SPEC® CFP2006 Result
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NEC Corporation
DX20a-X (Intel Xeon D-1527)

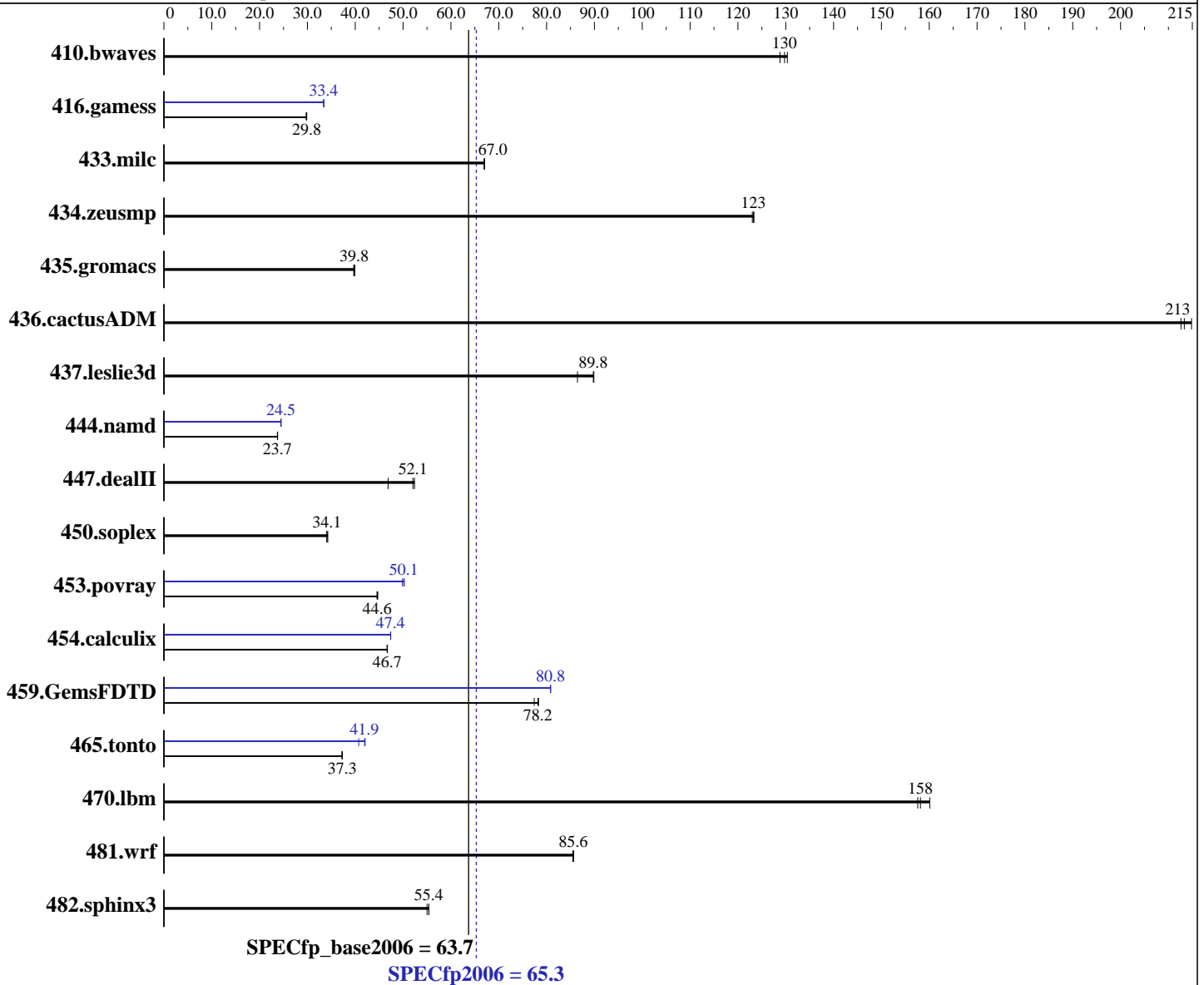$SPECfp^{®}2006 =$ 65.3

$SPECfp\_base2006 =$ 63.7

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

Test date: Mar-2016
Hardware Availability: Mar-2016
Software Availability: Nov-2015

