SPEC® CFP2006 Result
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Bull SAS

NovaScale R480 E1
(Intel Xeon E7420, 2.13 GHz)

$SPECfp®_rate2006 = $ 105

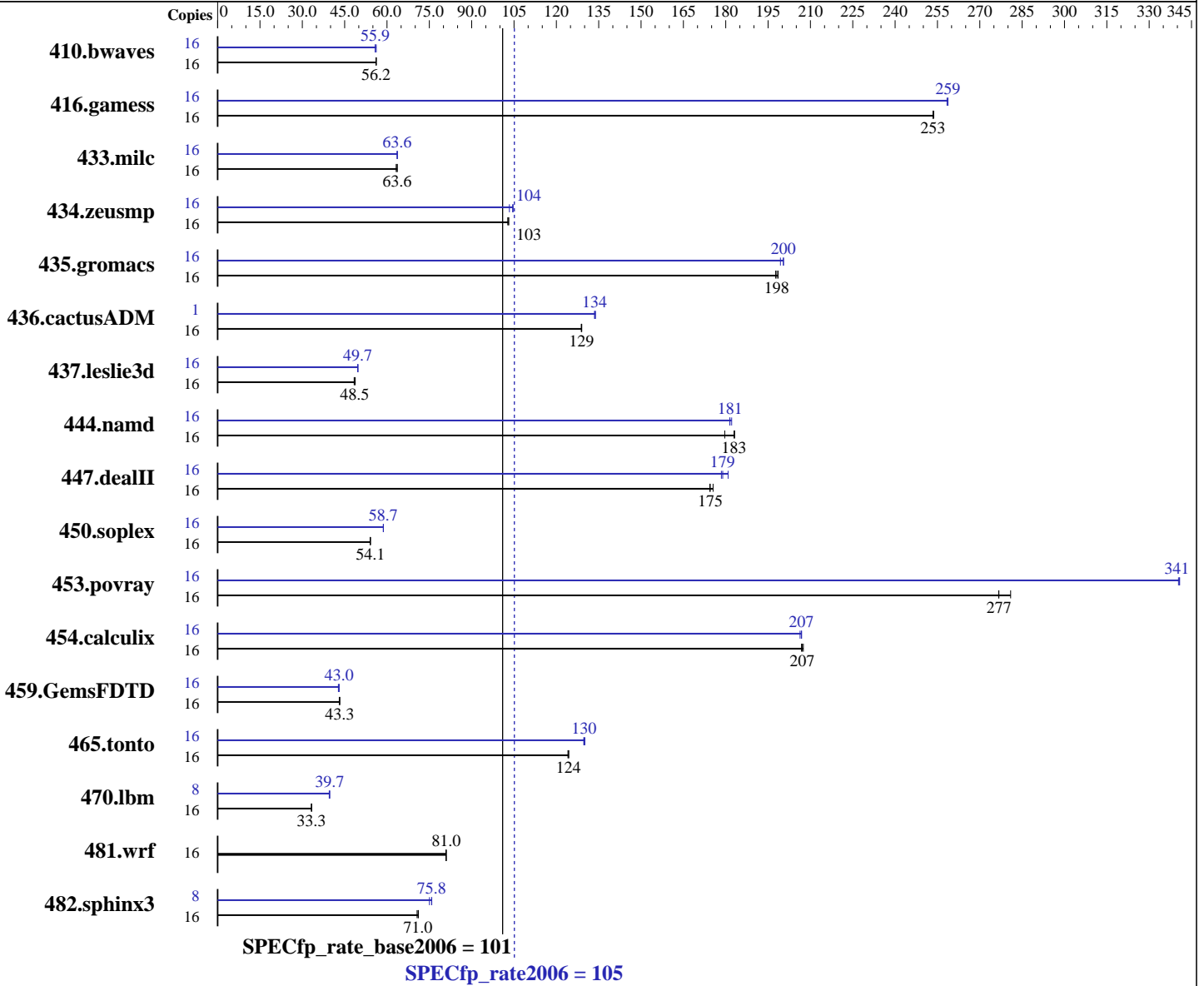$SPECfp_rate_base2006 = $ 101

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

Test date: Nov-2008
Hardware Availability: Nov-2008
Software Availability: Nov-2008

