



# SPEC<sup>®</sup> CFP2006 Result

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## Huawei

SPECfp<sup>®</sup>\_rate2006 = 3000

Huawei RH8100 V3 (Intel Xeon E7-8880L v2)

SPECfp\_rate\_base2006 = 2930

CPU2006 license: 3175

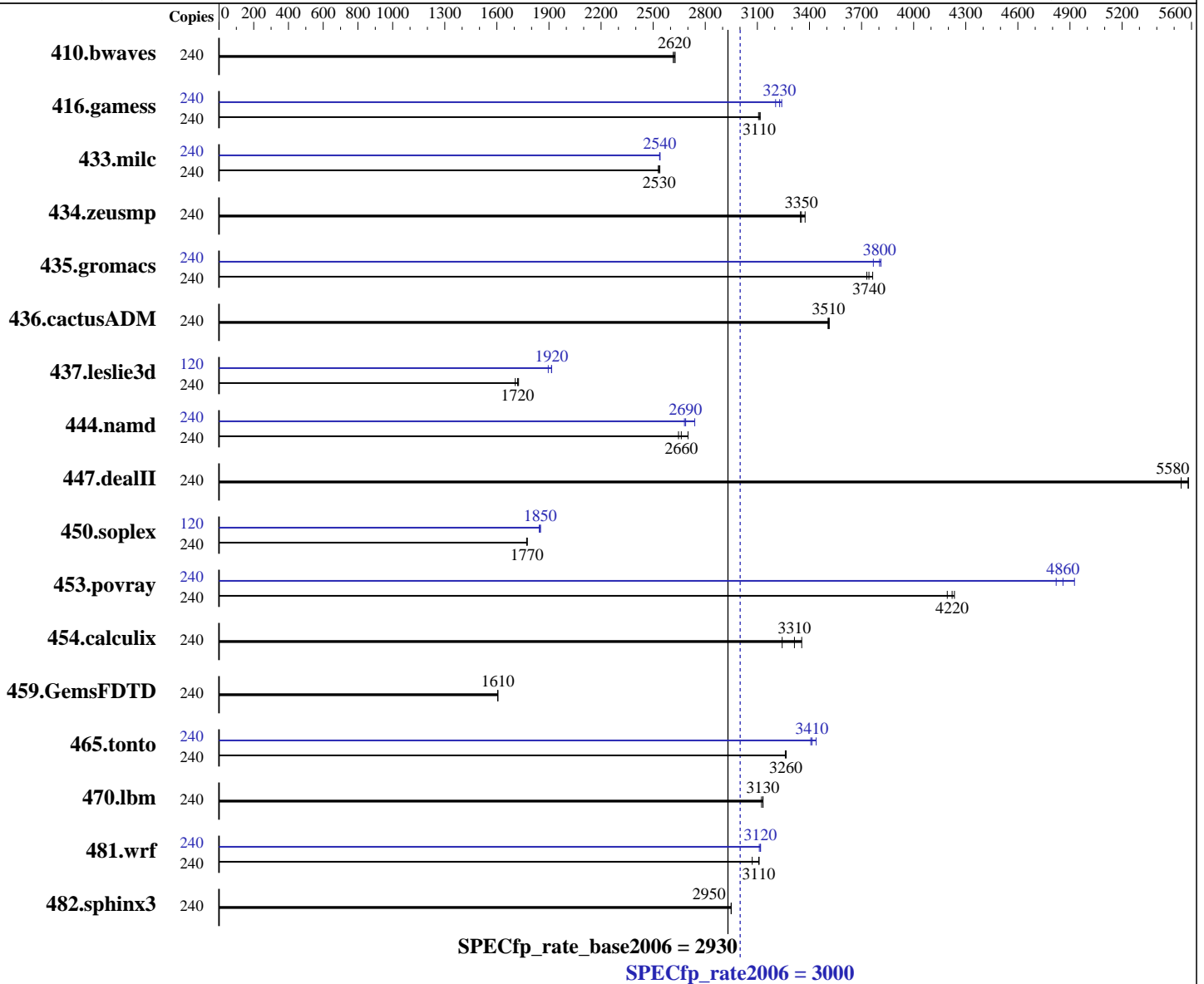
Test date: Aug-2014

Test sponsor: Huawei

Hardware Availability: Feb-2014

Tested by: Huawei

Software Availability: Nov-2013



### Hardware

CPU Name: Intel Xeon E7-8880L v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 120 cores, 8 chips, 15 cores/chip, 2 threads/core  
 CPU(s) orderable: 4,8 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: 37.5 MB I+D on chip per chip  
Other Cache: None  
Memory: 2 TB (128 x 16 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)  
Disk Subsystem: 2 x 600 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	240	1242	2630	1247	2620	<b>1244</b>	<b>2620</b>	240	1242	2630	1247	2620	<b>1244</b>	<b>2620</b>
416.gamess	240	1508	3120	<b>1510</b>	<b>3110</b>	1513	3110	240	<b>1456</b>	<b>3230</b>	1450	3240	1466	3210
433.milc	240	868	2540	871	2530	<b>869</b>	<b>2530</b>	240	868	2540	867	2540	<b>868</b>	<b>2540</b>
434.zeusmp	240	647	3370	<b>651</b>	<b>3350</b>	652	3350	240	647	3370	<b>651</b>	<b>3350</b>	652	3350
435.gromacs	240	459	3730	455	3760	<b>458</b>	<b>3740</b>	240	455	3770	450	3810	<b>451</b>	<b>3800</b>
436.cactusADM	240	<b>817</b>	<b>3510</b>	816	3510	818	3510	240	<b>817</b>	<b>3510</b>	816	3510	818	3510
437.leslie3d	240	1308	1730	<b>1312</b>	<b>1720</b>	1322	1710	120	<b>589</b>	<b>1920</b>	595	1900	589	1920
444.namd	240	727	2650	713	2700	<b>723</b>	<b>2660</b>	240	703	2740	718	2680	<b>716</b>	<b>2690</b>
447.dealII	240	492	5580	<b>492</b>	<b>5580</b>	496	5540	240	492	5580	<b>492</b>	<b>5580</b>	496	5540
450.soplex	240	<b>1129</b>	<b>1770</b>	1127	1780	1130	1770	120	543	1840	<b>541</b>	<b>1850</b>	541	1850
453.povray	240	304	4190	301	4230	<b>302</b>	<b>4220</b>	240	<b>263</b>	<b>4860</b>	259	4930	265	4820
454.calculix	240	<b>598</b>	<b>3310</b>	611	3240	590	3360	240	<b>598</b>	<b>3310</b>	611	3240	590	3360
459.GemsFDTD	240	<b>1586</b>	<b>1610</b>	1587	1600	1586	1610	240	<b>1586</b>	<b>1610</b>	1587	1600	1586	1610
465.tonto	240	<b>724</b>	<b>3260</b>	723	3270	724	3260	240	687	3440	<b>692</b>	<b>3410</b>	693	3410
470.lbm	240	1053	3130	<b>1053</b>	<b>3130</b>	1056	3120	240	1053	3130	<b>1053</b>	<b>3130</b>	1056	3120
481.wrf	240	862	3110	<b>863</b>	<b>3110</b>	873	3070	240	860	3120	<b>860</b>	<b>3120</b>	862	3110
