



# SPEC® CFP2006 Result

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## Huawei

**SPECfp®2006 = 146**

Huawei 2288H V5 (Intel Xeon Gold 6132)

**SPECfp\_base2006 = 139**

CPU2006 license: 3175

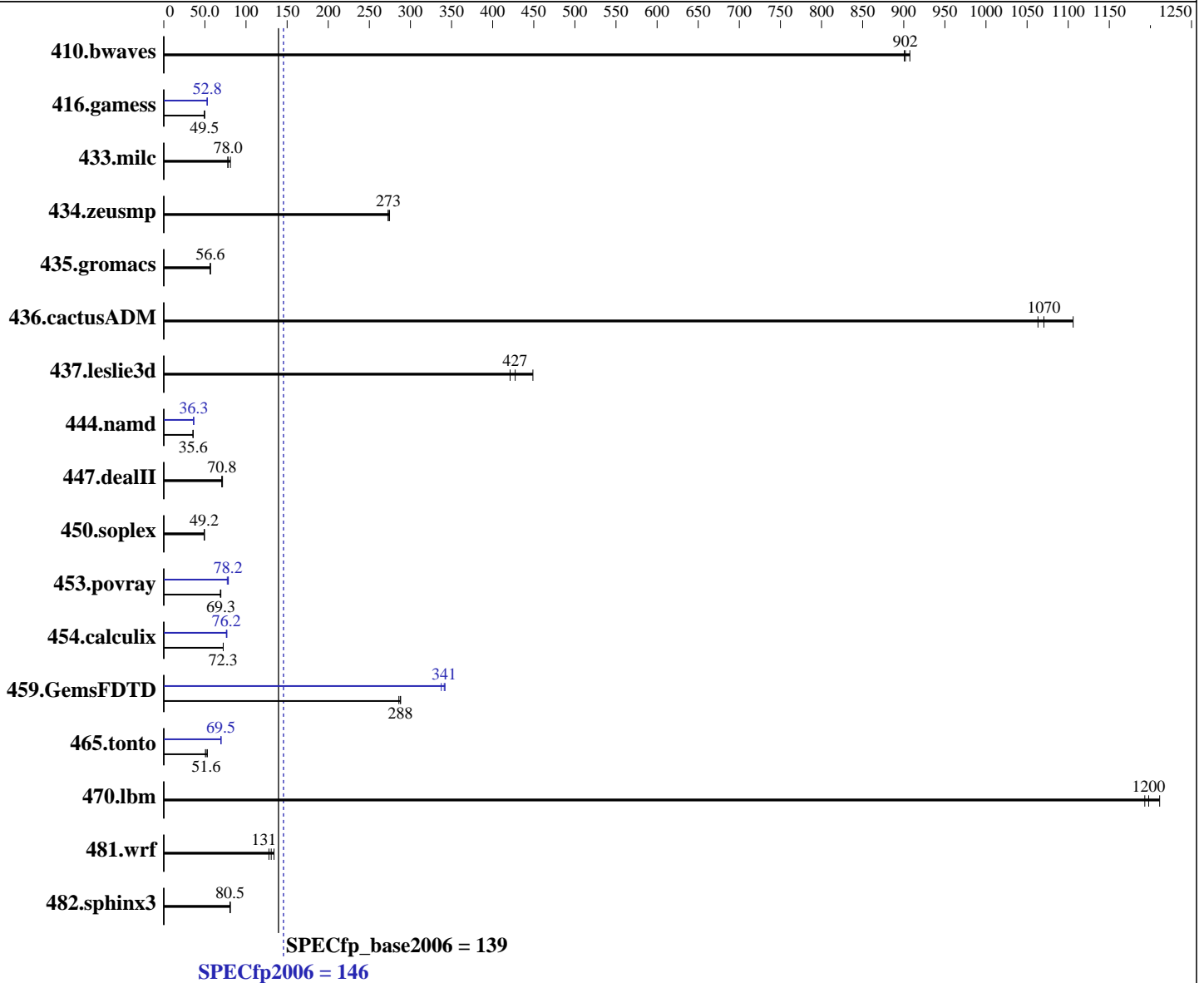
Test date: Jun-2017

Test sponsor: Huawei

Hardware Availability: Aug-2017

Tested by: Huawei

Software Availability: Nov-2016



### Hardware

CPU Name: Intel Xeon Gold 6132  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 28 cores, 2 chips, 14 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: 19.25 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	<b><u>15.1</u></b>	<b><u>902</u></b>	15.1	901	15.0	907	<b><u>15.1</u></b>	<b><u>902</u></b>	15.1	901	15.0	907
416.gamess	395	49.6	<b><u>395</u></b>	<b><u>49.5</u></b>	395	49.5	371	52.8	371	52.7	<b><u>371</u></b>	<b><u>52.8</u></b>
433.milc	118	77.9	113	81.0	<b><u>118</u></b>	<b><u>78.0</u></b>	118	77.9	113	81.0	<b><u>118</u></b>	<b><u>78.0</u></b>
434.zeusmp	33.3	273	<b><u>33.3</u></b>	<b><u>273</u></b>	33.1	275	33.3	273	<b><u>33.3</u></b>	<b><u>273</u></b>	33.1	275
435.gromacs	<b><u>126</u></b>	<b><u>56.6</u></b>	126	56.7	126	56.6	<b><u>126</u></b>	<b><u>56.6</u></b>	126	56.7	126	56.6
436.cactusADM	11.2	1060	<b><u>11.2</u></b>	<b><u>1070</u></b>	10.8	1110	11.2	1060	<b><u>11.2</u></b>	<b><u>1070</u></b>	10.8	1110
437.leslie3d	20.9	449	22.3	421	<b><u>22.0</u></b>	<b><u>427</u></b>	20.9	449	22.3	421	<b><u>22.0</u></b>	<b><u>427</u></b>
444.namd	225	35.6	225	35.6	<b><u>225</u></b>	<b><u>35.6</u></b>	221	36.3	221	36.3	<b><u>221</u></b>	<b><u>36.3</u></b>
447.dealII	160	71.4	<b><u>162</u></b>	<b><u>70.8</u></b>	162	70.5	160	71.4	<b><u>162</u></b>	<b><u>70.8</u></b>	162	70.5
450.soplex	<b><u>170</u></b>	<b><u>49.2</u></b>	169	49.5	170	49.2	<b><u>170</u></b>	<b><u>49.2</u></b>	169	49.5	170	49.2
453.povray	76.6	69.4	<b><u>76.8</u></b>	<b><u>69.3</u></b>	77.4	68.8	<b><u>68.1</u></b>	<b><u>78.2</u></b>	67.7	78.6	68.9	77.2
454.calculix	114	72.3	114	72.3	<b><u>114</u></b>	<b><u>72.3</u></b>	107	76.8	<b><u>108</u></b>	<b><u>76.2</u></b>	108	76.2
459.GemsFDTD	36.8	288	37.1	286	<b><u>36.9</u></b>	<b><u>288</u></b>	31.0	342	<b><u>31.1</u></b>	<b><u>341</u></b>	31.4	337