Benchmark	Value
410.bwaves	130
416.gamess	33.4 / 29.8
433.milc	67.0
434.zeusmp	123
435.gromacs	39.8
436.cactusADM	213
437.leslie3d	89.8
444.namd	24.5 / 23.7
447.dealII	52.1
450.soplex	34.1
453.povray	50.1 / 44.6
454.calculix	47.4 / 46.7
459.GemsFDTD	80.8 / 78.2
465.tonto	41.9 / 37.3
470.lbm	158
481.wrf	85.6
482.sphinx3	55.4

SPECfp_base2006 = 63.7
SPECfp2006 = 65.3

Hardware

CPU Name: Intel Xeon D-1527
CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
CPU(s) orderable: 1 chip
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 7.2 (Maipo)
Kernel 3.10.0-327.el7.x86_64
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext4

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L3 Cache:	6 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	64 GB (4 x 16 GB 2Rx8 PC4-2133P-T)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 512 GB SATA, SSD	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	104	130	106	129	**105**	**130**	104	130	106	129	**105**	**130**
416.gamess	658	29.7	656	29.9	**656**	**29.8**	585	33.4	**586**	**33.4**	586	33.4
433.milc	**137**	**67.0**	137	67.0	137	67.0	**137**	**67.0**	137	67.0	137	67.0
434.zeusmp	73.8	123	**73.8**	**123**	74.0	123	73.8	123	**73.8**	**123**	74.0	123
435.gromacs	**179**	**39.8**	179	39.9	180	39.7	**179**	**39.8**	179	39.9	180	39.7
436.cactusADM	**56.0**	**213**	55.6	215	56.2	213	**56.0**	**213**	55.6	215	56.2	213
437.leslie3d	109	86.5	**105**	**89.8**	105	89.9	109	86.5	**105**	**89.8**	105	89.9
444.namd	**338**	**23.7**	338	23.7	337	23.8	327	24.5	328	24.5	**328**	**24.5**
447.dealII	**220**	**52.1**	244	46.9	218	52.4	**220**	**52.1**	244	46.9	218	52.4
450.soplex	243	34.3	**245**	**34.1**	245	34.1	243	34.3	**245**	**34.1**	245	34.1
453.povray	**119**	**44.6**	119	44.5	119	44.7	**106**	**50.1**	107	49.9	106	50.3
454.calculix	**177**	**46.7**	177	46.7	177	46.6	**174**	**47.4**	174	47.4	174	47.4
459.GemsFDTD	137	77.4	**136**	**78.2**	135	78.3	131	80.9	**131**	**80.8**	131	80.8
465.tonto	264	37.3	**264**	**37.3**	264	37.2	234	42.1	242	40.7	**235**	**41.9**
470.lbm	85.8	160	87.2	158	**86.9**	**158**	85.8	160	87.2	158	**86.9**	**158**
481.wrf	131	85.5	**131**	**85.6**	130	85.6	131	85.5	**131**	**85.6**	130	85.6
482.sphinx3	354	55.0	**352**	**55.4**	352	55.4	354	55.0	**352**	**55.4**	352	55.4

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:
     Power Management Policy: Custom
     Energy Performance: Performance
     Patrol Scrub: Disabled
     Hyper-Threading: Disabled

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General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
OMP_NUM_THREADS = "4"

 Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
 memory using RedHat EL 7.1
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -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: `basepeak = yes`

470.lbm: `basepeak = yes`

482.sphinx3: `basepeak = yes`

C++ benchmarks:

Continued on next page

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Peak Optimization Flags (Continued)

444.namd: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias`
`-auto-ilp32`

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4`
`-ansi-alias`

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2`
`-inline-level=0 -scalar-rep-`

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2`
`-inline-level=0 -opt-prefetch -parallel`

465.tonto: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -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: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

481.wrf: basepeak = yes

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

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-DX-RevA.html

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

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-DX-RevA.xml

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

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