



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

Express5800/R140a-4  
(Intel Xeon E7440)

SPECfp<sup>®</sup>\_rate2006 = 65.6

SPECfp\_rate\_base2006 = 62.1

CPU2006 license: 9006

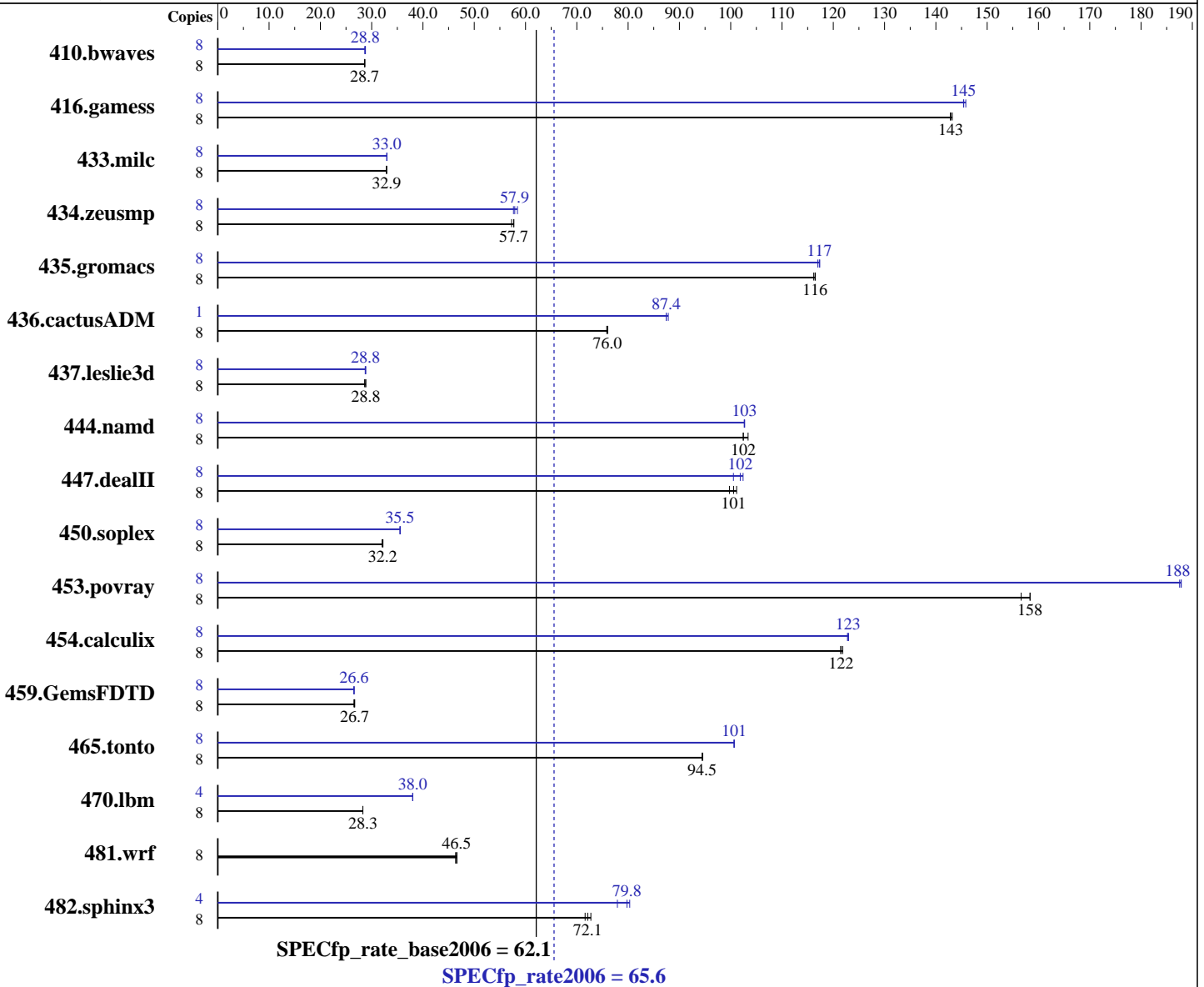
Test sponsor: NEC Corporation

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: 8 cores, 2 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: Binutils 2.18.50.0.7.20080502

