



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

Express5800/R140a-4  
(Intel Xeon E7440)

SPECfp<sup>®</sup>2006 = **21.8**

SPECfp\_base2006 = **20.7**

CPU2006 license: 9006

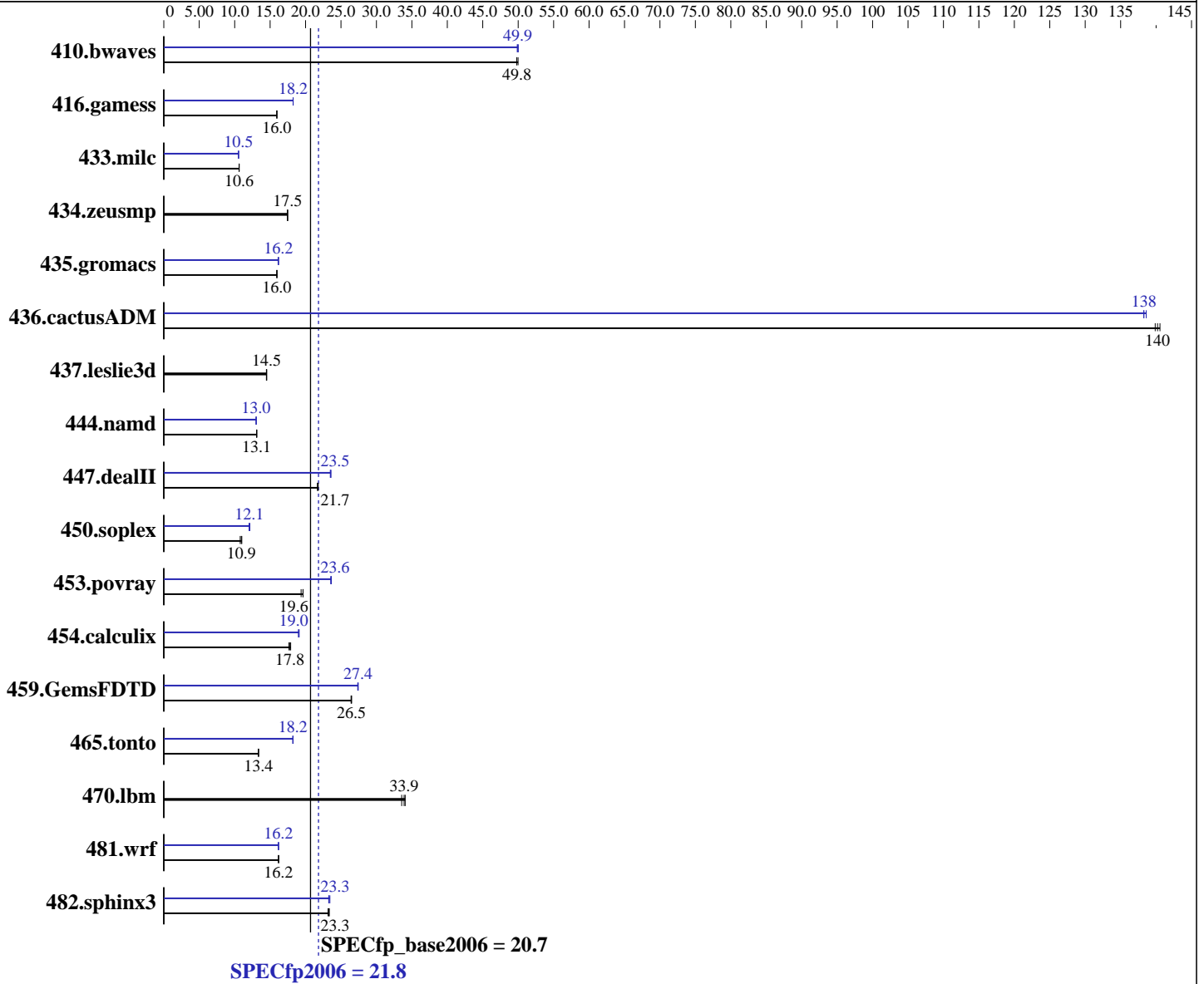
Test sponsor: NEC Corporation

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

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>

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

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