SPEC® CFP2006 Result

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NEC Corporation

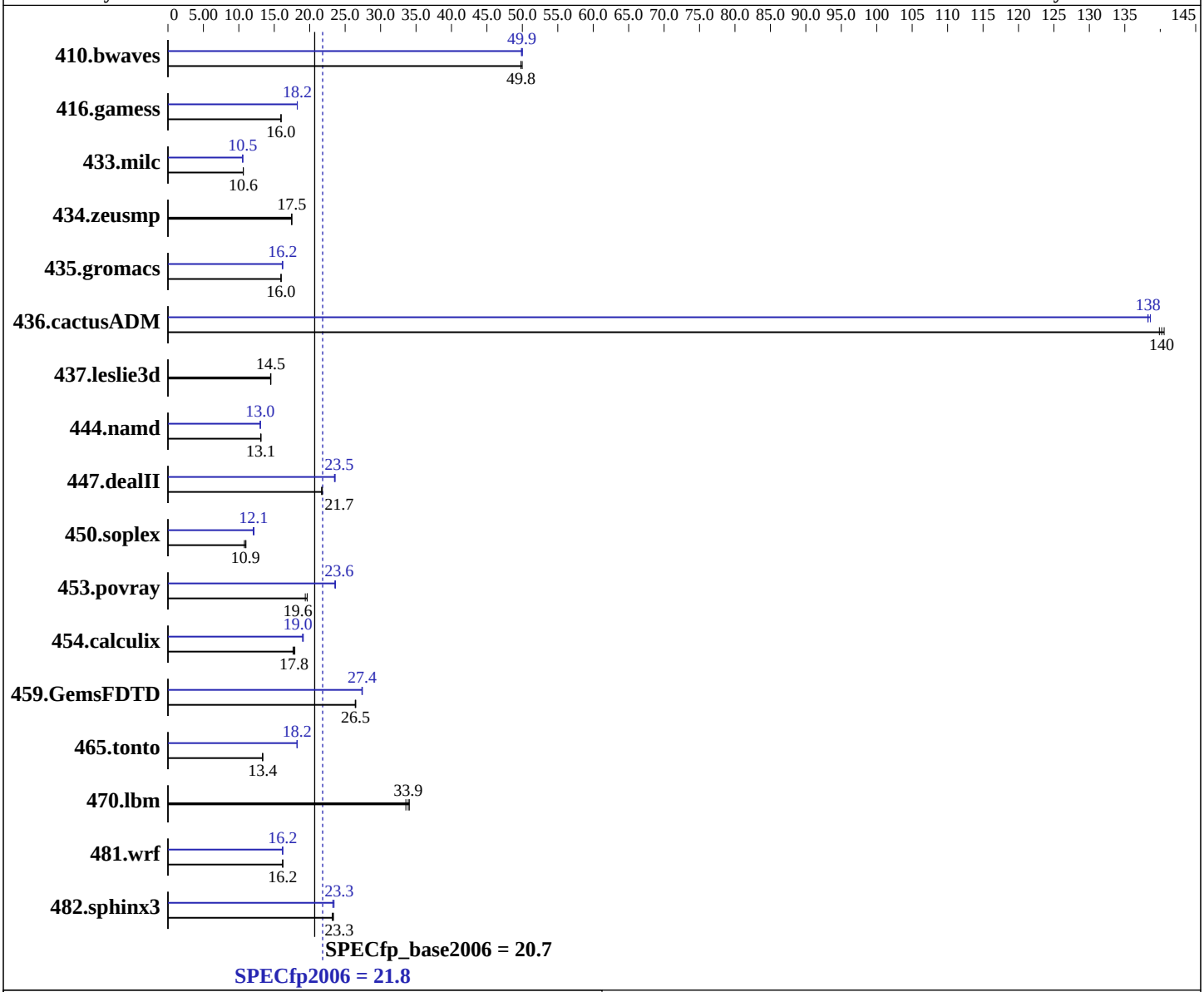
Express5800/R140a-4
(Intel Xeon E7440)

SPECfp®2006 = 21.8

SPECfp_base2006 = 20.7

CPU2006 license: 9006
Test sponsor: NEC Corporation
Tested by: Bull SAS

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



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

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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
Other Cache: None
Memory: 32 GB (16 x 2GB DDR2-667 FBDIMM)
Disk Subsystem: 1x146 GB SAS, 10000 RPM
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V8.1
Binutils 2.18.50.0.7.20080502

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	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
```

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

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`

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Tested with SPEC CPU2006 v1.1.
Report generated on Tue Jul 22 22:39:42 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 4 February 2009.