Hardware Availability: Sep-2013

Tested by: Huawei

Software Availability: Nov-2013



| Hardware             |                                    |
|----------------------|------------------------------------|
| CPU Name:            | Intel Xeon E5-2603 v2              |
| CPU Characteristics: |                                    |
| CPU MHz:             | 1800                               |
| FPU:                 | Integrated                         |
| CPU(s) enabled:      | 8 cores, 2 chips, 4 cores/chip     |
| CPU(s) orderable:    | 1,2 chip                           |
| Primary Cache:       | 32 KB I + 32 KB D on chip per core |
| Secondary Cache:     | 256 KB I+D on chip per core        |

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| Software          |  |
|-------------------|--|
| Operating System: | Red Hat Enterprise Linux Server release 6.5 (Santiago)           |
|                   | 2.6.32-431.el6.x86_64  |
| Compiler:         | C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;      |
|                   | Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux |
| Auto Parallel:    | Yes  |
| File System:      | ext4   |

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L3 Cache: 10 MB I+D on chip per chip  
Other Cache: None  
Memory: 128 GB (8 x 16 GB 2Rx4 PC3-14900R-11, ECC, running at 1333 MHz)  
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
Other Hardware: None

System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: None

## Results Table

| Benchmark     | Base        |             |             |             |             |             | Peak        |             |             |             |             |             |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|               | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       |
| 410.bwaves    | 54.8        | 248         | <b>55.4</b> | <b>245</b>  | 55.6        | 244         | 54.8        | 248         | <b>55.4</b> | <b>245</b>  | 55.6        | 244         |
| 416.gamess    | <b>1081</b> | <b>18.1</b> | 1081        | 18.1        | 1080        | 18.1        | 978         | 20.0        | 980         | 20.0        | <b>979</b>  | <b>20.0</b> |
| 433.milc      | 230         | 40.0        | 230         | 40.0        | <b>230</b>  | <b>40.0</b> | 228         | 40.3        | 235         | 39.1        | <b>228</b>  | <b>40.3</b> |
| 434.zeusmp    | 106         | 86.0        | 106         | 86.0        | <b>106</b>  | <b>86.0</b> | 106         | 86.0        | 106         | 86.0        | <b>106</b>  | <b>86.0</b> |
| 435.gromacs   | <b>304</b>  | <b>23.5</b> | 305         | 23.4        | 304         | 23.5        | <b>304</b>  | <b>23.5</b> | 305         | 23.4        | 304         | 23.5        |
| 436.cactusADM | <b>47.6</b> | <b>251</b>  | 48.2        | 248         | 47.4        | 252         | <b>47.6</b> | <b>251</b>  | 48.2        | 248         | 47.4        | 252         |
| 437.leslie3d  | 75.8        | 124         | 80.0        | 117         | <b>77.4</b> | <b>121</b>  | 75.8        | 124         | 80.0        | 117         | <b>77.4</b> | <b>121</b>  |
| 444.namd      | <b>637</b>  | <b>12.6</b> | 637         | 12.6        | 638         | 12.6        | <b>627</b>  | <b>12.8</b> | 627         | 12.8        | 627         | 12.8        |
| 447.dealII    | 353         | 32.4        | <b>354</b>  | <b>32.3</b> | 354         | 32.3        | 353         | 32.4        | <b>354</b>  | <b>32.3</b> | 354         | 32.3        |
| 450.soplex    | <b>357</b>  | <b>23.4</b> | 357         | 23.4        | 356         | 23.4        | <b>357</b>  | <b>23.4</b> | 357         | 23.4        | 356         | 23.4        |
| 453.povray    | 225         | 23.6        | <b>224</b>  | <b>23.8</b> | 224         | 23.8        | 185         | 28.8        | <b>185</b>  | <b>28.7</b> | 189         | 28.2        |
| 454.calculix  | 368         | 22.4        | <b>368</b>  | <b>22.4</b> | 368         | 22.4        | <b>368</b>  | <b>22.4</b> | 368         | 22.4        | 368         | 22.4        |
| 459.GemsFDTD  | <b>103</b>  | <b>103</b>  | 103         | 103         | 103         | 103         | <b>97.0</b> | <b>109</b>  | 96.8        | 110         | 97.0        | 109         |
| 465.tonto     | 436         | 22.6        | 442         | 22.3        | <b>436</b>  | <b>22.6</b> | 402         | 24.5        | <b>402</b>  | <b>24.5</b> | 402         | 24.5        |
| 470.lbm       | <b>58.0</b> | <b>237</b>  | 58.8        | 234         | 57.0        | 241         | <b>58.0</b> | <b>237</b>  | 58.8        | 234         | 57.0        | 241         |
| 481.wrf       | <b>219</b>  | <b>51.1</b> | 219         | 50.9        | 216         | 51.6        | <b>219</b>  | <b>51.1</b> | 219         | 50.9        | 216         | 51.6        |
| 482.sphinx3   | 439         | 44.4        | 443         | 44.0        | <b>439</b>  | <b>44.4</b> | 439         | 44.4        | 443         | 44.0        | <b>439</b>  | <b>44.4</b> |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