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	3793	28.7	<b><u>3794</u></b>	<b><u>28.7</u></b>	3797	28.6	8	3794	28.7	3776	28.8	<b><u>3781</u></b>	<b><u>28.8</u></b>
416.gamess	8	1094	143	<b><u>1096</u></b>	<b><u>143</u></b>	1097	143	8	<b><u>1077</u></b>	<b><u>145</u></b>	1074	146	1077	145
433.milc	8	<b><u>2232</u></b>	<b><u>32.9</u></b>	2232	32.9	2233	32.9	8	2229	32.9	<b><u>2228</u></b>	<b><u>33.0</u></b>	2226	33.0
434.zeusmp	8	1271	57.3	<b><u>1262</u></b>	<b><u>57.7</u></b>	1261	57.7	8	1246	58.4	1263	57.6	<b><u>1257</u></b>	<b><u>57.9</u></b>
435.gromacs	8	<b><u>491</u></b>	<b><u>116</u></b>	490	116	492	116	8	488	117	487	117	<b><u>487</u></b>	<b><u>117</u></b>
436.cactusADM	8	1258	76.0	1261	75.8	<b><u>1258</u></b>	<b><u>76.0</u></b>	1	136	87.8	<b><u>137</u></b>	<b><u>87.4</u></b>	137	87.4
437.leslie3d	8	2607	28.8	2627	28.6	<b><u>2608</u></b>	<b><u>28.8</u></b>	8	2607	28.8	2616	28.7	<b><u>2610</u></b>	<b><u>28.8</u></b>
444.namd	8	626	102	<b><u>626</u></b>	<b><u>102</u></b>	621	103	8	625	103	625	103	<b><u>625</u></b>	<b><u>103</u></b>
447.dealII	8	905	101	917	99.8	<b><u>910</u></b>	<b><u>101</u></b>	8	<b><u>899</u></b>	<b><u>102</u></b>	894	102	910	101
450.soplex	8	2083	32.0	<b><u>2073</u></b>	<b><u>32.2</u></b>	2072	32.2	8	1878	35.5	<b><u>1878</u></b>	<b><u>35.5</u></b>	1876	35.6
453.povray	8	272	157	<b><u>269</u></b>	<b><u>158</u></b>	269	158	8	227	188	<b><u>227</u></b>	<b><u>188</u></b>	227	188
454.calculix	8	<b><u>543</u></b>	<b><u>122</u></b>	542	122	543	121	8	<b><u>537</u></b>	<b><u>123</u></b>	538	123	537	123
459.GemsFDTD	8	3198	26.5	<b><u>3183</u></b>	<b><u>26.7</u></b>	3179	26.7	8	3201	26.5	3191	26.6	<b><u>3193</u></b>	<b><u>26.6</u></b>
465.tonto	8	833	94.5	834	94.4	<b><u>833</u></b>	<b><u>94.5</u></b>	8	782	101	782	101	<b><u>782</u></b>	<b><u>101</u></b>
470.lbm	8	3888	28.3	<b><u>3886</u></b>	<b><u>28.3</u></b>	3885	28.3	4	<b><u>1446</u></b>	<b><u>38.0</u></b>	1446	38.0	1446	38.0
481.wrf	8	1927	46.4	<b><u>1920</u></b>	<b><u>46.5</u></b>	1916	46.6	8	1927	46.4	<b><u>1920</u></b>	<b><u>46.5</u></b>	1916	46.6
482.sphinx3	8	2144	72.7	2177	71.6	<b><u>2161</u></b>	<b><u>72.1</u></b>	4	1001	77.9	971	80.3	<b><u>977</u></b>	<b><u>79.8</u></b>

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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CPU2006 license: 9006

Test sponsor: NEC Corporation

Tested by: Bull SAS

Test date: Jan-2009

Hardware Availability: Nov-2008

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## Platform Notes

BIOS Settings:  
Adjacent Cache Line Prefetch = Disabled  
Hardware Prefetcher = Disabled  
High Bandwidth option = 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



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**CPU2006 license:** 9006

**Test sponsor:** NEC Corporation

**Tested by:** Bull SAS

**Test date:** Jan-2009

**Hardware Availability:** Nov-2008

**Software Availability:** Nov-2008

## 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/11.0/042/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 (except as noted below):

`ifort`

437.leslie3d: `/opt/intel/Compiler/11.0/042/bin/ia32/ifort  
-L/opt/intel/Compiler/11.0/042/ipp/ia32/lib  
-I/opt/intel/Compiler/11.0/042/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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**Tested by:** Bull SAS

**Test date:** Jan-2009

**Hardware Availability:** Nov-2008

**Software Availability:** Nov-2008

## 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-revA.20090713.04.html>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.01.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-revA.20090713.04.xml>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.01.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.1.

Report generated on Tue Jul 22 22:59:40 2014 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 3 March 2009.