



SPEC[®] CFP2006 Result

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Hewlett-Packard Company

SPECfp[®]_rate2006 = 50.5

ProLiant ML310 G5
(2.83 GHz, Intel Xeon processor X3360)

SPECfp_rate_base2006 = 46.4

CPU2006 license: 3

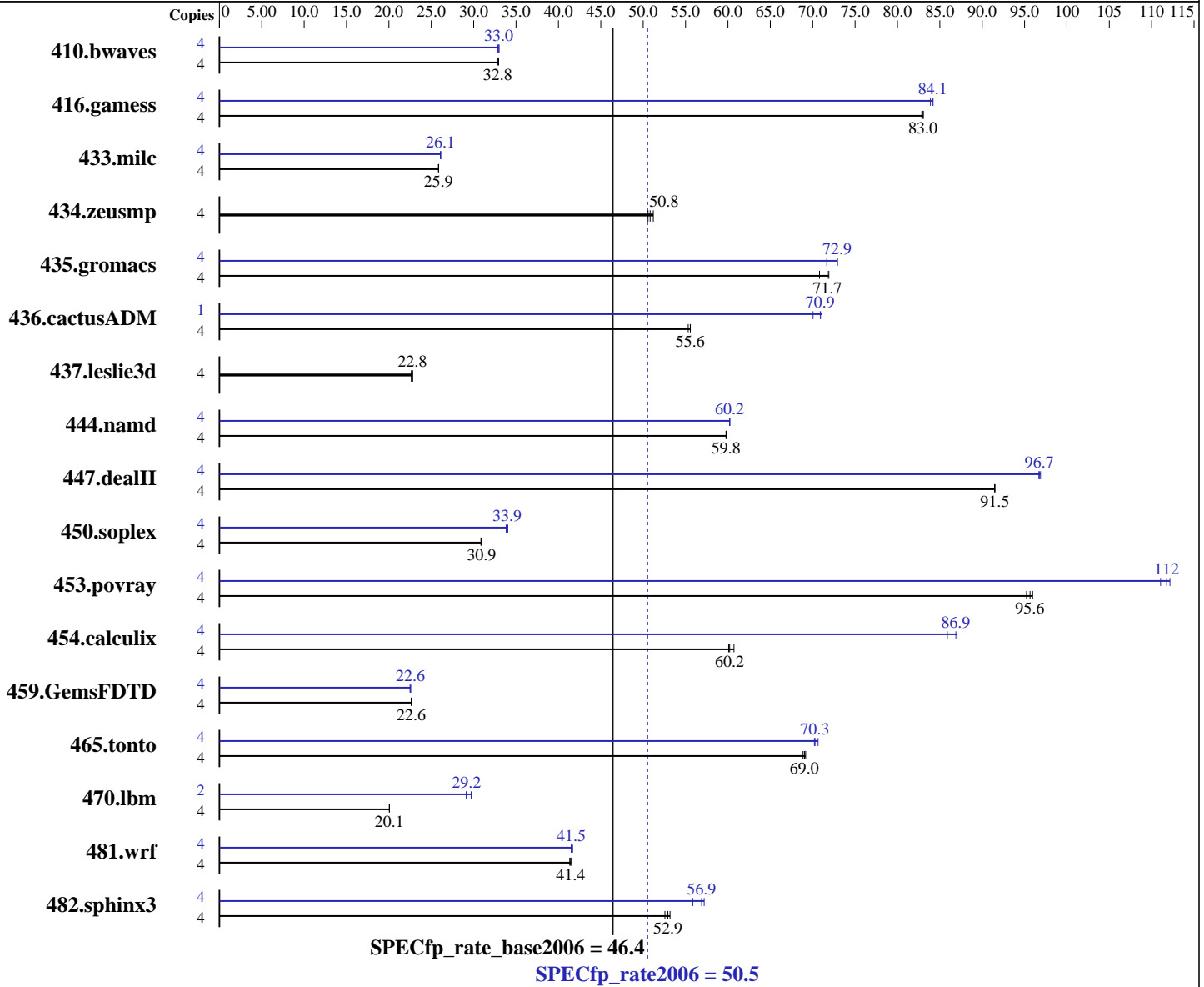
Test date: Apr-2008

Test sponsor: Hewlett-Packard Company

Hardware Availability: May-2008

Tested by: Hewlett-Packard Company

Software Availability: Sep-2007



Hardware

CPU Name: Intel Xeon X3360
 CPU Characteristics: 2.83 GHz, 2x6 MB L2 shared, 1333 MHz system bus
 CPU MHz: 2833
 FPU: Integrated
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
 CPU(s) orderable: 1 chip
 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

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Software

Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP1
 Kernel 2.6.16.46-0.12-smp
 Compiler: Intel C++ Compiler 10.1 for Linux
 Build 20070913 Package ID: l_cc_p_10.1.008
 Intel Fortran Compiler 10.1 for Linux
 Build 20070913 Package ID: l_cc_p_10.1.008
 Auto Parallel: Yes
 File System: ext2
 System State: Run level 3 (multi-user)

