SPEC® CFP2006 Result

IBM Corporation

$SPECfp®\_rate2006 = \quad 116$

IBM System p 570 (4.7 GHz, 4 core, RHEL)

$SPECfp\_rate\_base2006 = \quad 98.8$
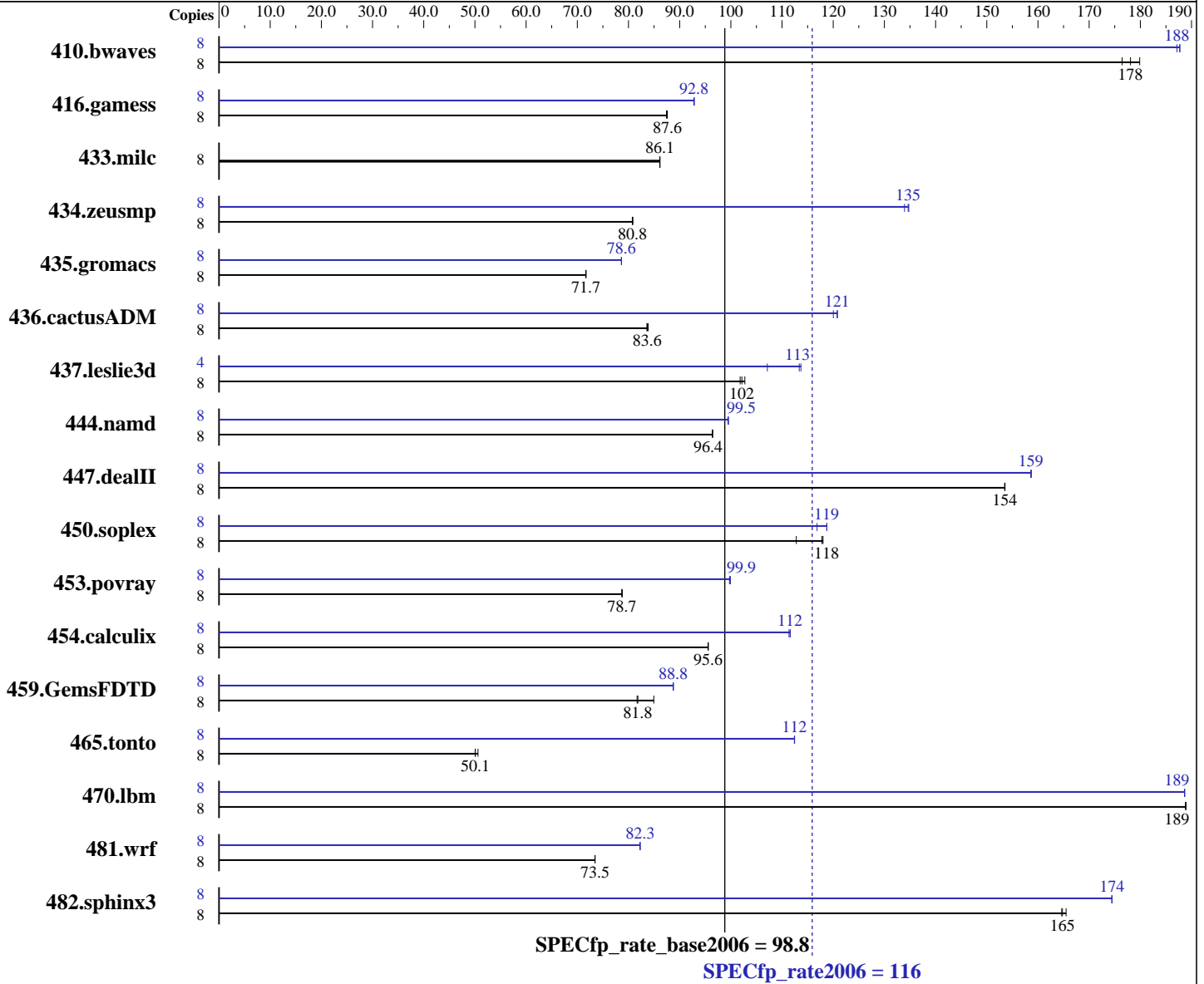
CPU2006 license: 11　　　　　　　　　　　　　　　　　　　　**Test date:** Oct-2007
Test sponsor: IBM Corporation　　　　　　　　　　　　**Hardware Availability:** Jun-2007
Tested by: IBM Corporation　　　　　　　　　　　　　　**Software Availability:** Oct-2007

Copies

410.bwaves	8 / 8	188 / 178
416.gamess	8 / 8	92.8 / 87.6
433.milc	8	86.1
434.zeusmp	8 / 8	135 / 80.8
435.gromacs	8 / 8	78.6 / 71.7
436.cactusADM	8 / 8	121 / 83.6
437.leslie3d	4 / 8	113 / 102
444.namd	8 / 8	99.5 / 96.4
447.dealII	8 / 8	159 / 154
450.soplex	8 / 8	119 / 118
453.povray	8 / 8	99.9 / 78.7
454.calculix	8 / 8	112 / 95.6
459.GemsFDTD	8 / 8	88.8 / 81.8
465.tonto	8 / 8	112 / 50.1
470.lbm	8 / 8	189 / 189
481.wrf	8 / 8	82.3 / 73.5
482.sphinx3	8 / 8	174 / 165

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Hardware

CPU Name: POWER6
CPU Characteristics:
CPU MHz: 4700
FPU: Integrated
CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable: 2,4,8,12,16 cores
Primary Cache: 64 KB I + 64 KB D on chip per core
Secondary Cache: 4 MB I+D on chip per core

