



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

Express5800/320Fc-MR  
(Intel Xeon X5355)

SPECfp<sup>®</sup>2006 = 18.0

SPECfp\_base2006 = 13.8

CPU2006 license: 9006

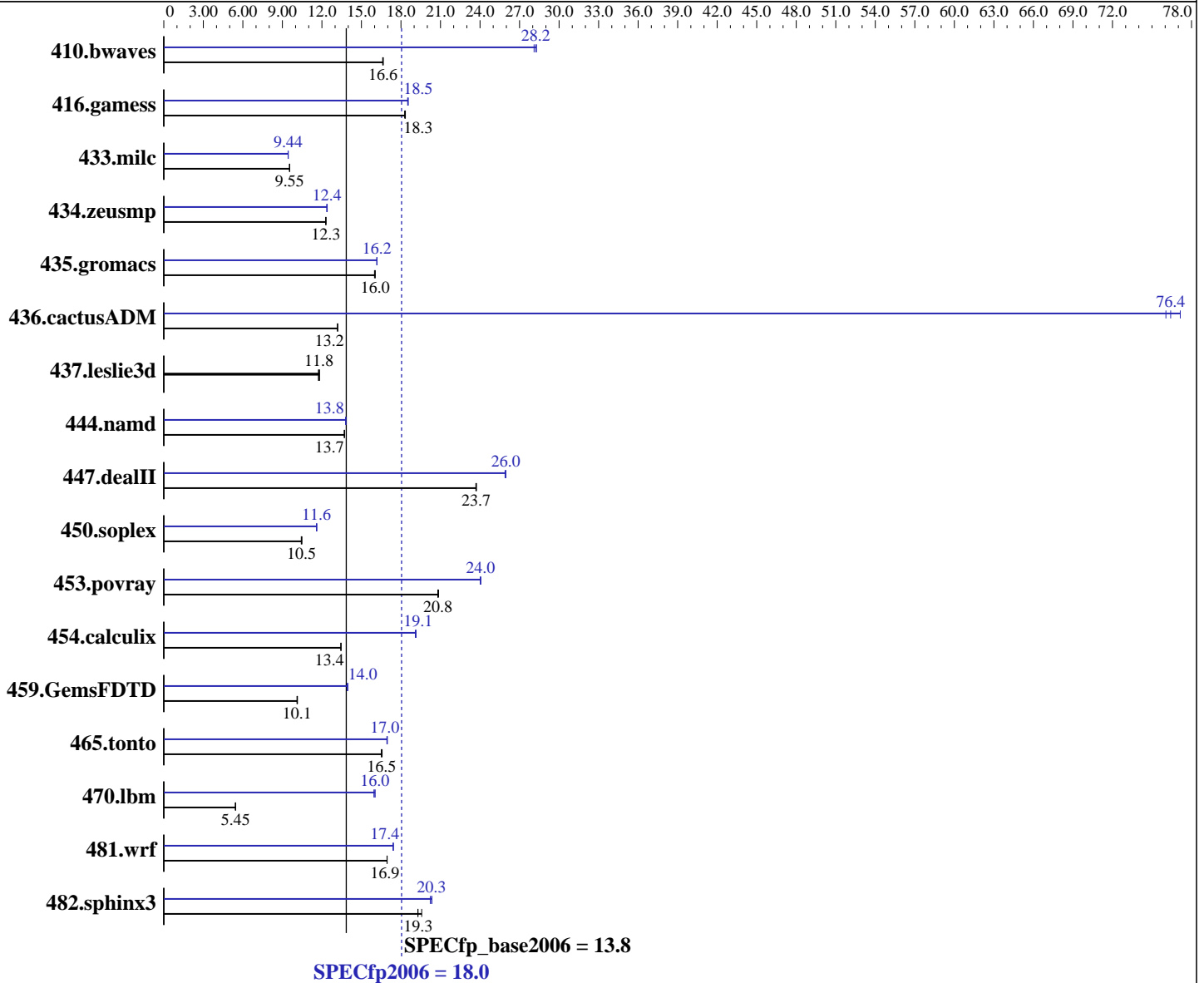
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Apr-2008

Hardware Availability: Oct-2007

Software Availability: Feb-2008



### Hardware

CPU Name: Intel Xeon X5355  
 CPU Characteristics: 2.66 GHz, 2x4 MB L2 shared, 1333 MHz bus  
 CPU MHz: 2667  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 8 MB I+D on chip per chip, 4 MB shared / 2 cores

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### Software

Operating System: Red Hat Enterprise Linux AS release4 (Nahant Update 5), Kernel 2.6.9-55.0.12.ELsmp on an X86\_64  
 Compiler: Intel C++ and Fortran Compiler for Linux32 and Linux64 version 10.1 Build 20070913 Package ID: l\_cc\_p\_10.1.008, l\_fc\_p\_10.1.008  
 Auto Parallel: Yes

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L3 Cache: None  
Other Cache: None  
Memory: 12 GB (6x2 GB PC2-5300F, 2 rank, CL5-5-5, ECC)  
Disk Subsystem: 2x73.2 GB SAS, 15000RPM, Software RAID Level1  
Other Hardware: None

File System: ext3  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: binutils-2.17.tar.gz, Version 2.17  
ft Server Control Software 5.0-0231

