



# SPEC<sup>®</sup> CFP2006 Result

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## HITACHI

SPECfp<sup>®</sup>2006 = **110**

BladeSymphony BS2500 (Intel Xeon E5-2699 v3)

SPECfp\_base2006 = **104**

CPU2006 license: 35

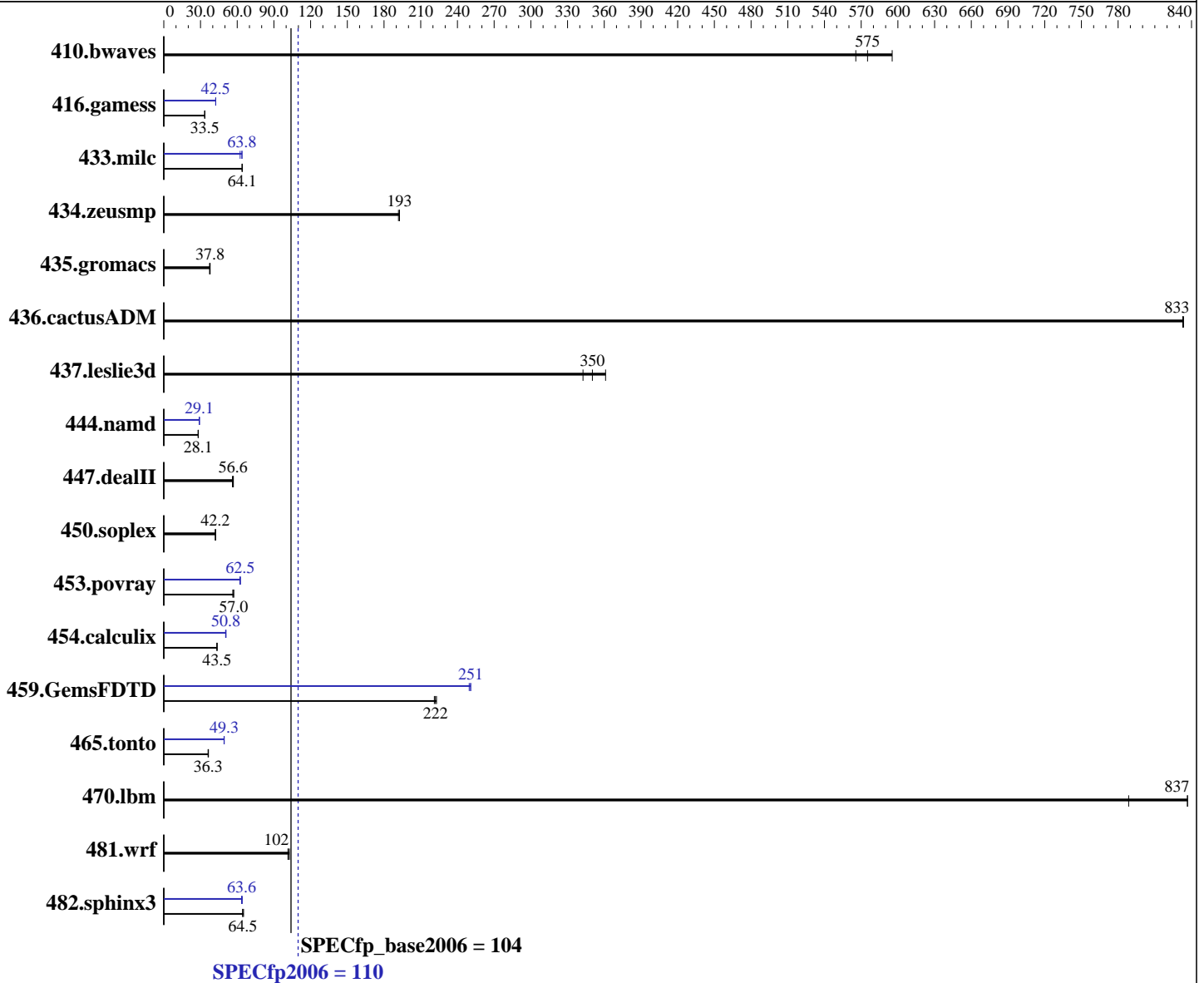
Test sponsor: HITACHI

Tested by: HITACHI

Test date: Jan-2015

Hardware Availability: Dec-2014

Software Availability: Nov-2013



### Hardware

CPU Name: Intel Xeon E5-2699 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 36 cores, 2 chips, 18 cores/chip, 2 threads/core  
 CPU(s) orderable: 1, 2 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: Yes  
 File System: ext4

