SPEC® CFP2006 Result
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Bull SAS

$SPECfp®2006 =$ 45.5

BL275 (Intel Xeon E5-2403, 1.80 GHz)
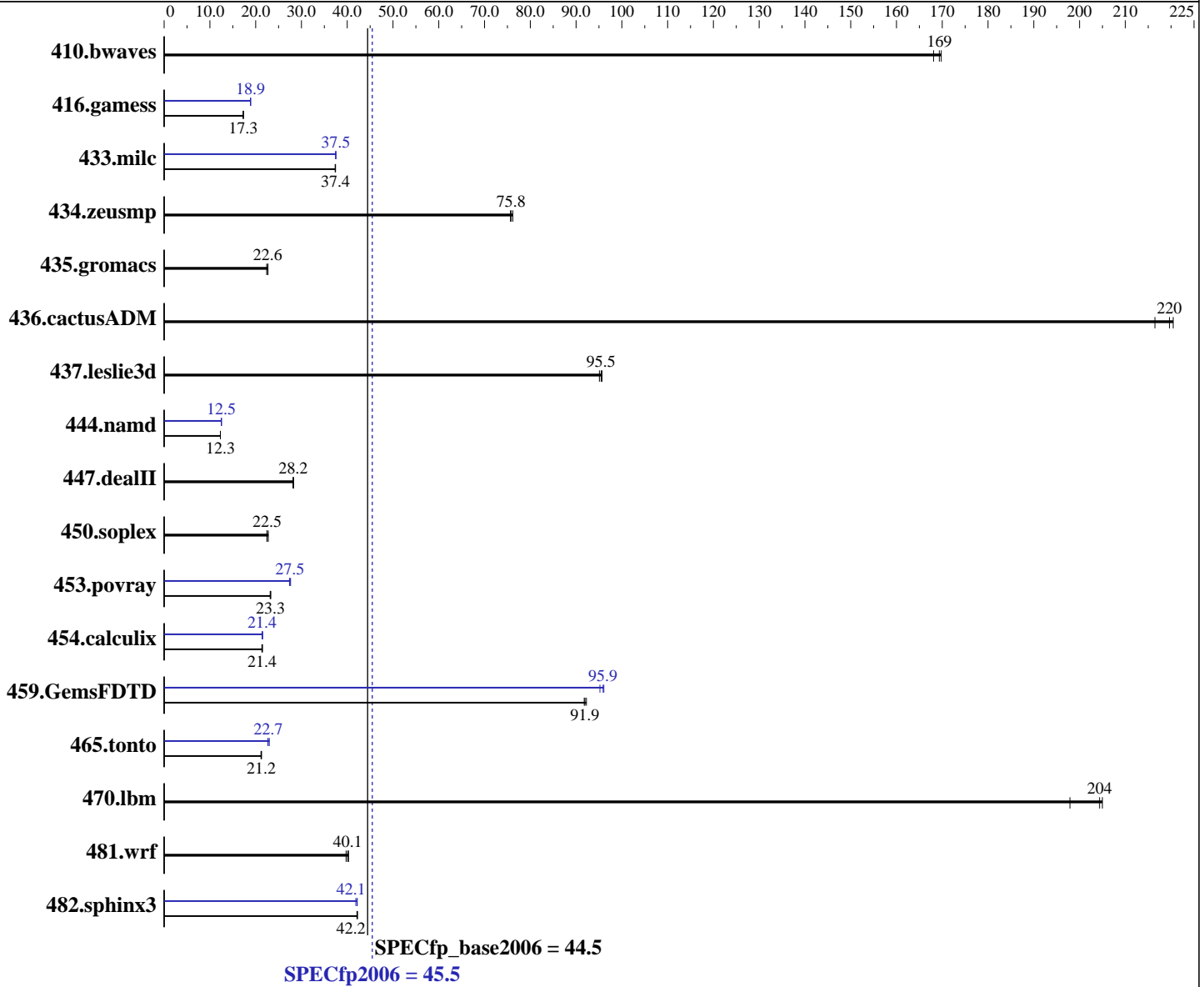
$SPECfp\_base2006 =$ 44.5

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

Test date: Feb-2013
Hardware Availability: Sep-2012
Software Availability: Oct-2012

410.bwaves 169
416.gamess 18.9 / 17.3
433.milc 37.5 / 37.4
434.zeusmp 75.8
435.gromacs 22.6
436.cactusADM 220
437.leslie3d 95.5
444.namd 12.5 / 12.3
447.dealII 28.2
450.soplex 22.5
453.povray 27.5 / 23.3
454.calculix 21.4 / 21.4
459.GemsFDTD 95.9 / 91.9
465.tonto 22.7 / 21.2
470.lbm 204
481.wrf 40.1
482.sphinx3 42.1 / 42.2

