



# SPEC<sup>®</sup> CFP2006 Result

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## SGI

SPECfp<sup>®</sup>\_rate2006 = 7880

SGI UV 300 (Intel Xeon E7-8890 v3, 2.5 GHz)

SPECfp\_rate\_base2006 = 7680

CPU2006 license: 4

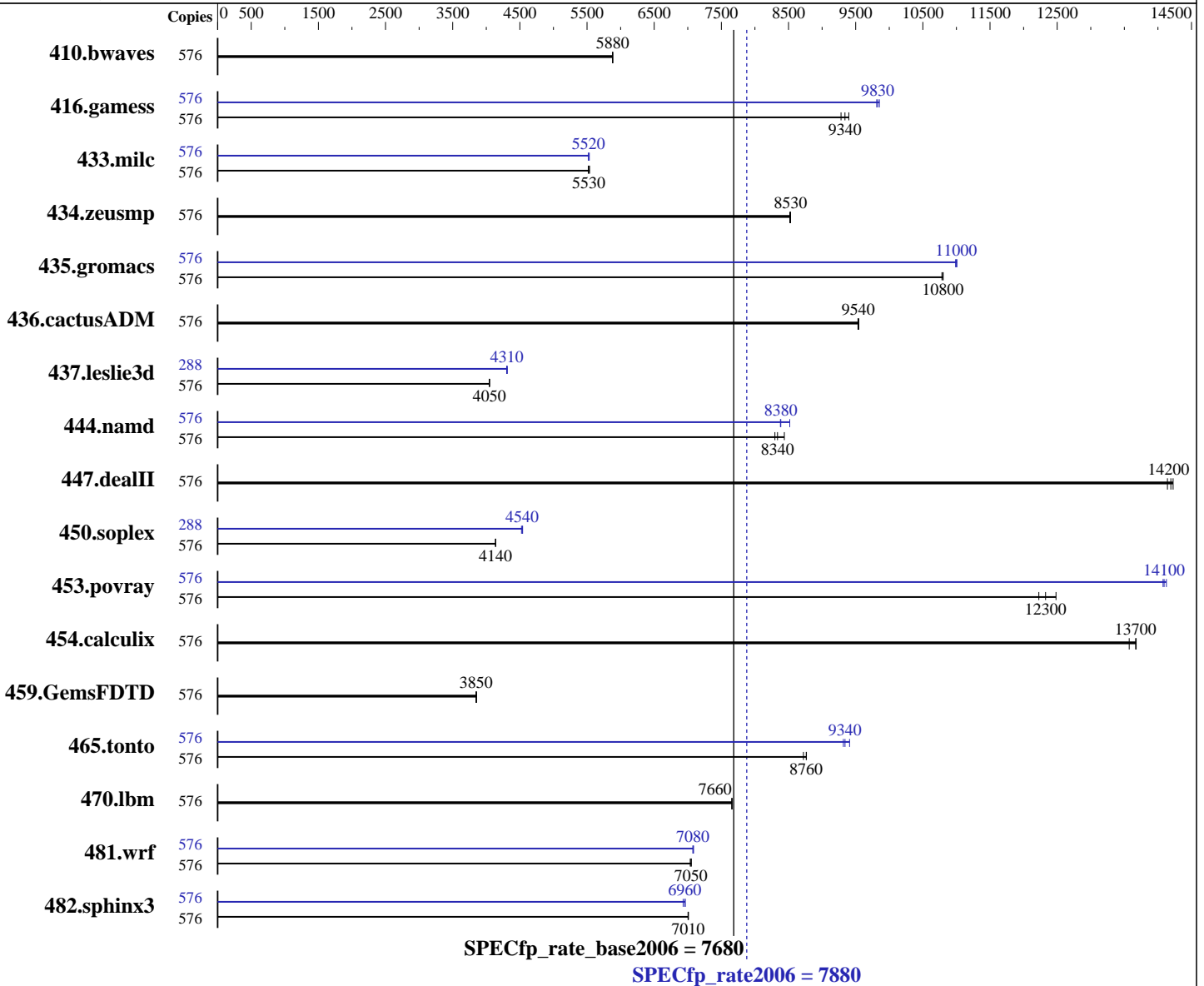
Test sponsor: SGI

Tested by: SGI

Test date: Dec-2015

Hardware Availability: Sep-2015

Software Availability: Nov-2015



### Hardware

CPU Name: Intel Xeon E7-8890 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 288 cores, 16 chips, 18 cores/chip, 2 threads/core  
 CPU(s) orderable: 4-64 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) SP4, Kernel 3.0.101-65.1.9552.0.PTF-default  
 Compiler: C/C++: Version 15.0.3.187 of Intel C++ Studio XE for Linux;  
 Fortran: Version 15.0.3.187 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: 45 MB I+D on chip per chip  
Other Cache: None  
Memory: 8 TB (256 x 32 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
Disk Subsystem: 8 TB tmpfs  
Other Hardware: None

