



# SPEC® CFP2006 Result

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## Huawei

SPECfp®\_rate2006 = 869

Huawei RH5885H V3 (Intel Xeon E7-8893 v4)

SPECfp\_rate\_base2006 = 854

CPU2006 license: 3175

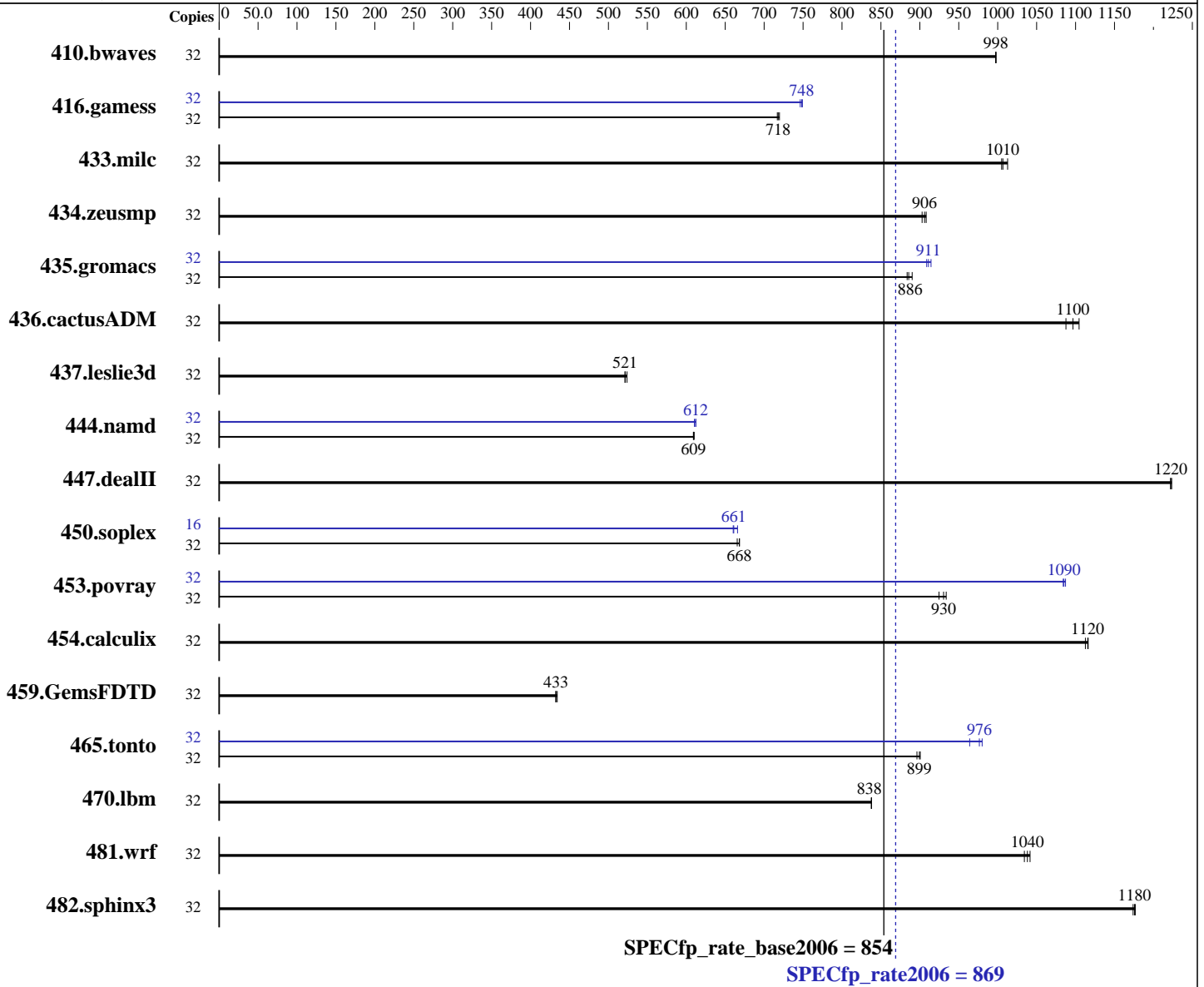
Test sponsor: Huawei

Tested by: Huawei

Test date: Aug-2016

Hardware Availability: Jun-2016

Software Availability: Oct-2015



### Hardware

CPU Name: Intel Xeon E7-8893 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz  
 CPU MHz: 3200  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 4 chips, 4 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 7.2 (Maipo)  
 3.10.0-327.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: xfs

