SPEC® CFP2006 Result
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IBM Corporation

IBM System x3690 X5 (Intel Xeon E7-2860)

$SPECfp®\_rate2006 = 360$

$SPECfp\_rate\_base2006 = 346$

CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: May-2011

Hardware Availability: May-2011

Software Availability: Jan-2011

410.bwaves — 40: 284 / 40: 284
416.gamess — 40: 364 / 40: 344
433.milc — 40: 319 / 40: 305
434.zeusmp — 40: 384
435.gromacs — 40: 366 / 40: 366
436.cactusADM — 40: 391
437.leslie3d — 40: 207
444.namd — 40: 354 / 40: 347
447.dealII — 40: 641
450.soplex — 40: 246 / 40: 230
453.povray — 40: 630 / 40: 523
454.calculix — 40: 448
459.GemsFDTD — 40: 198
465.tonto — 40: 443 / 40: 433
470.lbm — 40: 427 / 40: 335
481.wrf — 40: 365
482.sphinx3 — 40: 358 / 40: 339

SPECfp_rate_base2006 = 346

SPECfp_rate2006 = 360

Hardware

CPU Name: Intel Xeon E7-2860

CPU Characteristics: Intel Turbo Boost Technology up to 2.67 GHz

CPU MHz: 2267

FPU: Integrated

CPU(s) enabled: 20 cores, 2 chips, 10 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 SP1 (x86_64), Kernel 2.6.32.12-0.7-default

Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.1.116 Build 20101116

Auto Parallel: No

File System: ext3

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

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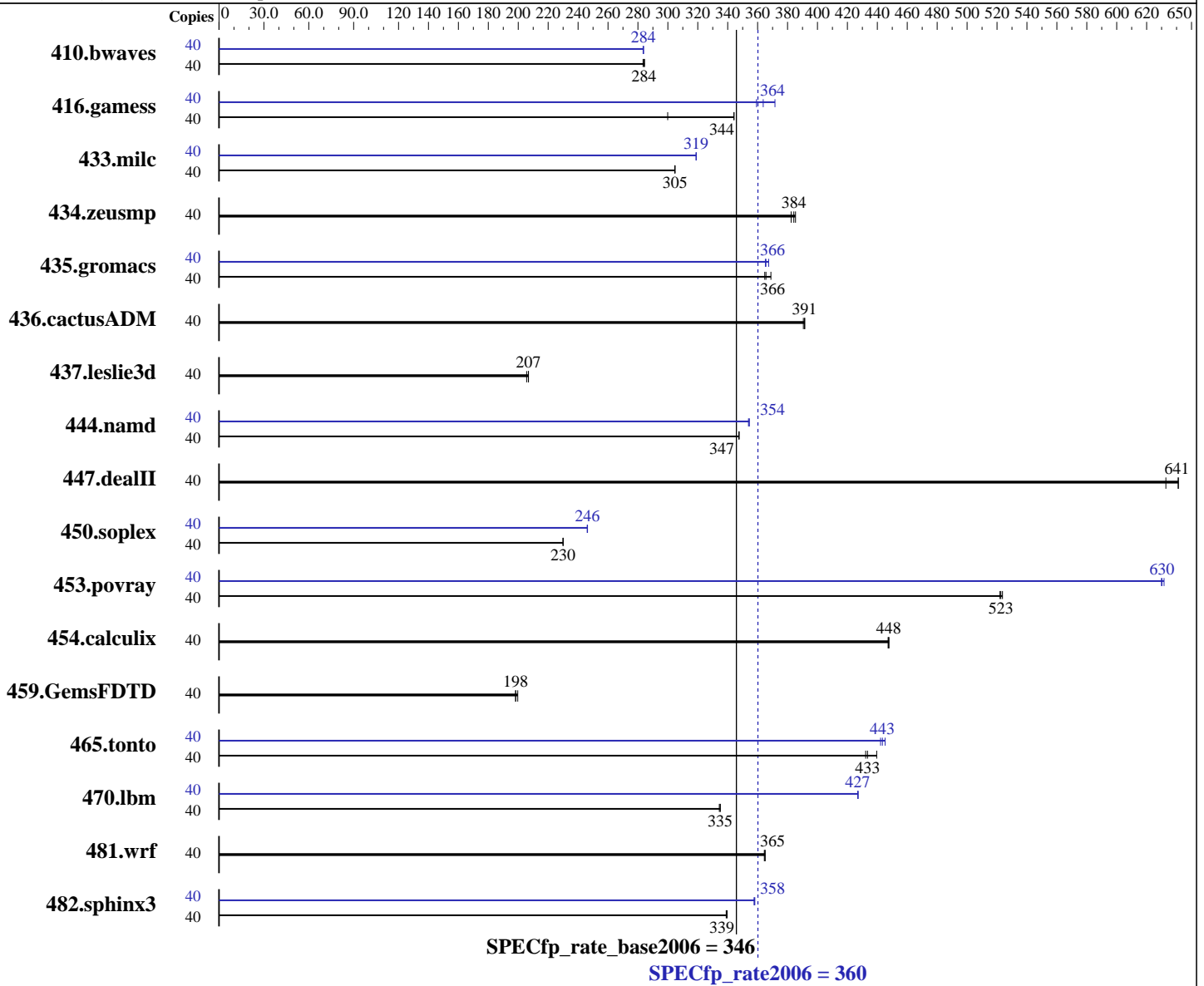**CPU2006 license:** 11　　　　　　　　　　　　　　　　　　　　　**Test date:** May-2011
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L3 Cache:	24 MB I+D on chip per chip	Peak Pointers:	32/64-bit
Other Cache:	None	Other Software:	None
Memory:	256 GB (32 x 8 GB 4Rx8 PC3-8500R-7, ECC)		
Disk Subsystem:	1 x 300 GB SAS, 10000 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	40	1918	283	**1914**	**284**	1911	284	40	1918	283	1916	284	**1916**	**284**
416.gamess	40	**2276**	**344**	2612	300	2275	344	40	2108	372	**2153**	**364**	2180	359
433.milc	40	1206	305	1205	305	**1205**	**305**	40	**1151**	**319**	1151	319	1151	319
434.zeusmp	40	**947**	**384**	952	382	945	385	40	**947**	**384**	952	382	945	385
435.gromacs	40	774	369	783	365	**781**	**366**	40	777	367	**781**	**366**	782	365
436.cactusADM	40	1221	392	**1221**	**391**	1224	391	40	1221	392	**1221**	**391**	1224	391
437.leslie3d	40	1818	207	1829	206	**1818**	**207**	40	1818	207	1829	206	**1818**	**207**
444.namd	40	**923**	**347**	923	348	923	347	40	907	354	**905**	**354**	905	354
447.dealII	40	714	641	723	633	**714**	**641**	40	714	641	723	633	**714**	**641**
450.soplex	40	**1451**	**230**	1450	230	1451	230	40	1354	246	1356	246	**1355**	**246**
453.povray	40	**407**	**523**	406	524	408	522	40	338	630	**338**	**630**	337	632
454.calculix	40	**737**	**448**	738	447	737	448	40	**737**	**448**	738	447	737	448
459.GemsFDTD	40	**2140**	**198**	2141	198	2125	200	40	**2140**	**198**	2141	198	2125	200
465.tonto	40	**908**	**433**	911	432	895	440	40	884	445	890	442	**888**	**443**
470.lbm	40	1644	334	1640	335	**1641**	**335**	40	1286	427	**1287**	**427**	1287	427
481.wrf	40	1224	365	**1225**	**365**	1226	364	40	1224	365	**1225**	**365**	1226	364
482.sphinx3	40	2295	340	2300	339	**2298**	**339**	40	2177	358	2179	358	**2179**	**358**

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

```
'ulimit -s unlimited' was used to set the stacksize to unlimited
'nodev   /mnt/hugepages   hugetlbfs   defaults   0 0' added to /etc/fstab
echo 36000 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

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Platform Notes

```
Load Default BIOS Settings and then change the following
  Turbo Boost Power Optimization set to Traditional
```

General Notes

```
Binaries compiled on RHEL 5.5
```

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 -ansi-alias
```

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Base Optimization Flags (Continued)

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

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

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

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) -prof-use(pass 2) -static -auto-ilp32

> 470.lbm: -xSSE4.2(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
> -ansi-alias -opt-prefetch -static -auto-ilp32

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

C++ benchmarks:

> 444.namd: -xSSE4.2(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: -xSSE4.2(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
> -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

> 453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
> -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

> 410.bwaves: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -prof-use(pass 2) -static

> 416.gamess: -xSSE4.2(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: basepeak = yes

> 465.tonto: -xSSE4.2(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
> -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

435.gromacs: -xSSE4.2(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

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.xml

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

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