



SPEC[®] CFP2006 Result

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NEC Corporation

SPECfp[®]_rate2006 = 470

Express5800/B120f-h (Intel Xeon E5-2699 v3)

SPECfp_rate_base2006 = 455

CPU2006 license: 9006

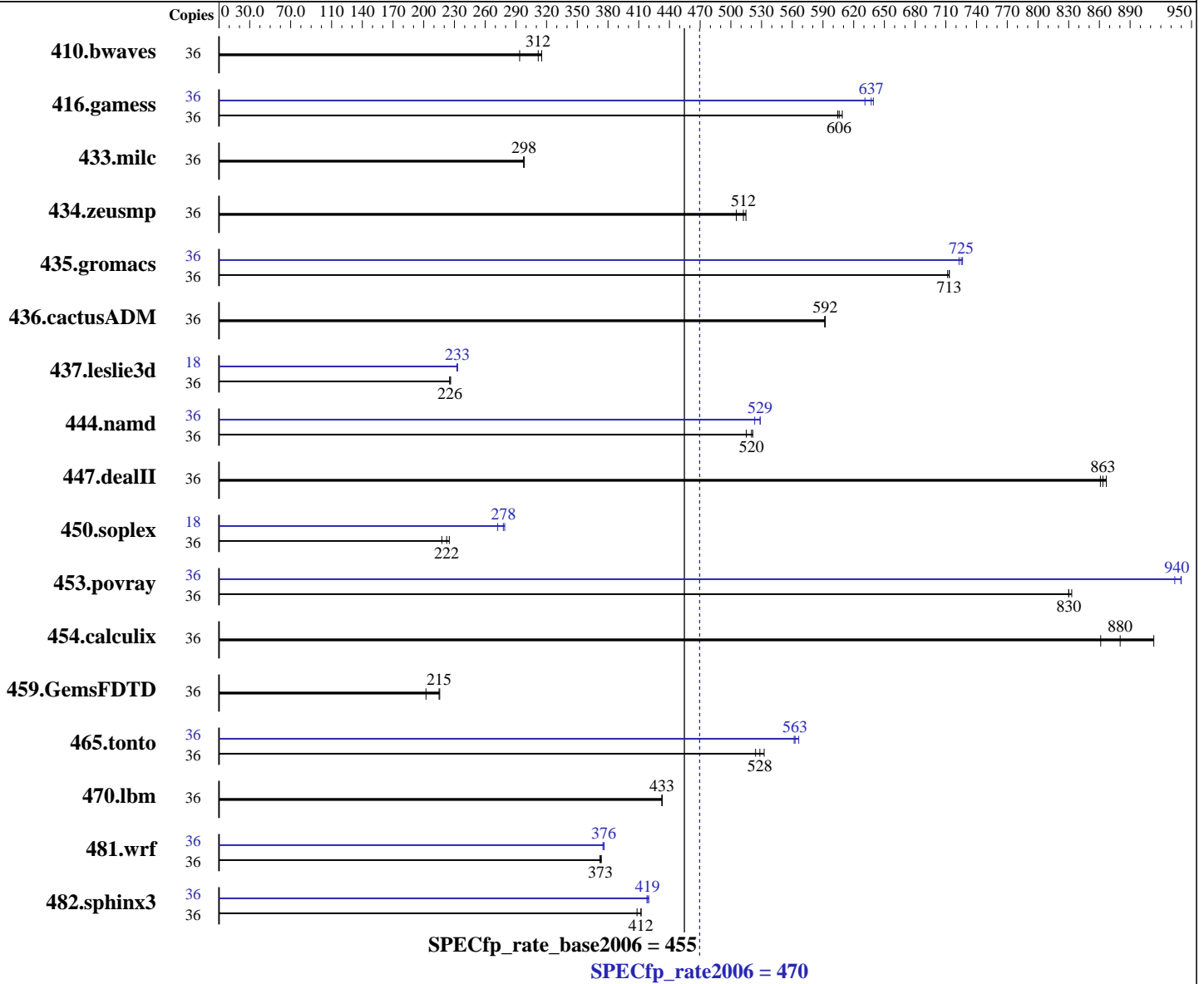
Test date: Jul-2015

Test sponsor: NEC Corporation

Hardware Availability: Jun-2015

Tested by: NEC Corporation

Software Availability: Oct-2014



Hardware

CPU Name: Intel Xeon E5-2699 v3
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
 CPU MHz: 2300
 FPU: Integrated
 CPU(s) enabled: 18 cores, 1 chip, 18 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

