SPEC® CFP2006 Result
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NEC Corporation

$SPECfp^{®}2006 = $ 82.3

Express5800/R120d-1M (Intel Xeon E5-2670)

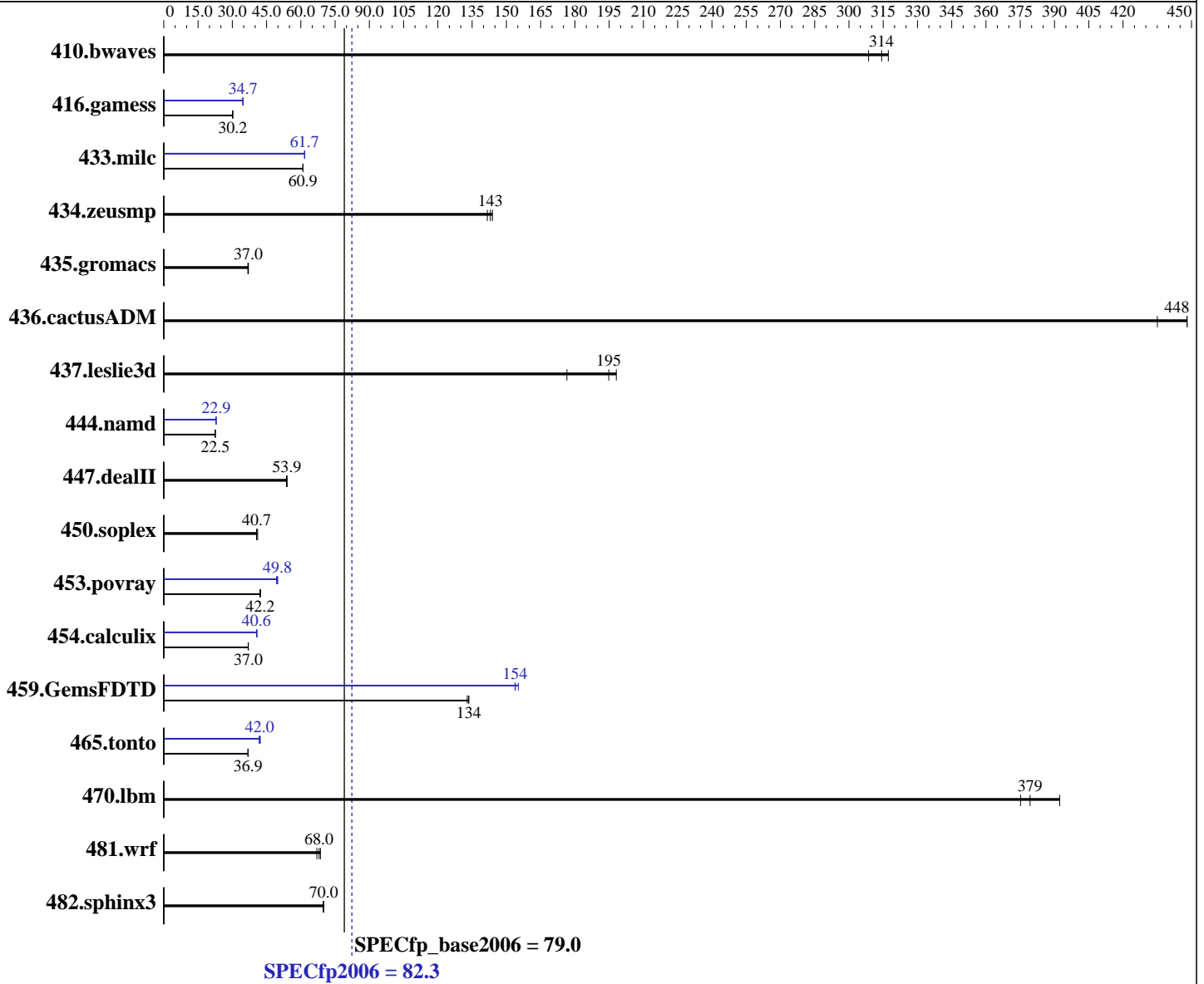$SPECfp_base2006 = $ 79.0

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

Test date: Apr-2012
Hardware Availability: Apr-2012
Software Availability: Dec-2011

Benchmark	Result
410.bwaves	314
416.gamess	34.7 / 30.2
433.milc	61.7 / 60.9
434.zeusmp	143
435.gromacs	37.0
436.cactusADM	448
437.leslie3d	195
444.namd	22.9 / 22.5
447.dealII	53.9
450.soplex	40.7
453.povray	49.8 / 42.2
454.calculix	40.6 / 37.0
459.GemsFDTD	154 / 134
465.tonto	42.0 / 36.9
470.lbm	379
481.wrf	68.0
482.sphinx3	70.0

SPECfp_base2006 = 79.0
SPECfp2006 = 82.3

Hardware

CPU Name:	Intel Xeon E5-2670
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz:	2600
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 cores/chip, 2 threads/core
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) 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

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L3 Cache:	20 MB I+D on chip per chip
Other Cache:	None
Memory:	128 GB (16 x 8 GB 2Rx4 PC3L-12800R-11, ECC)
Disk Subsystem:	1 x 500 GB SATA, 7200 RPM
Other Hardware:	None
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**43.2**	**314**	44.0	309	42.8	317	**43.2**	**314**	44.0	309	42.8	317
416.gamess	648	30.2	**648**	**30.2**	651	30.1	**565**	**34.7**	566	34.6	565	34.7
433.milc	151	60.9	151	60.9	**151**	**60.9**	**149**	**61.7**	149	61.7	149	61.6
434.zeusmp	63.2	144	64.2	142	**63.6**	**143**	63.2	144	64.2	142	**63.6**	**143**
435.gromacs	**193**	**37.0**	193	37.0	194	36.8	**193**	**37.0**	193	37.0	194	36.8
436.cactusADM	27.5	435	**26.7**	**448**	26.7	448	27.5	435	**26.7**	**448**	26.7	448
437.leslie3d	47.4	198	**48.2**	**195**	53.3	177	47.4	198	**48.2**	**195**	53.3	177
444.namd	356	22.5	356	22.5	**356**	**22.5**	350	22.9	350	22.9	**350**	**22.9**
447.dealII	212	53.9	**212**	**53.9**	213	53.7	212	53.9	**212**	**53.9**	213	53.7
450.soplex	203	41.1	**205**	**40.7**	205	40.6	203	41.1	**205**	**40.7**	205	40.6
453.povray	126	42.1	126	42.4	**126**	**42.2**	**107**	**49.8**	107	49.8	108	49.3
454.calculix	223	37.0	**223**	**37.0**	223	36.9	**203**	**40.6**	203	40.6	202	40.9
459.GemsFDTD	79.9	133	**79.5**	**134**	79.5	134	68.4	155	69.0	154	**69.0**	**154**
465.tonto	**267**	**36.9**	267	36.9	267	36.9	233	42.2	236	41.7	**234**	**42.0**
470.lbm	36.6	375	**36.2**	**379**	35.0	392	36.6	375	**36.2**	**379**	35.0	392
481.wrf	**164**	**68.0**	167	67.0	163	68.6	**164**	**68.0**	167	67.0	163	68.6
482.sphinx3	278	70.0	279	69.8	**278**	**70.0**	278	70.0	279	69.8	**278**	**70.0**

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
 Memory Voltage: 1.5 V
```

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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General Notes (Continued)

```
OMP_NUM_THREADS = "16"

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

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

 Transparent Huge Pages enabled with:
 echo always > /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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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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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: basepeak = yes

    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

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