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	818	16.6	<b>816</b>	<b>16.6</b>	816	16.7	<b>481</b>	<b>28.2</b>	484	28.1	480	28.3
416.gamess	<b>1068</b>	<b>18.3</b>	1068	18.3	1071	18.3	1058	18.5	1056	18.5	<b>1056</b>	<b>18.5</b>
433.milc	961	9.55	963	9.53	<b>961</b>	<b>9.55</b>	973	9.43	972	9.44	<b>972</b>	<b>9.44</b>
434.zeusmp	739	12.3	<b>740</b>	<b>12.3</b>	741	12.3	736	12.4	<b>735</b>	<b>12.4</b>	734	12.4
435.gromacs	<b>445</b>	<b>16.0</b>	445	16.0	447	16.0	442	16.2	<b>441</b>	<b>16.2</b>	441	16.2
436.cactusADM	906	13.2	<b>906</b>	<b>13.2</b>	905	13.2	155	77.1	<b>156</b>	<b>76.4</b>	157	76.1
437.leslie3d	795	11.8	<b>798</b>	<b>11.8</b>	801	11.7	795	11.8	<b>798</b>	<b>11.8</b>	801	11.7
444.namd	<b>585</b>	<b>13.7</b>	584	13.7	586	13.7	<b>581</b>	<b>13.8</b>	581	13.8	580	13.8
447.dealII	482	23.7	<b>482</b>	<b>23.7</b>	483	23.7	441	26.0	442	25.9	<b>441</b>	<b>26.0</b>
450.soplex	796	10.5	799	10.4	<b>798</b>	<b>10.5</b>	718	11.6	<b>719</b>	<b>11.6</b>	720	11.6
453.povray	255	20.9	256	20.8	<b>256</b>	<b>20.8</b>	222	24.0	<b>221</b>	<b>24.0</b>	221	24.1
454.calculix	<b>614</b>	<b>13.4</b>	613	13.4	614	13.4	432	19.1	431	19.1	<b>431</b>	<b>19.1</b>
459.GemsFDTD	1046	10.1	<b>1048</b>	<b>10.1</b>	1050	10.1	760	14.0	<b>760</b>	<b>14.0</b>	762	13.9
465.tonto	594	16.6	<b>595</b>	<b>16.5</b>	596	16.5	580	17.0	<b>580</b>	<b>17.0</b>	581	16.9
470.lbm	2518	5.46	2534	5.42	<b>2521</b>	<b>5.45</b>	<b>857</b>	<b>16.0</b>	862	15.9	857	16.0
481.wrf	659	16.9	659	16.9	<b>659</b>	<b>16.9</b>	641	17.4	642	17.4	<b>642</b>	<b>17.4</b>
482.sphinx3	996	19.6	1011	19.3	<b>1010</b>	<b>19.3</b>	958	20.3	<b>959</b>	<b>20.3</b>	964	20.2

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

## Platform Notes

This Express5800/320Fc-MR is a fault-tolerant server.  
Two modules are installed in this server and each module has "2CPU chips,12GB memory",  
so total "4CPU chips,24GB memory" are on this server.  
With lockstep technology, these two modules communicate each other  
and handle the same instructions at the same time,  
then logically the "CPU,Memory" is recognized as "2CPU chips,12GB memory" by the OS.



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### General Notes

All benchmarks compiled in 64-bit mode except 450.soplex, 470.lbm and 482.sphinx3, for peak, are compiled in 32-bit mode

The NEC Express5800/320Fc-MR(Intel Xeon X5355) and the Bull NovaScale R630 (Intel Xeon X5355,2.66GHz) models are electronically equivalent. The results have been measured on a NEC Express5800/320Fc-MR(Intel Xeon X5355) 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:  
-fast

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## Base Optimization Flags (Continued)

C++ benchmarks:

-fast

Fortran benchmarks:

-fast

Benchmarks using both Fortran and C:

-fast

## Peak Compiler Invocation

C benchmarks (except as noted below):

/opt/intel/cc/10.1.008/bin/icc -L/opt/intel/cc/10.1.008/lib

-I/opt/intel/cc/10.1.008/include

433.milc: icc

C++ benchmarks (except as noted below):

icpc

450.soplex: /opt/intel/cc/10.1.008/bin/icpc -L/opt/intel/cc/10.1.008/lib

-I/opt/intel/cc/10.1.008/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

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) -fast -fno-alias  
-auto-ilp32

470.lbm: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-scalar-rep- -prefetch -opt-malloc-options=3

482.sphinx3: -fast -unroll2

### C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -fast -fno-alias  
-auto-ilp32

447.dealII: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-ansi-alias -scalar-rep-

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -fast  
-opt-malloc-options=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4  
-ansi-alias

### Fortran benchmarks:

410.bwaves: -fast -prefetch -parallel

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0  
-ansi-alias -scalar-rep-

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -fast

437.leslie3d: basepeak = yes

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0  
-prefetch -parallel

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4 -auto

### Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch  
-auto-ilp32

436.cactusADM: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-prefetch -parallel -auto-ilp32

454.calculix: -fast -unroll-aggressive -auto-ilp32

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## Peak Optimization Flags (Continued)

481.wrf: -fast -parallel -prefetch -auto-ilp32

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/NEC-Intel-ic10.1-FP-intel64-linux-flags.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/NEC-Intel-ic10.1-FP-intel64-linux-flags.xml>

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