SPEC® CFP2006 Result

Bull SAS

NovaScale R480 E1
(Intel Xeon E7310, 1.60 GHz)

$SPECfp®2006 =$ 15.9

$SPECfp\_base2006 =$ 15.2

CPU2006 license: 20		**Test date:**	Dec-2008
Test sponsor: Bull SAS		**Hardware Availability:**	Nov-2008
Tested by: NEC Corporation		**Software Availability:**	Nov-2008

410.bwaves	45.7 / 45.6
416.gamess	11.7 / 10.6
433.milc	10.8 / 10.9
434.zeusmp	13.6
435.gromacs	10.2 / 10.1
436.cactusADM	111 / 114
437.leslie3d	11.1
444.namd	8.69 / 8.76
447.dealII	16.8 / 15.4
450.soplex	8.94 / 8.31
453.povray	15.5 / 12.7
454.calculix	12.3 / 11.6
459.GemsFDTD	23.5 / 22.4
465.tonto	10.9 / 9.52
470.lbm	29.8
481.wrf	12.3 / 12.3
482.sphinx3	11.5 / 11.0

SPECfp_base2006 = 15.2

SPECfp2006 = 15.9

Hardware

CPU Name:	Intel Xeon E7310
CPU Characteristics:	1066 MHz system bus
CPU MHz:	1600
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:	4 MB I+D on chip per chip, 2 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 20081105 Package ID: l_cproc_p_11.0.074, l_fproc_p_11.0.074
Auto Parallel:	Yes
File System:	ext2
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit

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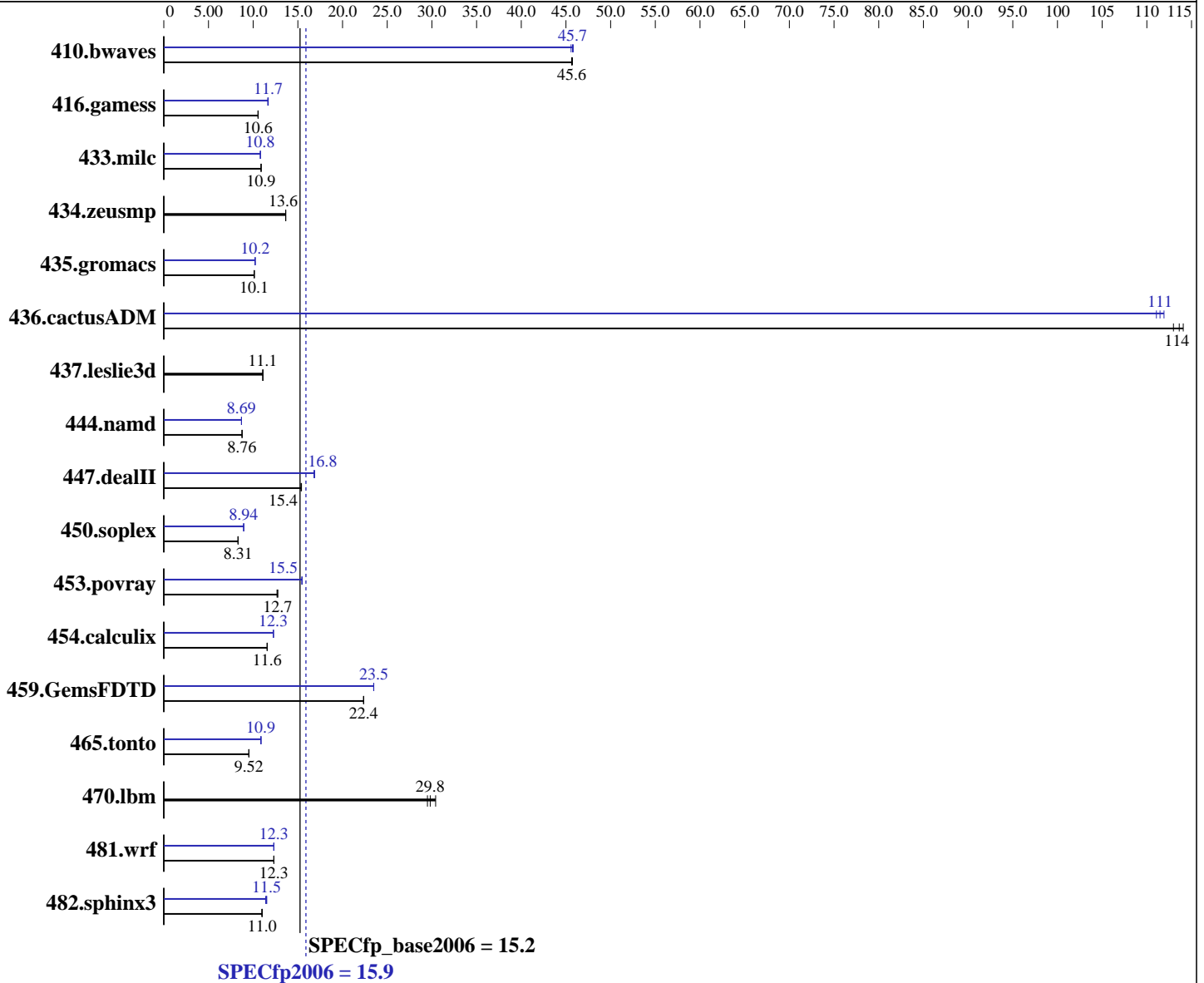|	
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L3 Cache:	None	Peak Pointers:	32/64-bit
Other Cache:	None	Other Software:	Binutils 2.18.50.0.7.20080502
Memory:	32 GB (16x2 GB PC2-5300F, 2 rank, CL5-5-5, ECC)		
Disk Subsystem:	1x73.2 GB SAS, 15000 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**298**	**45.6**	297	45.7	298	45.6	297	45.8	**297**	**45.7**	298	45.6
416.gamess	1853	10.6	1859	10.5	**1855**	**10.6**	1675	11.7	**1676**	**11.7**	1684	11.6
433.milc	**843**	**10.9**	843	10.9	843	10.9	849	10.8	**849**	**10.8**	850	10.8
434.zeusmp	667	13.6	667	13.6	**667**	**13.6**	667	13.6	667	13.6	**667**	**13.6**
435.gromacs	706	10.1	705	10.1	**705**	**10.1**	699	10.2	698	10.2	**698**	**10.2**
436.cactusADM	106	113	105	114	**105**	**114**	107	112	**107**	**111**	108	111
437.leslie3d	848	11.1	**848**	**11.1**	848	11.1	848	11.1	**848**	**11.1**	848	11.1
444.namd	917	8.75	915	8.77	**916**	**8.76**	923	8.69	922	8.70	**922**	**8.69**
447.dealII	**744**	**15.4**	745	15.4	742	15.4	678	16.9	**680**	**16.8**	680	16.8
450.soplex	1002	8.32	**1003**	**8.31**	1005	8.30	932	8.95	**933**	**8.94**	934	8.93
453.povray	417	12.8	420	12.7	**418**	**12.7**	344	15.5	344	15.4	**344**	**15.5**
454.calculix	712	11.6	**713**	**11.6**	714	11.6	672	12.3	**673**	**12.3**	673	12.3
459.GemsFDTD	**475**	**22.4**	475	22.4	474	22.4	452	23.5	452	23.5	**452**	**23.5**
465.tonto	**1034**	**9.52**	1032	9.53	1034	9.51	903	10.9	907	10.9	**906**	**10.9**
470.lbm	452	30.4	**461**	**29.8**	466	29.5	452	30.4	**461**	**29.8**	466	29.5
481.wrf	908	12.3	**906**	**12.3**	906	12.3	**906**	**12.3**	909	12.3	906	12.3
482.sphinx3	1778	11.0	**1770**	**11.0**	1768	11.0	1710	11.4	1692	11.5	**1695**	**11.5**

