SPEC® CFP2006 Result
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NEC Corporation

Express5800/R120d-1E (Intel Xeon E5-2403)

$SPECfp^{®}2006 = $ 44.5

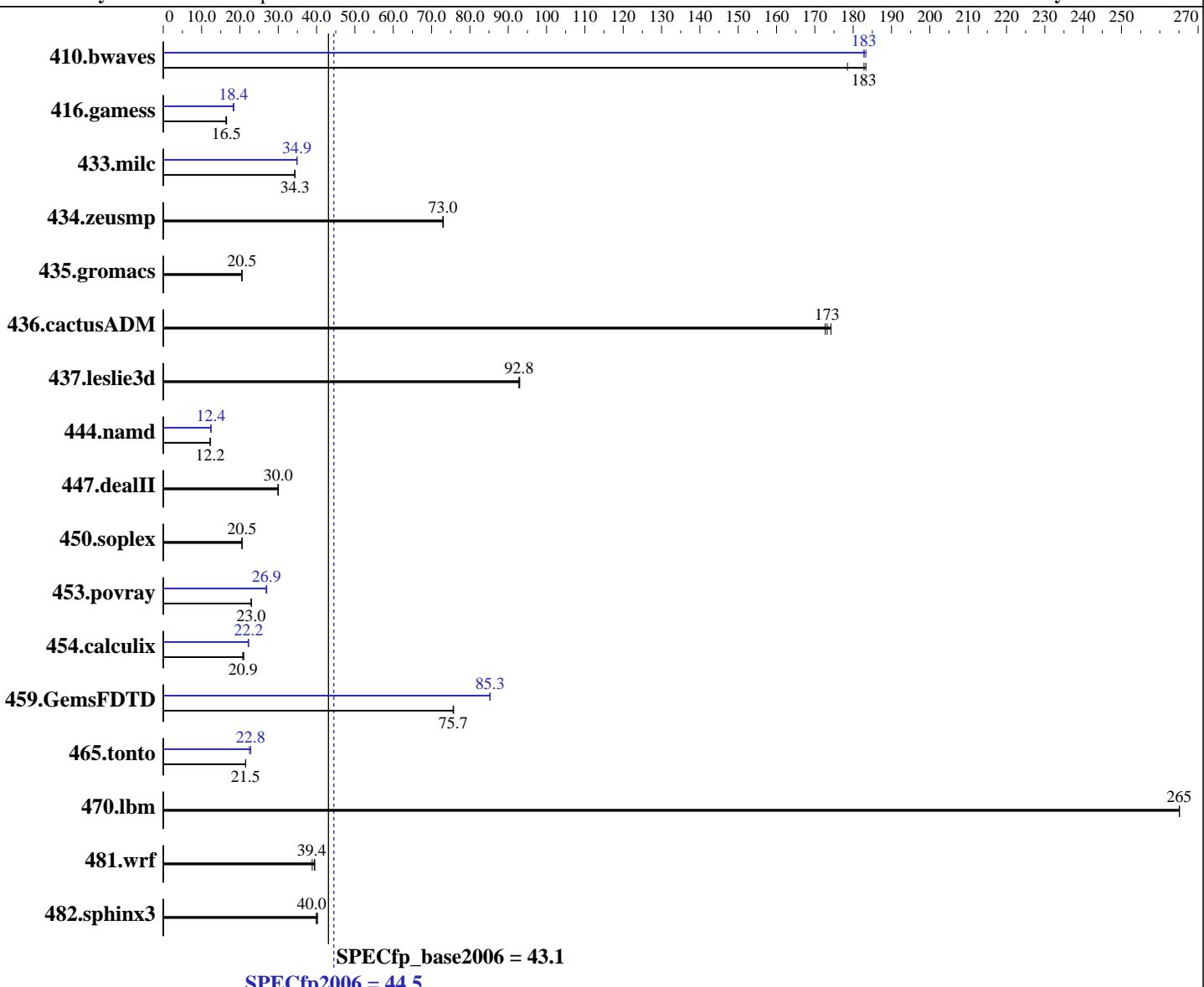$SPECfp_base2006 = $ 43.1

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

Test date: Jun-2012
Hardware Availability: May-2012
Software Availability: Dec-2011

Benchmark	Value
410.bwaves	183 / 183
416.gamess	18.4 / 16.5
433.milc	34.9 / 34.3
434.zeusmp	73.0
435.gromacs	20.5
436.cactusADM	173
437.leslie3d	92.8
444.namd	12.4 / 12.2
447.dealII	30.0
450.soplex	20.5
453.povray	26.9 / 23.0
454.calculix	22.2 / 20.9
459.GemsFDTD	85.3 / 75.7
465.tonto	22.8 / 21.5
470.lbm	265
481.wrf	39.4
482.sphinx3	40.0

