



# SPEC<sup>®</sup> CFP2006 Result

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## Huawei

SPECfp<sup>®</sup>\_rate2006 = 1100

Huawei RH5885 V3 (Intel Xeon E7-8870 v2)

SPECfp\_rate\_base2006 = 1080

CPU2006 license: 3175

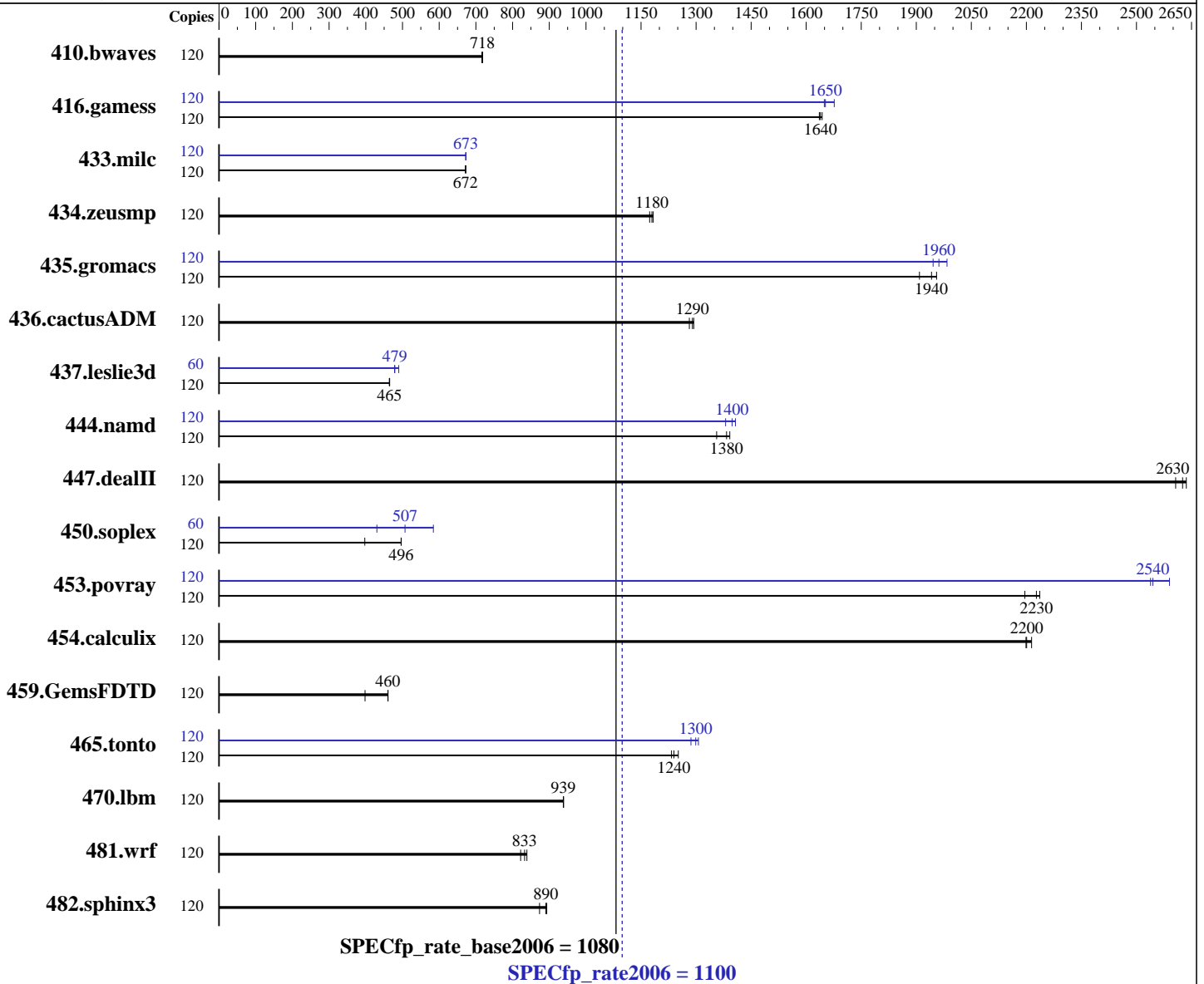
Test date: Aug-2014

Test sponsor: Huawei

Hardware Availability: Feb-2014

Tested by: Huawei

Software Availability: Nov-2013



### Hardware

CPU Name: Intel Xeon E7-8870 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 60 cores, 4 chips, 15 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 chips  
 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: No  
 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 PC3-12800R-11, ECC, running at 1333 MHz)  
 Disk Subsystem: 2 x 300 GB SAS, 10K RPM  
 Other Hardware: None

