



# SPEC® CFP2006 Result

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## Intel Corporation

SPECfp®2006 = 23.3

Intel Server System S7000FC4UR (Intel Xeon X7460)

SPECfp\_base2006 = 22.0

CPU2006 license: 13

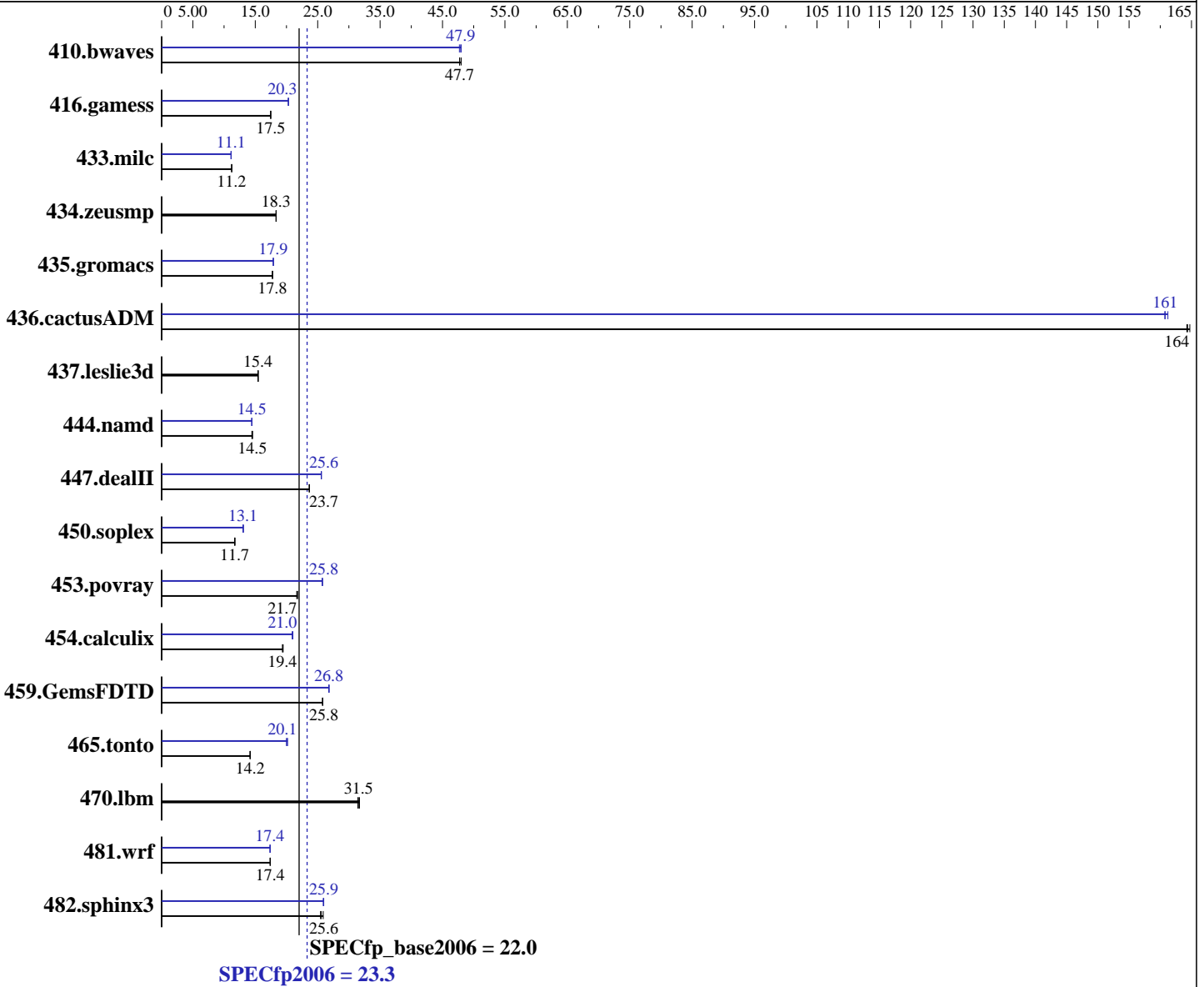
Test sponsor: Intel Corporation

Tested by: Intel Corporation

Test date: Sep-2008

Hardware Availability: Sep-2008

Software Availability: Nov-2008



### Hardware

CPU Name: Intel Xeon X7460  
 CPU Characteristics:  
 CPU MHz: 2666  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip  
 CPU(s) orderable: 1,2,4 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 9 MB I+D on chip per chip, 3 MB shared / 2 cores

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### Software

Operating System: SuSe Linux SLES10 SP2  
 Compiler: Intel C++ and Fortran Compiler 11.0 for Linux  
 Build 20080730 Package ID: l\_cproc\_b\_11.0.042,  
 l\_fproc\_b\_11.0.042  
 Auto Parallel: Yes  
 File System: ReiserFS  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