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	576	<b>1331</b>	<b>5880</b>	1330	5880	1332	5880	576	<b>1331</b>	<b>5880</b>	1330	5880	1332	5880
416.gamess	576	<b>1207</b>	<b>9340</b>	1200	9400	1215	9280	576	1149	9810	1145	9850	<b>1148</b>	<b>9830</b>
433.milc	576	955	5540	<b>957</b>	<b>5530</b>	958	5520	576	958	5520	956	5530	<b>957</b>	<b>5520</b>
434.zeusmp	576	<b>615</b>	<b>8530</b>	615	8520	614	8530	576	<b>615</b>	<b>8530</b>	615	8520	614	8530
435.gromacs	576	<b>381</b>	<b>10800</b>	381	10800	381	10800	576	<b>374</b>	<b>11000</b>	374	11000	374	11000
436.cactusADM	576	722	9530	721	9550	<b>722</b>	<b>9540</b>	576	722	9530	721	9550	<b>722</b>	<b>9540</b>
437.leslie3d	576	1337	4050	<b>1338</b>	<b>4050</b>	1339	4040	288	629	4300	628	4310	<b>629</b>	<b>4310</b>
444.namd	576	547	8440	557	8300	<b>554</b>	<b>8340</b>	576	<b>551</b>	<b>8380</b>	542	8520	551	8380
447.dealII	576	<b>464</b>	<b>14200</b>	463	14200	466	14100	576	<b>464</b>	<b>14200</b>	463	14200	466	14100
450.soplex	576	1161	4140	1161	4140	<b>1161</b>	<b>4140</b>	288	529	4540	531	4520	<b>529</b>	<b>4540</b>
453.povray	576	251	12200	245	12500	<b>249</b>	<b>12300</b>	576	<b>217</b>	<b>14100</b>	217	14100	218	14100
454.calculix	576	347	13700	<b>348</b>	<b>13700</b>	350	13600	576	347	13700	<b>348</b>	<b>13700</b>	350	13600
459.GemsFDTD	576	1585	3860	<b>1588</b>	<b>3850</b>	1588	3850	576	1585	3860	<b>1588</b>	<b>3850</b>	1588	3850
465.tonto	576	650	8720	647	8770	<b>647</b>	<b>8760</b>	576	608	9320	<b>607</b>	<b>9340</b>	602	9410
470.lbm	576	<b>1034</b>	<b>7660</b>	1033	7660	1034	7660	576	<b>1034</b>	<b>7660</b>	1033	7660	1034	7660
481.wrf	576	914	7040	912	7050	<b>913</b>	<b>7050</b>	576	908	7090	<b>909</b>	<b>7080</b>	909	7080
482.sphinx3	576	1601	7010	1603	7000	<b>1602</b>	<b>7010</b>	576	1620	6930	1612	6960	<b>1614</b>	<b>6960</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"

Tmpfs filesystem set up with:

```
mkdir -p /mnt/shm/cpu2006-ic15
```

```
mount -t tmpfs -o size=8192G,rw tmpfs /mnt/shm/cpu2006-ic15
```

Turbo mode activated with:

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## Operating System Notes (Continued)

```
modprobe acpi_cpufreq
cpupower frequency-set -u 3300MHz -d 3300MHz -g performance
```

## Platform Notes

BT Mode set to Auto-select

## General Notes

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

```
LD_LIBRARY_PATH = "/mnt/shm/cpu2006-ic15/libs/32:/mnt/shm/cpu2006-ic15/libs/64:/mnt/shm/cpu2006-ic15/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
```

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

436.cactusADM: -DSPEC\_CPU\_LP64 -nofor\_main

437.leslie3d: -DSPEC\_CPU\_LP64

444.namd: -DSPEC\_CPU\_LP64

447.dealIII: -DSPEC\_CPU\_LP64

450.soplex: -DSPEC\_CPU\_LP64

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## Base Portability Flags (Continued)

```

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/sw/sdev/intel/parallel_studio_xe_2015_update_3/composer_xe_2015.3.187/compiler/lib/ia32

```

Fortran benchmarks:

```

ifort -m64

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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**Software Availability:** Nov-2015

## 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: -xCORE-AVX2(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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
            -unroll2

```

C++ benchmarks:

```

444.namd: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2(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

```

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## Peak Optimization Flags (Continued)

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

459.GemsFDTD: basepeak = yes

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) -unroll4  
-auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(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: -xCORE-AVX2 -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-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/SGI-UV300-Platform-Flags.20160112.html>

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

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

<http://www.spec.org/cpu2006/flags/SGI-UV300-Platform-Flags.20160112.xml>



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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