



# SPEC<sup>®</sup> CFP2006 Result

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## SGI

SPECfp<sup>®</sup>\_rate2006 = 3440

SGI UV 300 (Intel Xeon E7-8890 v2, 2.8 GHz)

SPECfp\_rate\_base2006 = 3380

CPU2006 license: 4

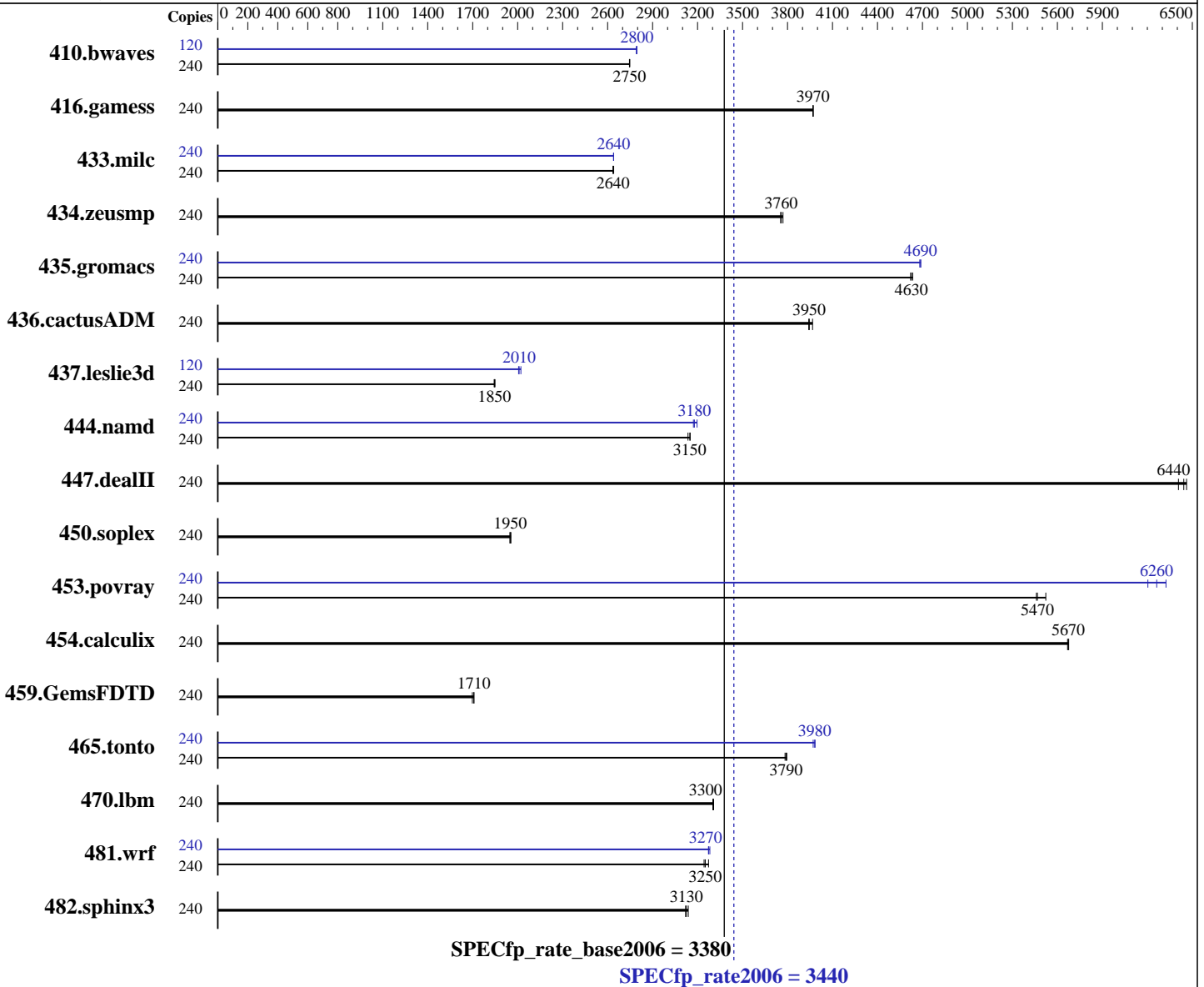
Test sponsor: SGI

Tested by: SGI

Test date: Jan-2015

Hardware Availability: Dec-2014

Software Availability: Nov-2014



### Hardware

CPU Name: Intel Xeon E7-8890 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 120 cores, 8 chips, 15 cores/chip, 2 threads/core  
 CPU(s) orderable: 4-32 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: SUSE Linux Enterprise Server 11 (x86\_64) SP3, Kernel 3.0.101-0.46-default  
 Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;  
 Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: tmpfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 37.5 MB I+D on chip per chip  
Other Cache: None  
Memory: 1 TB (128 x 8 GB 2Rx4 PC3-14900R-13, ECC, running at 1333 MHz)  
Disk Subsystem: 1 TB tmpfs  
Other Hardware: None

