# SPEC® CFP2006 Result
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## IBM Corporation

IBM System x3630 M3 (Intel Xeon E5503)

$SPECfp^®2006 =$    31.8
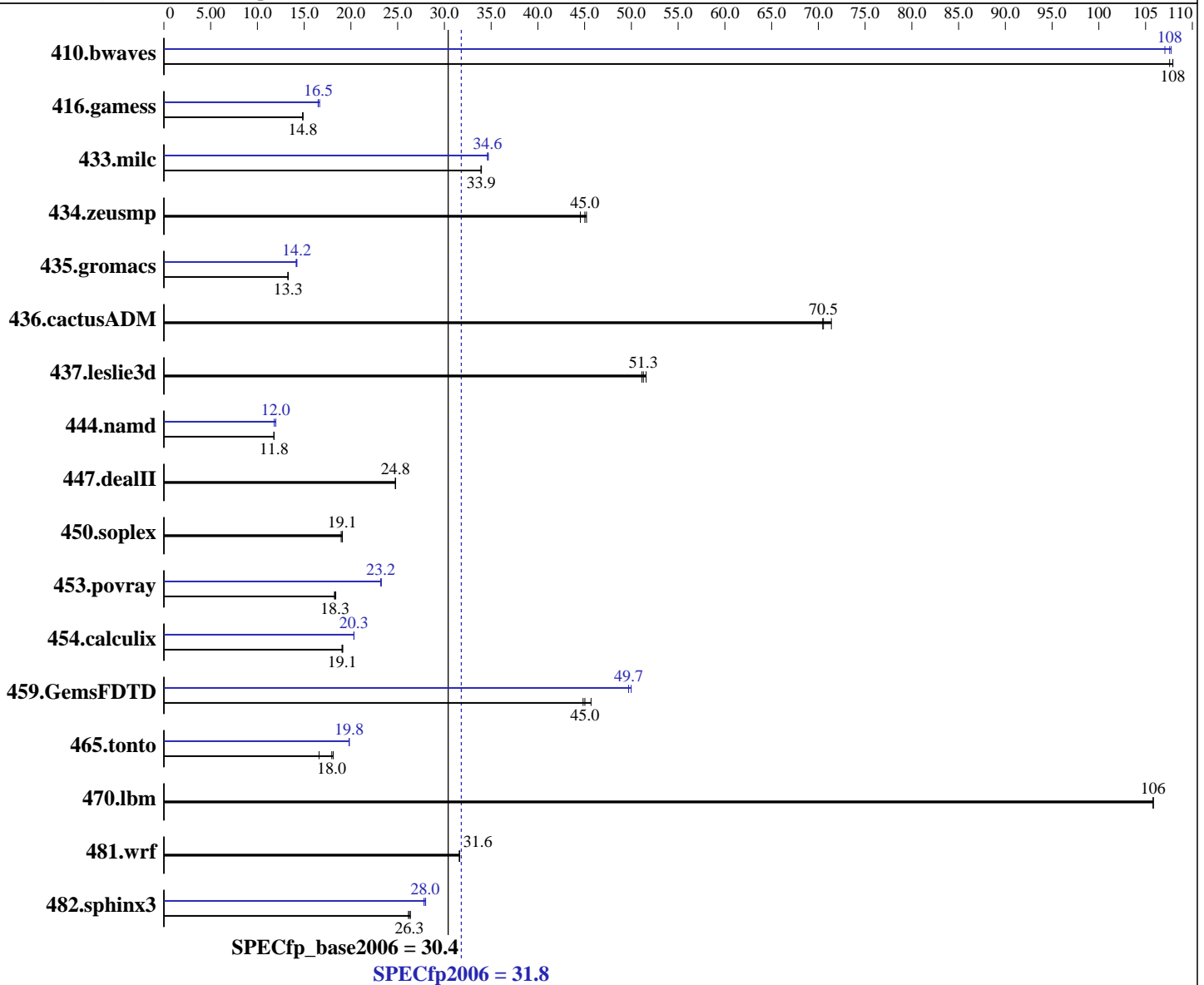
$SPECfp\_base2006 =$    30.4

**CPU2006 license:** 11
**Test sponsor:** IBM Corporation
**Tested by:** IBM Corporation

**Test date:** Apr-2011
**Hardware Availability:** Feb-2011
**Software Availability:** Jan-2011



410.bwaves 108 / 108
416.gamess 16.5 / 14.8
433.milc 34.6 / 33.9
434.zeusmp 45.0
435.gromacs 14.2 / 13.3
436.cactusADM 70.5
437.leslie3d 51.3
444.namd 12.0 / 11.8
447.dealII 24.8
450.soplex 19.1
453.povray 23.2 / 18.3
454.calculix 20.3 / 19.1
459.GemsFDTD 49.7 / 45.0
465.tonto 19.8 / 18.0
470.lbm 106
481.wrf 31.6
482.sphinx3 28.0 / 26.3

