SPEC® CFP2006 Result
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Bull SAS

NovaScale R460 F2 (Intel Xeon E5640, 2.66 GHz)

$SPECfp^{®}_rate2006 = $ 177

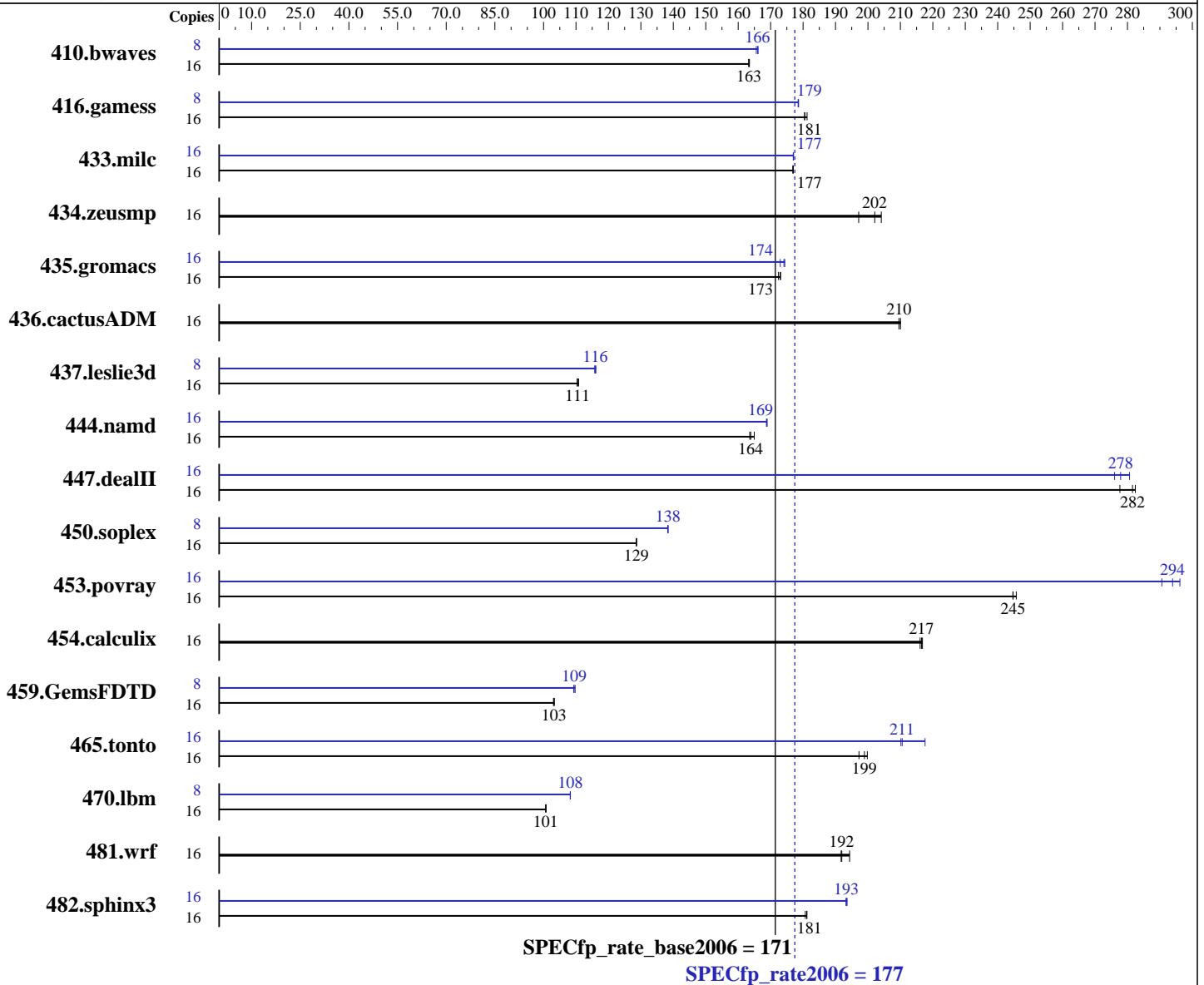$SPECfp_rate_base2006 = $ 171

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

Test date: Apr-2010
Hardware Availability: Mar-2010
Software Availability: Dec-2009

Copies	
410.bwaves	8: 166 / 16: 163
416.gamess	8: 179 / 16: 181
433.milc	16: 177 / 16: 177
434.zeusmp	16: 202
435.gromacs	16: 174 / 16: 173
436.cactusADM	16: 210
437.leslie3d	8: 116 / 16: 111
444.namd	16: 169 / 16: 164
447.dealII	16: 278 / 16: 282
450.soplex	8: 138 / 16: 129
453.povray	16: 294 / 16: 245
454.calculix	16: 217
459.GemsFDTD	8: 109 / 16: 103
465.tonto	16: 211 / 16: 199
470.lbm	8: 108 / 16: 101
481.wrf	16: 192
482.sphinx3	16: 193 / 16: 181

