



# SPEC® CFP2006 Result

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## SGI

SGI Altix ICE 8200EX (Intel Xeon X5570, 2.93 GHz)

SPECfp®\_rate2006 = 742

SPECfp\_rate\_base2006 = 723

CPU2006 license: 4

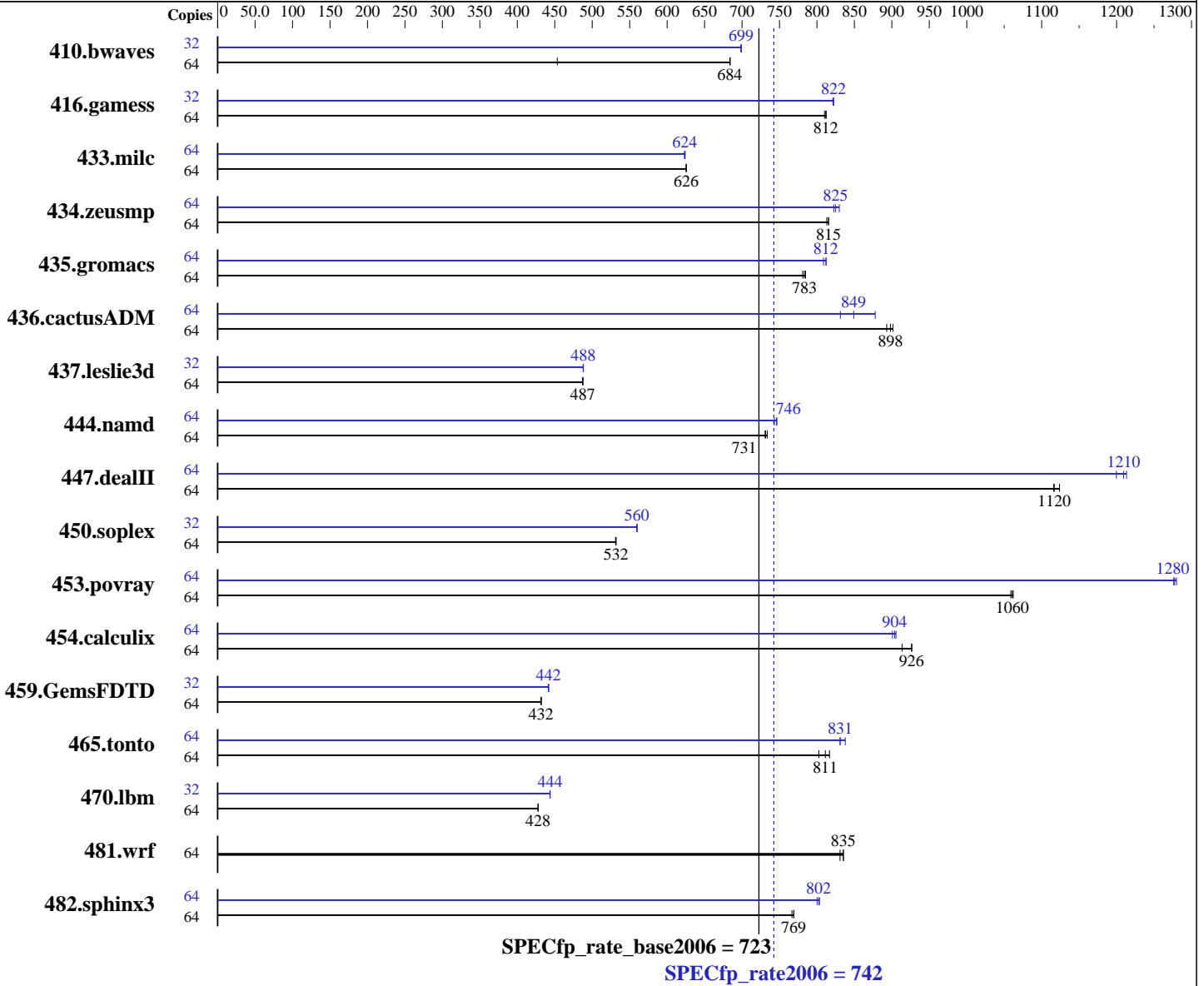
Test sponsor: SGI

Tested by: SGI

Test date: May-2009

Hardware Availability: Mar-2009

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon X5570  
 CPU Characteristics: Quad Core, 2.93 GHz  
 Intel Turbo Boost Technology up to 3.33 GHz  
 CPU MHz: 2933  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 8 chips, 4 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 chips per blade, 2-16384 blades  
 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 10 (x86\_64) SP2  
 with patch Linux kernel 20080917,  
 Kernel 2.6.16.60-0.30-smp  
 Compiler: Intel C++ and Fortran Compiler 11.0 for Linux  
 Build 20090131 Package ID: l\_cproc\_p\_11.0.080,  
 l\_cprof\_p\_11.0.080  
 Auto Parallel: No  
 File System: lustre v1.6.7 over DDR Infiniband  
 System State: Multi-user, run level 3

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L3 Cache: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 192 GB (4 x 12\*4GB DDR3-1066 CL7 RDIMMs)  
Disk Subsystem: 13 TB Lustre Parallel Filesystem  
1 Metadata Server and 6 Object Storage Servers  
96 x 136 GB SAS (Seagate Cheetah 15000 rpm)  
Other Hardware: None

Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: SGI ProPack 6 for Linux Service Pack 2  
Binutils 2.18.50.0.7.20080502

## Results Table

| Benchmark     | Base   |             |            |             |             |             |             | Peak   |            |             |             |            |            |             |
|---------------|--------|-------------|------------|-------------|-------------|-------------|-------------|--------|------------|-------------|-------------|------------|------------|-------------|
|               | Copies | Seconds     | Ratio      | Seconds     | Ratio       | Seconds     | Ratio       | Copies | Seconds    | Ratio       | Seconds     | Ratio      | Seconds    | Ratio       |
| 410.bwaves    | 64     | 1919        | 453        | 1271        | 684         | <u>1272</u> | <u>684</u>  | 32     | <u>622</u> | <u>699</u>  | 622         | 699        | 623        | 698         |
| 416.gamess    | 64     | 1547        | 810        | <u>1544</u> | <u>812</u>  | 1542        | 812         | 32     | <u>762</u> | <u>822</u>  | 762         | 822        | 763        | 821         |
| 433.milc      | 64     | 939         | 626        | 940         | 625         | <u>939</u>  | <u>626</u>  | 64     | 943        | 623         | 941         | 624        | <u>942</u> | <u>624</u>  |
| 434.zeusmp    | 64     | <u>714</u>  | <u>815</u> | 714         | 816         | 716         | 813         | 64     | <u>706</u> | <u>825</u>  | 702         | 830        | 708        | 823         |
