# SPEC® CFP2006 Result

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## Hewlett-Packard Company

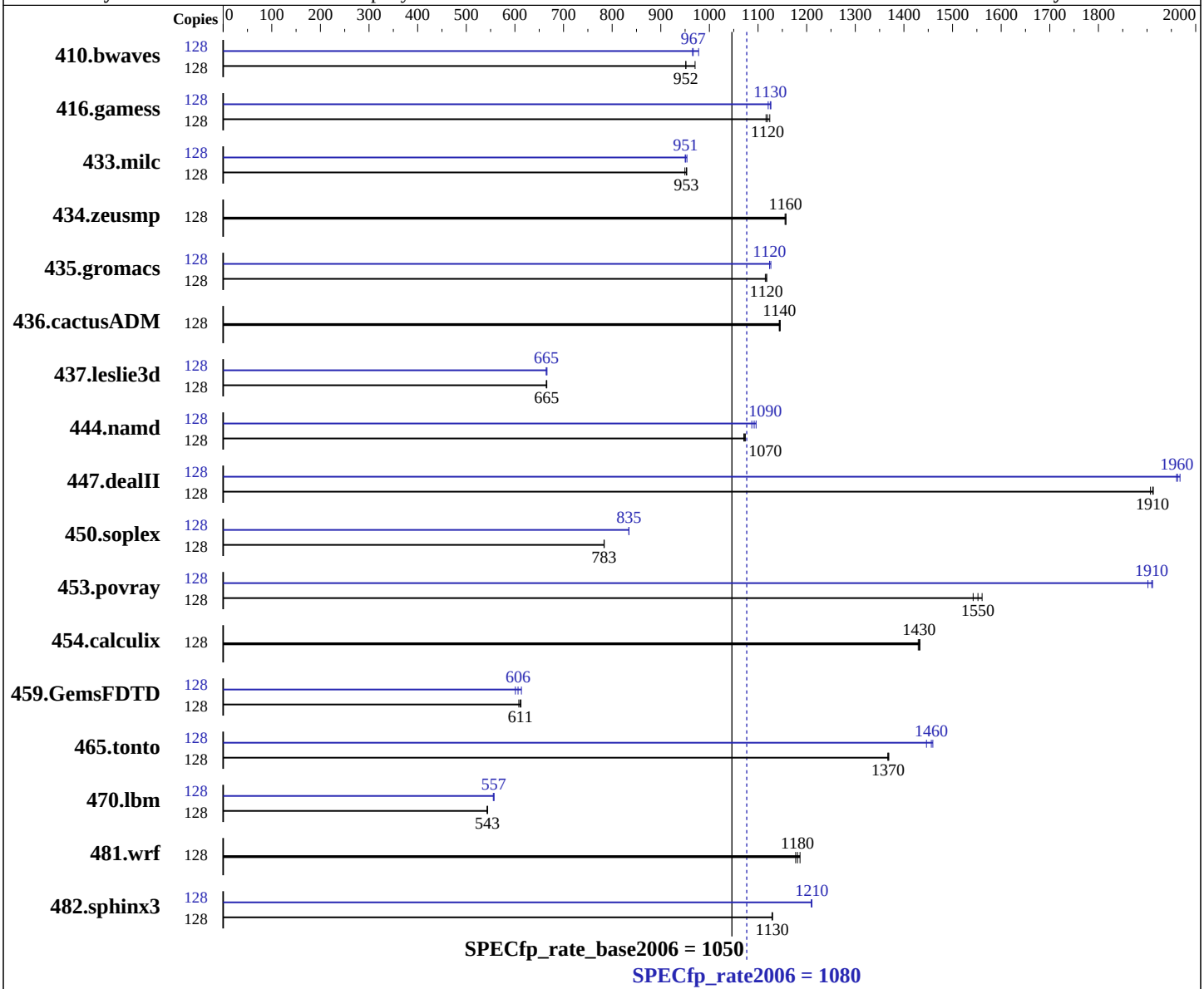
ProLiant DL980 G7 (2.27 GHz, Intel Xeon X7560)

SPECfp®_rate2006 = 1080

SPECfp_rate_base2006 = 1050

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

**Test date:** Sep-2010
**Hardware Availability:** Oct-2010
**Software Availability:** Jun-2010




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X7560 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.67 GHz |
| CPU MHz: | 2266 |
| FPU: | Integrated |
| CPU(s) enabled: | 64 cores, 8 chips, 8 cores/chip, 2 threads/core |
| CPU(s) orderable: | 4, 8 chips |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |

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## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 (x86_64) SP1<br>Kernel 2.6.32.12-0.7-default |
| Compiler: | Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1<br>Build 20100414 Package ID: l_cproc_p_11.1.072, l_cprof_p_11.1.072 |
| Auto Parallel: | No |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |

