



# SPEC<sup>®</sup> CFP2006 Result

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## Huawei

SPECfp<sup>®</sup>2006 = 76.5

Huawei RH2288 V3 (Intel Xeon E5-2670 v3)

SPECfp\_base2006 = 71.6

CPU2006 license: 3175

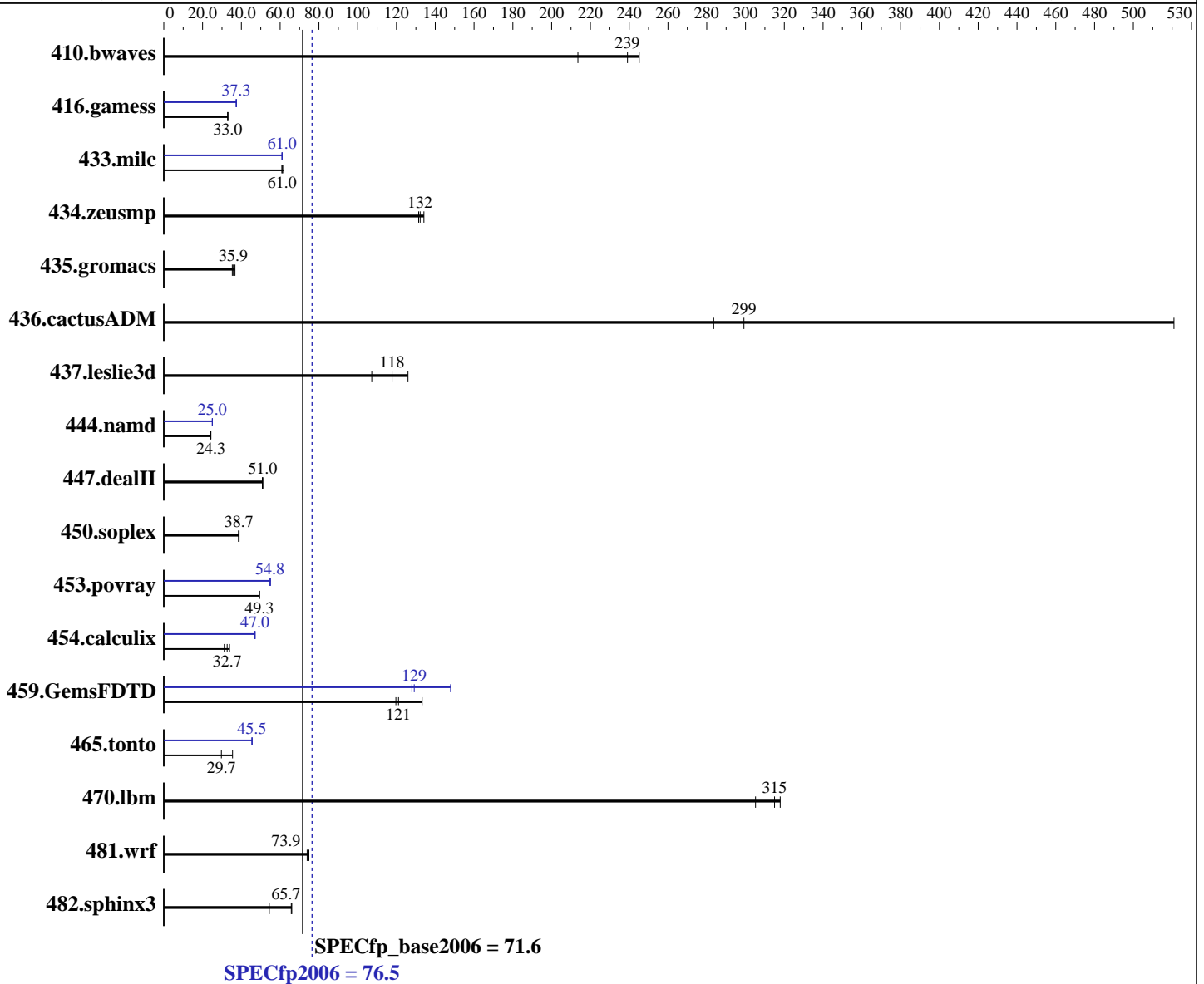
Test date: Aug-2014

Test sponsor: Huawei

Hardware Availability: Sep-2014

Tested by: Huawei

Software Availability: Nov-2013



### Hardware

CPU Name: Intel Xeon E5-2670 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 2 chips, 12 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 14.0.0.080 of Intel C++ Studio XE for Linux;  
 Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 30 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
 Disk Subsystem: 1 x 256 GB SATA, SSD  
 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    | <b><u>56.8</u></b> | <b><u>239</u></b>  | 63.6               | 214                | 55.4               | 245                | <b><u>56.8</u></b> | <b><u>239</u></b>  | 63.6               | 214                | 55.4               | 245                |
| 416.gamess    | 593                | 33.0               | 594                | 33.0               | <b><u>594</u></b>  | <b><u>33.0</u></b> | 525                | 37.3               | 522                | 37.5               | <b><u>524</u></b>  | <b><u>37.3</u></b> |
| 433.milc      | 151                | 60.9               | 149                | 61.7               | <b><u>150</u></b>  | <b><u>61.0</u></b> | <b><u>151</u></b>  | <b><u>61.0</u></b> | 150                | 61.0               | 151                | 61.0               |
| 434.zeusmp    | <b><u>68.8</u></b> | <b><u>132</u></b>  | 67.8               | 134                | 69.2               | 131                | <b><u>68.8</u></b> | <b><u>132</u></b>  | 67.8               | 134                | 69.2               | 131                |
| 435.gromacs   | <b><u>199</u></b>  | <b><u>35.9</u></b> | 195                | 36.7               | 202                | 35.3               | <b><u>199</u></b>  | <b><u>35.9</u></b> | 195                | 36.7               | 202                | 35.3               |
| 436.cactusADM | 42.1               | 284                | <b><u>39.9</u></b> | <b><u>299</u></b>  | 22.9               | 521                | 42.1               | 284                | <b><u>39.9</u></b> | <b><u>299</u></b>  | 22.9               | 521                |
| 437.leslie3d  | 87.6               | 107                | <b><u>79.8</u></b> | <b><u>118</u></b>  | 74.6               | 126                | 87.6               | 107                | <b><u>79.8</u></b> | <b><u>118</u></b>  | 74.6               | 126                |
| 444.namd      | 331                | 24.3               | 331                | 24.3               | <b><u>331</u></b>  | <b><u>24.3</u></b> | 320                | 25.0               | 320                | 25.0               | <b><u>320</u></b>  | <b><u>25.0</u></b> |
| 447.dealII    | <b><u>224</u></b>  | <b><u>51.0</u></b> | 224                | 51.0               | 225                | 50.8               | <b><u>224</u></b>  | <b><u>51.0</u></b> | 224                | 51.0               | 225                | 50.8               |
| 450.soplex    | <b><u>216</u></b>  | <b><u>38.7</u></b> | 215                | 38.8               | 216                | 38.5               | <b><u>216</u></b>  | <b><u>38.7</u></b> | 215                | 38.8               | 216                | 38.5               |
| 453.povray    | 108                | 49.3               | 108                | 49.1               | <b><u>108</u></b>  | <b><u>49.3</u></b> | <b><u>97.1</u></b> | <b><u>54.8</u></b> | 96.7               | 55.0               | 97.1               | 54.8               |
| 454.calculix  | 243                | 33.9               | 265                | 31.2               | <b><u>253</u></b>  | <b><u>32.7</u></b> | 175                | 47.0               | 175                | 47.0               | <b><u>175</u></b>  | <b><u>47.0</u></b> |
