# SPEC® CFP2006 Result



## Hewlett-Packard Company

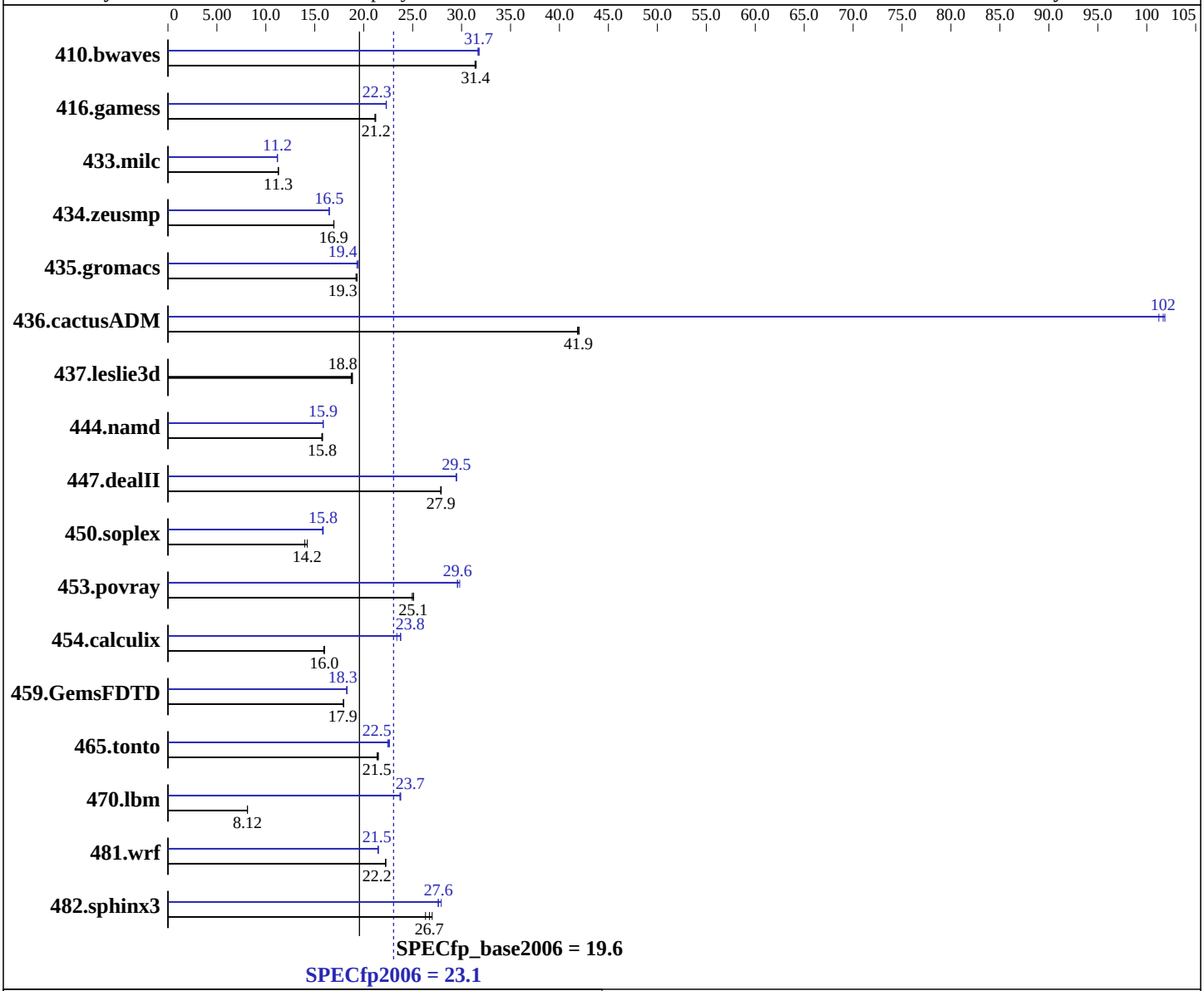
ProLiant BL2x220c G5
(3.00 GHz, Intel Xeon E5450)

SPECfp®2006 = 23.1

SPECfp_base2006 = 19.6

**CPU2006 license:** 3
**Test sponsor:** Hewlett-Packard Company
**Tested by:** Hewlett-Packard Company

**Test date:** May-2008
**Hardware Availability:** May-2008
**Software Availability:** Nov-2007




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5450 |
| CPU Characteristics: | 3.00 GHz, 2x6 MB L2 shared, 1333 MHz system bus |
| CPU MHz: | 3000 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 2 chips, 4 cores/chip |
| CPU(s) orderable: | 2,3,4 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 |

