



SPEC® CFP2006 Result

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Dell Inc.

SPECfp®2006 = 21.3

PowerEdge R900 (Intel Xeon E7450, 2.40 GHz)

SPECfp_base2006 = 20.2

CPU2006 license: 55

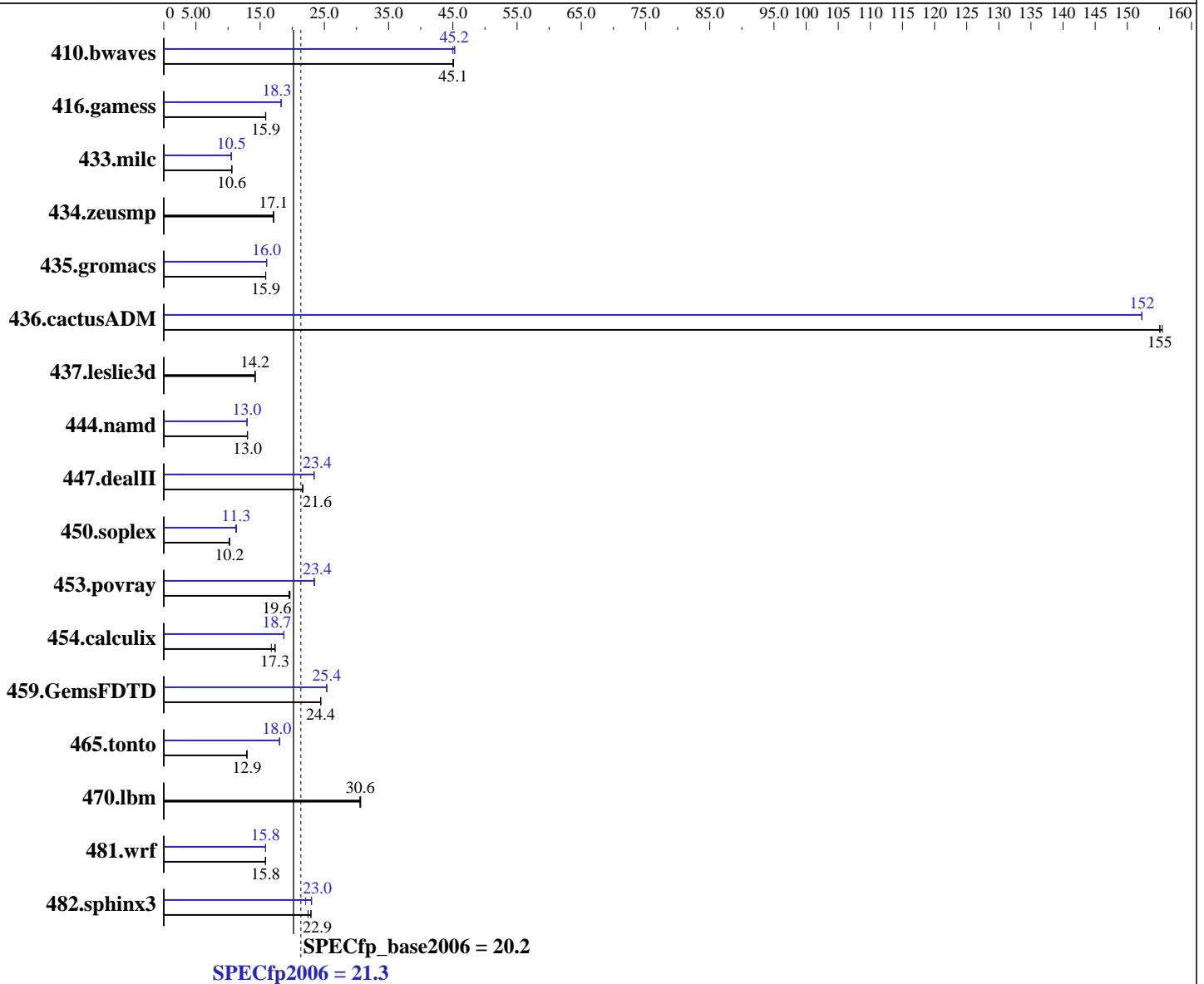
Test date: Sep-2008

Test sponsor: Dell Inc.

Hardware Availability: Sep-2008

Tested by: Dell Inc.