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L3 Cache: 60 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 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	32	436	997	436	998	<b><u>436</u></b>	<b><u>998</u></b>	32	436	997	436	998	<b><u>436</u></b>	<b><u>998</u></b>
416.gamess	32	871	720	<b><u>873</u></b>	<b><u>718</u></b>	874	717	32	836	749	839	746	<b><u>837</u></b>	<b><u>748</u></b>
433.milc	32	292	1010	290	1010	<b><u>292</u></b>	<b><u>1010</u></b>	32	292	1010	290	1010	<b><u>292</u></b>	<b><u>1010</u></b>
434.zeusmp	32	323	903	321	908	<b><u>321</u></b>	<b><u>906</u></b>	32	323	903	321	908	<b><u>321</u></b>	<b><u>906</u></b>
435.gromacs	32	<b><u>258</u></b>	<b><u>886</u></b>	257	890	259	884	32	251	909	<b><u>251</u></b>	<b><u>911</u></b>	250	914
436.cactusADM	32	<b><u>349</u></b>	<b><u>1100</u></b>	346	1100	352	1090	32	<b><u>349</u></b>	<b><u>1100</u></b>	346	1100	352	1090
437.leslie3d	32	577	521	574	524	<b><u>577</u></b>	<b><u>521</u></b>	32	577	521	574	524	<b><u>577</u></b>	<b><u>521</u></b>
444.namd	32	421	609	421	610	<b><u>421</u></b>	<b><u>609</u></b>	32	419	612	420	610	<b><u>419</u></b>	<b><u>612</u></b>
447.dealII	32	<b><u>299</u></b>	<b><u>1220</u></b>	300	1220	299	1220	32	<b><u>299</u></b>	<b><u>1220</u></b>	300	1220	299	1220
450.soplex	32	399	668	401	665	<b><u>399</u></b>	<b><u>668</u></b>	16	202	660	<b><u>202</u></b>	<b><u>661</u></b>	200	666
453.povray	32	184	925	182	934	<b><u>183</u></b>	<b><u>930</u></b>	32	<b><u>157</u></b>	<b><u>1090</u></b>	157	1090	157	1080
454.calculix	32	<b><u>237</u></b>	<b><u>1120</u></b>	237	1110	237	1120	32	<b><u>237</u></b>	<b><u>1120</u></b>	237	1110	237	1120
459.GemsFDTD	32	782	434	<b><u>785</u></b>	<b><u>433</u></b>	785	432	32	782	434	<b><u>785</u></b>	<b><u>433</u></b>	785	432
465.tonto	32	351	896	350	901	<b><u>350</u></b>	<b><u>899</u></b>	32	327	964	<b><u>322</u></b>	<b><u>976</u></b>	321	980
470.lbm	32	525	838	525	838	<b><u>525</u></b>	<b><u>838</u></b>	32	525	838	525	838	<b><u>525</u></b>	<b><u>838</u></b>
481.wrf	32	343	1040	346	1030	<b><u>344</u></b>	<b><u>1040</u></b>	32	343	1040	346	1030	<b><u>344</u></b>	<b><u>1040</u></b>
482.sphinx3	32	530	1180	531	1170	<b><u>530</u></b>	<b><u>1180</u></b>	32	530	1180	531	1170	<b><u>530</u></b>	<b><u>1180</u></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"  
 Turbo mode set with:  
 cpupower -c all frequency-set -g performance



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CPU2006 license: 3175

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Tested by: Huawei

Test date: Aug-2016

Hardware Availability: Jun-2016

Software Availability: Oct-2015

## 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 C0/C1

Sysinfo program /home/spec2006/config/sysinfo.rev6914

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1

running on RH5885hv3 Tue Aug 2 00:34:43 2016

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 E7-8893 v4 @ 3.20GHz

4 "physical id"s (chips)

32 "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 : 4

siblings : 8

physical 0: cores 5 11 18 24

physical 1: cores 12 13 25 26

physical 2: cores 12 13 25 26

physical 3: cores 12 13 25 26

cache size : 30720 KB

From /proc/meminfo

MemTotal: 528085980 kB

HugePages\_Total: 0

Hugepagesize: 2048 kB

From /etc/\*release\* /etc/\*version\*

os-release:

NAME="Red Hat Enterprise Linux Server"

VERSION="7.2 (Maipo)"

ID="rhel"

ID\_LIKE="fedora"

VERSION\_ID="7.2"

PRETTY\_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"

ANSI\_COLOR="0;31"

CPE\_NAME="cpe:/o:redhat:enterprise\_linux:7.2:GA:server"

redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

system-release-cpe: cpe:/o:redhat:enterprise\_linux:7.2:ga:server

uname -a:

Linux RH5885hv3 3.10.0-327.el7.x86\_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015

x86\_64 x86\_64 x86\_64 GNU/Linux

run-level 3 Aug 1 06:21

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## Platform Notes (Continued)

SPEC is set to: /home/spec2006

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel-root	xfs	525G	43G	482G	9%	/

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 American Megatrends Inc. 5.11 02/05/2016

Memory:

32x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600 MHz  
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 256 GB and the dmidecode description should have two lines reading as:

32x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600 MHz  
64x NO DIMM NO DIMM

## General Notes

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

LD\_LIBRARY\_PATH = "/home/spec2006/libs/32:/home/spec2006/libs/64:/home/spec2006/sh"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/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.lelie3d: -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:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

Fortran benchmarks:

```

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

```

Benchmarks using both Fortran and C:

```

-xCORE-AVX2 -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 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

```

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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  
450.soplex: -D\_FILE\_OFFSET\_BITS=64  
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: basepeak = yes  
470.lbm: basepeak = yes  
482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-malloc-options=3

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.2-BDW-RevG.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.2-BDW-RevG.xml>



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