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Software

Operating System: Red Hat Enterprise Linux Server release 6.6 (Santiago)
 Kernel 2.6.32-504.el6.x86_64
 Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
 Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
 Auto Parallel: No
 File System: ext4

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L3 Cache: 45 MB I+D on chip per chip
 Other Cache: None
 Memory: 64 GB (4 x 16 GB 2Rx4 PC4-2133P-R)
 Disk Subsystem: NEC Storage M100 via Fibre Channel
 (See additional details below)
 Other Hardware: None

System State: Run level 3 (multi-user)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit
 Other Software: None

Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	36	1552	315	<u>1569</u>	<u>312</u>	1666	294	36	1552	315	<u>1569</u>	<u>312</u>	1666	294		
416.gamess	36	<u>1164</u>	<u>606</u>	1166	604	1158	609	36	1103	639	1117	631	<u>1106</u>	<u>637</u>		
433.milc	36	1110	298	1109	298	<u>1110</u>	<u>298</u>	36	1110	298	1109	298	<u>1110</u>	<u>298</u>		
434.zeusmp	36	<u>640</u>	<u>512</u>	636	515	648	505	36	<u>640</u>	<u>512</u>	636	515	648	505		
435.gromacs	36	360	713	<u>360</u>	<u>713</u>	361	712	36	356	723	<u>354</u>	<u>725</u>	354	726		
436.cactusADM	36	726	592	727	592	<u>726</u>	<u>592</u>	36	726	592	727	592	<u>726</u>	<u>592</u>		
437.leslie3d	36	<u>1500</u>	<u>226</u>	1502	225	1496	226	18	<u>726</u>	<u>233</u>	728	232	726	233		
444.namd	36	554	521	561	515	<u>555</u>	<u>520</u>	36	546	529	552	523	<u>546</u>	<u>529</u>		
447.dealII	36	478	861	475	867	<u>477</u>	<u>863</u>	36	478	861	475	867	<u>477</u>	<u>863</u>		
450.soplex	36	1335	225	<u>1350</u>	<u>222</u>	1379	218	18	551	272	538	279	<u>541</u>	<u>278</u>		
453.povray	36	231	830	<u>231</u>	<u>830</u>	230	833	36	204	940	<u>204</u>	<u>940</u>	205	934		
454.calculix	36	325	913	345	861	<u>337</u>	<u>880</u>	36	325	913	345	861	<u>337</u>	<u>880</u>		
459.GemsFDTD	36	1772	216	<u>1777</u>	<u>215</u>	1889	202	36	1772	216	<u>1777</u>	<u>215</u>	1889	202		
465.tonto	36	665	533	676	524	<u>670</u>	<u>528</u>	36	631	562	<u>629</u>	<u>563</u>	626	566		
470.lbm	36	<u>1143</u>	<u>433</u>	1143	433	1143	433	36	<u>1143</u>	<u>433</u>	1143	433	1143	433		
481.wrf	36	1077	374	1081	372	<u>1079</u>	<u>373</u>	36	1072	375	1069	376	<u>1070</u>	<u>376</u>		
482.sphinx3	36	1702	412	<u>1702</u>	<u>412</u>	1718	408	36	1671	420	<u>1676</u>	<u>419</u>	1678	418		

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"



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Platform Notes

BIOS Settings:

Power Management Policy: Performance Preferred

Patrol Scrub: Disabled

Cluster on Die: Enabled

Storage Configuration for Disk Subsystem:

NEC Storage M100 has 4 x 600 GB 10000 RPM SAS disks under RAID-10 configuration

mounted over 8Gbps Fibre Channel interface with these options

"defaults" in the /etc/fstab.

General Notes

Environment variables set by runspec before the start of the run:

LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

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

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Base Portability Flags (Continued)

```
447.deallI: -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:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Peak Compiler Invocation

C benchmarks (except as noted below):

```
icc -m64
```

```
482.sphinx3: icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

C++ benchmarks (except as noted below):

```
icpc -m64
```

```
450.soplex: icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
icc -m64 ifort -m64
```



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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

```

Peak Optimization Flags

C benchmarks:

```

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
-unroll2

```

C++ benchmarks:

```

444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32
447.dealII: basepeak = yes
450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
-opt-malloc-options=3
453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
-ansi-alias

```

Fortran benchmarks:

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Peak Optimization Flags (Continued)

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(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-

434.zeusmp: basepeak = yes

437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xCORE-AVX2(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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
-opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-B120f-RevB.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-B120f-RevB.xml>

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