# SPEC® CFP2006 Result

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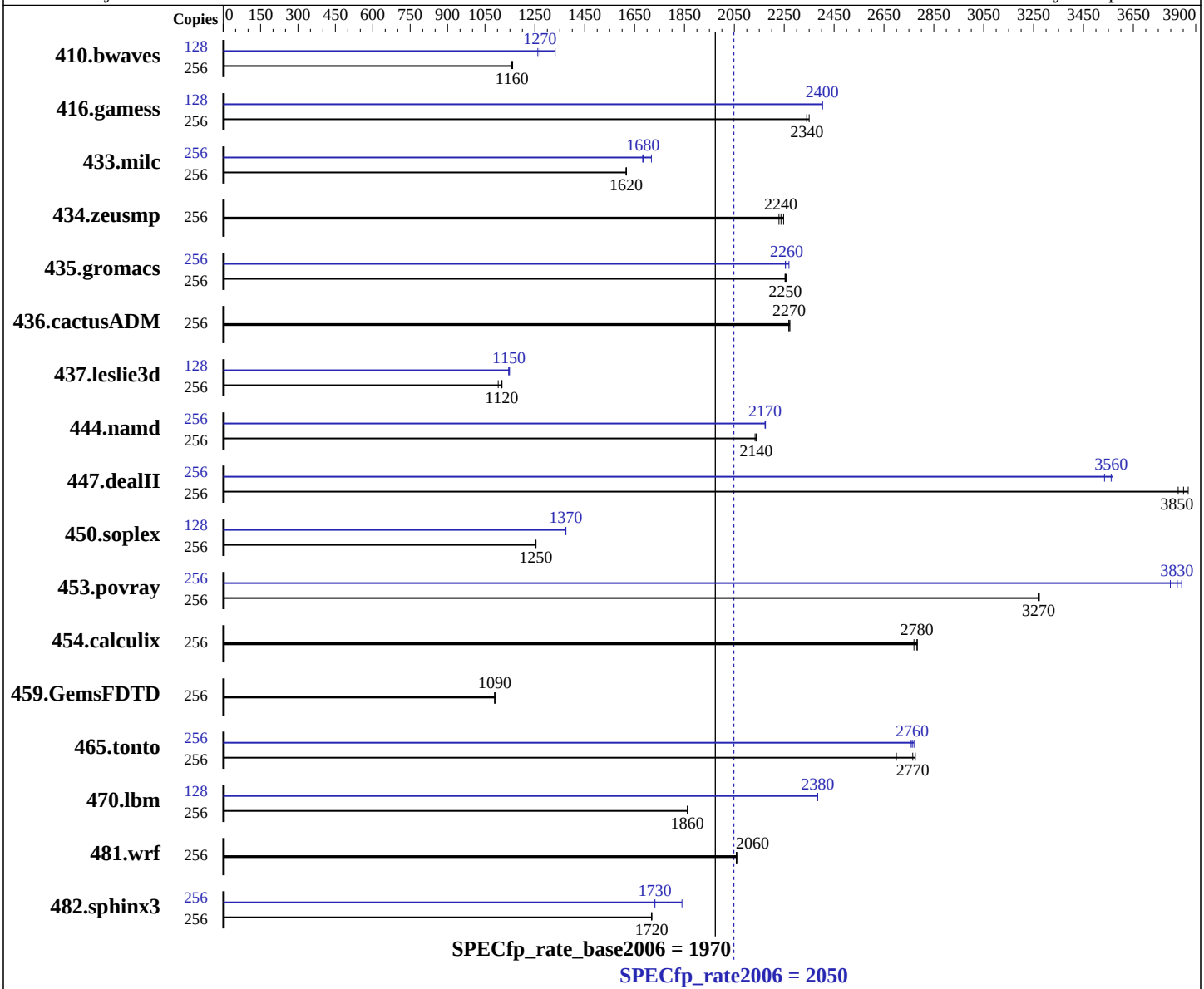
## Bull SAS
## bullx S6030

**SPECfp®_rate2006 = 2050**

**SPECfp_rate_base2006 = 1970**

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

**Test date:** Jun-2011
**Hardware Availability:** Sep-2011
**Software Availability:** Apr-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X7560 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.67 GHz |
| CPU MHz: | 2267 |
| FPU: | Integrated |
| CPU(s) enabled: | 128 cores, 16 chips, 8 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2, 4, 8, 12, 16 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: | Red Hat Enterprise Linux 6.0 (x86_64), Kernel 2.6.32-71.el6.x86_64 |
| Compiler: | Intel C++ Compiler XE for applications running on IA-32 Version 12.0.1.116 Build 20101116 |
| Auto Parallel: | No |
| File System: | tmpfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32-bit |

