



SPEC® CFP2006 Result

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Hewlett-Packard Company

SPECfp®_rate2006 = 44.5

ProLiant DL360 G5
(3.16 GHz, Intel Xeon processor X5460)

SPECfp_rate_base2006 = 41.3

CPU2006 license: 3

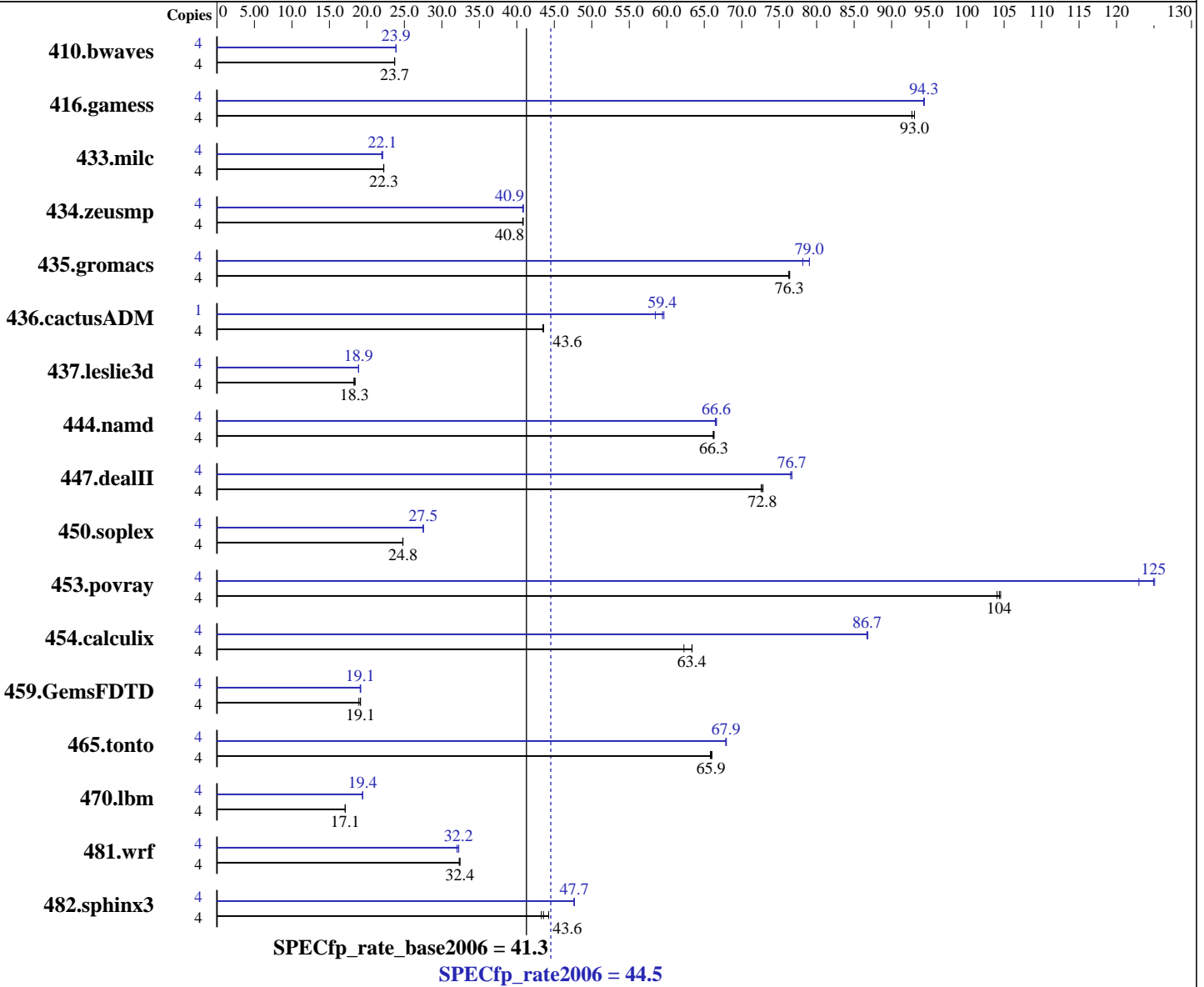
Test date: Oct-2007

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2007

Tested by: Hewlett-Packard Company

Software Availability: Nov-2007



Hardware

CPU Name: Intel Xeon X5460
 CPU Characteristics: 3.16 GHz, 2x6 MB L2 shared, 1333 MHz system bus
 CPU MHz: 3166
 FPU: Integrated
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
 CPU(s) orderable: 1 or 2 chips
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 12 MB I+D on chip per chip, 6 MB shared / 2 cores

Continued on next page

Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP1 kernel 2.6.16.46-0.12-smp
 Compiler: Intel C++ and Fortran Compiler for Linux32 and Linux64 version 10.1 Build 20070725
 Auto Parallel: Yes
 File System: ext2
 System State: Multi-user run level 3
 Base Pointers: 64-bit

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L3 Cache: None
Other Cache: None
Memory: 16 GB (8x2 GB PC2-5300F CL5)
Disk Subsystem: 1x72 GB 15 K SAS
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: binutils-2.17.50

Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|--------|-------------|-------------|-------------|-------------|------------|-------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 4 | 2292 | 23.7 | 2295 | 23.7 | <u>2294</u> | <u>23.7</u> | 4 | <u>2276</u> | <u>23.9</u> | 2276 | 23.9 | 2276 | 23.9 |
| 416.gamess | 4 | 842 | 93.0 | 845 | 92.7 | <u>842</u> | <u>93.0</u> | 4 | 831 | 94.3 | 830 | 94.4 | <u>830</u> | <u>94.3</u> |
| 433.milc | 4 | <u>1650</u> | <u>22.3</u> | 1652 | 22.2 | 1650 | 22.3 | 4 | 1670 | 22.0 | <u>1665</u> | <u>22.1</u> | 1661 | 22.1 |
| 434.zeusmp | 4 | 891 | 40.9 | <u>892</u> | <u>40.8</u> | 892 | 40.8 | 4 | 890 | 40.9 | 892 | 40.8 | <u>891</u> | <u>40.9</u> |
| 435.gromacs | 4 | <u>374</u> | <u>76.3</u> | 374 | 76.4 | 374 | 76.3 | 4 | 361 | 79.0 | <u>361</u> | <u>79.0</u> | 365 | 78.2 |
| 436.cactusADM | 4 | 1100 | 43.5 | 1097 | 43.6 | <u>1097</u> | <u>43.6</u> | 1 | 200 | 59.6 | <u>201</u> | <u>59.4</u> | 204 | 58.5 |
| 437.leslie3d | 4 | <u>2052</u> | <u>18.3</u> | 2058 | 18.3 | 2039 | 18.4 | 4 | 1989 | 18.9 | <u>1990</u> | <u>18.9</u> | 1992 | 18.9 |
| 444.namd | 4 | 485 | 66.2 | <u>484</u> | <u>66.3</u> | 484 | 66.3 | 4 | <u>482</u> | <u>66.6</u> | 483 | 66.5 | 481 | 66.6 |
| 447.dealII | 4 | 630 | 72.6 | 628 | 72.8 | <u>629</u> | <u>72.8</u> | 4 | 597 | 76.7 | 598 | 76.5 | <u>597</u> | <u>76.7</u> |
| 450.soplex | 4 | <u>1345</u> | <u>24.8</u> | 1346 | 24.8 | 1344 | 24.8 | 4 | <u>1211</u> | <u>27.5</u> | 1213 | 27.5 | 1211 | 27.5 |
| 453.povray | 4 | <u>204</u> | <u>104</u> | 204 | 105 | 204 | 104 | 4 | <u>170</u> | <u>125</u> | 173 | 123 | 170 | 125 |
| 454.calculix | 4 | 530 | 62.3 | 521 | 63.4 | <u>521</u> | <u>63.4</u> | 4 | 380 | 86.8 | <u>381</u> | <u>86.7</u> | 381 | 86.7 |
| 459.GemsFDTD | 4 | <u>2218</u> | <u>19.1</u> | 2216 | 19.2 | 2241 | 18.9 | 4 | 2221 | 19.1 | <u>2219</u> | <u>19.1</u> | 2212 | 19.2 |
| 465.tonto | 4 | 598 | 65.8 | <u>597</u> | <u>65.9</u> | 596 | 66.0 | 4 | 579 | 68.0 | 580 | 67.9 | <u>580</u> | <u>67.9</u> |
| 470.lbm | 4 | 3213 | 17.1 | <u>3211</u> | <u>17.1</u> | 3211 | 17.1 | 4 | <u>2828</u> | <u>19.4</u> | 2829 | 19.4 | 2828 | 19.4 |
| 481.wrf | 4 | <u>1379</u> | <u>32.4</u> | 1382 | 32.3 | 1378 | 32.4 | 4 | <u>1386</u> | <u>32.2</u> | 1395 | 32.0 | 1385 | 32.3 |
| 482.sphinx3 | 4 | <u>1790</u> | <u>43.6</u> | 1762 | 44.3 | 1802 | 43.3 | 4 | 1635 | 47.7 | <u>1636</u> | <u>47.7</u> | 1637 | 47.6 |

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 stacksize to unlimited prior to run
'/usr/bin/taskset' used to bind processes to CPUs
OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to physical,0
KMP_STACKSIZE set to 200M

Platform Notes

BIOS configuration:
Power Regulator set to Static High Performance Mode
Adjacent Sector Prefetch Disabled
Hardware Prefetcher 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.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:
-fast

C++ benchmarks:
-fast

Fortran benchmarks:
-fast

Benchmarks using both Fortran and C:
-fast



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Peak Compiler Invocation

C benchmarks (except as noted below):

```
/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/icc
-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib
-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include
```

433.milc: icc

C++ benchmarks (except as noted below):

icpc

```
450.soplex: /home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/icpc
-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib
-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include
```

Fortran benchmarks (except as noted below):

ifort

```
437.leslie3d: /home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/ifort
-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib
-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include
```

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
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) -fast -fno-alias
-auto-ilp32
```

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Peak Optimization Flags (Continued)

470.lbm: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2
-scalar-rep- -prefetch -opt-malloc-options=3

482.sphinx3: -fast -unroll2

C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -fast -fno-alias
-auto-ilp32

447.dealII: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2
-ansi-alias -scalar-rep-

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -fast
-opt-malloc-options=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: -fast -prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0
-ansi-alias -scalar-rep-

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -fast

437.leslie3d: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch
-opt-malloc-options=3

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0
-prefetch

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4 -auto

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch
-auto-ilp32

436.cactusADM: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2
-prefetch -parallel -auto-ilp32

454.calculix: -fast -unroll-aggressive -auto-ilp32

481.wrf: -fast -auto-ilp32



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

<http://www.spec.org/cpu2006/flags/HP-Intel-ic10.1-linux-fp-flags.20090714.01.html>

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

<http://www.spec.org/cpu2006/flags/HP-Intel-ic10.1-linux-fp-flags.20090714.01.xml>

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