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L3 Cache: 45 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
 Disk Subsystem: 2 x 600 GB SAS, 10000 RPM, RAID1  
 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	22.8	595	<b><u>23.6</u></b>	<b><u>575</u></b>	24.0	566	22.8	595	<b><u>23.6</u></b>	<b><u>575</u></b>	24.0	566
416.gamess	585	33.5	584	33.5	<b><u>585</u></b>	<b><u>33.5</u></b>	462	42.4	<b><u>461</u></b>	<b><u>42.5</u></b>	461	42.5
433.milc	<b><u>143</u></b>	<b><u>64.1</u></b>	144	63.9	143	64.3	144	63.9	147	62.4	<b><u>144</u></b>	<b><u>63.8</u></b>
434.zeusmp	47.2	193	47.4	192	<b><u>47.2</u></b>	<b><u>193</u></b>	47.2	193	47.4	192	<b><u>47.2</u></b>	<b><u>193</u></b>
435.gromacs	189	37.8	<b><u>189</u></b>	<b><u>37.8</u></b>	191	37.4	189	37.8	<b><u>189</u></b>	<b><u>37.8</u></b>	191	37.4
436.cactusADM	<b><u>14.3</u></b>	<b><u>833</u></b>	14.3	833	14.3	833	<b><u>14.3</u></b>	<b><u>833</u></b>	14.3	833	14.3	833
437.leslie3d	<b><u>26.8</u></b>	<b><u>350</u></b>	26.0	361	27.4	343	<b><u>26.8</u></b>	<b><u>350</u></b>	26.0	361	27.4	343
444.namd	<b><u>285</u></b>	<b><u>28.1</u></b>	285	28.1	286	28.1	<b><u>276</u></b>	<b><u>29.1</u></b>	276	29.1	276	29.1
447.dealII	204	56.1	<b><u>202</u></b>	<b><u>56.6</u></b>	201	56.9	204	56.1	<b><u>202</u></b>	<b><u>56.6</u></b>	201	56.9
450.soplex	<b><u>198</u></b>	<b><u>42.2</u></b>	198	42.1	197	42.3	<b><u>198</u></b>	<b><u>42.2</u></b>	198	42.1	197	42.3
453.povray	<b><u>93.3</u></b>	<b><u>57.0</u></b>	94.4	56.4	93.1	57.1	85.0	62.6	<b><u>85.1</u></b>	<b><u>62.5</u></b>	85.6	62.2
454.calculix	189	43.6	<b><u>190</u></b>	<b><u>43.5</u></b>	190	43.4	<b><u>163</u></b>	<b><u>50.8</u></b>	162	50.8	163	50.5
459.GemsFDTD	48.0	221	<b><u>47.8</u></b>	<b><u>222</u></b>	47.6	223	42.3	251	<b><u>42.3</u></b>	<b><u>251</u></b>	42.5	250
465.tonto	270	36.5	<b><u>271</u></b>	<b><u>36.3</u></b>	272	36.2	<b><u>199</u></b>	<b><u>49.3</u></b>	199	49.4	200	49.2
470.lbm	17.4	789	16.4	837	<b><u>16.4</u></b>	<b><u>837</u></b>	17.4	789	16.4	837	<b><u>16.4</u></b>	<b><u>837</u></b>
481.wrf	110	102	109	103	<b><u>110</u></b>	<b><u>102</u></b>	110	102	109	103	<b><u>110</u></b>	<b><u>102</u></b>
482.sphinx3	<b><u>302</u></b>	<b><u>64.5</u></b>	302	64.4	299	65.2	304	64.1	306	63.6	<b><u>306</u></b>	<b><u>63.6</u></b>

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:  
 Patrol Scrub = Disable  
 Per Core P-state = Disable

Sysinfo program /home/speccpu2006/cpu2006/config/sysinfo.rev6818  
 \$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
 running on 520Hx36564 Fri Jan 9 03:38:59 2015

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

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**SPECfp\_base2006 = 104**

CPU2006 license: 35

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Test date: Jan-2015

Hardware Availability: Dec-2014

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### Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) CPU E5-2699 v3 @ 2.30GHz
 2 "physical id"s (chips)
 72 "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 : 18
siblings  : 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 46080 KB
```

From /proc/meminfo

```
MemTotal: 263985944 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 520Hx36564 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 Jan 8 22:11

SPEC is set to: /home/speccpu2006/cpu2006

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg_520hx36564-lv_home ext4 485G 5.5G 455G 2% /home
```

Additional information from dmidecode:

```
BIOS HITACHI 08-20 01/06/2015
```

Memory:

```
8x NO DIMM Unknown
16x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank
```

(End of data from sysinfo program)

### General Notes

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

```
KMP_AFFINITY = "granularity=fine,compact,1,0"
```

```
LD_LIBRARY_PATH = "/home/speccpu2006/cpu2006/libs/32:/home/speccpu2006/cpu2006/libs/64:/home/speccpu2006/cpu2006/sh"
```

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## General Notes (Continued)

OMP\_NUM\_THREADS = "36"

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

runspec command invoked through numactl i.e.:

numactl --interleave=all runspec <etc>

BladeSymphony BS520H, Hitachi Compute Blade 520H and BladeSymphony BS2500 HC0A1 are electronically equivalent.

The results have been measured on a Hitachi Compute Blade 520H.

## 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  
 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



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## Base Optimization Flags

C benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

## 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:

433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-auto-ilp32 -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel

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## Peak Optimization Flags (Continued)

C++ benchmarks:

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

447.dealIII: basepeak = yes

450.soplex: basepeak = yes

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

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(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: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(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 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-inline-calloc -opt-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 -ansi-alias

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/PlatformHitachi-V1.2.20150127.html>



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<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.xml>

<http://www.spec.org/cpu2006/flags/PlatformHitachi-V1.2.20150127.xml>

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