# SPEC® CFP2006 Result



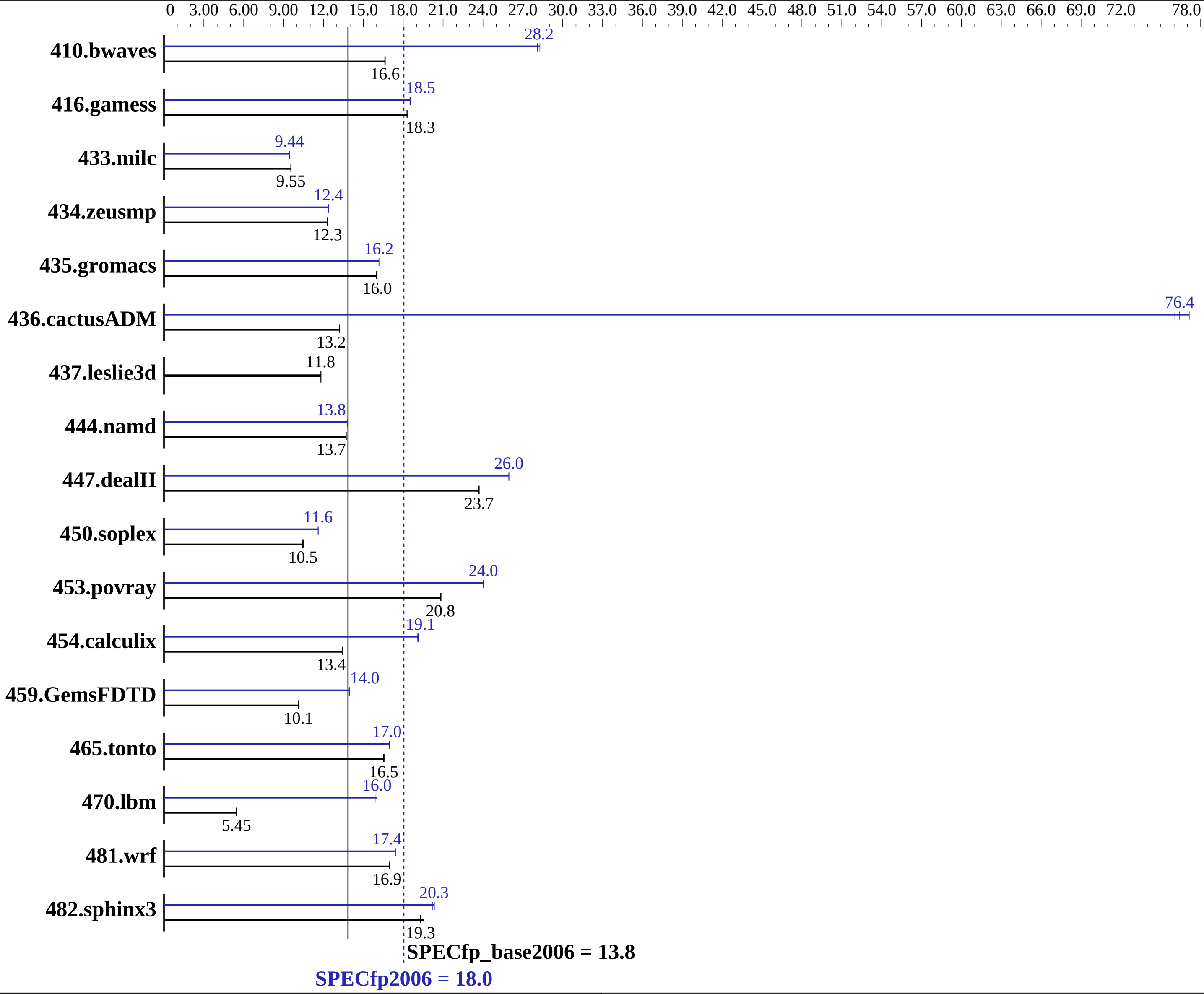
# Bull SAS

NovaScale R630
(Intel Xeon X5355,2.66GHz)

SPECfp®2006 = 18.0

SPECfp_base2006 = 13.8

| | | | |
|---|---|---|---|
| **CPU2006 license:** | 20 | **Test date:** | Apr-2008 |
| **Test sponsor:** | Bull SAS | **Hardware Availability:** | Oct-2007 |
| **Tested by:** | NEC Corporation | **Software Availability:** | Feb-2008 |




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5355 |
| CPU Characteristics: | 2.66 GHz, 2x4 MB L2 shared, 1333 MHz bus |
| CPU MHz: | 2667 |
| 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: | 8 MB I+D on chip per chip, 4 MB shared / 2 cores |