| 435.gromacs   | 64     | 585         | 781        | 582         | 785         | <u>583</u>  | <u>783</u>  | 64     | <u>563</u> | <u>812</u>  | 565         | 809        | 563        | 812         |
| 436.cactusADM | 64     | 856         | 893        | <u>852</u>  | <u>898</u>  | 848         | 901         | 64     | 871        | 878         | <u>901</u>  | <u>849</u> | 920        | 831         |
| 437.leslie3d  | 64     | <u>1234</u> | <u>487</u> | 1234        | 487         | 1234        | 488         | 32     | 617        | 488         | <u>616</u>  | <u>488</u> | 616        | 488         |
| 444.namd      | 64     | <u>702</u>  | <u>731</u> | 702         | 731         | 700         | 734         | 64     | 691        | 743         | 688         | 747        | <u>688</u> | <u>746</u>  |
| 447.dealII    | 64     | 652         | 1120       | 656         | 1120        | <u>656</u>  | <u>1120</u> | 64     | 610        | 1200        | 603         | 1210       | <u>605</u> | <u>1210</u> |
| 450.soplex    | 64     | <u>1004</u> | <u>532</u> | 1004        | 532         | 1005        | 531         | 32     | 477        | 560         | 477         | 560        | <u>477</u> | <u>560</u>  |
| 453.povray    | 64     | 321         | 1060       | <u>321</u>  | <u>1060</u> | 322         | 1060        | 64     | <u>267</u> | <u>1280</u> | 267         | 1280       | 266        | 1280        |
| 454.calculix  | 64     | 570         | 927        | <u>570</u>  | <u>926</u>  | 578         | 914         | 64     | 586        | 901         | 583         | 906        | <u>584</u> | <u>904</u>  |
| 459.GemsFDTD  | 64     | 1573        | 432        | <u>1572</u> | <u>432</u>  | 1572        | 432         | 32     | 768        | 442         | 769         | 442        | <u>769</u> | <u>442</u>  |
| 465.tonto     | 64     | 771         | 817        | <u>776</u>  | <u>811</u>  | 785         | 803         | 64     | <u>758</u> | <u>831</u>  | 758         | 831        | 752        | 838         |
| 470.lbm       | 64     | 2055        | 428        | <u>2056</u> | <u>428</u>  | 2056        | 428         | 32     | <u>991</u> | <u>444</u>  | 991         | 444        | 991        | 444         |
| 481.wrf       | 64     | 860         | 831        | <u>856</u>  | <u>835</u>  | 856         | 835         | 64     | 860        | 831         | <u>856</u>  | <u>835</u> | 856        | 835         |
| 482.sphinx3   | 64     | 1621        | 769        | <u>1622</u> | <u>769</u>  | 1627        | 767         | 64     | 1553       | 803         | <u>1555</u> | <u>802</u> | 1559       | 800         |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The config file option 'submit' was used.  
A submit.pl script was used to distribute benchmark copies across the 4 blades and to pin processes to cores using dplace. Each blade runs a separate instance of the operating system.

