# SPEC® CFP2006 Result

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## NEC Corporation

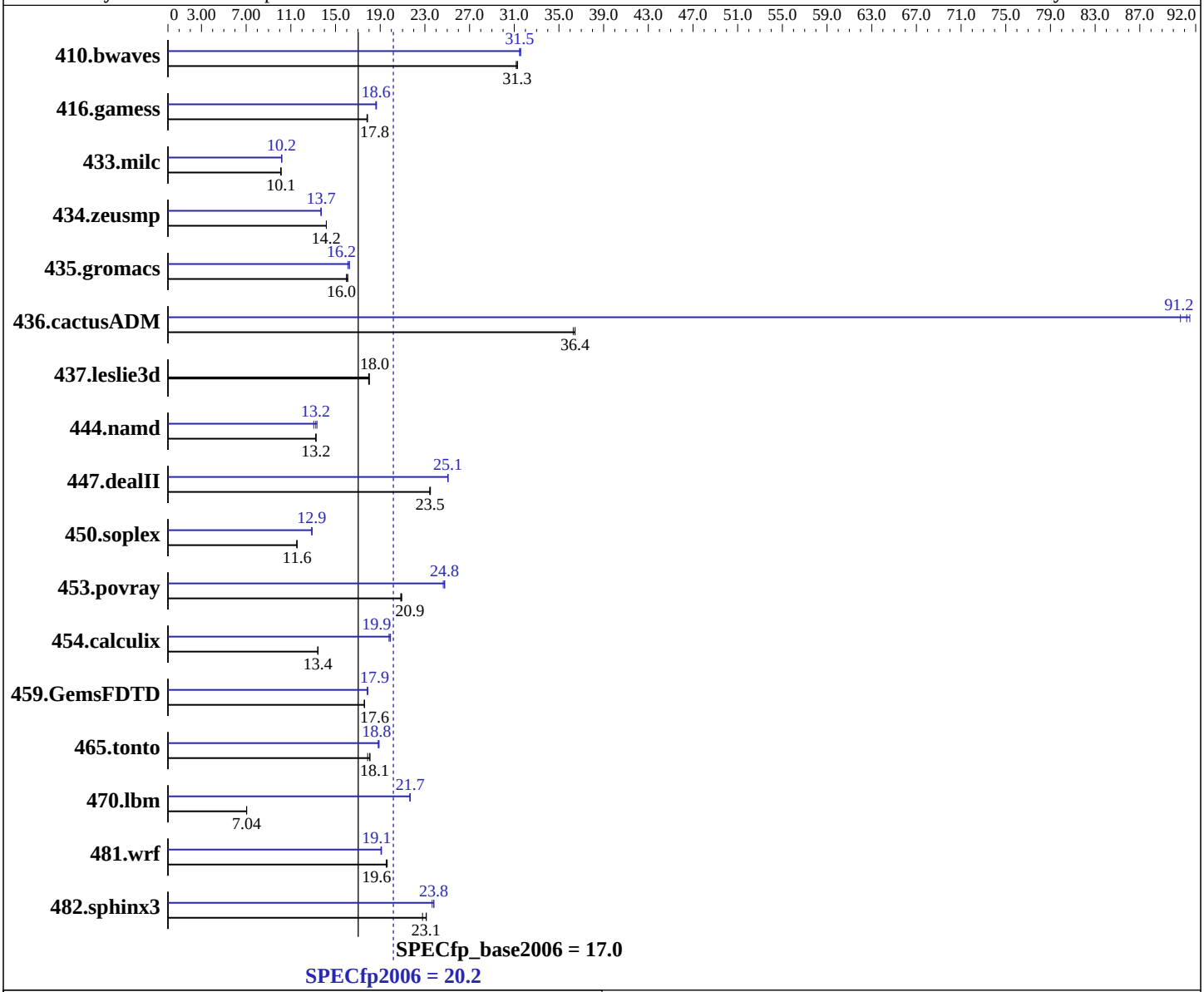
Express5800/120Rj-2
(Intel Xeon processor E5420)