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

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	120	2270	718	2276	716	<b>2272</b>	<b>718</b>	120	2270	718	2276	716	<b>2272</b>	<b>718</b>
416.gamess	120	1430	1640	<b>1434</b>	<b>1640</b>	1436	1640	120	1401	1680	1425	1650	<b>1422</b>	<b>1650</b>
433.milc	120	<b>1640</b>	<b>672</b>	1640	672	1638	672	120	1637	673	<b>1637</b>	<b>673</b>	1638	672
434.zeusmp	120	<b>926</b>	<b>1180</b>	923	1180	931	1170	120	<b>926</b>	<b>1180</b>	923	1180	931	1170
435.gromacs	120	438	1960	449	1910	<b>441</b>	<b>1940</b>	120	<b>437</b>	<b>1960</b>	432	1980	440	1950
436.cactusADM	120	1109	1290	<b>1112</b>	<b>1290</b>	1119	1280	120	1109	1290	<b>1112</b>	<b>1290</b>	1119	1280
437.leslie3d	120	<b>2426</b>	<b>465</b>	2426	465	2431	464	60	1151	490	1179	478	<b>1177</b>	<b>479</b>
444.namd	120	<b>696</b>	<b>1380</b>	710	1360	691	1390	120	697	1380	684	1410	<b>688</b>	<b>1400</b>
447.dealII	120	527	2610	521	2640	<b>523</b>	<b>2630</b>	120	527	2610	521	2640	<b>523</b>	<b>2630</b>
450.soplex	120	<b>2017</b>	<b>496</b>	2519	397	2015	497	60	1163	430	857	584	<b>987</b>	<b>507</b>
453.povray	120	<b>287</b>	<b>2230</b>	291	2200	285	2240	120	<b>251</b>	<b>2540</b>	246	2590	251	2540
454.calculix	120	<b>450</b>	<b>2200</b>	447	2210	450	2200	120	<b>450</b>	<b>2200</b>	447	2210	450	2200
459.GemsFDTD	120	3199	398	<b>2765</b>	<b>460</b>	2765	461	120	3199	398	<b>2765</b>	<b>460</b>	2765	461
465.tonto	120	<b>953</b>	<b>1240</b>	958	1230	943	1250	120	904	1310	<b>909</b>	<b>1300</b>	918	1290
470.lbm	120	1756	939	<b>1757</b>	<b>939</b>	1757	938	120	1756	939	<b>1757</b>	<b>939</b>	1757	938
481.wrf	120	1631	822	<b>1610</b>	<b>833</b>	1598	839	120	1631	822	<b>1610</b>	<b>833</b>	1598	839
482.sphinx3	120	2678	873	2619	893	<b>2627</b>	<b>890</b>	120	2678	873	2619	893	<b>2627</b>	<b>890</b>

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

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



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Test date: Aug-2014

Hardware Availability: Feb-2014

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### Platform Notes

BIOS configuration:

Set Power Efficiency Mode to Performance

Set Lock\_step to disabled

Sysinfo program /spec/config/sysinfo.rev6818

\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191

running on RH5885V3 Wed Aug 20 03:57:19 2014

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>

From /proc/cpuinfo

model name : Intel(R) Xeon(R) CPU E7-8870 v2 @ 2.30GHz

4 "physical id"s (chips)

120 "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 : 15

siblings : 30

physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

cache size : 30720 KB

From /proc/meminfo

MemTotal: 264348968 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 RH5885V3 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 19 10:40

SPEC is set to: /spec

Filesystem Type Size Used Avail Use% Mounted on

/dev/sda2 ext4 385G 114G 251G 32% /spec

Additional information from dmidecode:

BIOS American Megatrends Inc. BLISV050 06/07/2014

Memory:

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## Platform Notes (Continued)

16x 16 GB  
14x Hynix HMT42GR7AFR4C-PB 16 GB 1333 MHz 2 rank  
2x Hynix HMT42GR7MFR4C-PB 16 GB 1333 MHz 2 rank  
32x NO DIMM NO DIMM

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 256 GB and the dmidecode description should have two lines reading as:

14x Hynix HMT42GR7AFR4C-PB 16 GB 1333 MHz 2 rank  
2x Hynix HMT42GR7MFR4C-PB 16 GB 1333 MHz 2 rank

## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/spec/libs/32:/spec/libs/64:/spec/sh"

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

Filesystem page cache cleared with:

echo 1> /proc/sys/vm/drop\_caches

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

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## Base Portability Flags (Continued)

```

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

```

## Base Optimization Flags

C benchmarks:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

C++ benchmarks:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

Fortran benchmarks:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch

```

Benchmarks using both Fortran and C:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

## Peak Compiler Invocation

C benchmarks:

```

icc -m64

```

C++ benchmarks (except as noted below):

```

icpc -m64

```

```

450.soplex: icpc -m32

```

Fortran benchmarks:

```

ifort -m64

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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Tested by: Huawei

Software Availability: Nov-2013

## Peak 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
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

```

## 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) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -auto-ilp32

```

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

```

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -fno-alias -auto-ilp32

```

447.dealII: basepeak = yes

```

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -opt-malloc-options=3

```

```

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -unroll14 -ansi-alias

```

Fortran benchmarks:

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## Peak Optimization Flags (Continued)

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-

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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-revC.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-ic14.0-official-linux64-revC.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 Sep 10 16:30:37 2014 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 10 September 2014.