# SPEC® CFP2006 Result
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## Bull SAS

NovaScale T820 F3 (Intel Xeon E5-2440, 2.40 GHz)

$SPECfp^{®}2006 =$    61.5

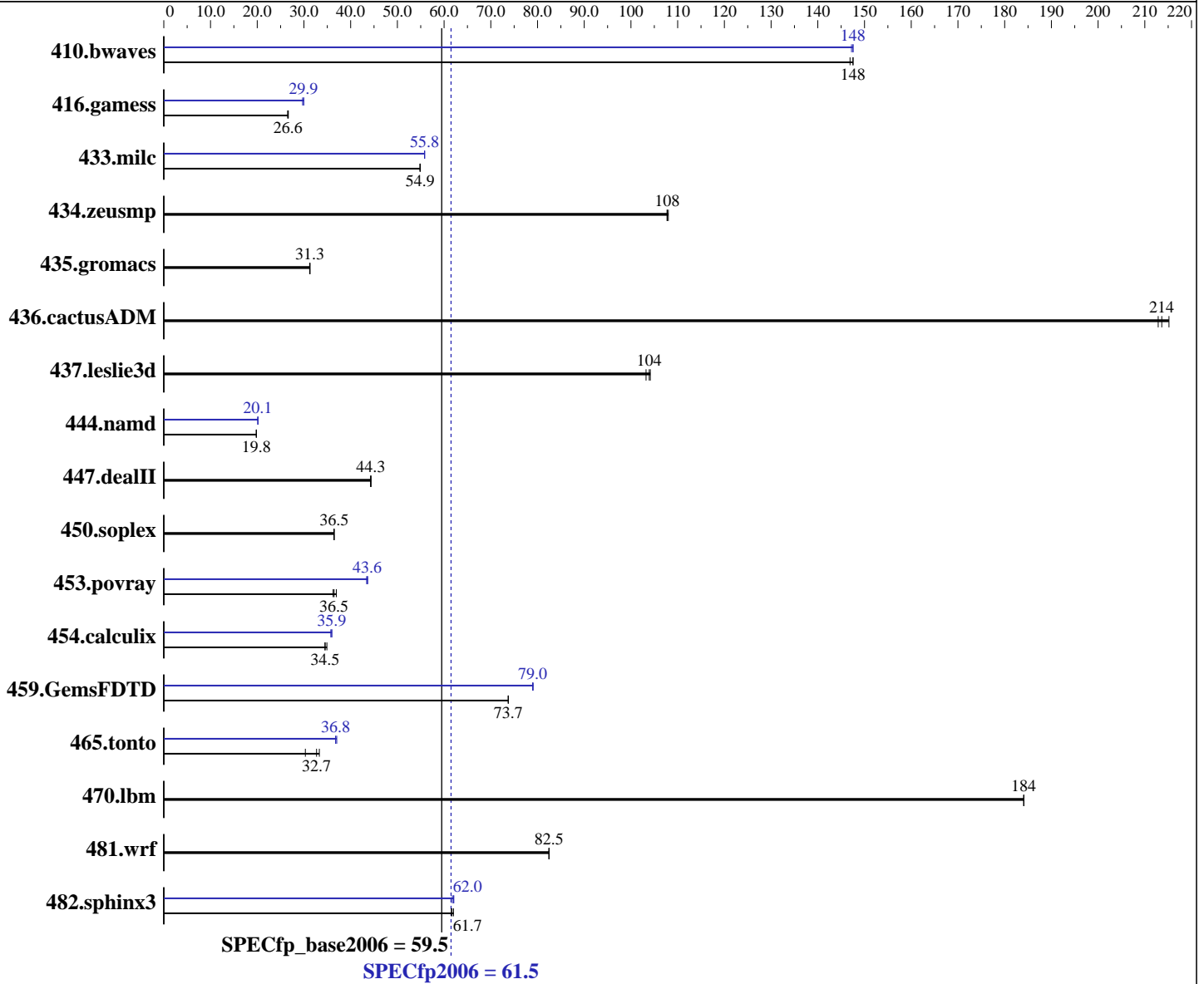$SPECfp\_base2006 =$    59.5

**CPU2006 license:** 20
**Test sponsor:** Bull SAS
**Tested by:** Dell Inc.

**Test date:** May-2012
**Hardware Availability:** Jun-2012
**Software Availability:** Feb-2012

| Benchmark | Score |
|---|---|
| 410.bwaves | 148 / 148 |
| 416.gamess | 29.9 / 26.6 |
| 433.milc | 55.8 / 54.9 |
| 434.zeusmp | 108 |
| 435.gromacs | 31.3 |
| 436.cactusADM | 214 |
| 437.leslie3d | 104 |
| 444.namd | 20.1 / 19.8 |
| 447.dealII | 44.3 |
| 450.soplex | 36.5 |
| 453.povray | 43.6 / 36.5 |
| 454.calculix | 35.9 / 34.5 |
| 459.GemsFDTD | 79.0 / 73.7 |
| 465.tonto | 36.8 / 32.7 |
| 470.lbm | 184 |
| 481.wrf | 82.5 |
| 482.sphinx3 | 62.0 / 61.7 |

**SPECfp_base2006 = 59.5**

**SPECfp2006 = 61.5**

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2440 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.90 GHz |
| CPU MHz: | 2400 |
| FPU: | Integrated |
| CPU(s) enabled: | 6 cores, 1 chip, 6 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 chip |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |

**Continued on next page**

## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 SP2(x86_64) 3.0.13-0.27-default |
| Compiler: | C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |

**Continued on next page**

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|---|---|---|---|
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| | | | |
|---|---|---|---|
| L3 Cache: | 15 MB I+D on chip per chip | Base Pointers: | 64-bit |
| Other Cache: | None | Peak Pointers: | 32/64-bit |
| Memory: | 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz) | Other Software: | None |
| Disk Subsystem: | 1 x 300 GB 15000 RPM SAS | | |
