# SPEC® CFP2006 Result

## Bull SAS

NovaScale R440 E1
(Intel Xeon X5460,3.16GHz)

$SPECfp^{®}2006 =$    23.3

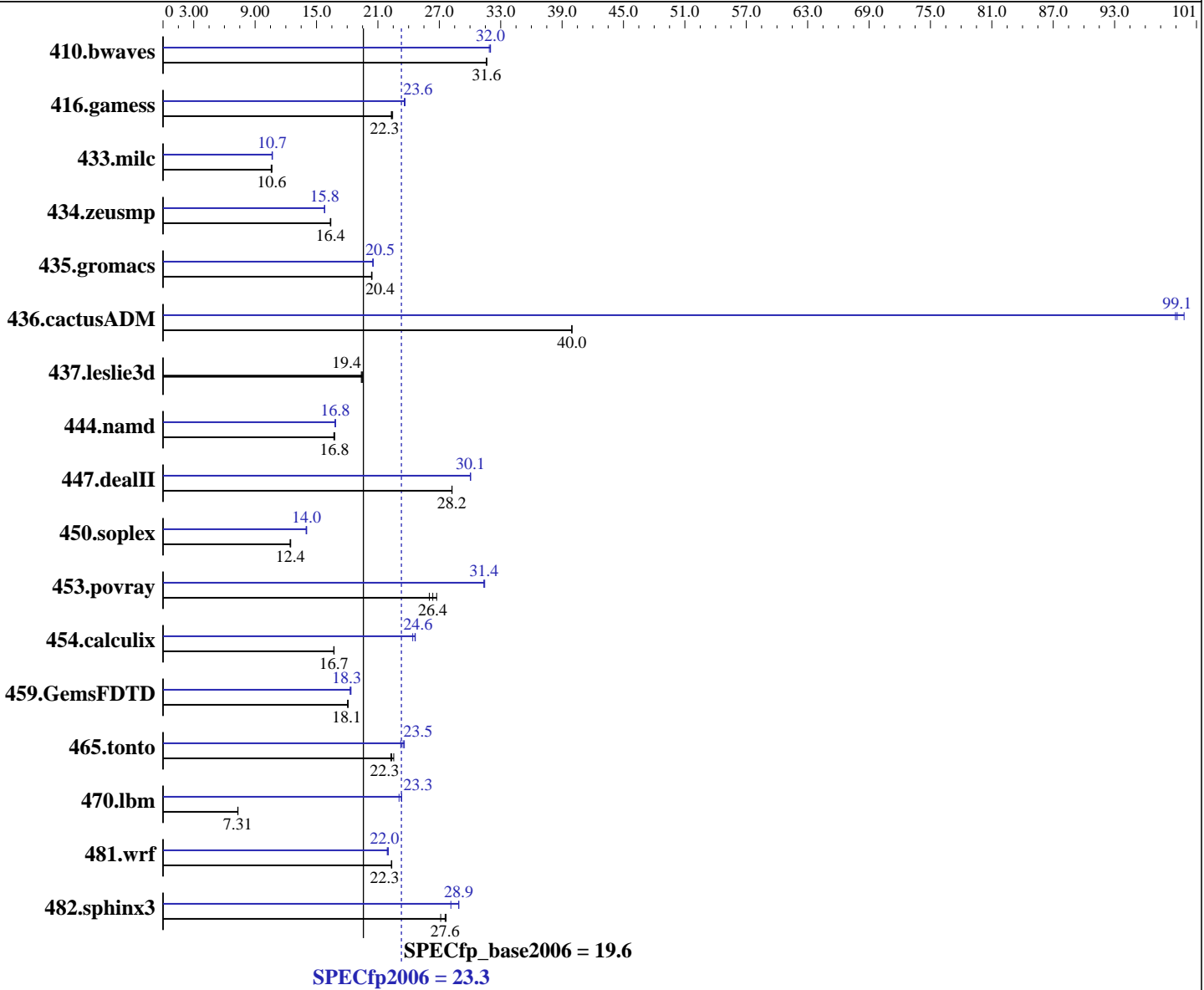$SPECfp\_base2006 =$    19.6

**CPU2006 license:** 20

**Test sponsor:** Bull SAS

**Tested by:** NEC Corporation

**Test date:** Dec-2007

**Hardware Availability:** Dec-2007

**Software Availability:** Nov-2007



| Benchmark | Peak | Base |
|---|---|---|
| 410.bwaves | 32.0 | 31.6 |
| 416.gamess | 23.6 | 22.3 |
| 433.milc | 10.7 | 10.6 |
| 434.zeusmp | 15.8 | 16.4 |
| 435.gromacs | 20.5 | 20.4 |
| 436.cactusADM | 99.1 | 40.0 |
| 437.leslie3d | | 19.4 |
| 444.namd | 16.8 | 16.8 |
| 447.dealII | 30.1 | 28.2 |
| 450.soplex | 14.0 | 12.4 |
| 453.povray | 31.4 | 26.4 |
| 454.calculix | 24.6 | 16.7 |
| 459.GemsFDTD | 18.3 | 18.1 |
| 465.tonto | 23.5 | 22.3 |
| 470.lbm | 23.3 | 7.31 |
| 481.wrf | 22.0 | 22.3 |
| 482.sphinx3 | 28.9 | 27.6 |