SPECfp®2006 = 20.2

SPECfp_base2006 = 17.0

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

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




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5420 |
| CPU Characteristics: | 2.50 GHz, 2x6 MB L2 shared, 1333 MHz bus |
| CPU MHz: | 2500 |
| 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: 1x73.2 GB SAS, 15000RPM
Other Hardware: None

System State: Multiuser, Runlevel 3
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: binutils-2.17.tar.gz, Version 2.17

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 436 | 31.2 | 434 | 31.3 | **435** | **31.3** | 432 | 31.5 | 430 | 31.6 | **432** | **31.5** |
| 416.gamess | 1099 | 17.8 | 1096 | 17.9 | **1098** | **17.8** | 1052 | 18.6 | 1049 | 18.7 | **1051** | **18.6** |
| 433.milc | **907** | **10.1** | 908 | 10.1 | 907 | 10.1 | **902** | **10.2** | 903 | 10.2 | 901 | 10.2 |
| 434.zeusmp | **642** | **14.2** | 642 | 14.2 | 642 | 14.2 | 665 | 13.7 | **664** | **13.7** | 663 | 13.7 |
| 435.gromacs | 443 | 16.1 | **446** | **16.0** | 447 | 16.0 | 440 | 16.2 | 443 | 16.1 | **440** | **16.2** |
| 436.cactusADM | 328 | 36.4 | 329 | 36.3 | **328** | **36.4** | 132 | 90.6 | **131** | **91.2** | 131 | 91.5 |
| 437.leslie3d | 523 | 18.0 | 521 | 18.0 | **522** | **18.0** | 523 | 18.0 | 521 | 18.0 | **522** | **18.0** |
| 444.namd | 605 | 13.2 | **605** | **13.2** | 605 | 13.2 | **606** | **13.2** | 601 | 13.3 | 615 | 13.0 |
| 447.dealII | **488** | **23.5** | 487 | 23.5 | 488 | 23.4 | **456** | **25.1** | 457 | 25.1 | 456 | 25.1 |
| 450.soplex | **722** | **11.6** | 721 | 11.6 | 724 | 11.5 | 646 | 12.9 | 648 | 12.9 | **648** | **12.9** |
| 453.povray | 255 | 20.8 | **255** | **20.9** | 254 | 20.9 | 216 | 24.6 | **215** | **24.8** | 215 | 24.8 |
| 454.calculix | 614 | 13.4 | **614** | **13.4** | 616 | 13.4 | 414 | 19.9 | 417 | 19.8 | **415** | **19.9** |
| 459.GemsFDTD | 604 | 17.6 | **603** | **17.6** | 603 | 17.6 | **594** | **17.9** | 595 | 17.8 | 593 | 17.9 |
| 465.tonto | 544 | 18.1 | 550 | 17.9 | **545** | **18.1** | 523 | 18.8 | **522** | **18.8** | 521 | 18.9 |
| 470.lbm | 1949 | 7.05 | **1952** | **7.04** | 1954 | 7.03 | **634** | **21.7** | 634 | 21.7 | 635 | 21.6 |
| 481.wrf | 569 | 19.6 | **571** | **19.6** | 572 | 19.5 | 586 | 19.1 | **585** | **19.1** | 584 | 19.1 |
| 482.sphinx3 | 855 | 22.8 | **843** | **23.1** | 843 | 23.1 | **819** | **23.8** | 819 | 23.8 | 824 | 23.6 |

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 (default).
```

## Platform Notes

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

## General Notes

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

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## General Notes (Continued)

```
The NEC Express5800/120Rh-1(Intel Xeon Processor E5420),
the NEC Express5800/120Rj-2(Intel Xeon Processor E5420),
the Bull NovaScale R440 E1 (Intel Xeon E5420,2.50GHz) and
the Bull NovaScale R460 E1 (Intel Xeon E5420,2.50GHz) models are electronically equivalent.
The results have been measured on a NEC Express5800/120Rj-2(Intel Xeon Processor E5420) model.
```

# 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`

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## Base Optimization Flags (Continued)

C++ benchmarks:
`-fast -parallel`

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/NEC-Intel-ic10.1-FP-intel64-linux-flags.20090714.01.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.20090714.01.xml`


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