SPEC® CFP2006 Result
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NEC Corporation

Express5800/R120d-2M (Intel Xeon E5-2670)

$SPECfp^{®}\_rate2006 =$ **485**

$SPECfp\_rate\_base2006 =$ **472**
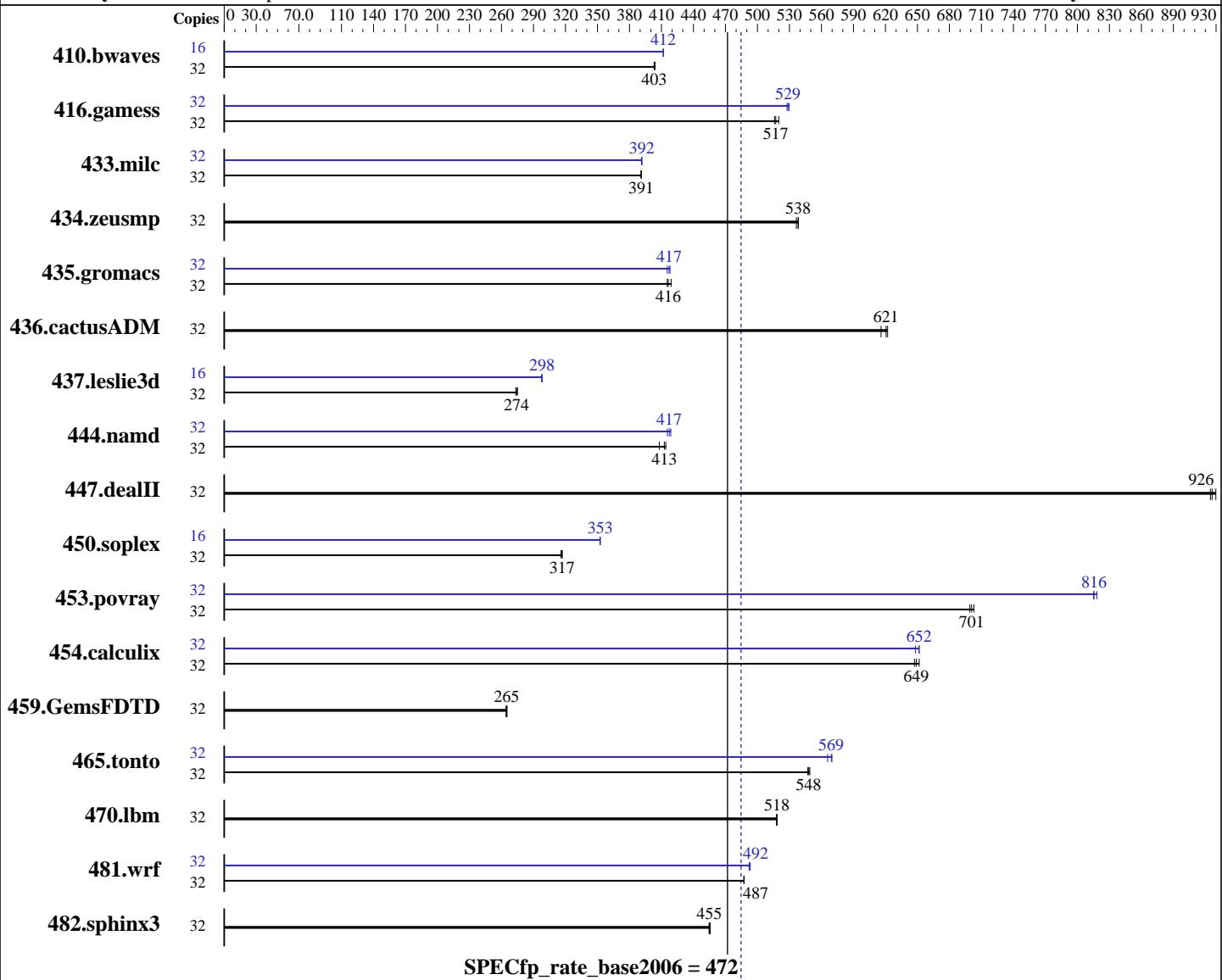
CPU2006 license: 9006
Test sponsor: NEC Corporation
Tested by: NEC Corporation

