



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

SPECfp®\_rate2006 = 49.2

ProLiant ML310 G5  
(2.66 GHz, Intel Xeon X3350)

SPECfp\_rate\_base2006 = 45.2

CPU2006 license: 3

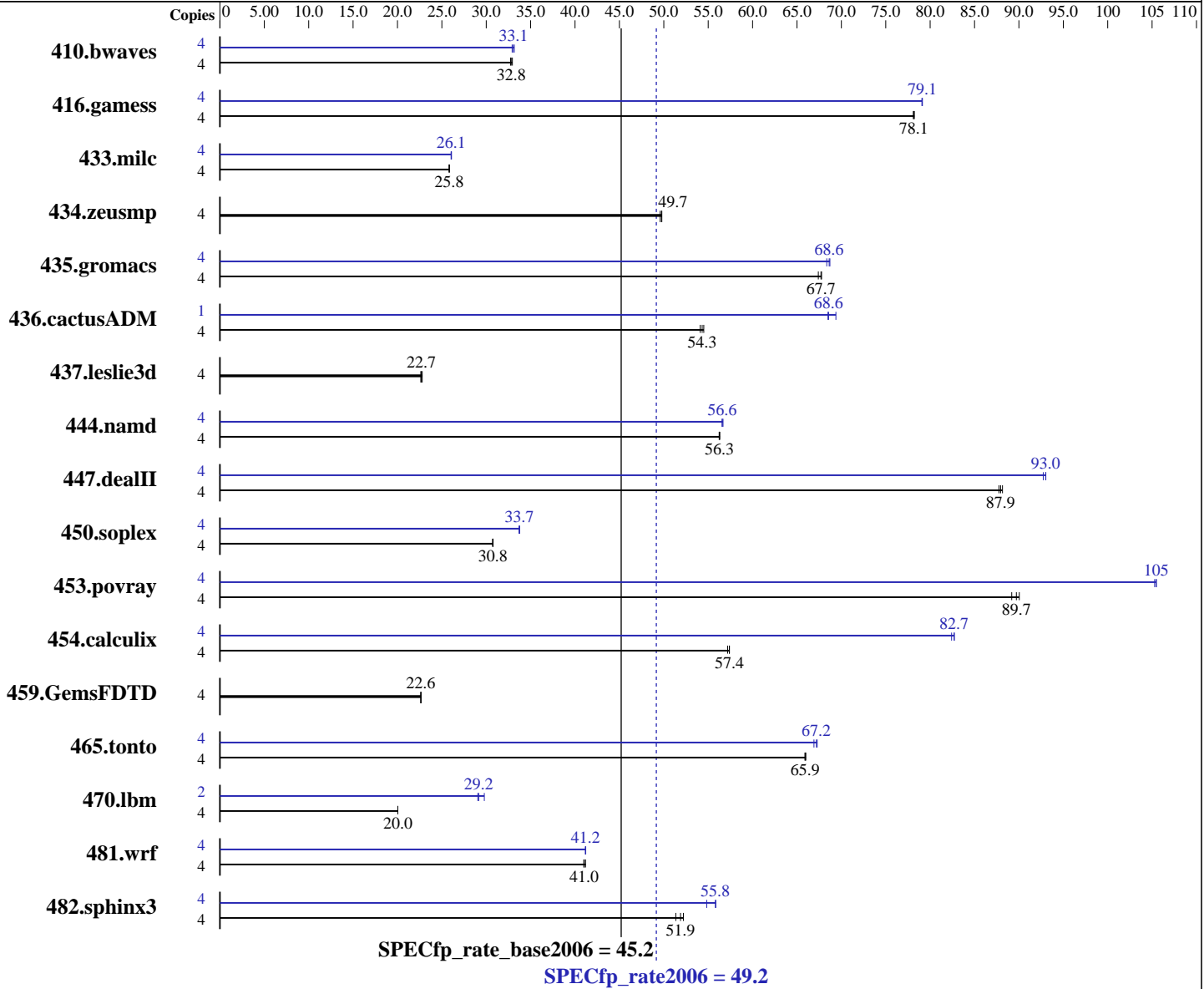
Test date: Apr-2008

Test sponsor: Hewlett-Packard Company

Hardware Availability: Mar-2008

Tested by: Hewlett-Packard Company

Software Availability: Sep-2007



### Hardware

CPU Name: Intel Xeon X3350  
 CPU Characteristics: 2.66 GHz, 2x6 MB L2 shared, 1333 MHz system bus  
 CPU MHz: 2666  
 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               | 32.9               | <b><u>1657</u></b> | <b><u>32.8</u></b> | 1660               | 32.7               | 4      | 1651               | 32.9               | <b><u>1645</u></b> | <b><u>33.1</u></b> | 1640               | 33.2               |
| 416.gamess    | 4      | 1003               | 78.1               | <b><u>1002</u></b> | <b><u>78.1</u></b> | 1001               | 78.2               | 4      | 990                | 79.1               | 990                | 79.1               | <b><u>990</u></b>  | <b><u>79.1</u></b> |
| 433.milc      | 4      | 1422               | 25.8               | <b><u>1421</u></b> | <b><u>25.8</u></b> | 1421               | 25.8               | 4      | <b><u>1409</u></b> | <b><u>26.1</u></b> | 1410               | 26.0               | 1408               | 26.1               |
| 434.zeusmp    | 4      | <b><u>732</u></b>  | <b><u>49.7</u></b> | 734                | 49.6               | 731                | 49.8               | 4      | <b><u>732</u></b>  | <b><u>49.7</u></b> | 734                | 49.6               | 731                | 49.8               |
| 435.gromacs   | 4      | 424                | 67.4               | <b><u>422</u></b>  | <b><u>67.7</u></b> | 421                | 67.8               | 4      | 416                | 68.7               | 418                | 68.4               | <b><u>416</u></b>  | <b><u>68.6</u></b> |
| 436.cactusADM | 4      | <b><u>880</u></b>  | <b><u>54.3</u></b> | 877                | 54.5               | 884                | 54.1               | 1      | 172                | 69.4               | 174                | 68.5               | <b><u>174</u></b>  | <b><u>68.6</u></b> |
| 437.leslie3d  | 4      | 1662               | 22.6               | <b><u>1657</u></b> | <b><u>22.7</u></b> | 1650               | 22.8               | 4      | 1662               | 22.6               | <b><u>1657</u></b> | <b><u>22.7</u></b> | 1650               | 22.8               |
| 444.namd      | 4      | <b><u>570</u></b>  | <b><u>56.3</u></b> | 570                | 56.2               | 570                | 56.3               | 4      | 566                | 56.7               | <b><u>567</u></b>  | <b><u>56.6</u></b> | 567                | 56.6               |
