SPEC® CFP2006 Result
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Bull SAS

NovaScale R480 E1
(Intel Xeon E7450, 2.40 GHz)

$SPECfp^{®}2006 =$ 21.7

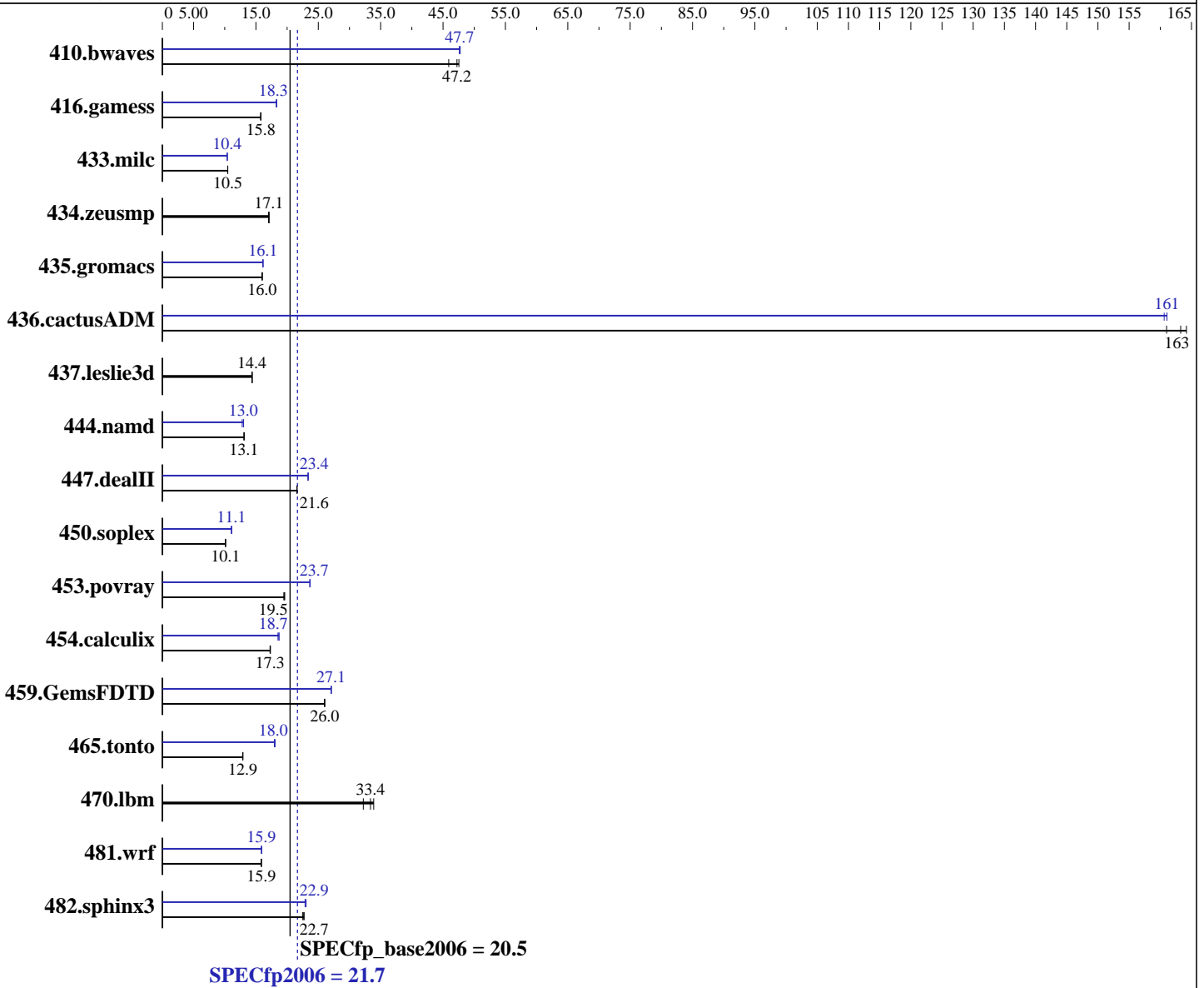$SPECfp\_base2006 =$ 20.5

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

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

410.bwaves 47.7 / 47.2
416.gamess 18.3 / 15.8
433.milc 10.4 / 10.5
434.zeusmp 17.1
435.gromacs 16.1 / 16.0
436.cactusADM 161 / 163
437.leslie3d 14.4
444.namd 13.0 / 13.1
447.dealII 23.4 / 21.6
450.soplex 11.1 / 10.1
453.povray 23.7 / 19.5
454.calculix 18.7 / 17.3
459.GemsFDTD 27.1 / 26.0
465.tonto 18.0 / 12.9
470.lbm 33.4
481.wrf 15.9 / 15.9
482.sphinx3 22.9 / 22.7

SPECfp_base2006 = 20.5
SPECfp2006 = 21.7

Hardware

CPU Name:	Intel Xeon E7450
CPU Characteristics:	1066 MHz system bus
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	24 cores, 4 chips, 6 cores/chip
CPU(s) orderable:	1,2,3,4 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	9 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:	12 MB I+D on chip per chip
Other Cache:	None
Memory:	64 GB (16 x 4GB DDR2-667 FBDIMM)
Disk Subsystem:	1x146 GB SAS, 10000 RPM
Other Hardware:	None

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

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	296	45.9	**288**	**47.2**	286	47.5	285	47.8	285	47.6	**285**	**47.7**
416.gamess	1243	15.7	1239	15.8	**1239**	**15.8**	1072	18.3	1068	18.3	**1069**	**18.3**
433.milc	877	10.5	875	10.5	**876**	**10.5**	883	10.4	**883**	**10.4**	882	10.4