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

Benchmark	Copies	Result
410.bwaves	16	412
	32	403
416.gamess	32	529
	32	517
433.milc	32	392
	32	391
434.zeusmp	32	538
435.gromacs	32	417
	32	416
436.cactusADM	32	621
437.leslie3d	16	298
	32	274
444.namd	32	417
	32	413
447.dealII	32	926
450.soplex	16	353
	32	317
453.povray	32	816
	32	701
454.calculix	32	652
	32	649
459.GemsFDTD	32	265
465.tonto	32	569
	32	548
470.lbm	32	518
481.wrf	32	492
	32	487
482.sphinx3	32	455

SPECfp_rate_base2006 = 472
SPECfp_rate2006 = 485

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: No
File System: ext4

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	1077	404	**1078**	**403**	1079	403	16	**528**	**412**	528	412	528	412
416.gamess	32	1214	516	1205	520	**1212**	**517**	32	1187	528	**1185**	**529**	1183	530
433.milc	32	751	391	**751**	**391**	751	391	32	750	391	**750**	**392**	750	392
434.zeusmp	32	541	538	543	537	**541**	**538**	32	541	538	543	537	**541**	**538**
435.gromacs	32	545	419	550	415	**549**	**416**	32	550	415	547	418	**548**	**417**
436.cactusADM	32	615	622	**616**	**621**	621	616	32	615	622	**616**	**621**	621	616
437.leslie3d	32	1094	275	1100	273	**1097**	**274**	16	505	298	**505**	**298**	505	298
444.namd	32	629	408	620	414	**622**	**413**	32	**615**	**417**	613	419	618	416
447.dealII	32	396	925	**395**	**926**	394	930	32	396	925	**395**	**926**	394	930
450.soplex	32	**843**	**317**	842	317	845	316	16	379	352	**379**	**353**	379	353
453.povray	32	243	699	242	703	**243**	**701**	32	**209**	**816**	209	815	208	818
454.calculix	32	405	652	408	647	**407**	**649**	32	**405**	**652**	405	652	407	648
459.GemsFDTD	32	1280	265	**1282**	**265**	1285	264	32	1280	265	**1282**	**265**	1285	264
465.tonto	32	**575**	**548**	573	549	576	547	32	557	566	553	570	**553**	**569**
470.lbm	32	848	518	**848**	**518**	849	518	32	848	518	**848**	**518**	849	518
481.wrf	32	734	487	733	487	**733**	**487**	32	726	492	**726**	**492**	725	493
482.sphinx3	32	1372	455	1369	456	**1371**	**455**	32	1372	455	1369	456	**1371**	**455**

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

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

Platform Notes

    BIOS Settings:
     Energy Performance: Performance
     Memory Voltage: 1.5 V

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General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64"

  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
  Filesystem page cache cleared with:
  echo 1>         /proc/sys/vm/drop_caches
  runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
```

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
```

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Base Portability Flags (Continued)

```
   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:
```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

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

Benchmarks using both Fortran and C:
```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Peak Compiler Invocation

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

C++ benchmarks (except as noted below):
```
icpc  -m64
```

```
  450.soplex: icpc -m32
```

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

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

Peak Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
   433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
```

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Peak Portability Flags (Continued)

```
    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
     482.sphinx3: -DSPEC_CPU_LP64
```

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
               -opt-mem-layout-trans=3

     470.lbm: basepeak = yes

   482.sphinx3: basepeak = yes
```

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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
               -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

   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(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
               -no-prec-div(pass 2) -prof-use(pass 2) -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
```

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Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch
-static -auto-ilp32 -opt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -static -auto-ilp32
-opt-mem-layout-trans=3

481.wrf: Same as 454.calculix

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

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

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Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 06:02:12 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 5 June 2012.