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L3 Cache: 24 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (128 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem: 1 x 500 GB 7200 RPM SATA
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V9.01

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 256 | 2997 | 1160 | 3006 | 1160 | **3002** | **1160** | 128 | **1369** | **1270** | 1307 | 1330 | 1379 | 1260 |
| 416.gamess | 256 | 2133 | 2350 | 2142 | 2340 | **2141** | **2340** | 128 | 1043 | 2400 | 1043 | 2400 | **1043** | **2400** |
| 433.milc | 256 | 1454 | 1620 | 1453 | 1620 | **1454** | **1620** | 256 | **1395** | **1680** | 1368 | 1720 | 1397 | 1680 |
| 434.zeusmp | 256 | 1045 | 2230 | **1041** | **2240** | 1037 | 2250 | 256 | 1045 | 2230 | **1041** | **2240** | 1037 | 2250 |
| 435.gromacs | 256 | 811 | 2250 | 810 | 2260 | **811** | **2250** | 256 | 811 | 2250 | **809** | **2260** | 806 | 2270 |
| 436.cactusADM | 256 | **1348** | **2270** | 1349 | 2270 | 1346 | 2270 | 256 | **1348** | **2270** | 1349 | 2270 | 1346 | 2270 |
| 437.leslie3d | 256 | **2153** | **1120** | 2182 | 1100 | 2152 | 1120 | 128 | 1051 | 1140 | 1048 | 1150 | **1050** | **1150** |
| 444.namd | 256 | 962 | 2130 | **960** | **2140** | 959 | 2140 | 256 | 945 | 2170 | **944** | **2170** | 944 | 2170 |
| 447.dealII | 256 | 765 | 3830 | **760** | **3850** | 757 | 3870 | 256 | **822** | **3560** | 821 | 3570 | 829 | 3530 |
| 450.soplex | 256 | **1702** | **1250** | 1704 | 1250 | 1702 | 1250 | 128 | **777** | **1370** | 777 | 1370 | 777 | 1370 |
| 453.povray | 256 | 417 | 3270 | 416 | 3270 | **416** | **3270** | 256 | 354 | 3840 | 359 | 3800 | **356** | **3830** |
| 454.calculix | 256 | **759** | **2780** | 759 | 2780 | 762 | 2770 | 256 | **759** | **2780** | 759 | 2780 | 762 | 2770 |
| 459.GemsFDTD | 256 | 2492 | 1090 | **2494** | **1090** | 2495 | 1090 | 256 | 2492 | 1090 | **2494** | **1090** | 2495 | 1090 |
| 465.tonto | 256 | **911** | **2770** | 908 | 2780 | 933 | 2700 | 256 | 913 | 2760 | 909 | 2770 | **911** | **2760** |
| 470.lbm | 256 | 1889 | 1860 | **1889** | **1860** | 1889 | 1860 | 128 | 738 | 2380 | 738 | 2380 | **738** | **2380** |
| 481.wrf | 256 | 1388 | 2060 | 1390 | 2060 | **1389** | **2060** | 256 | 1388 | 2060 | 1390 | 2060 | **1389** | **2060** |
| 482.sphinx3 | 256 | **2903** | **1720** | 2903 | 1720 | 2904 | 1720 | 256 | 2712 | 1840 | 2884 | 1730 | **2881** | **1730** |

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
 Tmpfs filesystem set up with:
  mkdir -p /mnt/shm
  mount -t tmpfs -o rw,mpol=interleave tmpfs /mnt/shm/
 The mpol=interleave option sets the NUMA
 memory allocation policy for all files to allocate
 from each node in turn.
Operating system file is ext3
Spec benchmark is copied from hard disk ext3 to tmpfs
Binaries were compiled with huge pages enabled
but huge pages were not used
```

## Platform Notes

```
System is composed of 4 modules with 32 DIMMs on each module.
```

## General Notes

```
The Bull novascale bullion and
the Bull bullx S6030 models are electronically equivalent.
The results have been measured on a novascale bullion model.
Binaries were compiled on RHEL5.5
```

## 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 -ansi-alias`

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

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

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

## 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`

Continued on next page

## Peak Portability Flags (Continued)

470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX

## 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

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

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

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

447.dealII: -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

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

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

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## Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

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) -unroll4 -auto -inline-calloc -opt-malloc-options=3 -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) -opt-prefetch -static -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-ic12.0-linux64-revB.20110705.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110705.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.20110705.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110705.xml


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