SPEC® CFP2006 Result
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IBM Corporation

IBM BladeCenter HX5 (Intel Xeon E7-4850)

$SPECfp^{®}_rate2006 = $ 629

$SPECfp_rate_base2006 = $ 606

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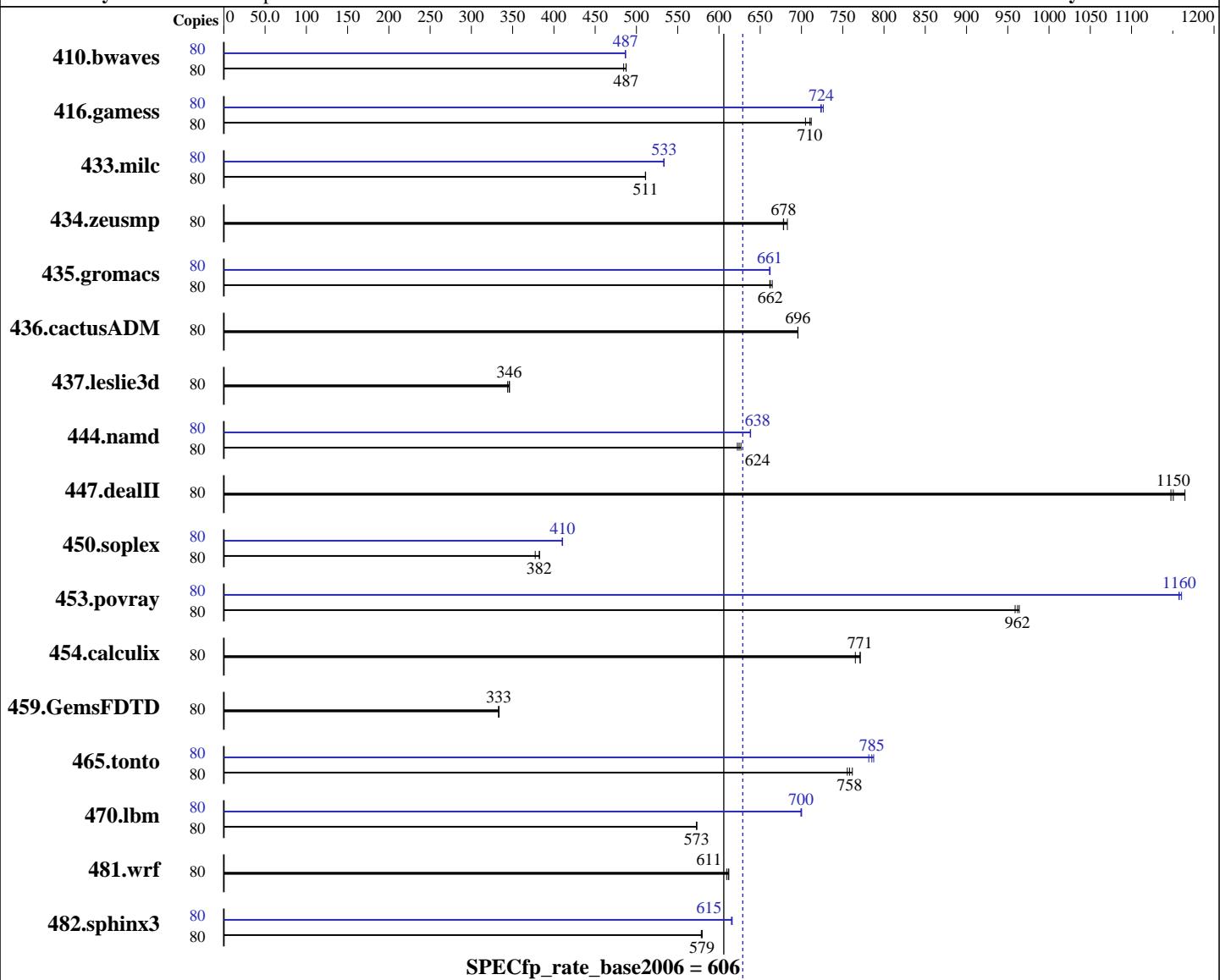**Test sponsor:** IBM Corporation
Tested by: IBM Corporation