| Other Hardware: | None | | |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 92.5 | 147 | **92.1** | **148** | 92.1 | 148 | 92.3 | 147 | **92.1** | **148** | 92.1 | 148 |
| 416.gamess | **737** | **26.6** | 738 | 26.5 | 734 | 26.7 | 659 | 29.7 | 654 | 30.0 | **654** | **29.9** |
| 433.milc | 167 | 54.8 | **167** | **54.9** | 167 | 54.9 | 164 | 55.8 | 164 | 55.8 | **164** | **55.8** |
| 434.zeusmp | **84.5** | **108** | 84.5 | 108 | 84.3 | 108 | **84.5** | **108** | 84.5 | 108 | 84.3 | 108 |
| 435.gromacs | 229 | 31.2 | **228** | **31.3** | 228 | 31.3 | 229 | 31.2 | **228** | **31.3** | 228 | 31.3 |
| 436.cactusADM | 56.1 | 213 | 55.5 | 215 | **55.9** | **214** | 56.1 | 213 | 55.5 | 215 | **55.9** | **214** |
| 437.leslie3d | 91.1 | 103 | **90.5** | **104** | 90.3 | 104 | 91.1 | 103 | **90.5** | **104** | 90.3 | 104 |
| 444.namd | 405 | 19.8 | **405** | **19.8** | 405 | 19.8 | **398** | **20.1** | 398 | 20.2 | 398 | 20.1 |
| 447.dealII | 258 | 44.4 | **258** | **44.3** | 258 | 44.3 | 258 | 44.4 | **258** | **44.3** | 258 | 44.3 |
| 450.soplex | **229** | **36.5** | 229 | 36.5 | 229 | 36.4 | **229** | **36.5** | 229 | 36.5 | 229 | 36.4 |
| 453.povray | **146** | **36.5** | 144 | 36.9 | 147 | 36.2 | 122 | 43.7 | 123 | 43.4 | **122** | **43.6** |
| 454.calculix | 236 | 34.9 | 239 | 34.5 | **239** | **34.5** | **230** | **35.9** | 231 | 35.7 | 229 | 36.0 |
| 459.GemsFDTD | 144 | 73.7 | 144 | 73.7 | **144** | **73.7** | **134** | **79.0** | 134 | 79.1 | 134 | 79.0 |
| 465.tonto | **301** | **32.7** | 325 | 30.3 | 296 | 33.3 | 267 | 36.8 | **267** | **36.8** | 266 | 37.0 |
| 470.lbm | 74.6 | 184 | **74.6** | **184** | 74.6 | 184 | 74.6 | 184 | **74.6** | **184** | 74.6 | 184 |
| 481.wrf | 135 | 82.5 | **135** | **82.5** | 135 | 82.5 | 135 | 82.5 | **135** | **82.5** | 135 | 82.5 |
| 482.sphinx3 | 314 | 62.0 | 317 | 61.5 | **316** | **61.7** | 314 | 62.1 | 316 | 61.8 | **314** | **62.0** |

