# SPEC® CFP2006 Result

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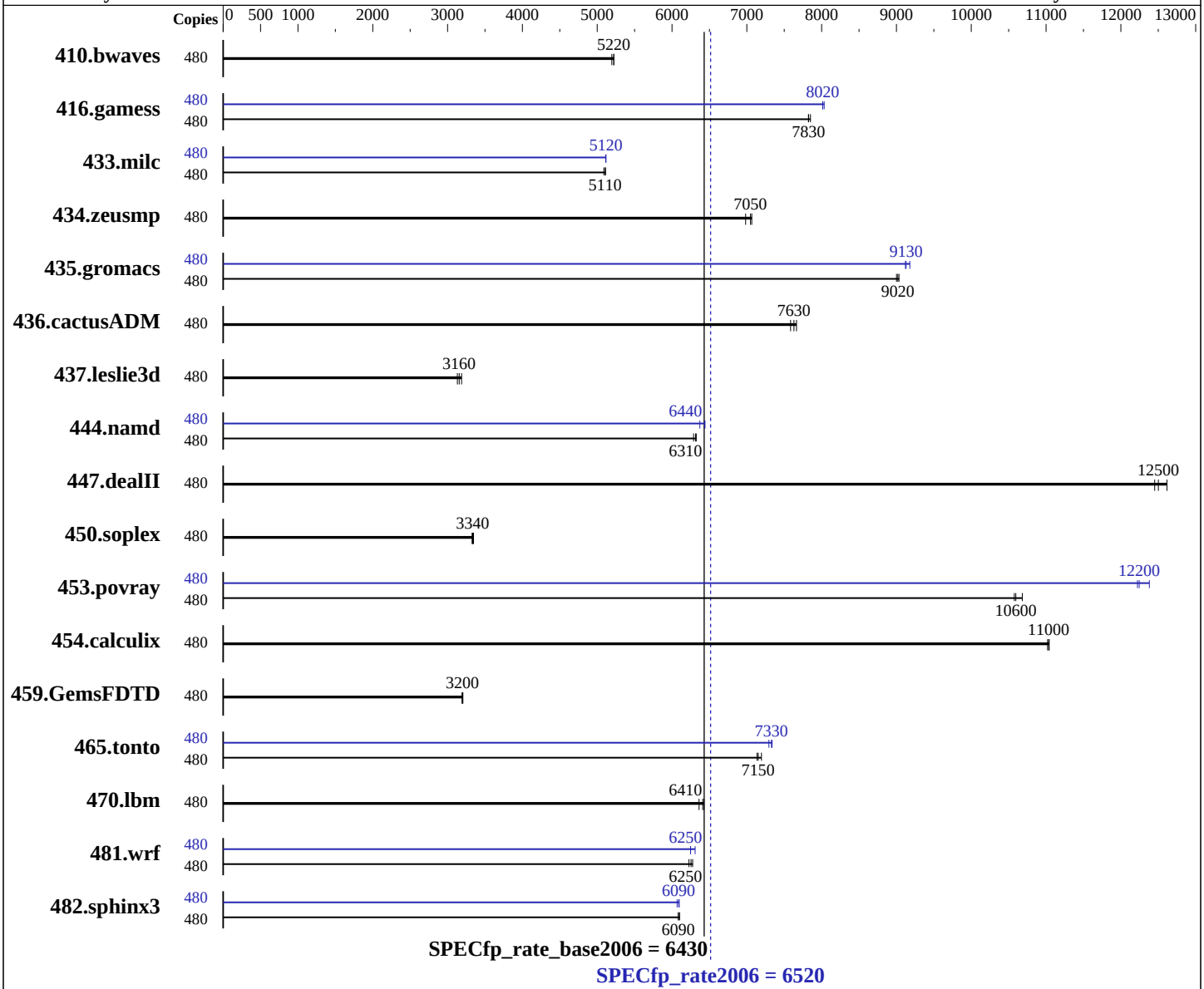
## Bull SAS
## bullion S16 ( E7-4890 v2 )

**SPECfp®_rate2006 = 6520**

**SPECfp_rate_base2006 = 6430**

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

**Test date:** Sep-2014
**Hardware Availability:** Oct-2014
**Software Availability:** Nov-2013




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-4890 v2 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.40 GHz |
| CPU MHz: | 2800 |
| FPU: | Integrated |
| CPU(s) enabled: | 240 cores, 16 chips, 15 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2, 4, 8, 16 chip |
| 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 Server release 6.5 (Santiago)<br>2.6.32-431.el6.x86_64 |
| Compiler: | C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;<br>Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | No |
| File System: | tmpfs |

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L3 Cache: 37.5 MB I+D on chip per chip
Other Cache: None
Memory: 2 TB (256 x 8 GB 2Rx8 PC3-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM
Other Hardware: None