SPECfp_base2006 = 43.1
SPECfp2006 = 44.5

Hardware

CPU Name:	Intel Xeon E5-2403
CPU Characteristics:	
CPU MHz:	1800
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:	256 KB I+D on chip per core

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.2 (Santiago) Kernel 2.6.32-220.el6.x86_64
Compiler:	C/C++: Version 12.1.2.273 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.2.273 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4

Continued on next page

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L3 Cache:	10 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	96 GB (12 x 8 GB 2Rx4 PC3L-12800R-11, ECC, running at 1066 MHz and CL7)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 250 GB SATA, 7200 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	76.1	179	**74.3**	**183**	74.1	183	**74.3**	**183**	74.3	183	74.1	183
416.gamess	1184	16.5	1198	16.3	**1188**	**16.5**	1073	18.2	**1066**	**18.4**	1064	18.4
433.milc	**267**	**34.3**	267	34.3	268	34.3	**263**	**34.9**	263	34.9	263	34.9
434.zeusmp	124	73.1	125	73.0	**125**	**73.0**	124	73.1	125	73.0	**125**	**73.0**
435.gromacs	**348**	**20.5**	348	20.5	348	20.5	**348**	**20.5**	348	20.5	348	20.5
436.cactusADM	**69.0**	**173**	69.2	173	68.6	174	**69.0**	**173**	69.2	173	68.6	174
437.leslie3d	**101**	**92.8**	101	93.0	101	92.8	**101**	**92.8**	101	93.0	101	92.8
444.namd	655	12.2	656	12.2	**655**	**12.2**	644	12.4	645	12.4	**644**	**12.4**
447.dealII	**381**	**30.0**	382	29.9	381	30.0	**381**	**30.0**	382	29.9	381	30.0
450.soplex	406	20.6	406	20.5	**406**	**20.5**	406	20.6	406	20.5	**406**	**20.5**
453.povray	231	23.0	232	22.9	**232**	**23.0**	198	26.8	197	27.0	**198**	**26.9**
454.calculix	393	21.0	**395**	**20.9**	398	20.7	371	22.3	373	22.1	**371**	**22.2**
459.GemsFDTD	140	75.8	140	75.7	**140**	**75.7**	124	85.3	124	85.3	**124**	**85.3**
465.tonto	**458**	**21.5**	458	21.5	457	21.5	**432**	**22.8**	431	22.8	437	22.5
470.lbm	**51.8**	**265**	51.8	265	51.8	265	**51.8**	**265**	51.8	265	51.8	265
481.wrf	287	38.9	282	39.5	**283**	**39.4**	287	38.9	282	39.5	**283**	**39.4**
482.sphinx3	484	40.3	488	39.9	**488**	**40.0**	484	40.3	488	39.9	**488**	**40.0**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

    Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

    BIOS Settings:
     Energy Performance: Performance

General Notes

    Environment variables set by runspec before the start of the run:
    KMP_AFFINITY = "granularity=fine,scatter"
    LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64"

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Test date: Jun-2012
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General Notes (Continued)

```
OMP_NUM_THREADS = "8"

 The Express5800/R120d-1E and
 the Express5800/R120d-2E models are electronically equivalent.
 The results have been measured on the Express5800/R120d-2E model.

 Added glibc-static-2.12-1.47.el6.x86_64.rpm
 to enable static linking

 Transparent Huge Pages disabled with:
 echo never  > /sys/kernel/mm/redhat_transparent_hugepage/enabled
```

Base Compiler Invocation

C benchmarks:
```
     icc   -m64
```

C++ benchmarks:
```
     icpc  -m64
```

Fortran benchmarks:
```
     ifort -m64
```

Benchmarks using both Fortran and C:
```
     icc   -m64 ifort -m64
```

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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$SPECfp2006 = $ **44.5**

$SPECfp_base2006 = $ **43.1**

Base Optimization Flags

C benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

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

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

Peak Compiler Invocation

C benchmarks:
```
icc    -m64
```

C++ benchmarks:
```
icpc   -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
          -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes
```

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Hardware Availability: May-2012
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Peak Optimization Flags (Continued)

C++ benchmarks:

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

> 447.dealII: `basepeak = yes`

> 450.soplex: `basepeak = yes`

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

Fortran benchmarks:

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

> 416.gamess: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -prof-use(pass 2) -unroll2`
> `-inline-level=0 -scalar-rep- -static`

> 434.zeusmp: `basepeak = yes`

> 437.leslie3d: `basepeak = yes`

> 459.GemsFDTD: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -prof-use(pass 2) -unroll2`
> `-inline-level=0 -opt-prefetch -parallel`

> 465.tonto: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc`
> `-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

> 435.gromacs: `basepeak = yes`

> 436.cactusADM: `basepeak = yes`

> 454.calculix: `-xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

> 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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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