SPEC® CFP2006 Result
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Bull SAS

NovaScale R450 F3 (Intel Xeon E5-2407, 2.20 GHz)

$SPECfp^{®}2006 =$ 52.4
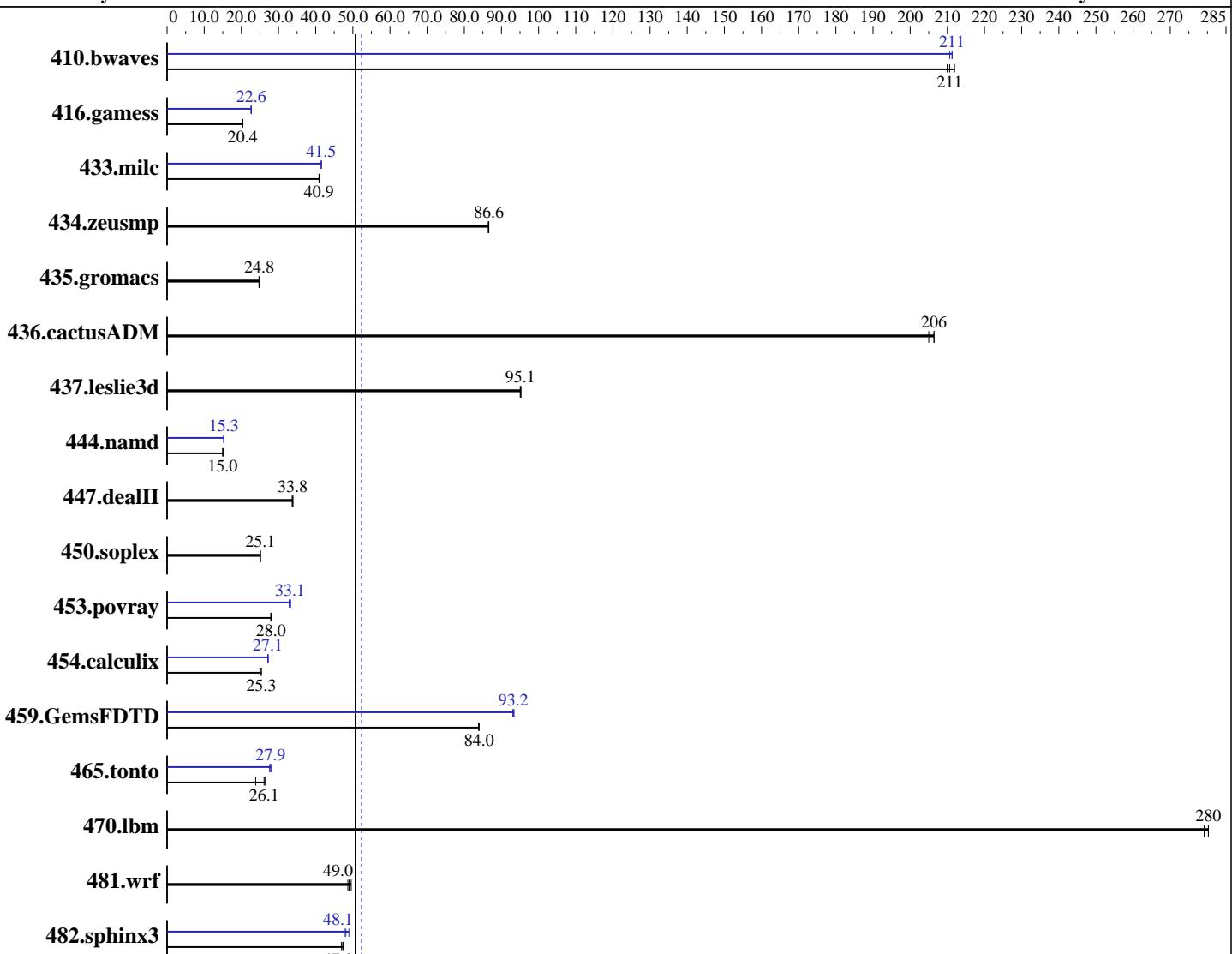
$SPECfp\_base2006 =$ 50.7

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

Test date: Mar-2012
Hardware Availability: May-2012
Software Availability: Feb-2012