434.zeusmp	534	17.0	**533**	**17.1**	532	17.1	534	17.0	**533**	**17.1**	532	17.1
435.gromacs	447	16.0	**446**	**16.0**	446	16.0	442	16.1	**443**	**16.1**	443	16.1
436.cactusADM	74.2	161	72.8	164	**73.2**	**163**	74.4	161	74.2	161	**74.2**	**161**
437.leslie3d	**654**	**14.4**	654	14.4	653	14.4	**654**	**14.4**	654	14.4	653	14.4
444.namd	**613**	**13.1**	611	13.1	613	13.1	616	13.0	627	12.8	**618**	**13.0**
447.dealII	**530**	**21.6**	530	21.6	530	21.6	490	23.4	489	23.4	**490**	**23.4**
450.soplex	**824**	**10.1**	823	10.1	825	10.1	750	11.1	753	11.1	**753**	**11.1**
453.povray	273	19.5	271	19.6	**273**	**19.5**	**225**	**23.7**	225	23.7	225	23.7
454.calculix	476	17.3	**477**	**17.3**	478	17.3	445	18.5	441	18.7	**441**	**18.7**
459.GemsFDTD	408	26.0	408	26.0	**408**	**26.0**	392	27.0	**392**	**27.1**	391	27.1
465.tonto	761	12.9	764	12.9	**764**	**12.9**	545	18.1	**547**	**18.0**	548	18.0
470.lbm	426	32.2	**412**	**33.4**	405	33.9	426	32.2	**412**	**33.4**	405	33.9
481.wrf	706	15.8	**704**	**15.9**	703	15.9	702	15.9	703	15.9	**703**	**15.9**
482.sphinx3	867	22.5	857	22.7	**860**	**22.7**	852	22.9	845	23.1	**851**	**22.9**

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 E7450) and
the Bull NovaScale R480 E1(Intel Xeon E7450, 2.40 GHz) models are electronically equivalent.
The results have been measured on a Bull NovaScale R480 E1(Intel Xeon E7450, 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.

Tested with SPEC CPU2006 v1.1.
Report generated on Tue Jul 22 22:39:49 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 4 February 2009.