SPEC® CFP2006 Result
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Bull SAS

NovaScale R480 E1
(Intel Xeon E7440, 2.40 GHz)

$SPECfp®2006 =$ 21.8

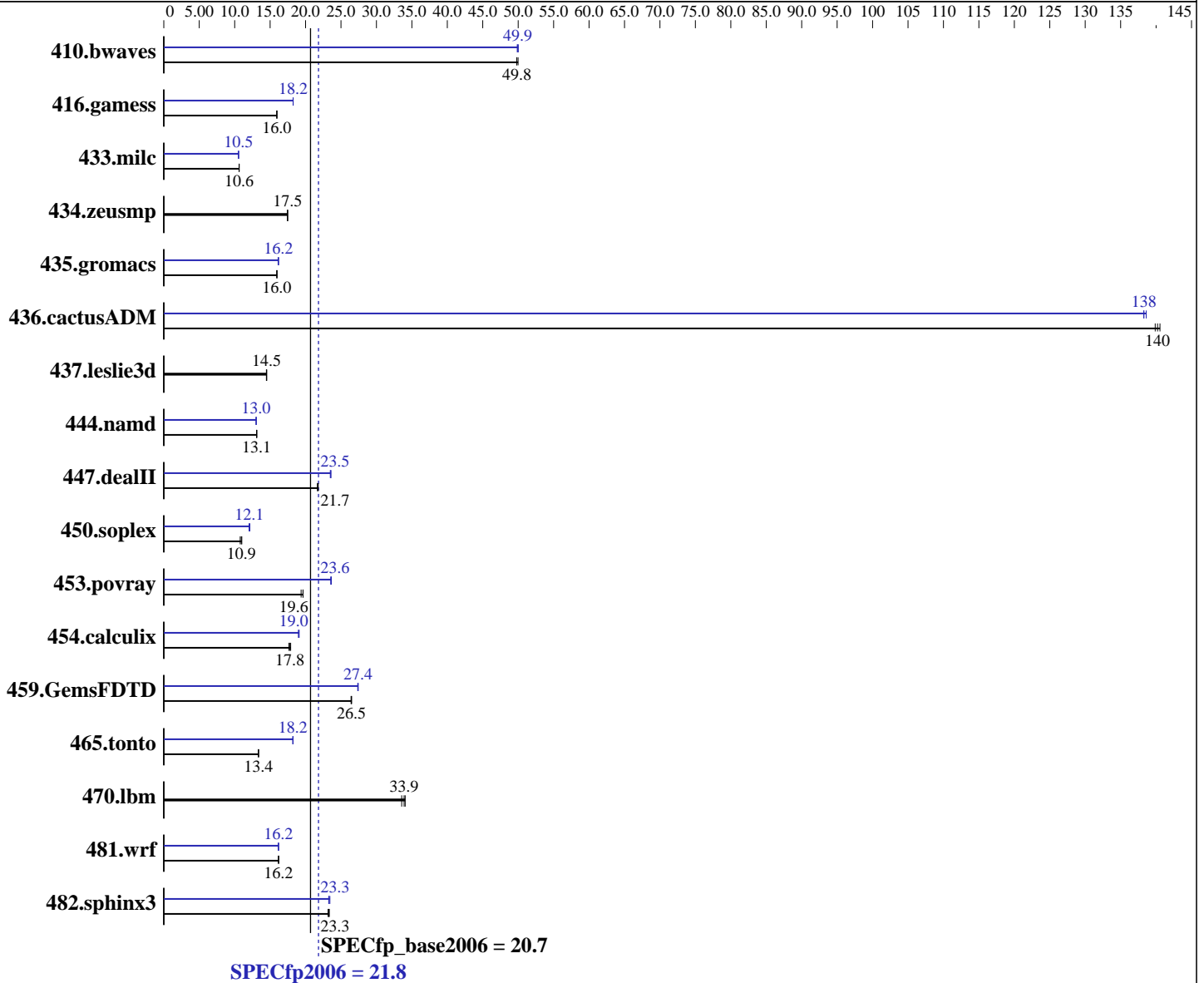$SPECfp\_base2006 =$ 20.7

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

Test date: Jan-2009
Hardware Availability: Nov-2008
Software Availability: Nov-2008