Test date: Apr-2011
Hardware Availability: May-2011
Software Availability: Jan-2011

Benchmark	Copies	Base	Peak
410.bwaves	80 / 80	487	487
416.gamess	80 / 80	710	724
433.milc	80 / 80	511	533
434.zeusmp	80	678	
435.gromacs	80 / 80	662	661
436.cactusADM	80	696	
437.leslie3d	80	346	
444.namd	80 / 80	624	638
447.dealII	80	1150	
450.soplex	80 / 80	382	410
453.povray	80 / 80	962	1160
454.calculix	80	771	
459.GemsFDTD	80	333	
465.tonto	80 / 80	758	785
470.lbm	80 / 80	573	700
481.wrf	80	611	
482.sphinx3	80 / 80	579	615

SPECfp_rate_base2006 = 606

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Hardware

CPU Name: Intel Xeon E7-4850
CPU Characteristics: Intel Turbo Boost Technology up to 2.4 GHz
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 1,2,3,4 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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L3 Cache:	24 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (32 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem:	4 x 50 GB SSD, RAID 0
Other Hardware:	None

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	80	2244	485	2230	488	**2231**	**487**	80	2235	486	**2233**	**487**	2233	487
416.gamess	80	2201	712	**2205**	**710**	2222	705	80	2165	723	2156	726	**2163**	**724**
433.milc	80	1437	511	1437	511	**1437**	**511**	80	1378	533	1376	534	**1377**	**533**
434.zeusmp	80	**1073**	**678**	1074	678	1066	683	80	**1073**	**678**	1074	678	1066	683
435.gromacs	80	859	665	863	662	**863**	**662**	80	864	661	863	662	**864**	**661**
436.cactusADM	80	**1374**	**696**	1374	696	1374	696	80	**1374**	**696**	1374	696	1374	696
437.leslie3d	80	**2175**	**346**	2186	344	2172	346	80	**2175**	**346**	2186	344	2172	346
444.namd	80	1024	627	**1027**	**624**	1031	622	80	1005	638	1006	638	**1005**	**638**
447.dealII	80	786	1160	797	1150	**795**	**1150**	80	786	1160	797	1150	**795**	**1150**
450.soplex	80	1768	377	1744	383	**1745**	**382**	80	**1626**	**410**	1627	410	1625	411
453.povray	80	**442**	**962**	442	964	444	959	80	368	1160	367	1160	**368**	**1160**
454.calculix	80	856	771	862	765	**856**	**771**	80	856	771	862	765	**856**	**771**
459.GemsFDTD	80	2550	333	**2546**	**333**	2546	333	80	2550	333	**2546**	**333**	2546	333
465.tonto	80	**1038**	**758**	1034	762	1042	756	80	1007	782	1000	788	**1003**	**785**
470.lbm	80	**1918**	**573**	1918	573	1919	573	80	**1571**	**700**	1571	699	1570	700
481.wrf	80	1460	612	1466	609	**1462**	**611**	80	1460	612	1466	609	**1462**	**611**
482.sphinx3	80	**2691**	**579**	2695	579	2690	580	80	**2533**	**615**	2531	616	2534	615

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 prior to run
   echo 1 > /proc/sys/vm/zone_reclaim_mode
   'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
   echo 36000 > /proc/sys/vm/nr_hugepages
   export HUGETLB_MORECORE=yes
   export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

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Platform Notes

```
    BIOS Settings:
    Turbo Boost Power Optimization set to Traditional
```

General Notes

```
    Binaries were compiled on RHEL5.5
```

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

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Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 20:45:22 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 10 May 2011.