



SPEC® CFP2006 Result

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Huawei

SPECfp®2006 = 154

Huawei 2288H V5 (Intel Xeon Platinum 8168)

SPECfp_base2006 = 147

CPU2006 license: 3175

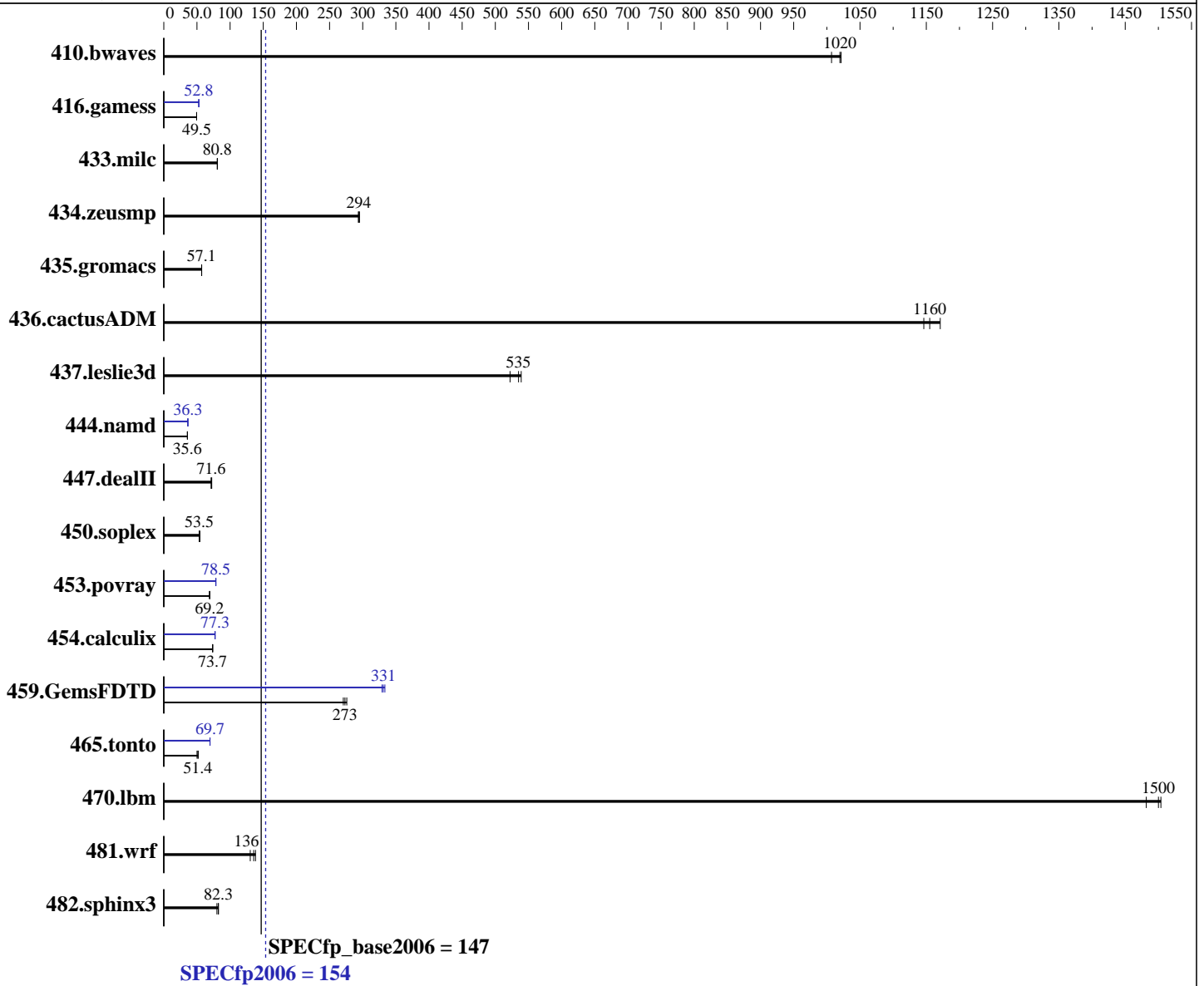
Test sponsor: Huawei

Tested by: Huawei

Test date: Jun-2017

Hardware Availability: Aug-2017

Software Availability: Nov-2016



Hardware

CPU Name: Intel Xeon Platinum 8168
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
 CPU MHz: 2700
 FPU: Integrated
 CPU(s) enabled: 48 cores, 2 chips, 24 cores/chip
 CPU(s) orderable: 1,2 chip
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core

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Software

Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo)
 3.10.0-514.el7.x86_64
 Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux;
 Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux
 Auto Parallel: Yes
 File System: xfs