Benchmark	Copies	Value
410.bwaves	16	55.9
410.bwaves	16	56.2
416.gamess	16	259
416.gamess	16	253
433.milc	16	63.6
433.milc	16	63.6
434.zeusmp	16	104
434.zeusmp	16	103
435.gromacs	16	200
435.gromacs	16	198
436.cactusADM	1	134
436.cactusADM	16	129
437.leslie3d	16	49.7
437.leslie3d	16	48.5
444.namd	16	181
444.namd	16	183
447.dealII	16	179
447.dealII	16	175
450.soplex	16	58.7
450.soplex	16	54.1
453.povray	16	341
453.povray	16	277
454.calculix	16	207
454.calculix	16	207
459.GemsFDTD	16	43.0
459.GemsFDTD	16	43.3
465.tonto	16	130
465.tonto	16	124
470.lbm	8	39.7
470.lbm	16	33.3
481.wrf	16	81.0
482.sphinx3	8	75.8
482.sphinx3	16	71.0

SPECfp_rate_base2006 = 101

SPECfp_rate2006 = 105

Hardware

CPU Name:	Intel Xeon E7420
CPU Characteristics:	1066 MHz system bus
CPU MHz:	2133
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip
CPU(s) orderable:	1,2,3,4 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	6 MB I+D on chip per chip, 3 MB shared / 2 cores

Continued on next page

Software

Operating System:	SUSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp
Compiler:	Intel C++ and Fortran Compiler 11.0 for Linux Build 20080730 Package ID: l_cproc_b_11.0.044, l_cprof_b_11.0.044
Auto Parallel:	Yes
File System:	ext2
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit

Continued on next page

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L3 Cache:	8 MB I+D on chip per chip	Peak Pointers:	32/64-bit
Other Cache:	None	Other Software:	Binutils 2.18.50.0.7.20080502
Memory:	32 GB (16x2 GB PC2-5300F, 2 rank, CL5-5-5, ECC)		
Disk Subsystem:	1x73.2 GB SAS, 15000RPM		
Other Hardware:	None		

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	3869	56.2	3877	56.1	**3872**	**56.2**	16	3895	55.8	3869	56.2	**3892**	**55.9**
416.gamess	16	1236	253	**1236**	**253**	1235	254	16	1212	258	**1211**	**259**	1211	259
433.milc	16	2323	63.2	2309	63.6	**2310**	**63.6**	16	2310	63.6	**2308**	**63.6**	2308	63.6
434.zeusmp	16	**1413**	**103**	1412	103	1417	103	16	1391	105	1409	103	**1393**	**104**
435.gromacs	16	575	199	578	198	**577**	**198**	16	**570**	**200**	573	199	570	201
436.cactusADM	16	1484	129	1482	129	**1483**	**129**	1	**89.5**	**134**	89.3	134	89.5	134
437.leslie3d	16	3085	48.8	**3100**	**48.5**	3110	48.4	16	3030	49.6	**3027**	**49.7**	3027	49.7
444.namd	16	**701**	**183**	701	183	714	180	16	**707**	**181**	707	181	705	182
447.dealII	16	1050	174	**1049**	**175**	1043	176	16	1012	181	**1023**	**179**	1026	178
450.soplex	16	2471	54.0	**2465**	**54.1**	2465	54.1	16	2274	58.7	**2273**	**58.7**	2272	58.7
453.povray	16	308	277	303	281	**308**	**277**	16	**250**	**341**	250	341	250	340
454.calculix	16	636	207	638	207	**637**	**207**	16	638	207	640	206	**638**	**207**
459.GemsFDTD	16	3940	43.1	**3924**	**43.3**	3924	43.3	16	3969	42.8	**3947**	**43.0**	3946	43.0
465.tonto	16	1266	124	1269	124	**1267**	**124**	16	1210	130	1214	130	**1213**	**130**
470.lbm	16	**6611**	**33.3**	6605	33.3	6613	33.2	8	2781	39.5	2769	39.7	**2770**	**39.7**
481.wrf	16	2210	80.9	**2208**	**81.0**	2206	81.0	16	2210	80.9	**2208**	**81.0**	2206	81.0
482.sphinx3	16	4385	71.1	**4392**	**71.0**	4414	70.7	8	**2057**	**75.8**	2055	75.9	2078	75.0