SPECfp_rate_base2006 = 171

SPECfp_rate2006 = 177

Hardware

CPU Name: Intel Xeon E5640
CPU Characteristics: Intel Turbo Boost Technology up to 2.93 GHz
CPU MHz: 2667
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core
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: SUSE Linux Enterprise Server 11 (x86_64), Kernel 2.6.27.19-5-smp
Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1
Build 20091130 Package ID: l_cproc_p_11.1.064, l_cprof_p_11.1.064
Auto Parallel: No
File System: ext3
System State: Run level 3 (multi-user)
Continued on next page

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L3 Cache:	12 MB I+D on chip per chip
Other Cache:	None
Memory:	48 GB (12 x 4 GB DDR3-1333 DR RDIMM downclocked to 1066 MHz)
Disk Subsystem:	1 x 146 GB 15000 RPM SAS
Other Hardware:	None

Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	Binutils 2.18.50.0.7.20080502

Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	1330	163	1332	163	**1331**	**163**	8	657	166	654	166	**655**	**166**
416.gamess	16	1736	180	1729	181	**1735**	**181**	8	877	179	878	178	**877**	**179**
433.milc	16	831	177	830	177	**830**	**177**	16	829	177	**830**	**177**	830	177
434.zeusmp	16	739	197	**720**	**202**	713	204	16	739	197	**720**	**202**	713	204
435.gromacs	16	663	172	660	173	**661**	**173**	16	**656**	**174**	655	174	660	173
436.cactusADM	16	910	210	912	210	**912**	**210**	16	910	210	912	210	**912**	**210**
437.leslie3d	16	**1361**	**111**	1363	110	1357	111	8	**649**	**116**	650	116	648	116
444.namd	16	**783**	**164**	785	164	778	165	16	**760**	**169**	760	169	760	169
447.dealII	16	659	278	**650**	**282**	648	282	16	**659**	**278**	652	281	663	276
450.soplex	16	**1037**	**129**	1037	129	1038	129	8	482	138	**482**	**138**	482	138
453.povray	16	348	245	**348**	**245**	346	246	16	287	296	293	291	**290**	**294**
454.calculix	16	609	217	**610**	**217**	611	216	16	609	217	**610**	**217**	611	216
459.GemsFDTD	16	**1645**	**103**	1647	103	1643	103	8	773	110	776	109	**776**	**109**
465.tonto	16	**791**	**199**	798	197	788	200	16	**748**	**211**	723	218	749	210
470.lbm	16	2181	101	**2183**	**101**	2184	101	8	1015	108	1016	108	**1015**	**108**
481.wrf	16	932	192	920	194	**931**	**192**	16	932	192	920	194	**931**	**192**
482.sphinx3	16	1721	181	**1721**	**181**	1726	181	16	1611	194	**1613**	**193**	1614	193

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

Submit Notes

    The config file option 'submit' was used.
     numactl was used to bind copies to the cores

Operating System Notes

    'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run

Platform Notes

    BIOS Settings:
    Power Management = Maximum Performance (Default = Active Power Controller)
    Data Reuse = Disabled (Default = Enabled)

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$SPECfp_rate_base2006 = $ 171

General Notes

    The Dell PowerEdge R710 and
    the Bull NovaScale R460 F2 models are electronically equivalent.
    The results have been measured on a Dell PowerEdge R710 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

Base Optimization Flags

C benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

C++ benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

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Base Optimization Flags (Continued)

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

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

Peak Compiler Invocation

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

```
482.sphinx3: icc -m32
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```

```
450.soplex: icpc -m32
```

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
        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
```

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Peak Optimization Flags

C benchmarks:

> 433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -fno-alias -opt-prefetch

> 470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -opt-malloc-options=3 -ansi-alias -auto-ilp32

> 482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

C++ benchmarks:

> 444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -fno-alias -auto-ilp32

> 447.dealII: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -unroll2 -ansi-alias -scalar-rep-

> 450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -opt-malloc-options=3

> 453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -unroll4 -ansi-alias

Fortran benchmarks:

> 410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

> 416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -unroll2 -Ob0 -ansi-alias -scalar-rep-

> 434.zeusmp: basepeak = yes

> 437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div -static

> 459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -unroll2 -Ob0

> 465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
> -unroll4 -auto -inline-calloc -opt-malloc-options=3

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Peak Optimization Flags (Continued)

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) -static(pass 2) -prof-use(pass 2)
             -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes
```

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100330.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100330.xml`

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