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

## Operating System Notes

    Stack size set to unlimited using "ulimit -s unlimited"

## Platform Notes

    CPU Power Management set to Maximum Performance
    Memory Frequency set to Maximum Performance
    Turbo Boost set to Enabled
    C States/C1E set to Enabled
    Sysinfo program /root/CPU2006-1.2/config/sysinfo.rev6800
    $Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
    running on linux-sxkz Mon May 21 16:21:30 2012

    This section contains SUT (System Under Test) info as seen by

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**Test date:** May-2012
**Hardware Availability:** Jun-2012
**Software Availability:** Feb-2012

## Platform Notes (Continued)

```
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 E5-2440 0 @ 2.40GHz
      1 "physical id"s (chips)
      12 "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 : 6
      siblings  : 12
      physical 0: cores 0 1 2 3 4 5
   cache size : 15360 KB

From /proc/meminfo
   MemTotal:       49348896 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 11 (x86_64)
      VERSION = 11
      PATCHLEVEL = 2

uname -a:
   Linux linux-sxkz 3.0.13-0.27-default #1 SMP Wed Feb 15 13:33:49 UTC 2012
   (d73692b) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 21 09:06 last=S

SPEC is set to: /root/CPU2006-1.2
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext3  271G   40G  218G  16% /

Additional information from dmidecode:

(End of data from sysinfo program)
```

## General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/root/CPU2006-1.2/libs/32:/root/CPU2006-1.2/libs/64"
OMP_NUM_THREADS = "6"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
```

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## General Notes (Continued)

```
memory using RHEL5.5
Transparent Huge Pages disabled with:
echo never  > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1>         /proc/sys/vm/drop_caches
The Dell PowerEdge T320 and
the Bull NovaScale T820 F3 models are electronically equivalent.
The results have been measured on a Dell PowerEdge T320 model
```

## 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
```

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## Base Optimization Flags

C benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

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

Benchmarks using both Fortran and C:
```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

## Peak Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

## Peak Portability Flags

```
Same as Base Portability Flags
```

## 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) -prof-use(pass 2) -static -auto-ilp32
              -ansi-alias

    470.lbm: basepeak = yes

    482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
              -parallel
```

Continued on next page

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# Peak Optimization Flags (Continued)

C++ benchmarks:

    444.namd: `-xAVX(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: basepeak = yes

    450.soplex: basepeak = yes

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

Fortran benchmarks:

    410.bwaves: `-xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel`
        `-static`

    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- -static`

    434.zeusmp: basepeak = yes

    437.leslie3d: basepeak = yes

  459.GemsFDTD: `-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 -opt-prefetch -parallel`

    465.tonto: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
        `-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc`
        `-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

    435.gromacs: basepeak = yes

  436.cactusADM: basepeak = yes

    454.calculix: `-xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

    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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.html

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

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