SPEC® CFP2006 Result
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Bull SAS

$SPECfp^{®}2006 =$ 48.5

NovaScale R480 F2 (Intel Xeon E7540, 2.00 GHz)

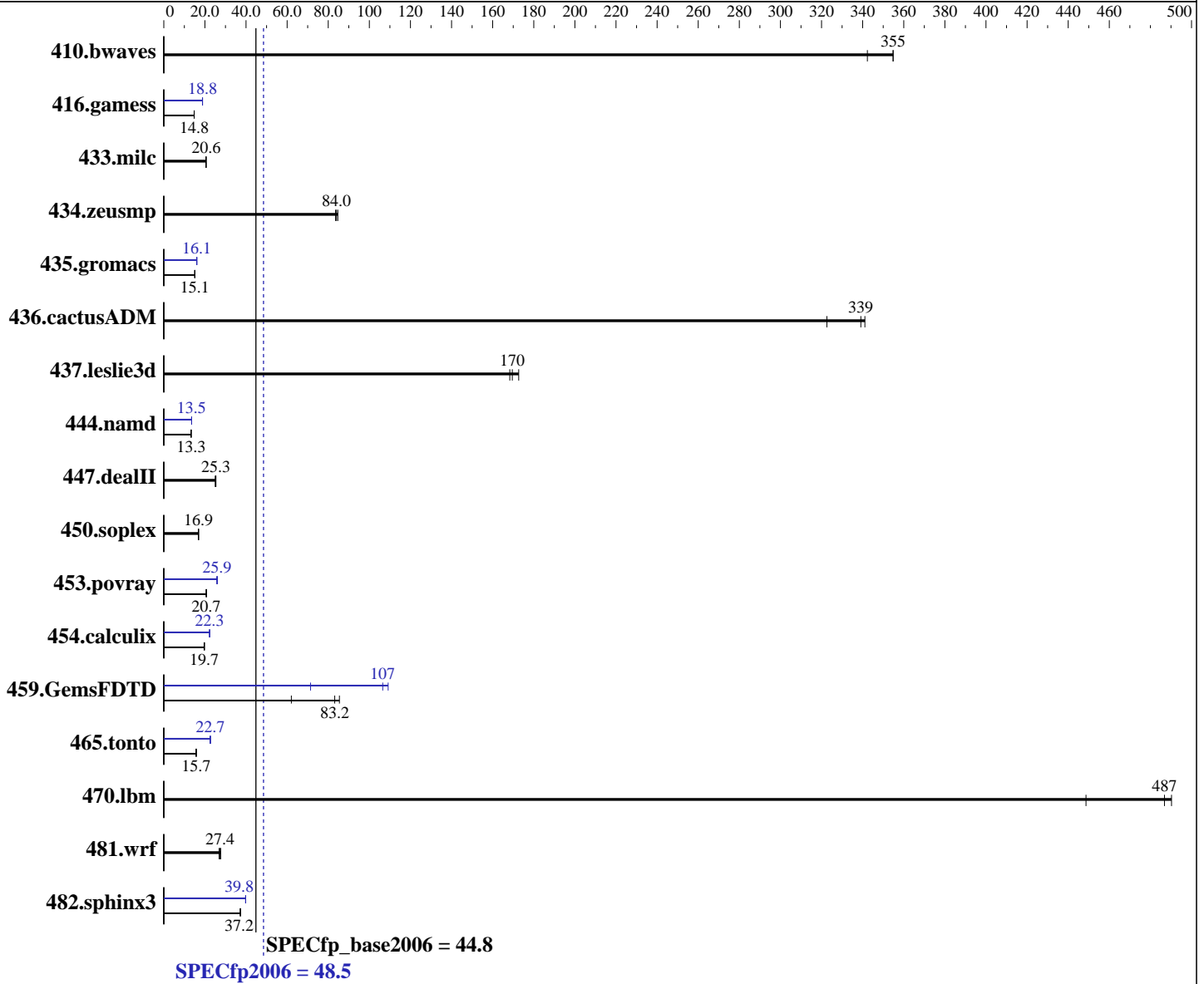$SPECfp\_base2006 =$ 44.8

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

Test date: Apr-2011
Hardware Availability: Jul-2011
Software Availability: Apr-2011

