# SPEC® CFP2006 Result

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## Bull SAS

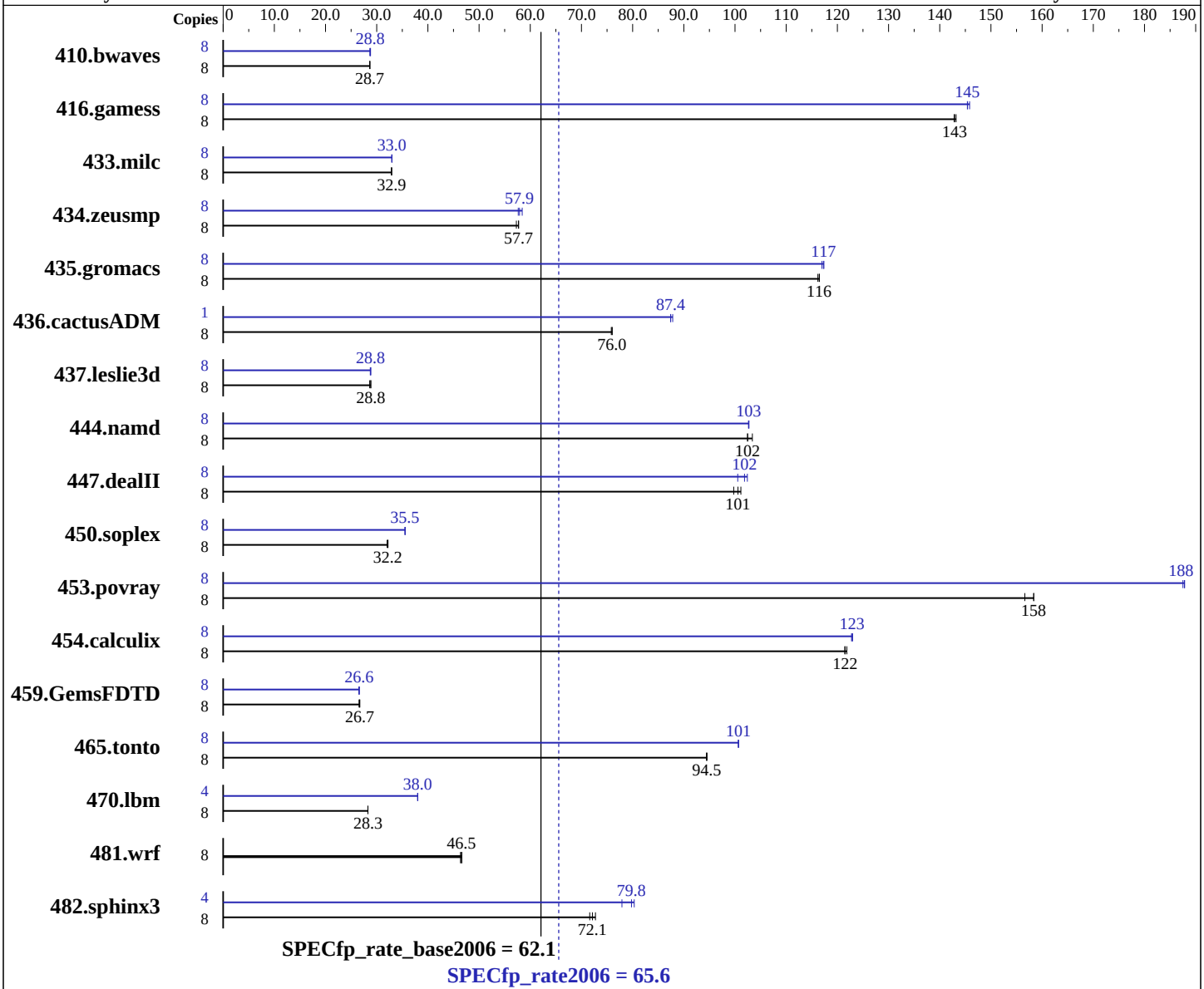
NovaScale R480 E1
(Intel Xeon E7440, 2.40 GHz)

SPECfp®_rate2006 = 65.6

SPECfp_rate_base2006 = 62.1

**CPU2006 license:** 20
**Test sponsor:** Bull SAS
**Tested by:** Bull SAS

**Test date:** Jan-2009
**Hardware Availability:** Nov-2008
**Software Availability:** Nov-2008




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7440 |
| CPU Characteristics: | 1066 MHz system bus |
| CPU MHz: | 2400 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 2 chips, 4 cores/chip |
| CPU(s) orderable: | 1,2,3,4 chips |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 6 MB I+D on chip per chip, 3 MB shared / 2 cores |

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### Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp |
| Compiler: | Intel C++ and Fortran Compiler 11.0 for Linux Build 20080730 Package ID: l_cproc_b_11.0.042, l_fproc_b_11.0.042 |
| Auto Parallel: | Yes |
| File System: | ReiserFS |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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L3 Cache: 16 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (16 x 2GB DDR2-667 FBDIMM)
Disk Subsystem: 1x146 GB SAS, 10000 RPM
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: Binutils 2.18.50.0.7.20080502