Benchmark	Peak	Base
410.bwaves	49.9	49.8
416.gamess	18.2	16.0
433.milc	10.5	10.6
434.zeusmp		17.5
435.gromacs	16.2	16.0
436.cactusADM	138	140
437.leslie3d		14.5
444.namd	13.0	13.1
447.dealII	23.5	21.7
450.soplex	12.1	10.9
453.povray	23.6	19.6
454.calculix	19.0	17.8
459.GemsFDTD	27.4	26.5
465.tonto	18.2	13.4
470.lbm		33.9
481.wrf	16.2	16.2
482.sphinx3	23.3	23.3

SPECfp_base2006 = 20.7
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Hardware

CPU Name: Intel Xeon E7440
CPU Characteristics: 1066 MHz system bus
CPU MHz: 2400
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

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_11.0.042, l_fproc_b_11.0.042
Auto Parallel: Yes
File System: ReiserFS
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache:	16 MB I+D on chip per chip	Peak Pointers:	32/64-bit
Other Cache:	None	Other Software:	Microquill SmartHeap V8.1
Memory:	32 GB (16 x 2GB DDR2-667 FBDIMM)		Binutils 2.18.50.0.7.20080502
Disk Subsystem:	1x146 GB SAS, 10000 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	273	49.8	**273**	**49.8**	272	50.0	272	50.0	273	49.9	**272**	**49.9**
416.gamess	1228	15.9	1227	16.0	**1227**	**16.0**	**1073**	**18.2**	1073	18.3	1074	18.2
433.milc	864	10.6	**864**	**10.6**	864	10.6	871	10.5	**871**	**10.5**	870	10.6
434.zeusmp	521	17.5	522	17.4	**521**	**17.5**	521	17.5	522	17.4	**521**	**17.5**
435.gromacs	447	16.0	**447**	**16.0**	448	15.9	441	16.2	**441**	**16.2**	443	16.1
436.cactusADM	85.0	141	85.4	140	**85.2**	**140**	86.2	139	86.4	138	**86.4**	**138**
437.leslie3d	649	14.5	648	14.5	**648**	**14.5**	649	14.5	648	14.5	**648**	**14.5**
444.namd	**613**	**13.1**	613	13.1	611	13.1	616	13.0	615	13.0	**615**	**13.0**
447.dealII	**527**	**21.7**	528	21.7	525	21.8	487	23.5	485	23.6	**486**	**23.5**
450.soplex	758	11.0	774	10.8	**763**	**10.9**	**690**	**12.1**	687	12.1	693	12.0
453.povray	**271**	**19.6**	271	19.7	275	19.4	**225**	**23.6**	225	23.6	226	23.5
454.calculix	461	17.9	**464**	**17.8**	467	17.7	434	19.0	432	19.1	**434**	**19.0**
459.GemsFDTD	**401**	**26.5**	402	26.4	401	26.5	387	27.4	388	27.4	**387**	**27.4**
465.tonto	736	13.4	737	13.3	**736**	**13.4**	539	18.2	540	18.2	**540**	**18.2**
470.lbm	409	33.6	**405**	**33.9**	403	34.1	409	33.6	**405**	**33.9**	403	34.1
481.wrf	**690**	**16.2**	690	16.2	689	16.2	690	16.2	692	16.2	**690**	**16.2**
482.sphinx3	841	23.2	**837**	**23.3**	835	23.4	838	23.3	832	23.4	**836**	**23.3**

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
OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to physical,0
KMP_STACKSIZE set to 200M
```

Platform Notes

```
BIOS Settings:
Adjacent Cache Line Prefetch = Enabled
Hardware Prefetcher = Enabled
```

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General Notes

The NEC Express5800/R140a-4(Intel Xeon E7440) and
the Bull NovaScale R480 E1(Intel Xeon E7440, 2.40 GHz) models are electronically equivalent.
The results have been measured on a Bull NovaScale R480 E1(Intel Xeon E7440, 2.40 GHz) 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`

Base Optimization Flags

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

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

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Base Optimization Flags (Continued)

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

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

Peak Compiler Invocation

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

```
482.sphinx3: /opt/intel/Compiler/11.0/042/bin/ia32/icc
        -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

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

```
450.soplex: /opt/intel/Compiler/11.0/042/bin/ia32/icpc
        -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

Fortran benchmarks:
```
ifort
```

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

470.lbm: `basepeak = yes`

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-`
`-opt-prefetch`

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`
`-parallel`

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: `basepeak = yes`

437.leslie3d: `basepeak = yes`

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

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`

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Peak Optimization Flags (Continued)

```
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: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
               -parallel -auto-ilp32
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.01.html
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.04.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.01.xml
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.04.xml

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

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