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.
     taskset was used to bind processes to cores except
     for 436.cactusADM peak.
     For peak modules using 1/2 the number of available cores, copies
     were each assigned to a single L2 cache using mysubmit.pl script.
     See the flags description file for mysubmit.pl details.
```

Operating System Notes

```
     'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
     OMP_NUM_THREADS set to number of cores
     KMP_AFFINITY set to "physical,0"
     KMP_STACKSIZE set to 64M
```

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$SPECfp\_rate\_base2006 = \quad 101$

CPU2006 license: 20
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Tested by: NEC Corporation

Test date: Nov-2008
Hardware Availability: Nov-2008
Software Availability: Nov-2008

Platform Notes

```
    Bios settings:
    Hardware Prefetcher:           Disabled
    Adjacent Cache Line Prefetch:  Disabled
    FSB High Bandwidth Optimization: Enabled
```

General Notes

```
    The NEC Express5800/R140a-4(Intel Xeon E7420) and
    the Bull NovaScale R480 E1(Intel Xeon E7420, 2.13 GHz) models are electronically equivalent.
    The results have been measured on a NEC Express5800/R140a-4(Intel Xeon E7420) model.
```

Base Compiler Invocation

C benchmarks:
```
    icc
```

C++ benchmarks:
```
    icpc
```

Fortran benchmarks:
```
    ifort
```

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

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:
```
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
```

C++ benchmarks:
```
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
```

Fortran benchmarks:
```
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc
```
```
482.sphinx3: /opt/intel/Compiler/11.0/044/bin/ia32/icc
        -L/opt/intel/Compiler/11.0/044/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/044/ipp/ia32/include
```

C++ benchmarks (except as noted below):
```
icpc
```
```
450.soplex: /opt/intel/Compiler/11.0/044/bin/ia32/icpc
        -L/opt/intel/Compiler/11.0/044/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/044/ipp/ia32/include
```

Fortran benchmarks (except as noted below):
```
ifort
```
```
437.leslie3d: /opt/intel/Compiler/11.0/044/bin/ia32/ifort
        -L/opt/intel/Compiler/11.0/044/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/044/ipp/ia32/include
```

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

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
```

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Peak Portability Flags (Continued)

```
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
   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
```

Peak Optimization Flags

C benchmarks:

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

470.lbm: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
         -auto-ilp32

482.sphinx3: -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2
```

C++ benchmarks:

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

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

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

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

Fortran benchmarks:

```
410.bwaves: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

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

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
            -no-prec-div -static
```

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Peak Optimization Flags (Continued)

```
 437.leslie3d: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
               -no-prec-div -static -opt-malloc-options=3 -opt-prefetch

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

     465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                -no-prec-div -static -unroll4 -auto
```

Benchmarks using both Fortran and C:

```
  435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
               -no-prec-div -static -opt-prefetch -auto-ilp32

436.cactusADM: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
               -no-prec-div -static -unroll2 -opt-prefetch -parallel
               -auto-ilp32

  454.calculix: -xSSE4.1 -ipo -O3 -no-prec-div -static -auto-ilp32

      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-ic11.0-fp-linux64-revD.html
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revD.xml
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revB.xml

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

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