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### Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 10 (x86_64) SP1<br>Kernel 2.6.16.46-0.12-smp |
| Compiler: | Intel C++ Compiler 10.1 for Linux<br>Build 20070913 Package ID: l_cc_p_10.1.008<br>Intel Fortran Compiler 10.1 for Linux<br>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: 16 GB (4x4 GB PC2-5300P CL5)
Disk Subsystem: 1x120 GB 5.4 K RPM 2.5" SFF SATA
Other Hardware: None

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

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | **433** | **31.4** | 431 | 31.5 | 433 | 31.4 | 429 | 31.7 | **428** | **31.7** | 427 | 31.8 |
| 416.gamess | 922 | 21.2 | **925** | **21.2** | 925 | 21.2 | 877 | 22.3 | **878** | **22.3** | 879 | 22.3 |
| 433.milc | 813 | 11.3 | **814** | **11.3** | 815 | 11.3 | 822 | 11.2 | 820 | 11.2 | **821** | **11.2** |
| 434.zeusmp | 536 | 17.0 | 537 | 16.9 | **537** | **16.9** | 553 | 16.5 | **552** | **16.5** | 552 | 16.5 |
| 435.gromacs | **370** | **19.3** | 372 | 19.2 | 370 | 19.3 | **368** | **19.4** | 370 | 19.3 | 368 | 19.4 |
| 436.cactusADM | 284 | 42.0 | 286 | 41.8 | **285** | **41.9** | 118 | 101 | **118** | **102** | 117 | 102 |
| 437.leslie3d | 499 | 18.8 | **499** | **18.8** | 502 | 18.7 | 499 | 18.8 | **499** | **18.8** | 502 | 18.7 |
| 444.namd | 508 | 15.8 | **509** | **15.8** | 510 | 15.7 | **506** | **15.9** | 506 | 15.8 | 505 | 15.9 |
| 447.dealII | 411 | 27.9 | **410** | **27.9** | 410 | 27.9 | 388 | 29.4 | **388** | **29.5** | 388 | 29.5 |
| 450.soplex | 586 | 14.2 | **586** | **14.2** | 596 | 14.0 | 526 | 15.9 | 528 | 15.8 | **526** | **15.8** |
| 453.povray | 212 | 25.1 | 213 | 25.0 | **212** | **25.1** | **180** | **29.6** | 178 | 29.8 | 180 | 29.6 |
| 454.calculix | 516 | 16.0 | **516** | **16.0** | 518 | 15.9 | 347 | 23.8 | 353 | 23.4 | **347** | **23.8** |
| 459.GemsFDTD | 592 | 17.9 | **591** | **17.9** | 591 | 17.9 | 581 | 18.3 | 580 | 18.3 | **580** | **18.3** |
| 465.tonto | 458 | 21.5 | 461 | 21.4 | **459** | **21.5** | 435 | 22.6 | **436** | **22.5** | 438 | 22.5 |
| 470.lbm | 1690 | 8.13 | **1693** | **8.12** | 1694 | 8.11 | 578 | 23.8 | 580 | 23.7 | **579** | **23.7** |
| 481.wrf | **503** | **22.2** | 503 | 22.2 | 502 | 22.3 | 521 | 21.5 | 519 | 21.5 | **520** | **21.5** |
| 482.sphinx3 | 741 | 26.3 | 722 | 27.0 | **730** | **26.7** | 706 | 27.6 | 698 | 27.9 | **705** | **27.6** |

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
 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
```

## General Notes

The ProLiant BL2x220c G5 is comprised of two independent server nodes in a single chassis. Only one of the server nodes was used for this benchmark; the other server node was idle during the benchmark. The active server node contained all of the CPUs and memory described in this disclosure.

## 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 -parallel

C++ benchmarks:
-fast -parallel

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## Base Optimization Flags (Continued)

Fortran benchmarks:
`-fast -parallel`

Benchmarks using both Fortran and C:
`-fast -parallel`

## 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`

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 -parallel`

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: `basepeak = yes`

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

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`

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## Peak Optimization Flags (Continued)

481.wrf: `-fast -parallel -prefetch -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`



For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 17:41:04 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 25 June 2008.