Results chart (scale 0 to 285):
- 410.bwaves: 211 / 211
- 416.gamess: 22.6 / 20.4
- 433.milc: 41.5 / 40.9
- 434.zeusmp: 86.6
- 435.gromacs: 24.8
- 436.cactusADM: 206
- 437.leslie3d: 95.1
- 444.namd: 15.3 / 15.0
- 447.dealII: 33.8
- 450.soplex: 25.1
- 453.povray: 33.1 / 28.0
- 454.calculix: 27.1 / 25.3
- 459.GemsFDTD: 93.2 / 84.0
- 465.tonto: 27.9 / 26.1
- 470.lbm: 280
- 481.wrf: 49.0
- 482.sphinx3: 48.1 / 47.3

SPECfp_base2006 = 50.7
SPECfp2006 = 52.4

Hardware

CPU Name: Intel Xeon E5-2407
CPU Characteristics:
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1,2 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) 3.0.13-0.9-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 (add definition here)

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L3 Cache:	10 MB I+D on chip per chip
Other Cache:	None
Memory:	48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1066 MHz)
Disk Subsystem:	2 x 600 GB 15000 RPM SAS, RAID 1
Other Hardware:	None

Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	64.7	210	64.1	212	**64.5**	**211**	64.3	211	**64.3**	**211**	64.5	211
416.gamess	964	20.3	961	20.4	**962**	**20.4**	863	22.7	**865**	**22.6**	866	22.6
433.milc	**224**	**40.9**	224	40.9	224	40.9	221	41.5	**221**	**41.5**	221	41.5
434.zeusmp	105	86.6	105	86.4	**105**	**86.6**	105	86.6	105	86.4	**105**	**86.6**
435.gromacs	287	24.9	**288**	**24.8**	289	24.7	287	24.9	**288**	**24.8**	289	24.7
436.cactusADM	**57.9**	**206**	58.3	205	57.9	206	**57.9**	**206**	58.3	205	57.9	206
437.leslie3d	98.7	95.3	**98.9**	**95.1**	98.9	95.1	98.7	95.3	**98.9**	**95.1**	98.9	95.1
444.namd	**534**	**15.0**	534	15.0	534	15.0	**525**	**15.3**	525	15.3	525	15.3
447.dealII	338	33.9	**338**	**33.8**	340	33.7	338	33.9	**338**	**33.8**	340	33.7
450.soplex	332	25.1	332	25.1	**332**	**25.1**	332	25.1	332	25.1	**332**	**25.1**
453.povray	**190**	**28.0**	189	28.1	191	27.9	162	32.9	160	33.2	**160**	**33.1**
454.calculix	**326**	**25.3**	325	25.4	330	25.0	304	27.1	**304**	**27.1**	303	27.2
459.GemsFDTD	**126**	**84.0**	126	84.0	127	83.8	114	93.4	**114**	**93.2**	114	93.1
465.tonto	373	26.4	413	23.8	**377**	**26.1**	357	27.6	352	28.0	**353**	**27.9**
470.lbm	49.0	280	**49.0**	**280**	49.2	279	49.0	280	**49.0**	**280**	49.2	279
481.wrf	**228**	**49.0**	225	49.6	230	48.7	**228**	**49.0**	225	49.6	230	48.7
482.sphinx3	411	47.4	**412**	**47.3**	415	46.9	408	47.7	398	48.9	**405**	**48.1**

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 Silk-2P Thu Mar 15 20:42:18 2012

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

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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 E5-2407 0 @ 2.20GHz
       2 "physical id"s (chips)
       8 "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 : 4
       siblings  : 4
       physical 0: cores 0 1 2 3
       physical 1: cores 0 1 2 3
    cache size : 10240 KB

 From /proc/meminfo
    MemTotal:       49381468 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 Silk-2P 3.0.13-0.9-default #1 SMP Mon Jan 16 17:33:03 UTC 2012
    (54ddfaf) x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Mar 15 11:40 last=S

 SPEC is set to: /root/CPU2006-1.2
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda1       ext3  493G  9.1G  459G   2% /

 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 = "8"
```

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General Notes (Continued)

```
Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
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 R520 and
the Bull NovaScale R450 F3 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R520 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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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.xml

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

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