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## Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux AS release4 ( Update 5), Kernel 2.6.9-55.0.12.ELsmp on an X86_64 |
| 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 |

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| | |
|---|---|
| L3 Cache: | None |
| Other Cache: | None |
| Memory: | 12 GB (6x2 GB PC2-5300F, 2 rank, CL5-5-5, ECC) |
| Disk Subsystem: | 2x73.2 GB SAS, 15000RPM, Software RAID Level1 |
| Other Hardware: | None |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | binutils-2.17.tar.gz, Version 2.17<br>ft Server Control Software 5.0-0231 |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 818 | 16.6 | **816** | **16.6** | 816 | 16.7 | **481** | **28.2** | 484 | 28.1 | 480 | 28.3 |
| 416.gamess | **1068** | **18.3** | 1068 | 18.3 | 1071 | 18.3 | 1058 | 18.5 | 1056 | 18.5 | **1056** | **18.5** |
| 433.milc | 961 | 9.55 | 963 | 9.53 | **961** | **9.55** | 973 | 9.43 | 972 | 9.44 | **972** | **9.44** |
| 434.zeusmp | 739 | 12.3 | **740** | **12.3** | 741 | 12.3 | 736 | 12.4 | **735** | **12.4** | 734 | 12.4 |
| 435.gromacs | **445** | **16.0** | 445 | 16.0 | 447 | 16.0 | 442 | 16.2 | **441** | **16.2** | 441 | 16.2 |
| 436.cactusADM | 906 | 13.2 | **906** | **13.2** | 905 | 13.2 | 155 | 77.1 | **156** | **76.4** | 157 | 76.1 |
| 437.leslie3d | 795 | 11.8 | **798** | **11.8** | 801 | 11.7 | 795 | 11.8 | **798** | **11.8** | 801 | 11.7 |
| 444.namd | **585** | **13.7** | 584 | 13.7 | 586 | 13.7 | **581** | **13.8** | 581 | 13.8 | 580 | 13.8 |
| 447.dealII | 482 | 23.7 | **482** | **23.7** | 483 | 23.7 | 441 | 26.0 | 442 | 25.9 | **441** | **26.0** |
| 450.soplex | 796 | 10.5 | 799 | 10.4 | **798** | **10.5** | 718 | 11.6 | **719** | **11.6** | 720 | 11.6 |
| 453.povray | 255 | 20.9 | 256 | 20.8 | **256** | **20.8** | 222 | 24.0 | **221** | **24.0** | 221 | 24.1 |
| 454.calculix | **614** | **13.4** | 613 | 13.4 | 614 | 13.4 | 432 | 19.1 | 431 | 19.1 | **431** | **19.1** |
| 459.GemsFDTD | 1046 | 10.1 | **1048** | **10.1** | 1050 | 10.1 | 760 | 14.0 | **760** | **14.0** | 762 | 13.9 |
| 465.tonto | 594 | 16.6 | **595** | **16.5** | 596 | 16.5 | 580 | 17.0 | **580** | **17.0** | 581 | 16.9 |
| 470.lbm | 2518 | 5.46 | 2534 | 5.42 | **2521** | **5.45** | **857** | **16.0** | 862 | 15.9 | 857 | 16.0 |
| 481.wrf | 659 | 16.9 | 659 | 16.9 | **659** | **16.9** | 641 | 17.4 | 642 | 17.4 | **642** | **17.4** |
| 482.sphinx3 | 996 | 19.6 | 1011 | 19.3 | **1010** | **19.3** | 958 | 20.3 | **959** | **20.3** | 964 | 20.2 |

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
```

## Platform Notes

```
This Express5800/320Fc-MR is a fault-tolerant server.
Two modules are installed in this server and each module has "2CPU chips,12GB memory",
so total "4CPU chips,24GB memory" are on this server.
With lockstep technology, these two modules communicate each other
and handle the same instructions at the same time,
then logically the "CPU,Memory" is recognized as "2CPU chips,12GB memory" by the OS.
```

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## 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

 The NEC Express5800/320Fc-MR(Intel Xeon X5355) and
 the Bull NovaScale R630 (Intel Xeon X5355,2.66GHz) models are electronically equivalent.
 The results have been measured on a NEC Express5800/320Fc-MR(Intel Xeon X5355) 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`

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## Base Optimization Flags (Continued)

C++ benchmarks:
```
-fast
```

Fortran benchmarks:
```
-fast
```

Benchmarks using both Fortran and C:
```
-fast
```

## 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.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.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 17:25:16 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 11 June 2008.