**SPECfp_base2006 = 19.6**

**SPECfp2006 = 23.3**

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5460 |
| CPU Characteristics: | 3.16 GHz, 2x6 MB L2 shared, 1333 MHz bus |
| CPU MHz: | 3160 |
| 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 | System State: | Run level 3 (multi-user) |
| Other Cache: | None | Base Pointers: | 64-bit |
| Memory: | 12 GB (12x1 GB PC2-5300F, 2 rank, CL5-5-5, ECC) | Peak Pointers: | 32/64-bit |
| Disk Subsystem: | 1x73.2 GB SAS, 15000RPM | Other Software: | binutils-2.17.tar.gz, Version 2.17 |
| Other Hardware: | None | | |

## Results Table

| Benchmark | Base Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Peak Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 410.bwaves | **430** | **31.6** | 430 | 31.6 | 429 | 31.6 | **425** | **32.0** | 426 | 31.9 | 425 | 32.0 |
| 416.gamess | **876** | **22.3** | 878 | 22.3 | 873 | 22.4 | 830 | 23.6 | 828 | 23.7 | **830** | **23.6** |
| 433.milc | **865** | **10.6** | 863 | 10.6 | 868 | 10.6 | **860** | **10.7** | 858 | 10.7 | 862 | 10.7 |
| 434.zeusmp | 557 | 16.4 | 555 | 16.4 | **556** | **16.4** | 576 | 15.8 | **576** | **15.8** | 577 | 15.8 |
| 435.gromacs | 350 | 20.4 | **350** | **20.4** | 350 | 20.4 | **348** | **20.5** | 348 | 20.5 | 348 | 20.5 |
| 436.cactusADM | 299 | 40.0 | **299** | **40.0** | 299 | 40.0 | **121** | **99.1** | 121 | 99.0 | 120 | 99.8 |
| 437.leslie3d | 483 | 19.5 | 485 | 19.4 | **484** | **19.4** | 483 | 19.5 | 485 | 19.4 | **484** | **19.4** |
| 444.namd | **478** | **16.8** | 480 | 16.7 | 478 | 16.8 | 477 | 16.8 | **477** | **16.8** | 475 | 16.9 |
| 447.dealII | 405 | 28.3 | 405 | 28.2 | **405** | **28.2** | 381 | 30.1 | **381** | **30.1** | 381 | 30.0 |
| 450.soplex | 668 | 12.5 | **671** | **12.4** | 671 | 12.4 | **594** | **14.0** | 594 | 14.0 | 597 | 14.0 |
| 453.povray | 204 | 26.0 | **202** | **26.4** | 199 | 26.7 | **170** | **31.4** | 170 | 31.4 | 169 | 31.4 |
| 454.calculix | **494** | **16.7** | 493 | 16.7 | 494 | 16.7 | 338 | 24.4 | **335** | **24.6** | 335 | 24.7 |
| 459.GemsFDTD | 588 | 18.0 | **587** | **18.1** | 586 | 18.1 | 578 | 18.4 | 580 | 18.3 | **579** | **18.3** |
| 465.tonto | 436 | 22.5 | 442 | 22.3 | **440** | **22.3** | 417 | 23.6 | 424 | 23.2 | **419** | **23.5** |
| 470.lbm | 1874 | 7.33 | 1882 | 7.30 | **1879** | **7.31** | **589** | **23.3** | 589 | 23.3 | 596 | 23.1 |
| 481.wrf | 500 | 22.3 | 500 | 22.4 | **500** | **22.3** | 510 | 21.9 | **509** | **22.0** | 507 | 22.0 |
| 482.sphinx3 | 705 | 27.7 | **707** | **27.6** | 718 | 27.1 | 674 | 28.9 | **675** | **28.9** | 693 | 28.1 |

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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$SPECfp\_base2006 =$     19.6

**CPU2006 license:** 20
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**Test date:** Dec-2007
**Hardware Availability:** Dec-2007
**Software Availability:** Nov-2007

## General Notes (Continued)

```
The NEC Express5800/120Rh-1(Intel Xeon Prosessor X5460),
the NEC Express5800/120Rj-2(Intel Xeon Prosessor X5460),
the Bull NovaScale R440 E1 (Intel Xeon X5460,3.16GHz) and
the Bull NovaScale R460 E1 (Intel Xeon X5460,3.16GHz) models are electronically equivalent.
The results have been measured on a NEC Express5800/120Rj-2(Intel Xeon Prosessor X5460) 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
```

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# 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.20090713.00.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.20090713.00.xml

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

Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 18:07:07 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 17 April 2008.