## Platform Notes

BIOS configuration:  
Set Power Efficiency Mode to Custom  
Baseboard Management Controller used to adjust the fan speed to 100%  
Sysinfo program /spec/config/sysinfo.rev6800  
\$Rev: 6800 \$ \$Date:: 2011-10-11 #\$ 6f2ebdff5032aaa42e583f96b07f99d3  
running on localhost Sat Aug 30 14:02:34 2014

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page



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Hardware Availability: Sep-2013

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## Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) CPU E5-2603 v2 @ 1.80GHz
 2 "physical id"s (chips)
 8 "processors"
```

cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

```
cpu cores : 4
siblings   : 4
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB
```

From /proc/meminfo

```
MemTotal:      132103760 kB
HugePages_Total: 0
Hugepagesize:   2048 kB
```

/usr/bin/lsb\_release -d

```
Red Hat Enterprise Linux Server release 6.5 (Santiago)
```

From /etc/\*release\* /etc/\*version\*

```
redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

uname -a:

```
Linux localhost 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Aug 29 00:48

SPEC is set to: /spec

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal        ext4  439G   74G  343G  18% /
```

Additional information from dmidecode:

Memory:

```
8x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank
```

(End of data from sysinfo program)

Dmidecode mistakenly believes the memory was running at 1866 MHz, when it should only run at 1333 MHz

## General Notes

Environment variables set by runspec before the start of the run:

```
KMP_AFFINITY = "granularity=fine,compact,0,1"
LD_LIBRARY_PATH = "/spec/libs/32:/spec/libs/64"
OMP_NUM_THREADS = "8"
```

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## General Notes (Continued)

Binaries compiled on a system with 2x Xeon X5645 CPU + 16GB memory using RHEL 6.1

Transparent Huge Pages enabled with:

```
echo always >
```

The Huawei RH2288A V2 and Huawei RH1288A V2

are electronically equivalent.

The results have been measured on a Huawei RH2288A V2 model

## Base Compiler Invocation

C benchmarks:

```
icc -m64
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
icc -m64 ifort -m64
```

## Base Portability Flags

```

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.deallI: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

```



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## Base Optimization Flags

C benchmarks:

`-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch  
-ansi-alias`

C++ benchmarks:

`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias`

Fortran benchmarks:

`-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

Benchmarks using both Fortran and C:

`-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch  
-ansi-alias`

## Peak Compiler Invocation

C benchmarks:

`icc -m64`

C++ benchmarks:

`icpc -m64`

Fortran benchmarks:

`ifort -m64`

Benchmarks using both Fortran and C:

`icc -m64 ifort -m64`

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

`433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32  
-ansi-alias`

`470.lbm: basepeak = yes`

`482.sphinx3: basepeak = yes`

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -fno-alias  
-auto-ilp32

447.dealIII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2  
-inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc  
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.html>

<http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.0-IVB-RevG.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml>

<http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.0-IVB-RevG.xml>

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