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

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General Notes

The NEC Express5800/R140a-4(Intel Xeon E7310) and
the Bull NovaScale R480 E1(Intel Xeon E7310, 1.60 GHz) models are electronically equivalent.
The results have been measured on a NEC Express5800/R140a-4(Intel Xeon E7310) 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:
    -xSSSE3 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

C++ benchmarks:
    -xSSSE3 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

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Hardware Availability: Nov-2008
Software Availability: Nov-2008

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-xSSSE3 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSSE3 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Peak Compiler Invocation

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

```
482.sphinx3: /opt/intel/Compiler/11.0/074/bin/ia32/icc
        -L/opt/intel/Compiler/11.0/074/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/074/ipp/ia32/include
```

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

```
450.soplex: /opt/intel/Compiler/11.0/074/bin/ia32/icpc
        -L/opt/intel/Compiler/11.0/074/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/074/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) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -fno-alias`

>   470.lbm: `basepeak = yes`

>   482.sphinx3: `-xSSSE3 -ipo -O3 -no-prec-div -static -unroll2`

C++ benchmarks:

>   444.namd: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -fno-alias -auto-ilp32`

>   447.dealII: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -unroll2 -ansi-alias -scalar-rep-`
>   `-opt-prefetch`

>   450.soplex: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -opt-malloc-options=3`

>   453.povray: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -unroll4 -ansi-alias`

Fortran benchmarks:

>   410.bwaves: `-xSSSE3 -ipo -O3 -no-prec-div -static -opt-prefetch`
>   `-parallel`

>   416.gamess: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -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) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -unroll2 -Ob0 -opt-prefetch`
>   `-parallel`

>   465.tonto: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -ipo -O3`
>   `-no-prec-div -static -unroll4 -auto`

Benchmarks using both Fortran and C:

>   435.gromacs: `-prof-gen(pass 1) -prof-use(pass 2) -xSSSE3 -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) -xSSSE3 -ipo -O3
-no-prec-div -static -unroll2 -opt-prefetch -parallel
-auto-ilp32

454.calculix: -xSSSE3 -ipo -O3 -no-prec-div -static -auto-ilp32

481.wrf: -xSSSE3 -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-ic11.0-fp-linux64-revE.20090710.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-revE.20090710.xml
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revB.xml

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