SPEC® CFP2006 Result
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IBM Corporation

IBM System x3690 X5 + MAX5 (Intel Xeon X7560)

$SPECfp^{®}_rate2006 = $ 300
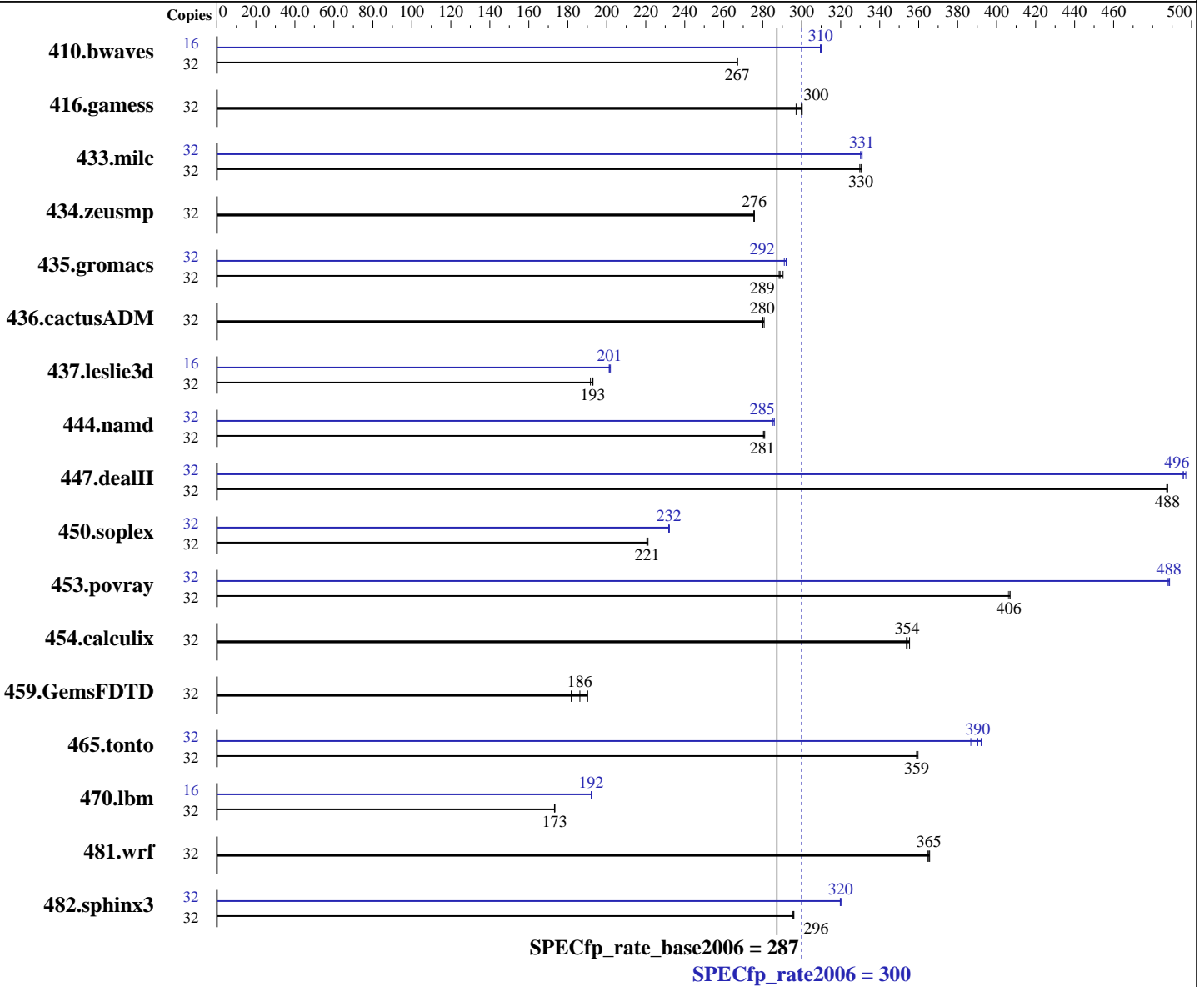
$SPECfp_rate_base2006 = $ 287

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Sep-2010
Hardware Availability: Aug-2010
Software Availability: Jan-2010