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L3 Cache: 33 MB I+D on chip per chip
 Other Cache: None
 Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
 Disk Subsystem: 1 x 1200 GB SAS, 10000 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 | 13.3 | 1020 | 13.5 | 1010 | <u>13.3</u> | <u>1020</u> | 13.3 | 1020 | 13.5 | 1010 | <u>13.3</u> | <u>1020</u> |
| 416.gamess | 396 | 49.4 | 395 | 49.5 | <u>395</u> | <u>49.5</u> | 370 | 52.9 | 371 | 52.7 | <u>371</u> | <u>52.8</u> |
| 433.milc | <u>114</u> | <u>80.8</u> | 113 | 80.9 | 114 | 80.6 | <u>114</u> | <u>80.8</u> | 113 | 80.9 | 114 | 80.6 |
| 434.zeusmp | 31.0 | 293 | 30.8 | 295 | <u>30.9</u> | <u>294</u> | 31.0 | 293 | 30.8 | 295 | <u>30.9</u> | <u>294</u> |
| 435.gromacs | 125 | 57.0 | 125 | 57.2 | <u>125</u> | <u>57.1</u> | 125 | 57.0 | 125 | 57.2 | <u>125</u> | <u>57.1</u> |
| 436.cactusADM | 10.4 | 1150 | 10.2 | 1170 | <u>10.3</u> | <u>1160</u> | 10.4 | 1150 | 10.2 | 1170 | <u>10.3</u> | <u>1160</u> |
| 437.leslie3d | <u>17.6</u> | <u>535</u> | 18.0 | 522 | 17.4 | 539 | <u>17.6</u> | <u>535</u> | 18.0 | 522 | 17.4 | 539 |
| 444.namd | 225 | 35.6 | <u>225</u> | <u>35.6</u> | 225 | 35.6 | 221 | 36.3 | <u>221</u> | <u>36.3</u> | 221 | 36.3 |
| 447.dealII | <u>160</u> | <u>71.6</u> | 160 | 71.4 | 158 | 72.3 | <u>160</u> | <u>71.6</u> | 160 | 71.4 | 158 | 72.3 |
| 450.soplex | <u>156</u> | <u>53.5</u> | 153 | 54.5 | 156 | 53.4 | <u>156</u> | <u>53.5</u> | 153 | 54.5 | 156 | 53.4 |
| 453.povray | <u>76.9</u> | <u>69.2</u> | 77.3 | 68.8 | 76.6 | 69.5 | <u>67.8</u> | <u>78.5</u> | 67.6 | 78.7 | 67.9 | 78.3 |
| 454.calculix | 112 | 73.7 | 112 | 73.7 | <u>112</u> | <u>73.7</u> | 106 | 77.5 | 107 | 77.1 | <u>107</u> | <u>77.3</u> |
| 459.GemsFDTD | 39.2 | 271 | <u>38.8</u> | <u>273</u> | 38.4 | 276 | <u>32.0</u> | <u>331</u> | 31.8 | 334 | 32.2 | 329 |
| 465.tonto | 196 | 50.1 | <u>192</u> | <u>51.4</u> | 189 | 51.9 | 141 | 69.6 | 141 | 69.7 | <u>141</u> | <u>69.7</u> |
| 470.lbm | 9.14 | 1500 | <u>9.16</u> | <u>1500</u> | 9.27 | 1480 | 9.14 | 1500 | <u>9.16</u> | <u>1500</u> | 9.27 | 1480 |
| 481.wrf | <u>82.4</u> | <u>136</u> | 80.8 | 138 | 85.7 | 130 | <u>82.4</u> | <u>136</u> | 80.8 | 138 | 85.7 | 130 |
| 482.sphinx3 | 243 | 80.1 | <u>237</u> | <u>82.3</u> | 237 | 82.3 | 243 | 80.1 | <u>237</u> | <u>82.3</u> | 237 | 82.3 |

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 Hyper-Threading to Disable
 Sysinfo program /spec17/config/sysinfo.rev6993
 Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
 running on localhost.localdomain Tue Jun 20 00:18:03 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

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Platform Notes (Continued)

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Platinum 8168 CPU @ 2.70GHz
 2 "physical id"s (chips)
 48 "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 : 24
  siblings  : 24
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
cache size : 33792 KB

```

```

From /proc/meminfo
MemTotal:      394145204 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

```

```

uname -a:
Linux localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13
EDT 2016 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Jun 19 11:29

```

SPEC is set to: /spec17
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   262G  85G  177G  33% /

```

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS INSYDE Corp. 0.10 02/14/2017

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Platform Notes (Continued)

Memory:
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/spec17/libs/32:/spec17/libs/64:/spec17/sh10.2"
OMP_NUM_THREADS = "48"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/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

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Base Portability Flags (Continued)

```

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

```

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

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



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Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0
-qopt-prefetch -parallel

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3
-auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

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Peak Optimization Flags (Continued)

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

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-ic17.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.xml>

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For other inquiries, please contact webmaster@spec.org.

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