# SPEC® CFP2006 Result

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## NEC Corporation

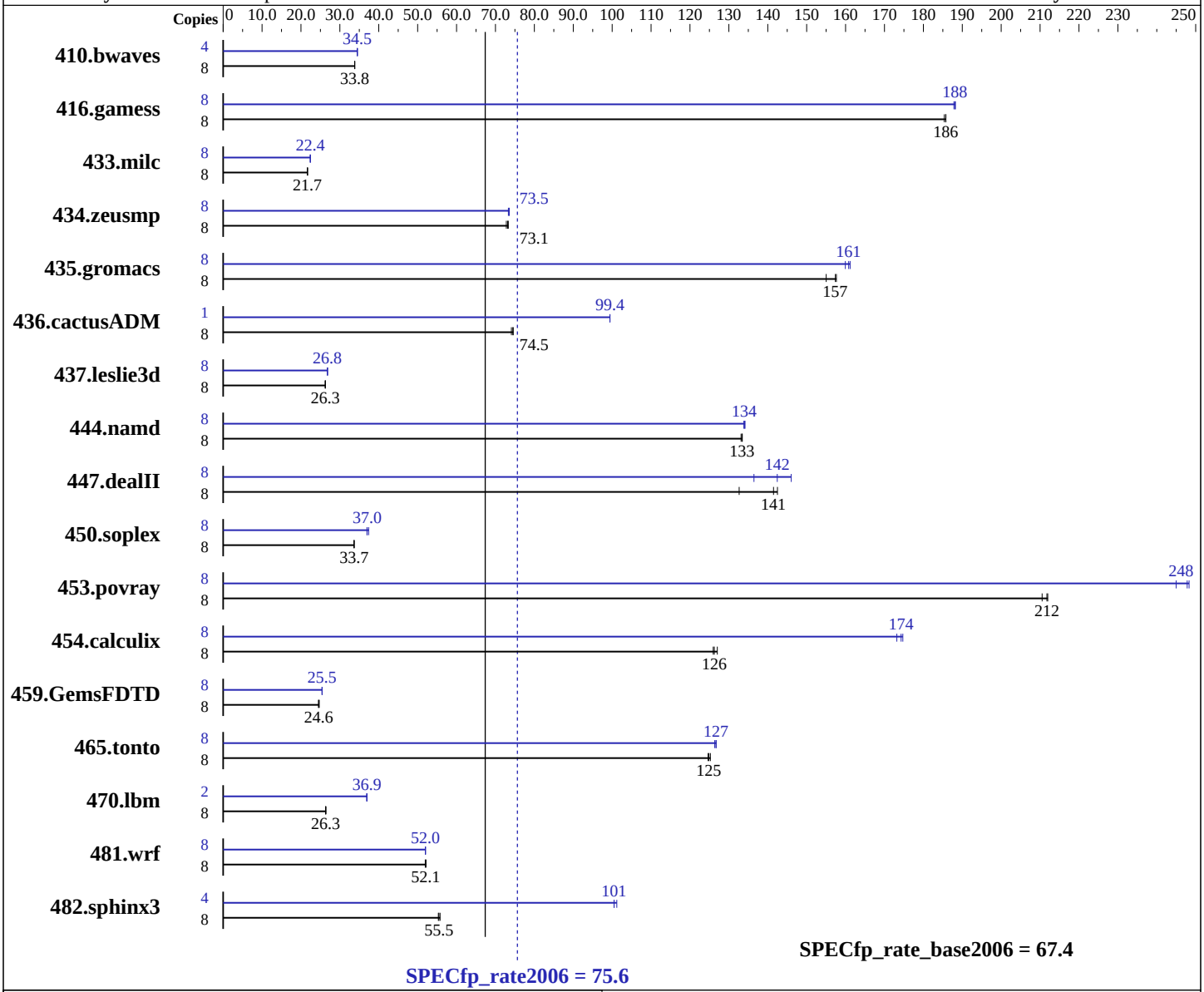
T120Rc-1
(Intel Xeon X5460)

SPECfp®_rate2006 = 75.6

SPECfp_rate_base2006 = 67.4

**CPU2006 license:** 9006
**Test sponsor:** NEC Corporation
**Tested by:** NEC Corporation

**Test date:** Feb-2008
**Hardware Availability:** Jan-2008
**Software Availability:** Nov-2007




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5460 |
| CPU Characteristics: | 3.16 GHz, 2x6 MB L2 shared, 1333 MHz bus |
| CPU MHz: | 3167 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 2 chips, 4 cores/chip |
| CPU(s) orderable: | 1,2 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 |