| 459.GemsFDTD  | 88.6               | 120                | 79.6               | 133                | <b><u>87.7</u></b> | <b><u>121</u></b>  | 71.7               | 148                | 82.9               | 128                | <b><u>82.2</u></b> | <b><u>129</u></b>  |
| 465.tonto     | <b><u>331</u></b>  | <b><u>29.7</u></b> | 340                | 29.0               | 278                | 35.5               | <b><u>216</u></b>  | <b><u>45.5</u></b> | 216                | 45.5               | 216                | 45.5               |
| 470.lbm       | 43.2               | 318                | <b><u>43.6</u></b> | <b><u>315</u></b>  | 45.0               | 305                | 43.2               | 318                | <b><u>43.6</u></b> | <b><u>315</u></b>  | 45.0               | 305                |
| 481.wrf       | <b><u>151</u></b>  | <b><u>73.9</u></b> | 156                | 71.7               | 149                | 74.8               | <b><u>151</u></b>  | <b><u>73.9</u></b> | 156                | 71.7               | 149                | 74.8               |
| 482.sphinx3   | 358                | 54.4               | <b><u>296</u></b>  | <b><u>65.7</u></b> | 295                | 66.0               | 358                | 54.4               | <b><u>296</u></b>  | <b><u>65.7</u></b> | 295                | 66.0               |

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  
 Set Snoop Mode to HS  
 Set Hyper-Threading to Disabled  
 Baseboard Management Controller used to adjust the fan speed to 100%  
 Sysinfo program /spec/config/sysinfo.rev6818  
 \$Rev: 6818 \$ \$Date:: 2012-07-17 # \$ e86d102572650a6e4d596a3cee98f191  
 running on xjt Thu Aug 28 20:19:22 2014

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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## Platform Notes (Continued)

some common utilities. To remove or add to this section, see:  
<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2670 v3 @ 2.30GHz
 2 "physical id"s (chips)
 24 "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 : 12
  siblings  : 12
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
cache size : 30720 KB

```

```

From /proc/meminfo
MemTotal:      264301908 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 xjt 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 28 14:30

```

SPEC is set to: /spec
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal       ext4  222G  110G  101G  53% /

```

Additional information from dmidecode:

```

BIOS Insyde Corp. 8.09 07/14/2014
Memory:
 8x NO DIMM NO DIMM      3 rank
 8x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 1 rank
 8x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank

```

(End of data from sysinfo program)



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## General Notes

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

LD\_LIBRARY\_PATH = "/spec/libs/32:/spec/libs/64:/spec/sh"

OMP\_NUM\_THREADS = "24"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled

runspec command invoked through numactl i.e.:

numactl --interleave=all runspec <etc>

## 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.dealII: -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:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-auto-ilp32 -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2(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-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2 -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-ic14.0-official-linux64.20140128.html>

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



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

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml>

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

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Wed Oct 22 12:19:53 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 22 October 2014.