SPECfp_base2006 = 30.4
SPECfp2006 = 31.8

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5503 |
| CPU Characteristics: | |
| CPU MHz: | 2000 |
| FPU: | Integrated |
| CPU(s) enabled: | 4 cores, 2 chips, 2 cores/chip |
| CPU(s) orderable: | 1,2 chips |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |

*Continued on next page*

## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default |
| Compiler: | Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3 |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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| | |
|---|---|
| L3 Cache: | 4 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC, running at 800 MHz) |
| Disk Subsystem: | 1 x 146 GB SAS, 15000 RPM |
| Other Hardware: | None |

| | |
|---|---|
| Peak Pointers: | 32/64-bit |
| Other Software: | None |

## Results Table

| Benchmark | Base Seconds | Base Ratio | Base Seconds | Base Ratio | Base Seconds | Base Ratio | Peak Seconds | Peak Ratio | Peak Seconds | Peak Ratio | Peak Seconds | Peak Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 410.bwaves | 126 | 108 | 126 | 108 | **126** | **108** | **126** | **108** | 127 | 107 | 126 | 108 |
| 416.gamess | **1319** | **14.8** | 1316 | 14.9 | 1319 | 14.8 | 1175 | 16.7 | **1185** | **16.5** | 1187 | 16.5 |
| 433.milc | 270 | 34.0 | **271** | **33.9** | 271 | 33.9 | 265 | 34.6 | 265 | 34.7 | **265** | **34.6** |
| 434.zeusmp | 204 | 44.5 | **202** | **45.0** | 201 | 45.2 | 204 | 44.5 | **202** | **45.0** | 201 | 45.2 |
| 435.gromacs | **538** | **13.3** | 539 | 13.3 | 537 | 13.3 | 502 | 14.2 | **503** | **14.2** | 505 | 14.1 |
| 436.cactusADM | **169** | **70.5** | 170 | 70.5 | 167 | 71.4 | **169** | **70.5** | 170 | 70.5 | 167 | 71.4 |
| 437.leslie3d | 182 | 51.6 | **183** | **51.3** | 184 | 51.1 | 182 | 51.6 | **183** | **51.3** | 184 | 51.1 |
| 444.namd | **681** | **11.8** | 681 | 11.8 | 681 | 11.8 | 680 | 11.8 | 670 | 12.0 | **670** | **12.0** |
| 447.dealII | **462** | **24.8** | 462 | 24.8 | 462 | 24.8 | **462** | **24.8** | 462 | 24.8 | 462 | 24.8 |
| 450.soplex | **437** | **19.1** | 440 | 19.0 | 437 | 19.1 | **437** | **19.1** | 440 | 19.0 | 437 | 19.1 |
| 453.povray | **291** | **18.3** | 289 | 18.4 | 292 | 18.2 | 229 | 23.3 | **229** | **23.2** | 229 | 23.2 |
| 454.calculix | 431 | 19.1 | **433** | **19.1** | 433 | 19.1 | 406 | 20.3 | **406** | **20.3** | 406 | 20.3 |
| 459.GemsFDTD | 232 | 45.7 | 237 | 44.8 | **236** | **45.0** | 212 | 50.0 | **213** | **49.7** | 213 | 49.7 |
| 465.tonto | 593 | 16.6 | **548** | **18.0** | 543 | 18.1 | 497 | 19.8 | **497** | **19.8** | 496 | 19.8 |
| 470.lbm | **130** | **106** | 130 | 106 | 130 | 106 | **130** | **106** | 130 | 106 | 130 | 106 |
| 481.wrf | 354 | 31.6 | **353** | **31.6** | 353 | 31.6 | 354 | 31.6 | **353** | **31.6** | 353 | 31.6 |
| 482.sphinx3 | 739 | 26.4 | **742** | **26.3** | 745 | 26.1 | 701 | 27.8 | 696 | 28.0 | **697** | **28.0** |

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
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

```
Power C-State enabled in BIOS
Data Reuse disabled in BIOS
Demand Scrub disabled in BIOS
```

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## General Notes

```
  Binaries compiled on RHEL5.5
  OMP_NUM_THREADS set to number of cores
```

## 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 -parallel -opt-prefetch
    -ansi-alias
```

C++ benchmarks:
```
    -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

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## Base Optimization Flags (Continued)

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

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

## Peak Compiler Invocation

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

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

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

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

## Peak Portability Flags

```
Same as Base Portability Flags
```

## Peak Optimization Flags

C benchmarks:

```
    433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
              -ansi-alias

    470.lbm: basepeak = yes

  482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
              -parallel
```

C++ benchmarks:

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

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# Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

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

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

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

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

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-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.20110420.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.20110420.xml

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

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