SPECfp_rate_base2006 = 287

SPECfp_rate2006 = 300

Hardware

CPU Name: Intel Xeon X7560
CPU Characteristics: Intel Turbo Boost Technology up to 2.67 GHz
CPU MHz: 2267
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: SuSE Linux Enterprise Server 11 (x86_64), Kernel 2.6.27.19-5-default
Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1
Build 20091130 Package ID: l_cproc_p_11.1.064, l_cprof_p_11.1.064
Auto Parallel: No
File System: ext3
System State: Run level 3 (multi-user)
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L3 Cache:	24 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (64 x 4 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem:	1 x 146 GB SAS, 15000 RPM
Other Hardware:	None

Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	**1629**	**267**	1629	267	1629	267	16	**702**	**310**	701	310	702	310
416.gamess	32	2087	300	2109	297	**2090**	**300**	32	2087	300	2109	297	**2090**	**300**
433.milc	32	888	331	**889**	**330**	891	330	32	890	330	**888**	**331**	887	331
434.zeusmp	32	1056	276	1057	275	**1057**	**276**	32	1056	276	1057	275	**1057**	**276**
435.gromacs	32	787	290	**791**	**289**	792	288	32	**782**	**292**	785	291	782	292
436.cactusADM	32	**1365**	**280**	1366	280	1362	281	32	**1365**	**280**	1366	280	1362	281
437.leslie3d	32	1559	193	**1560**	**193**	1570	192	16	**747**	**201**	747	201	745	202
444.namd	32	917	280	**915**	**281**	913	281	32	901	285	**899**	**285**	898	286
447.dealII	32	**751**	**488**	751	488	751	487	32	738	496	737	497	**738**	**496**
450.soplex	32	1207	221	1210	221	**1209**	**221**	32	**1151**	**232**	1150	232	1151	232
453.povray	32	418	407	**419**	**406**	420	405	32	**349**	**488**	349	488	348	489
454.calculix	32	**746**	**354**	746	354	743	355	32	**746**	**354**	746	354	743	355
459.GemsFDTD	32	1785	190	**1823**	**186**	1868	182	32	1785	190	**1823**	**186**	1868	182
465.tonto	32	**877**	**359**	877	359	875	360	32	**807**	**390**	814	387	803	392
470.lbm	32	2539	173	2536	173	**2537**	**173**	16	1145	192	1145	192	**1145**	**192**
481.wrf	32	980	365	**979**	**365**	978	366	32	980	365	**979**	**365**	978	366
482.sphinx3	32	2110	296	2107	296	**2109**	**296**	32	1948	320	**1949**	**320**	1950	320

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

Submit Notes

```
The config file option 'submit' was used.
 numactl was used to bind copies to the cores
```

Operating System Notes

```
echo 1 > /proc/sys/vm/zone_reclaim_mode
```

Platform Notes

```
Turbo Boost set to Traditional
```

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General Notes

'ulimit -s unlimited' was used to set the stack size to unlimited prior to run
Binaries were compiled on SLES 10 with Binutils 2.18.50.0.7.20080502

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

Base Optimization Flags

C benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

C++ benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

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CPU2006 license: 11	**Test date:**	Sep-2010
Test sponsor: IBM Corporation	**Hardware Availability:**	Aug-2010
Tested by: IBM Corporation	**Software Availability:**	Jan-2010

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

Peak Compiler Invocation

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

```
482.sphinx3: icc -m32
```

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
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
```

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Peak Optimization Flags

C benchmarks:

> 433.milc: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-fno-alias -opt-prefetch`

> 470.lbm: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-opt-malloc-options=3 -ansi-alias -auto-ilp32`

> 482.sphinx3: `-xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2`

C++ benchmarks:

> 444.namd: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-fno-alias -auto-ilp32`

> 447.dealII: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-unroll2 -ansi-alias -scalar-rep-`

> 450.soplex: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-opt-malloc-options=3`

> 453.povray: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-unroll4 -ansi-alias`

Fortran benchmarks:

> 410.bwaves: `-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch`

> 416.gamess: `basepeak = yes`

> 434.zeusmp: `basepeak = yes`

> 437.leslie3d: `-xSSE4.2 -ipo -O3 -no-prec-div -static`

> 459.GemsFDTD: `basepeak = yes`

> 465.tonto: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-unroll4 -auto -inline-calloc -opt-malloc-options=3`

Benchmarks using both Fortran and C:

> 435.gromacs: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)`
> `-opt-prefetch -auto-ilp32`

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Peak Optimization Flags (Continued)

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100929.00.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100929.00.xml

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