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L3 Cache: 16 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 32 GB (16x2 GB Micron DDR2 5300F, CL5-5-5, 2 rank, ECC)  
 Disk Subsystem: 73 GB Seagate SAS, 10K RPM  
 Other Hardware: None

Other Software: Microquill SmartHeap V8.1  
 Binutils 2.18.50.0.7.20080502

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	285	47.7	<b>285</b>	<b>47.7</b>	283	48.0	285	47.7	<b>284</b>	<b>47.9</b>	283	48.0
416.gamess	1120	17.5	<b>1121</b>	<b>17.5</b>	1121	17.5	965	20.3	<b>964</b>	<b>20.3</b>	964	20.3
433.milc	818	11.2	817	11.2	<b>818</b>	<b>11.2</b>	826	11.1	<b>825</b>	<b>11.1</b>	824	11.1
434.zeusmp	496	18.3	496	18.3	<b>496</b>	<b>18.3</b>	496	18.3	496	18.3	<b>496</b>	<b>18.3</b>
435.gromacs	402	17.8	402	17.8	<b>402</b>	<b>17.8</b>	399	17.9	399	17.9	<b>399</b>	<b>17.9</b>
436.cactusADM	72.5	165	<b>72.7</b>	<b>164</b>	72.8	164	74.4	161	74.1	161	<b>74.3</b>	<b>161</b>
437.leslie3d	607	15.5	609	15.4	<b>609</b>	<b>15.4</b>	607	15.5	609	15.4	<b>609</b>	<b>15.4</b>
444.namd	<b>551</b>	<b>14.5</b>	551	14.6	555	14.5	<b>555</b>	<b>14.5</b>	555	14.5	556	14.4
447.dealII	<b>484</b>	<b>23.7</b>	484	23.7	483	23.7	447	25.6	447	25.6	<b>447</b>	<b>25.6</b>
450.soplex	<b>712</b>	<b>11.7</b>	709	11.8	713	11.7	640	13.0	636	13.1	<b>639</b>	<b>13.1</b>
453.povray	244	21.8	246	21.6	<b>245</b>	<b>21.7</b>	<b>207</b>	<b>25.8</b>	207	25.7	206	25.8
454.calculix	424	19.5	<b>426</b>	<b>19.4</b>	426	19.4	394	20.9	392	21.0	<b>393</b>	<b>21.0</b>
459.GemsFDTD	<b>411</b>	<b>25.8</b>	411	25.8	412	25.8	395	26.8	396	26.8	<b>396</b>	<b>26.8</b>
465.tonto	695	14.2	693	14.2	<b>694</b>	<b>14.2</b>	492	20.0	488	20.2	<b>489</b>	<b>20.1</b>
470.lbm	437	31.4	<b>436</b>	<b>31.5</b>	433	31.7	437	31.4	<b>436</b>	<b>31.5</b>	433	31.7
481.wrf	<b>642</b>	<b>17.4</b>	643	17.4	642	17.4	643	17.4	<b>643</b>	<b>17.4</b>	643	17.4
482.sphinx3	766	25.5	753	25.9	<b>762</b>	<b>25.6</b>	750	26.0	753	25.9	<b>751</b>	<b>25.9</b>

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

## General Notes

All benchmarks compiled in 64-bit mode except 450.soplex and 482.sphinx3, at peak, are compiled in 32-bit mode  
 OMP\_NUM\_THREADS set to number of processors  
 KMP\_AFFINITY set to "physical,0"  
 KMP\_STACKSIZE set to 200M  
 Hardware Prefetcher: Enabled  
 Adjacent Cache Line Prefetcher: Enabled  
 High Bandwidth Option: Disabled



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## 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.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:

-xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

C++ benchmarks:

-xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Fortran benchmarks:

-xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch



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## Peak Compiler Invocation

C benchmarks (except as noted below):

icc

```
482.sphinx3: /opt/intel/Compiler/11.0/042/bin/ia32/icc
             -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
             -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

C++ benchmarks (except as noted below):

icpc

```
450.soplex: /opt/intel/Compiler/11.0/042/bin/ia32/icpc
            -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
            -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

Fortran benchmarks:

ifort

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
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
```

## Peak Optimization Flags

C benchmarks:

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

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## Peak Optimization Flags (Continued)

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2

### C++ benchmarks:

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

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

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

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

### Fortran benchmarks:

410.bwaves: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch  
-parallel

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

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

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

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

### Benchmarks using both Fortran and C:

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

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

454.calculix: -xSSE4.1 -ipo -O3 -no-prec-div -static -auto-ilp32

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## Peak Optimization Flags (Continued)

481.wrf: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch  
-parallel -auto-ilp32

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.20090713.09.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.20090713.09.xml>

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