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 8 | 3793 | 28.7 | **3794** | **28.7** | 3797 | 28.6 | 8 | 3794 | 28.7 | 3776 | 28.8 | **3781** | **28.8** |
| 416.gamess | 8 | 1094 | 143 | **1096** | **143** | 1097 | 143 | 8 | **1077** | **145** | 1074 | 146 | 1077 | 145 |
| 433.milc | 8 | **2232** | **32.9** | 2232 | 32.9 | 2233 | 32.9 | 8 | 2229 | 32.9 | **2228** | **33.0** | 2226 | 33.0 |
| 434.zeusmp | 8 | 1271 | 57.3 | **1262** | **57.7** | 1261 | 57.7 | 8 | 1246 | 58.4 | 1263 | 57.6 | **1257** | **57.9** |
| 435.gromacs | 8 | **491** | **116** | 490 | 116 | 492 | 116 | 8 | 488 | 117 | 487 | 117 | **487** | **117** |
| 436.cactusADM | 8 | 1258 | 76.0 | 1261 | 75.8 | **1258** | **76.0** | 1 | 136 | 87.8 | **137** | **87.4** | 137 | 87.4 |
| 437.leslie3d | 8 | 2607 | 28.8 | 2627 | 28.6 | **2608** | **28.8** | 8 | 2607 | 28.8 | 2616 | 28.7 | **2610** | **28.8** |
| 444.namd | 8 | 626 | 102 | **626** | **102** | 621 | 103 | 8 | 625 | 103 | 625 | 103 | **625** | **103** |
| 447.dealII | 8 | 905 | 101 | 917 | 99.8 | **910** | **101** | 8 | **899** | **102** | 894 | 102 | 910 | 101 |
| 450.soplex | 8 | 2083 | 32.0 | **2073** | **32.2** | 2072 | 32.2 | 8 | 1878 | 35.5 | **1878** | **35.5** | 1876 | 35.6 |
| 453.povray | 8 | 272 | 157 | **269** | **158** | 269 | 158 | 8 | 227 | 188 | **227** | **188** | 227 | 188 |
| 454.calculix | 8 | **543** | **122** | 542 | 122 | 543 | 121 | 8 | **537** | **123** | 538 | 123 | 537 | 123 |
| 459.GemsFDTD | 8 | 3198 | 26.5 | **3183** | **26.7** | 3179 | 26.7 | 8 | 3201 | 26.5 | 3191 | 26.6 | **3193** | **26.6** |
| 465.tonto | 8 | 833 | 94.5 | 834 | 94.4 | **833** | **94.5** | 8 | 782 | 101 | 782 | 101 | **782** | **101** |
| 470.lbm | 8 | 3888 | 28.3 | **3886** | **28.3** | 3885 | 28.3 | 4 | **1446** | **38.0** | 1446 | 38.0 | 1446 | 38.0 |
| 481.wrf | 8 | 1927 | 46.4 | **1920** | **46.5** | 1916 | 46.6 | 8 | 1927 | 46.4 | **1920** | **46.5** | 1916 | 46.6 |
| 482.sphinx3 | 8 | 2144 | 72.7 | 2177 | 71.6 | **2161** | **72.1** | 4 | 1001 | 77.9 | 971 | 80.3 | **977** | **79.8** |

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.
 taskset was used to bind processes to cores except
 for 436.cactusADM peak
 For peak modules using 1/2 the number of available cores, copies
 were each assigned to a single L2 cache using mysubmit.pl script.
 See the flags description file for mysubmit.pl details.
```

## 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 64M
```

## Platform Notes

```
BIOS Settings:
Adjacent Cache Line Prefetch = Disabled
Hardware Prefetcher = Disabled
High Bandwidth option = Enabled
```

## General Notes

```
The NEC Express5800/R140a-4(Intel Xeon E7440) and
the Bull NovaScale R480 E1(Intel Xeon E7440, 2.40 GHz) models are electronically equivalent.
The results have been measured on a Bull NovaScale R480 E1(Intel Xeon E7440, 2.40 GHz) 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:
`-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch`

C++ benchmarks:
`-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch`

Fortran benchmarks:
`-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch`

Benchmarks using both Fortran and C:
`-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch`

## Peak Compiler Invocation

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

482.sphinx3: `/opt/intel/Compiler/11.0/042/bin/ia32/icc -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib -I/opt/intel/Compiler/11.0/042/ipp/ia32/include`

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

450.soplex: `/opt/intel/Compiler/11.0/042/bin/ia32/icpc -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib -I/opt/intel/Compiler/11.0/042/ipp/ia32/include`

Fortran benchmarks (except as noted below):
`ifort`

437.leslie3d: `/opt/intel/Compiler/11.0/042/bin/ia32/ifort -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib -I/opt/intel/Compiler/11.0/042/ipp/ia32/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`

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## Peak Portability Flags (Continued)

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
470.lbm: -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) -xSSE4.1 -ipo -O3
-no-prec-div -static -fno-alias

470.lbm: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
-auto-ilp32

482.sphinx3: -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2

C++ benchmarks:

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

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

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

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

Fortran benchmarks:

410.bwaves: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

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

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
-no-prec-div -static

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## Peak Optimization Flags (Continued)

437.leslie3d: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-malloc-options=3 -opt-prefetch`

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

465.tonto: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xSSE4.1 -ipo -O3 -no-prec-div -static -unroll4 -auto`

Benchmarks using both Fortran and C:

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

436.cactusADM: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2 -opt-prefetch -parallel -auto-ilp32`

454.calculix: `-xSSE4.1 -ipo -O3 -no-prec-div -static -auto-ilp32`

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-ic11.0-fp-linux64-revA.20090713.04.html`
`http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.01.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.04.xml`
`http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.01.xml`


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