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L3 Cache: 24 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (128 x 8 GB PC3-10600R dual-rank)
Disk Subsystem: 2 x 146 GB 15K SAS
Other Hardware: 512 MB Flash Backed Write Controller Module for P410i Smart Array

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: none

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 128 | 1792 | 971 | 1829 | 951 | **1828** | **952** | 128 | 1802 | 965 | 1779 | 978 | **1799** | **967** |
| 416.gamess | 128 | 2229 | 1120 | 2245 | 1120 | **2239** | **1120** | 128 | 2236 | 1120 | 2225 | 1130 | **2228** | **1130** |
| 433.milc | 128 | **1233** | **953** | 1237 | 950 | 1232 | 953 | 128 | 1232 | 954 | 1237 | 950 | **1235** | **951** |
| 434.zeusmp | 128 | 1008 | 1160 | 1006 | 1160 | **1007** | **1160** | 128 | 1008 | 1160 | 1006 | 1160 | **1007** | **1160** |
| 435.gromacs | 128 | **818** | **1120** | 820 | 1110 | 818 | 1120 | 128 | 811 | 1130 | 813 | 1120 | **813** | **1120** |
| 436.cactusADM | 128 | **1337** | **1140** | 1337 | 1140 | 1335 | 1150 | 128 | **1337** | **1140** | 1337 | 1140 | 1335 | 1150 |
| 437.leslie3d | 128 | 1811 | 665 | 1808 | 666 | **1809** | **665** | 128 | 1810 | 665 | **1810** | **665** | 1807 | 666 |
| 444.namd | 128 | **958** | **1070** | 959 | 1070 | 956 | 1070 | 128 | 944 | 1090 | 937 | 1100 | **940** | **1090** |
| 447.dealII | 128 | **766** | **1910** | 768 | 1910 | 766 | 1910 | 128 | 744 | 1970 | 747 | 1960 | **746** | **1960** |
| 450.soplex | 128 | 1363 | 783 | **1363** | **783** | 1362 | 784 | 128 | 1280 | 834 | 1279 | 835 | **1279** | **835** |
| 453.povray | 128 | 442 | 1540 | **439** | **1550** | 436 | 1560 | 128 | 356 | 1910 | 358 | 1900 | **357** | **1910** |
| 454.calculix | 128 | 737 | 1430 | 739 | 1430 | **738** | **1430** | 128 | 737 | 1430 | 739 | 1430 | **738** | **1430** |
| 459.GemsFDTD | 128 | 2234 | 608 | **2223** | **611** | 2217 | 612 | 128 | 2214 | 613 | 2260 | 601 | **2239** | **606** |
| 465.tonto | 128 | 922 | 1370 | 920 | 1370 | **921** | **1370** | 128 | **865** | **1460** | 863 | 1460 | 871 | 1450 |
| 470.lbm | 128 | 3240 | 543 | 3233 | 544 | **3237** | **543** | 128 | 3166 | 556 | **3159** | **557** | 3158 | 557 |
| 481.wrf | 128 | **1210** | **1180** | 1205 | 1190 | 1214 | 1180 | 128 | **1210** | **1180** | 1205 | 1190 | 1214 | 1180 |
| 482.sphinx3 | 128 | **2209** | **1130** | 2208 | 1130 | 2210 | 1130 | 128 | **2061** | **1210** | 2060 | 1210 | 2063 | 1210 |

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

## Submit Notes

```
The config file option 'submit' was used.
 numactl was used to bind copies to the cores
```

## Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
SPEC files placed in /dev/shm/cpu2006 with /dev/shm
mounted as tempfs with mpol=interleave
The mpol=interleave option sets the NUMA memory allocation
policy for all files to allocate from each node in turn.
```

## Platform Notes

```
Power Regulator set to HP Static High Performance Mode
```

## Base Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

## 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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

Continued on next page

## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static`

## Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m64`

482.sphinx3: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m64`

450.soplex: `icpc -m32`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`icc -m64 ifort -m64`

## 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`

## Peak Optimization Flags

C benchmarks:

Continued on next page

# Peak Optimization Flags (Continued)

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -fno-alias -opt-prefetch

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -opt-malloc-options=3 -ansi-alias -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll2 -ansi-alias -scalar-rep-

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll2 -Ob0 -ansi-alias -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div -static

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll2 -Ob0

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

Continued on next page

## Peak Optimization Flags (Continued)

435.gromacs: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2) `-opt-prefetch -auto-ilp32`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

481.wrf: `basepeak = yes`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100511.html`
`http://www.spec.org/cpu2006/flags/HP-Intel-Linux-Settings-flags.20100525.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100511.xml`
`http://www.spec.org/cpu2006/flags/HP-Intel-Linux-Settings-flags.20100525.xml`


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