System State: Run level 3 (Full multiuser mode)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 480 | 1256 | 5200 | **1249** | **5220** | 1249 | 5220 | 480 | 1256 | 5200 | **1249** | **5220** | 1249 | 5220 |
| 416.gamess | 480 | 1201 | 7820 | 1197 | 7850 | **1201** | **7830** | 480 | 1170 | 8030 | **1173** | **8020** | 1173 | 8010 |
| 433.milc | 480 | 866 | 5090 | **863** | **5110** | 862 | 5110 | 480 | 862 | 5110 | **861** | **5120** | 861 | 5120 |
| 434.zeusmp | 480 | 618 | 7070 | 625 | 6980 | **620** | **7050** | 480 | 618 | 7070 | 625 | 6980 | **620** | **7050** |
| 435.gromacs | 480 | 379 | 9030 | 381 | 9000 | **380** | **9020** | 480 | 373 | 9180 | **375** | **9130** | 376 | 9120 |
| 436.cactusADM | 480 | 756 | 7580 | **752** | **7630** | 748 | 7660 | 480 | 756 | 7580 | **752** | **7630** | 748 | 7660 |
| 437.leslie3d | 480 | **1430** | **3160** | 1416 | 3190 | 1441 | 3130 | 480 | **1430** | **3160** | 1416 | 3190 | 1441 | 3130 |
| 444.namd | 480 | **610** | **6310** | 609 | 6320 | 612 | 6290 | 480 | 598 | 6440 | **598** | **6440** | 604 | 6370 |
| 447.dealII | 480 | 435 | 12600 | **439** | **12500** | 441 | 12500 | 480 | 435 | 12600 | **439** | **12500** | 441 | 12500 |
| 450.soplex | 480 | 1203 | 3330 | 1196 | 3350 | **1200** | **3340** | 480 | 1203 | 3330 | 1196 | 3350 | **1200** | **3340** |
| 453.povray | 480 | 239 | 10700 | **241** | **10600** | 241 | 10600 | 480 | **209** | **12200** | 206 | 12400 | 209 | 12200 |
| 454.calculix | 480 | 359 | 11000 | **359** | **11000** | 359 | 11000 | 480 | 359 | 11000 | **359** | **11000** | 359 | 11000 |
| 459.GemsFDTD | 480 | 1589 | 3200 | 1595 | 3190 | **1593** | **3200** | 480 | 1589 | 3200 | 1595 | 3190 | **1593** | **3200** |
| 465.tonto | 480 | 656 | 7200 | 662 | 7140 | **660** | **7150** | 480 | 644 | 7340 | **644** | **7330** | 647 | 7300 |
| 470.lbm | 480 | 1026 | 6430 | **1029** | **6410** | 1037 | 6360 | 480 | 1026 | 6430 | **1029** | **6410** | 1037 | 6360 |
| 481.wrf | 480 | 854 | 6280 | 861 | 6230 | **857** | **6250** | 480 | **858** | **6250** | 850 | 6310 | 858 | 6250 |
| 482.sphinx3 | 480 | 1533 | 6100 | **1537** | **6090** | 1537 | 6080 | 480 | **1536** | **6090** | 1535 | 6100 | 1542 | 6070 |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

## Operating System Notes

```
SPEC files placed in /spec2006, with /spec2006
mounted as tmpfs with mpol=interleave, size=1024G
Stack size set to unlimited using "ulimit -s unlimited"
Kernel booted with option clocksource=jiffies (allows to count time with interrupts at
1 jiffy period instead using HPET counters)
```

## Platform Notes

```
BIOS configuration:
Set Power Efficiency Mode to Performance
Set Memory RAS mode to Performance
Sysinfo program /spec2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on timco Sat Sep 27 08:49:58 2014

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E7-4890 v2 @ 2.80GHz
      16 "physical id"s (chips)
      480 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 15
      siblings  : 30
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 4: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 5: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 6: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 7: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 8: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 9: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 10: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 11: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 12: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 13: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 14: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 15: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
   cache size : 38400 KB

From /proc/meminfo
   MemTotal:       2117731976 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
```

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## Platform Notes (Continued)

```
      Linux timco 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013 x86_64
      x86_64 x86_64 GNU/Linux

   run-level 3 Sep 26 10:11

   SPEC is set to: /spec2006
      Filesystem     Type   Size  Used Avail Use% Mounted on
      none           tmpfs  1.0T  4.7G 1020G   1% /spec2006

   Additional information from dmidecode:
     BIOS Bull INX05.013.04.130 10/09/2014
     Memory:
      256x   8 GB
      160x Micron 18KSF1G72PDZ-1G6E1 8 GB 1333 MHz 2 rank
      128x NO DIMM Unknown
      96x Samsung M393B1G73QH0-YK0 8 GB 1333 MHz 2 rank

   (End of data from sysinfo program)
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/spec2006/libs/32:/spec2006/libs/64:/spec2006/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

## 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:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

Fortran benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

## Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64

482.sphinx3: icc -m32

C++ benchmarks:
icpc -m64

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## Peak Compiler Invocation (Continued)

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
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

## Peak Optimization Flags

C benchmarks:

433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
-unroll2

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

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# Peak Optimization Flags (Continued)

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xAVX(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-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(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

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Bull-BullionS-Flags-V1.0.html
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Bull-BullionS-Flags-V1.0.xml
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml

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