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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++ and Fortran Compiler for Linux32 and Linux64 version 10.1 Build 20070913 Package ID: l_cc_p_10.1.008, l_fc_p_10.1.008 |
| Auto Parallel: | Yes |
| File System: | ext2 |

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L3 Cache: None
Other Cache: None
Memory: 12 GB (12x1 GB PC2-5300F, 2 rank, CL5-5-5, ECC)
Disk Subsystem: 1x250 GB SATAII, 7200RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: binutils-2.17.tar.gz, Version 2.17

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 8 | **3215** | **33.8** | 3215 | 33.8 | 3214 | 33.8 | 4 | 1576 | 34.5 | 1576 | 34.5 | **1576** | **34.5** |
| 416.gamess | 8 | 845 | 185 | **843** | **186** | 843 | 186 | 8 | **833** | **188** | 834 | 188 | 832 | 188 |
| 433.milc | 8 | **3388** | **21.7** | 3389 | 21.7 | 3387 | 21.7 | 8 | 3278 | 22.4 | **3277** | **22.4** | 3277 | 22.4 |
| 434.zeusmp | 8 | 1000 | 72.8 | 993 | 73.3 | **995** | **73.1** | 8 | **991** | **73.5** | 993 | 73.3 | 990 | 73.5 |
| 435.gromacs | 8 | 368 | 155 | 362 | 158 | **363** | **157** | 8 | 354 | 161 | **355** | **161** | 357 | 160 |
| 436.cactusADM | 8 | **1284** | **74.5** | 1290 | 74.1 | 1282 | 74.6 | 1 | 120 | 99.4 | **120** | **99.4** | 120 | 99.4 |
| 437.leslie3d | 8 | 2867 | 26.2 | **2865** | **26.3** | 2858 | 26.3 | 8 | **2805** | **26.8** | 2806 | 26.8 | 2803 | 26.8 |
| 444.namd | 8 | 482 | 133 | 481 | 133 | **481** | **133** | 8 | 479 | 134 | **479** | **134** | 478 | 134 |
| 447.dealII | 8 | 642 | 142 | **647** | **141** | 690 | 133 | 8 | **643** | **142** | 627 | 146 | 671 | 136 |
| 450.soplex | 8 | 1984 | 33.6 | **1982** | **33.7** | 1981 | 33.7 | 8 | **1802** | **37.0** | 1805 | 37.0 | 1783 | 37.4 |
| 453.povray | 8 | 202 | 211 | 201 | 212 | **201** | **212** | 8 | 174 | 245 | **172** | **248** | 171 | 248 |
| 454.calculix | 8 | 520 | 127 | 524 | 126 | **523** | **126** | 8 | 381 | 173 | **379** | **174** | 378 | 175 |
| 459.GemsFDTD | 8 | 3436 | 24.7 | 3462 | 24.5 | **3457** | **24.6** | 8 | 3334 | 25.5 | **3335** | **25.5** | 3342 | 25.4 |
| 465.tonto | 8 | 629 | 125 | **630** | **125** | 631 | 125 | 8 | 621 | 127 | 623 | 126 | **621** | **127** |
| 470.lbm | 8 | 4156 | 26.4 | 4177 | 26.3 | **4175** | **26.3** | 2 | 743 | 37.0 | 744 | 36.9 | **744** | **36.9** |
| 481.wrf | 8 | **1716** | **52.1** | 1714 | 52.1 | 1720 | 51.9 | 8 | 1720 | 52.0 | **1719** | **52.0** | 1717 | 52.0 |
| 482.sphinx3 | 8 | 2819 | 55.3 | 2796 | 55.8 | **2811** | **55.5** | 4 | **776** | **101** | 776 | 100 | 770 | 101 |

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
```

## Platform Notes

```
Bios settings:
Intel SpeedStep Technology: Disabled
```

## General Notes

```
All benchmarks compiled in 64-bit mode except 437.leslie3d,
450.soplex, 470.lbm and 482.sphinx3, for peak, are
compiled in 32-bit mode
```

## 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

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## Base Optimization Flags (Continued)

Fortran benchmarks:
`-fast`

Benchmarks using both Fortran and C:
`-fast`

## 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 (except as noted below):
`ifort`

437.leslie3d: `/opt/intel/fc/10.1.008/bin/ifort -L/opt/intel/fc/10.1.008/lib -I/opt/intel/fc/10.1.008/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.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`

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`

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# Peak Optimization Flags (Continued)

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/NEC-Intel-ic10.1-FP-intel64-linux-flags.20090713.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/NEC-Intel-ic10.1-FP-intel64-linux-flags.20090713.xml`


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