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L3 Cache: None
Other Cache: None
Memory: 8 GB (4x2 GB PC2-6400E CL5)
Disk Subsystem: 1x250 GB 7.2 K SATA
Other Hardware: None

Base Pointers: 64-bit
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 | 1650 | 33.0 | <u>1655</u> | <u>32.8</u> | 1660 | 32.8 | 4 | 1648 | 33.0 | <u>1648</u> | <u>33.0</u> | 1655 | 32.8 |
| 416.gamess | 4 | <u>943</u> | <u>83.0</u> | 943 | 83.0 | 945 | 82.9 | 4 | <u>931</u> | <u>84.1</u> | 934 | 83.9 | 930 | 84.2 |
| 433.milc | 4 | 1421 | 25.8 | <u>1420</u> | <u>25.9</u> | 1420 | 25.9 | 4 | 1406 | 26.1 | 1408 | 26.1 | <u>1407</u> | <u>26.1</u> |
| 434.zeusmp | 4 | <u>716</u> | <u>50.8</u> | 720 | 50.6 | 711 | 51.2 | 4 | <u>716</u> | <u>50.8</u> | 720 | 50.6 | 711 | 51.2 |
| 435.gromacs | 4 | <u>398</u> | <u>71.7</u> | 397 | 71.9 | 403 | 70.8 | 4 | 399 | 71.7 | <u>392</u> | <u>72.9</u> | 392 | 72.9 |
| 436.cactusADM | 4 | <u>860</u> | <u>55.6</u> | 864 | 55.3 | 860 | 55.6 | 1 | 168 | 71.1 | <u>169</u> | <u>70.9</u> | 171 | 70.0 |
| 437.leslie3d | 4 | 1661 | 22.6 | 1650 | 22.8 | <u>1652</u> | <u>22.8</u> | 4 | 1661 | 22.6 | 1650 | 22.8 | <u>1652</u> | <u>22.8</u> |
| 444.namd | 4 | 536 | 59.8 | <u>537</u> | <u>59.8</u> | 537 | 59.8 | 4 | <u>533</u> | <u>60.2</u> | 533 | 60.2 | 533 | 60.2 |
| 447.dealII | 4 | 500 | 91.5 | 500 | 91.5 | <u>500</u> | <u>91.5</u> | 4 | 472 | 96.9 | <u>473</u> | <u>96.7</u> | 473 | 96.7 |
| 450.soplex | 4 | 1079 | 30.9 | 1081 | 30.9 | <u>1079</u> | <u>30.9</u> | 4 | 986 | 33.8 | <u>983</u> | <u>33.9</u> | 980 | 34.0 |
| 453.povray | 4 | 222 | 95.9 | 223 | 95.2 | <u>222</u> | <u>95.6</u> | 4 | 190 | 112 | 192 | 111 | <u>190</u> | <u>112</u> |
| 454.calculix | 4 | <u>548</u> | <u>60.2</u> | 544 | 60.7 | 549 | 60.1 | 4 | <u>380</u> | <u>86.9</u> | 384 | 85.9 | 379 | 87.0 |
| 459.GemsFDTD | 4 | 1873 | 22.7 | 1876 | 22.6 | <u>1874</u> | <u>22.6</u> | 4 | 1887 | 22.5 | 1881 | 22.6 | <u>1882</u> | <u>22.6</u> |
| 465.tonto | 4 | <u>570</u> | <u>69.0</u> | 569 | 69.2 | 572 | 68.9 | 4 | 557 | 70.6 | 561 | 70.2 | <u>560</u> | <u>70.3</u> |
| 470.lbm | 4 | 2741 | 20.1 | 2739 | 20.1 | <u>2740</u> | <u>20.1</u> | 2 | 925 | 29.7 | <u>943</u> | <u>29.2</u> | 943 | 29.1 |
| 481.wrf | 4 | 1077 | 41.5 | 1081 | 41.3 | <u>1078</u> | <u>41.4</u> | 4 | 1076 | 41.5 | <u>1076</u> | <u>41.5</u> | 1072 | 41.7 |
| 482.sphinx3 | 4 | <u>1473</u> | <u>52.9</u> | 1483 | 52.6 | 1466 | 53.2 | 4 | 1363 | 57.2 | 1396 | 55.9 | <u>1370</u> | <u>56.9</u> |

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 64M

Platform Notes

BIOS configuration:
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):

```
/opt/intel/cc/10.1.008/bin/icc -L/opt/intel/cc/10.1.008/lib
-I/opt/intel/cc/10.1.008/include
```

433.milc: icc

C++ benchmarks (except as noted below):

icpc

```
450.soplex: /opt/intel/cc/10.1.008/bin/icpc -L/opt/intel/cc/10.1.008/lib
-I/opt/intel/cc/10.1.008/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
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
```

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

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Peak Optimization Flags (Continued)

482.sphinx3: -fast -unroll2

C++ benchmarks:

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

447.dealIII: -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: basepeak = yes

437.leslie3d: basepeak = yes

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

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.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.xml>



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