Base Pointers: 32/64-bit  
Peak Pointers: 32/64-bit  
Other Software: SGI Foundation Software 2.11, Build 711rp42.sles11sp3-1412152100

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	240	<b>1188</b>	<b>2750</b>	1188	2750	1187	2750	120	584	2790	<b>583</b>	<b>2800</b>	583	2800
416.gamess	240	1183	3970	1184	3970	<b>1183</b>	<b>3970</b>	240	1183	3970	1184	3970	<b>1183</b>	<b>3970</b>
433.milc	240	<b>836</b>	<b>2640</b>	834	2640	836	2640	240	835	2640	<b>834</b>	<b>2640</b>	834	2640
434.zeusmp	240	579	3770	<b>581</b>	<b>3760</b>	582	3750	240	579	3770	<b>581</b>	<b>3760</b>	582	3750
435.gromacs	240	370	4630	371	4620	<b>370</b>	<b>4630</b>	240	<b>366</b>	<b>4690</b>	365	4690	366	4680
436.cactusADM	240	723	3970	<b>727</b>	<b>3950</b>	728	3940	240	723	3970	<b>727</b>	<b>3950</b>	728	3940
437.leslie3d	240	<b>1222</b>	<b>1850</b>	1220	1850	1224	1840	120	558	2020	562	2010	<b>561</b>	<b>2010</b>
444.namd	240	<b>611</b>	<b>3150</b>	611	3150	614	3140	240	602	3200	<b>605</b>	<b>3180</b>	607	3170
447.dealII	240	425	6460	<b>426</b>	<b>6440</b>	429	6410	240	425	6460	<b>426</b>	<b>6440</b>	429	6410
450.soplex	240	1024	1950	1027	1950	<b>1025</b>	<b>1950</b>	240	1024	1950	1027	1950	<b>1025</b>	<b>1950</b>
453.povray	240	234	5460	231	5520	<b>234</b>	<b>5470</b>	240	<b>204</b>	<b>6260</b>	206	6200	202	6320
454.calculix	240	349	5680	349	5670	<b>349</b>	<b>5670</b>	240	349	5680	349	5670	<b>349</b>	<b>5670</b>
459.GemsFDTD	240	<b>1491</b>	<b>1710</b>	1491	1710	1500	1700	240	<b>1491</b>	<b>1710</b>	1491	1710	1500	1700
465.tonto	240	622	3800	624	3780	<b>623</b>	<b>3790</b>	240	595	3970	593	3980	<b>593</b>	<b>3980</b>
470.lbm	240	<b>998</b>	<b>3300</b>	997	3310	999	3300	240	<b>998</b>	<b>3300</b>	997	3310	999	3300
481.wrf	240	<b>824</b>	<b>3250</b>	826	3240	819	3270	240	<b>819</b>	<b>3270</b>	817	3280	819	3270
482.sphinx3	240	<b>1497</b>	<b>3130</b>	1491	3140	1499	3120	240	<b>1497</b>	<b>3130</b>	1491	3140	1499	3120

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"

Tmpfs filesystem set up with:

```
mkdir -p /mnt/shm
mount -t tmpfs -o size=1024g,rw tmpfs /mnt/shm/
```

Turbo mode activated with:

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## Operating System Notes (Continued)

```
modprobe acpi_cpufreq
cpupower frequency-set -u 3400MHz -d 3400MHz -g performance
```

## General Notes

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

```
LD_LIBRARY_PATH = "/mnt/shm/cpu2006-1.2/libs/32:/mnt/shm/cpu2006-1.2/libs/64:/mnt/shm/cpu2006-1.2/sh"
```

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
```

## 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:

`-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:

`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: -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`

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## Peak Optimization Flags (Continued)

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.deallI: basepeak = yes

450.soplex: basepeak = yes

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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2)

416.gamess: basepeak = yes

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/SGI-UV300-Platform-Flags.html>

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html>



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

<http://www.spec.org/cpu2006/flags/SGI-UV300-Platform-Flags.xml>

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

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