SPECfp_base2006 = 44.5
SPECfp2006 = 45.5

Hardware

CPU Name: Intel Xeon E5-2403
CPU Characteristics:
CPU MHz: 1800
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: 256 KB I+D on chip per core
Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 6.2 (Santiago)
2.6.32-220.el6.x86_64
Compiler: C/C++: Version 13.0.0.133 of Intel C++ Studio XE for Linux;
Fortran: Version 13.0.0.133 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext4
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L3 Cache:	10 MB I+D on chip per chip
Other Cache:	None
Memory:	96 GB (12 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1066 MHz and CL7)
Disk Subsystem:	2 x 146 GB 15000 RPM SAS, RAID 0
Other Hardware:	None

System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	80.8	168	**80.2**	**169**	80.0	170	80.8	168	**80.2**	**169**	80.0	170
416.gamess	**1131**	**17.3**	1131	17.3	1134	17.3	**1037**	**18.9**	1036	18.9	1037	18.9
433.milc	**245**	**37.4**	245	37.4	246	37.4	245	37.5	**245**	**37.5**	245	37.5
434.zeusmp	120	75.7	**120**	**75.8**	119	76.2	120	75.7	**120**	**75.8**	119	76.2
435.gromacs	319	22.4	**316**	**22.6**	315	22.7	319	22.4	**316**	**22.6**	315	22.7
436.cactusADM	54.2	220	**54.4**	**220**	55.2	216	54.2	220	**54.4**	**220**	55.2	216
437.leslie3d	**98.5**	**95.5**	98.3	95.7	98.9	95.1	**98.5**	**95.5**	98.3	95.7	98.9	95.1
444.namd	**653**	**12.3**	652	12.3	653	12.3	**641**	**12.5**	641	12.5	641	12.5
447.dealII	405	28.3	406	28.1	**405**	**28.2**	405	28.3	406	28.1	**405**	**28.2**
450.soplex	366	22.8	371	22.5	**371**	**22.5**	366	22.8	371	22.5	**371**	**22.5**
453.povray	229	23.3	**229**	**23.3**	230	23.2	194	27.4	193	27.6	**193**	**27.5**
454.calculix	**385**	**21.4**	386	21.4	384	21.5	**385**	**21.4**	386	21.4	383	21.5
459.GemsFDTD	**115**	**91.9**	116	91.8	115	92.3	111	95.2	110	96.1	**111**	**95.9**
465.tonto	463	21.3	**463**	**21.2**	465	21.2	**433**	**22.7**	434	22.7	428	23.0
470.lbm	**67.2**	**204**	67.0	205	69.4	198	**67.2**	**204**	67.0	205	69.4	198
481.wrf	**279**	**40.1**	277	40.3	281	39.7	**279**	**40.1**	277	40.3	281	39.7
482.sphinx3	463	42.1	**462**	**42.2**	461	42.2	466	41.9	462	42.2	**463**	**42.1**

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

    Sysinfo program /spec/cpu2006.1.2/config/sysinfo.rev6818
    $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
    running on localhost.localdomain Sun Feb 24 20:55:43 2013

    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

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Hardware Availability: Sep-2012
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Platform Notes (Continued)

```
    model name : Intel(R) Xeon(R) CPU E5-2403 0 @ 1.80GHz
       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:       99039688 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

  /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.2 (Santiago)

  From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

  uname -a:
    Linux localhost.localdomain 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13
    EST 2011 x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Feb 24 20:54

  SPEC is set to: /spec/cpu2006.1.2
    Filesystem    Type    Size  Used Avail Use% Mounted on
    /dev/mapper/VolGroup-lv_root
                  ext4    153G   38G  108G  26% /

  Additional information from dmidecode:
    BIOS IBM Corp. -[AHEG24BUS-1.21]- 01/25/2013
    Memory:
    12x Samsung M392B1K70DM0-CK0 8 GB 1066 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 = "/spec/cpu2006.1.2/libs/32:/spec/cpu2006.1.2/libs/64:/spec/cpu2006.1.2/sh"
 OMP_NUM_THREADS = "8"

  Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
  memory using RHEL5.5
```

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General Notes (Continued)

```
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
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 -static -parallel -opt-prefetch
-ansi-alias
```

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Base Optimization Flags (Continued)

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`

C++ benchmarks:

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Peak Optimization Flags (Continued)

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: 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- -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-ic13-official-linux64.html
http://www.spec.org/cpu2006/flags/Bull-Platform-Settings-V1.2.20130313.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic13-official-linux64.xml
http://www.spec.org/cpu2006/flags/Bull-Platform-Settings-V1.2.20130313.xml

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