465.tonto	<b><u>191</u></b>	<b><u>51.6</u></b>	186	53.0	194	50.6	142	69.5	<b><u>142</u></b>	<b><u>69.5</u></b>	141	69.5
470.lbm	<b><u>11.5</u></b>	<b><u>1200</u></b>	11.3	1210	11.5	1190	<b><u>11.5</u></b>	<b><u>1200</u></b>	11.3	1210	11.5	1190
481.wrf	<b><u>85.5</u></b>	<b><u>131</u></b>	87.3	128	83.3	134	<b><u>85.5</u></b>	<b><u>131</u></b>	87.3	128	83.3	134
482.sphinx3	<b><u>242</u></b>	<b><u>80.5</u></b>	241	81.0	242	80.5	<b><u>242</u></b>	<b><u>80.5</u></b>	241	81.0	242	80.5

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 27 05:33:45 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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Test date: Jun-2017

Hardware Availability: Aug-2017

Software Availability: Nov-2016

## Platform Notes (Continued)

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Gold 6132 CPU @ 2.60GHz
 2 "physical id"s (chips)
28 "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 : 14
  siblings  : 14
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 19712 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 26 08:03

```

SPEC is set to: /spec17
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   262G  87G  175G  34% /

```

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

Memory:  
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz  
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## Platform Notes (Continued)

(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 = "28"

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

454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main

459.GemsFDTD: -DSPEC\_CPU\_LP64

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## Base Portability Flags (Continued)

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

## Peak Optimization Flags

C benchmarks:

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## Peak Optimization Flags (Continued)

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.dealIII: 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

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

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## Peak Optimization Flags (Continued)

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](mailto:webmaster@spec.org).

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