Benchmark	Result
410.bwaves	355
416.gamess	18.8 / 14.8
433.milc	20.6
434.zeusmp	84.0
435.gromacs	16.1 / 15.1
436.cactusADM	339
437.leslie3d	170
444.namd	13.5 / 13.3
447.dealII	25.3
450.soplex	16.9
453.povray	25.9 / 20.7
454.calculix	22.3 / 19.7
459.GemsFDTD	107 / 83.2
465.tonto	22.7 / 15.7
470.lbm	487
481.wrf	27.4
482.sphinx3	39.8 / 37.2

SPECfp_base2006 = 44.8
SPECfp2006 = 48.5

Hardware

CPU Name: Intel Xeon E7540
CPU Characteristics: Intel Turbo Boost Technology up to 2.27 GHz
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip, 2 threads/core
CPU(s) orderable: 2,4 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: SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache:	18 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (64 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem:	1 x 500 GB 7200 RPM SAS 6Gb
Other Hardware:	None
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	38.3	355	**38.3**	**355**	39.7	342	38.3	355	**38.3**	**355**	39.7	342
416.gamess	1326	14.8	1323	14.8	**1325**	**14.8**	1039	18.8	1041	18.8	**1039**	**18.8**
433.milc	448	20.5	**446**	**20.6**	445	20.6	448	20.5	**446**	**20.6**	445	20.6
434.zeusmp	109	83.6	**108**	**84.0**	107	84.7	109	83.6	**108**	**84.0**	107	84.7
435.gromacs	472	15.1	474	15.1	**474**	**15.1**	**445**	**16.1**	444	16.1	446	16.0
436.cactusADM	35.0	341	37.0	323	**35.2**	**339**	35.0	341	37.0	323	**35.2**	**339**
437.leslie3d	54.4	173	55.8	168	**55.4**	**170**	54.4	173	55.8	168	**55.4**	**170**
444.namd	603	13.3	**603**	**13.3**	603	13.3	592	13.5	**592**	**13.5**	593	13.5
447.dealII	458	25.0	**452**	**25.3**	451	25.4	458	25.0	**452**	**25.3**	451	25.4
450.soplex	495	16.9	493	16.9	**494**	**16.9**	495	16.9	493	16.9	**494**	**16.9**
453.povray	256	20.8	259	20.6	**257**	**20.7**	**206**	**25.9**	206	25.8	204	26.1
454.calculix	421	19.6	417	19.8	**418**	**19.7**	370	22.3	**370**	**22.3**	371	22.2
459.GemsFDTD	**128**	**83.2**	124	85.4	171	62.1	149	71.4	**99.6**	**107**	97.2	109
465.tonto	**625**	**15.7**	628	15.7	620	15.9	438	22.5	**434**	**22.7**	433	22.7
470.lbm	28.0	490	30.6	449	**28.2**	**487**	28.0	490	30.6	449	**28.2**	**487**
481.wrf	404	27.7	415	26.9	**408**	**27.4**	404	27.7	415	26.9	**408**	**27.4**
482.sphinx3	522	37.3	**523**	**37.2**	524	37.2	489	39.8	**489**	**39.8**	490	39.8

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
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
BIOS Settings:
Power Management = Maximum Performance (Default = Active Power Controller)
Node Interleaving = Enabled (Default = Disabled)
```

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General Notes

```
The Dell PowerEdge R910 and
the Bull NovaScale R480 F2 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R910 model.
 OMP_NUM_THREADS set to number of cores
 Binaries were compiled on RHEL5.5
```

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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

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Bull SAS

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Base Optimization Flags (Continued)

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -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: basepeak = yes

> 470.lbm: basepeak = yes

> 482.sphinx3: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel`

C++ benchmarks:

> 444.namd: `-xSSE4.2(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`

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Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(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: -xSSE4.2(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
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(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
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(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

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -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-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.xml

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