| 447.dealII    | 4      | <b><u>520</u></b>  | <b><u>87.9</u></b> | 521                | 87.8               | 519                | 88.1               | 4      | 493                | 92.7               | 492                | 93.0               | <b><u>492</u></b>  | <b><u>93.0</u></b> |
| 450.soplex    | 4      | 1084               | 30.8               | 1087               | 30.7               | <b><u>1084</u></b> | <b><u>30.8</u></b> | 4      | <b><u>989</u></b>  | <b><u>33.7</u></b> | 988                | 33.8               | 990                | 33.7               |
| 453.povray    | 4      | <b><u>237</u></b>  | <b><u>89.7</u></b> | 239                | 89.2               | 236                | 90.0               | 4      | <b><u>202</u></b>  | <b><u>105</u></b>  | 202                | 105                | 202                | 105                |
| 454.calculix  | 4      | 577                | 57.2               | 575                | 57.4               | <b><u>575</u></b>  | <b><u>57.4</u></b> | 4      | 400                | 82.4               | <b><u>399</u></b>  | <b><u>82.7</u></b> | 399                | 82.7               |
| 459.GemsFDTD  | 4      | <b><u>1875</u></b> | <b><u>22.6</u></b> | 1873               | 22.7               | 1876               | 22.6               | 4      | <b><u>1875</u></b> | <b><u>22.6</u></b> | 1873               | 22.7               | 1876               | 22.6               |
| 465.tonto     | 4      | <b><u>597</u></b>  | <b><u>65.9</u></b> | 596                | 66.0               | 597                | 65.9               | 4      | 585                | 67.3               | <b><u>586</u></b>  | <b><u>67.2</u></b> | 588                | 66.9               |
| 470.lbm       | 4      | 2742               | 20.0               | 2742               | 20.0               | <b><u>2742</u></b> | <b><u>20.0</u></b> | 2      | 923                | 29.8               | 946                | 29.0               | <b><u>942</u></b>  | <b><u>29.2</u></b> |
| 481.wrf       | 4      | 1090               | 41.0               | <b><u>1089</u></b> | <b><u>41.0</u></b> | 1085               | 41.2               | 4      | 1086               | 41.2               | 1084               | 41.2               | <b><u>1084</u></b> | <b><u>41.2</u></b> |
| 482.sphinx3   | 4      | 1518               | 51.4               | 1493               | 52.2               | <b><u>1503</u></b> | <b><u>51.9</u></b> | 4      | 1396               | 55.9               | 1422               | 54.8               | <b><u>1397</u></b> | <b><u>55.8</u></b> |

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: basepeak = yes

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

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