Software Availability: Nov-2008



Hardware

CPU Name: Intel Xeon E7450
 CPU Characteristics:
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip
 CPU(s) orderable: 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 Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16-60.0.21-smp
 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

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L3 Cache: 12 MB I+D on chip per chip
 Other Cache: None
 Memory: 64 GB (16 x 4GB DDR2-667 FBDIMM)
 Disk Subsystem: 2 x 36 GB SAS 15000 RPM (RAID-0) for OS,
 1 x 73 GB SAS 10000 RPM for benchmark
 Other Hardware: None

Peak Pointers: 32/64-bit
 Other Software: 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 | <u>302</u> | <u>45.1</u> | 302 | 45.0 | 301 | 45.1 | 300 | 45.3 | 302 | 45.0 | <u>301</u> | <u>45.2</u> |
| 416.gamess | 1236 | 15.8 | 1233 | 15.9 | <u>1234</u> | <u>15.9</u> | 1071 | 18.3 | 1073 | 18.2 | <u>1071</u> | <u>18.3</u> |
| 433.milc | 866 | 10.6 | <u>867</u> | <u>10.6</u> | 868 | 10.6 | 875 | 10.5 | 873 | 10.5 | <u>873</u> | <u>10.5</u> |
| 434.zeusmp | 533 | 17.1 | 532 | 17.1 | <u>532</u> | <u>17.1</u> | 533 | 17.1 | 532 | 17.1 | <u>532</u> | <u>17.1</u> |
| 435.gromacs | 450 | 15.9 | 450 | 15.9 | <u>450</u> | <u>15.9</u> | <u>446</u> | <u>16.0</u> | 447 | 16.0 | 446 | 16.0 |
| 436.cactusADM | 76.9 | 155 | 77.1 | 155 | <u>77.1</u> | <u>155</u> | <u>78.5</u> | <u>152</u> | 78.5 | 152 | 78.5 | 152 |
| 437.leslie3d | 662 | 14.2 | <u>661</u> | <u>14.2</u> | 660 | 14.2 | 662 | 14.2 | <u>661</u> | <u>14.2</u> | 660 | 14.2 |
| 444.namd | 615 | 13.0 | 616 | 13.0 | <u>616</u> | <u>13.0</u> | 619 | 13.0 | <u>619</u> | <u>13.0</u> | 619 | 13.0 |
| 447.dealII | <u>529</u> | <u>21.6</u> | 529 | 21.6 | 528 | 21.6 | <u>489</u> | <u>23.4</u> | 489 | 23.4 | 489 | 23.4 |
| 450.soplex | 814 | 10.2 | 817 | 10.2 | <u>817</u> | <u>10.2</u> | 736 | 11.3 | 743 | 11.2 | <u>741</u> | <u>11.3</u> |
| 453.povray | <u>271</u> | <u>19.6</u> | 271 | 19.7 | 273 | 19.5 | 227 | 23.4 | <u>227</u> | <u>23.4</u> | 227 | 23.5 |
| 454.calculix | 493 | 16.7 | 476 | 17.3 | <u>477</u> | <u>17.3</u> | 442 | 18.7 | <u>441</u> | <u>18.7</u> | 441 | 18.7 |
| 459.GemsFDTD | 434 | 24.5 | <u>434</u> | <u>24.4</u> | 435 | 24.4 | <u>418</u> | <u>25.4</u> | 419 | 25.3 | 418 | 25.4 |
| 465.tonto | 759 | 13.0 | <u>760</u> | <u>12.9</u> | 762 | 12.9 | 545 | 18.0 | <u>546</u> | <u>18.0</u> | 547 | 18.0 |
| 470.lbm | 450 | 30.5 | <u>449</u> | <u>30.6</u> | 448 | 30.7 | 450 | 30.5 | <u>449</u> | <u>30.6</u> | 448 | 30.7 |
| 481.wrf | 706 | 15.8 | 704 | 15.9 | <u>706</u> | <u>15.8</u> | 705 | 15.8 | 705 | 15.8 | <u>705</u> | <u>15.8</u> |
| 482.sphinx3 | 868 | 22.5 | <u>852</u> | <u>22.9</u> | 850 | 22.9 | <u>848</u> | <u>23.0</u> | 882 | 22.1 | 847 | 23.0 |

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

Operating System Notes

'ulimit -s unlimited' was used to set the stack size to unlimited prior to run

Platform Notes

BIOS Settings:
 Hardware Prefetcher = Disabled (Default = Enabled)
 Adjacent Cache Line Prefetch = Disabled (Default = Enabled)
 High Bandwidth = Enabled (Default = Disabled)



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General Notes

OMP_NUM_THREADS set to number of processors
KMP_AFFINITY set to "physical,0"
KMP_STACKSIZE set to 200M

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:

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

C++ benchmarks:

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

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Base Optimization Flags (Continued)

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

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



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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

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

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Peak Optimization Flags (Continued)

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

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

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.05.html>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.11.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.05.xml>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.11.xml>

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For other inquiries, please contact webmaster@spec.org.

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