482.sphinx3	240	1586	2950	1586	2950	<b>1586</b>	<b>2950</b>	240	1586	2950	1586	2950	<b>1586</b>	<b>2950</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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## Platform Notes

BIOS configuration:

Set Power Efficiency Mode to Performance

Set Lock\_step to disabled

Baseboard Management Controller used to adjust the fan speed to 100%

Set C-state to C6

Sysinfo program /spec/config/sysinfo.rev6818

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

running on RH8100 Tue Aug 19 23:58:25 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 E7-8880L v2 @ 2.20GHz

8 "physical id"s (chips)

240 "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

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

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

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

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

cache size : 38400 KB

From /proc/meminfo

MemTotal: 2117574140 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 RH8100 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 04:33

SPEC is set to: /spec

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info@spec.org

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## Platform Notes (Continued)

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda5	ext4	452G	207G	222G	49%	/spec

Additional information from dmidecode:

BIOS American Megatrends Inc. BLHSV020 07/29/2014

Memory:

128x 16 GB

123x Hynix HMT42GR7AFR4C-PB 16 GB 1333 MHz 2 rank

5x Hynix HMT42GR7MFR4C-PB 16 GB 1333 MHz 2 rank

64x NO DIMM NO DIMM

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 2 TB and the dmidecode description should have two lines reading as:

123x Hynix HMT42GR7AFR4C-PB 16 GB 1333 MHz 2 rank

5x 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



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## 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

```

## 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

```

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## Peak Compiler Invocation (Continued)

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## 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

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## Peak Optimization Flags (Continued)

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) -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-

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: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

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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