## General Notes

Adjacent cache line prefetch enabled  
System has 4 blades with 2 chips/blade.



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**SPECfp\_rate\_base2006 = 723**

**CPU2006 license:** 4  
**Test sponsor:** SGI  
**Tested by:** SGI

**Test date:** May-2009  
**Hardware Availability:** Mar-2009  
**Software Availability:** Feb-2009

## Base Compiler Invocation

C benchmarks:  
icc

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

Benchmarks using both Fortran and C:  
icc ifort

## 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:  
-xSSE4.2 -ipo -O3 -no-prec-div -static

C++ benchmarks:  
-xSSE4.2 -ipo -O3 -no-prec-div -static

Fortran benchmarks:  
-xSSE4.2 -ipo -O3 -no-prec-div -static

Benchmarks using both Fortran and C:  
-xSSE4.2 -ipo -O3 -no-prec-div -static



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**Software Availability:** Feb-2009

## Peak Compiler Invocation

C benchmarks (except as noted below):

icc

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc

450.soplex: icpc -m32

Fortran benchmarks (except as noted below):

ifort

437.leslie3d: ifort -m32

Benchmarks using both Fortran and C:

icc ifort

## 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  
 444.namd: -DSPEC\_CPU\_LP64  
 447.deallI: -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

## Peak Optimization Flags

C benchmarks:

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
 -fno-alias

470.lbm: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch  
 -auto-ilp32

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## Peak Optimization Flags (Continued)

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

### C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-fno-alias -auto-ilp32

447.dealII: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -ansi-alias -scalar-rep-

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -ansi-alias

### Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -ansi-alias -scalar-rep-

434.zeusmp: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)

437.leslie3d: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3 -opt-prefetch

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -opt-prefetch

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -auto

### Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-prefetch -auto-ilp32

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## Peak Optimization Flags (Continued)

436.cactusADM: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -opt-prefetch -auto-ilp32

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32

481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090710.14.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090710.14.xml>

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

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