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Advanced Platform 5.1
　　　　　　for IBM POWER
Compiler: IBM XL C/C++ Advanced Edition for Linux, V9.0
　　　　IBM XL Fortran Advanced Edition for Linux, V11.1
Auto Parallel: No
File System: ext3
System State: Multi-User
Base Pointers: 32-bit
Peak Pointers: 32/64-bit

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L3 Cache:	32 MB I+D off chip per chip	Other Software: -IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-10
Other Cache:	None	-MicroQuill SmartHeap 8.1
Memory:	32 GB (16x2 GB) DDR2 667 MHz	-IBM Engineering and Scientific Subroutine
Disk Subsystem:	2x73 GB SAS 15K RPM	Library for Linux on POWER, Version 4.3
Other Hardware:	None	

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	604	180	616	176	**611**	**178**	8	**579**	**188**	579	188	581	187
416.gamess	8	**1789**	**87.6**	1792	87.4	1788	87.6	8	1687	92.8	**1687**	**92.8**	1688	92.8
433.milc	8	853	86.1	**853**	**86.1**	852	86.2	8	853	86.1	**853**	**86.1**	852	86.2
434.zeusmp	8	**901**	**80.8**	902	80.7	900	80.9	8	540	135	544	134	**541**	**135**
435.gromacs	8	**797**	**71.7**	797	71.7	797	71.7	8	727	78.6	**726**	**78.6**	726	78.6
436.cactusADM	8	**1143**	**83.6**	1143	83.6	1140	83.8	8	**792**	**121**	797	120	791	121
437.leslie3d	8	732	103	739	102	**736**	**102**	4	351	107	331	114	**332**	**113**
444.namd	8	665	96.4	**665**	**96.4**	665	96.4	8	645	99.5	**645**	**99.5**	645	99.5
447.dealII	8	**596**	**154**	596	154	596	153	8	577	159	**577**	**159**	577	159
450.soplex	8	592	113	565	118	**566**	**118**	8	571	117	**562**	**119**	562	119
453.povray	8	541	78.7	**541**	**78.7**	540	78.8	8	427	99.7	**426**	**99.9**	426	99.9
454.calculix	8	691	95.5	**691**	**95.6**	690	95.6	8	591	112	593	111	**592**	**112**
459.GemsFDTD	8	**1037**	**81.8**	999	85.0	1039	81.7	8	**956**	**88.8**	957	88.7	956	88.8
465.tonto	8	1573	50.0	1556	50.6	**1572**	**50.1**	8	700	112	**700**	**112**	700	112
470.lbm	8	582	189	582	189	**582**	**189**	8	583	189	583	189	**583**	**189**
481.wrf	8	1216	73.5	**1217**	**73.5**	1217	73.4	8	1087	82.2	1086	82.3	**1086**	**82.3**
482.sphinx3	8	**946**	**165**	942	165	947	165	8	894	174	**894**	**174**	894	174

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

General Notes

```
    kernel release 2.6.18-52.el5.

    See flags file for details on following settings.

    ulimit -s (stack) set to 262144.


    System set to Enhanced mode when defining partition on HMC

    Large pages reserved as follows by root user:
        echo 800 > /proc/sys/vm/nr_hugepages
    System configured with libhugetlbfs library for application access to large pages
    Environment variables set before executing benchmarks.
        export HUGETLB_VERBOSE=0
```

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General Notes (Continued)

```
     export HUGETLB_MORECORE=yes
     export XLFRTEOPTS=intrinthds=1

 fdpr binary optimization tool used for
     435.gromacs 436.cactusADM 482.sphinx3

 Benchmarks bound to a processor using numactl on the submit command.
```

Base Compiler Invocation

C benchmarks:
```
     xlc -qlanglvl=extc99
```

C++ benchmarks:
```
     xlC
```

Fortran benchmarks:
```
     xlf95
```

Benchmarks using both Fortran and C:
```
     xlc -qlanglvl=extc99 xlf95
```

Base Portability Flags

```
    410.bwaves: -qfixed
    416.gamess: -qfixed
    434.zeusmp: -qfixed
   435.gromacs: -qfixed -qextname
 436.cactusADM: -qfixed -qextname
   437.leslie3d: -qfixed
   454.calculix: -qfixed -qextname
       481.wrf: -DNOUNDERSCORE
   482.sphinx3: -qchars=signed
```

Base Optimization Flags

C benchmarks:
```
     -O5 -qnoenablevmx -lhugetlbfs
```

C++ benchmarks:
```
     -O5 -qrtti -qnoenablevmx -qstaticlink
```

Fortran benchmarks:
```
     -O5 -qsmallstack=dynlenonheap -qalias=nostd -qnoenablevmx
     -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
```

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

```
-O5 -qnoenablevmx -qsmallstack=dynlenonheap -qalias=nostd
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
```

Base Other Flags

C benchmarks:

```
-qipa=noobject -qipa=threads
```

C++ benchmarks:

```
-qipa=noobject -qipa=threads
```

Fortran benchmarks:

```
-qipa=noobject -qipa=threads
```

Benchmarks using both Fortran and C:

```
-qipa=noobject -qipa=threads
```

Peak Compiler Invocation

C benchmarks:

```
xlc -qlanglvl=extc99
```

C++ benchmarks:

```
xlC
```

Fortran benchmarks:

```
xlf95
```

Benchmarks using both Fortran and C:

```
xlc -qlanglvl=extc99 xlf95
```

Peak Portability Flags

```
    410.bwaves: -qfixed
    416.gamess: -qfixed
    434.zeusmp: -qfixed
   435.gromacs: -qfixed -qextname
  436.cactusADM: -qfixed -qextname
    437.leslie3d: -qfixed
   454.calculix: -qfixed -qextname
        481.wrf: -DNOUNDERSCORE
    482.sphinx3: -qchars=signed
```

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Peak Optimization Flags

C benchmarks:

    433.milc: basepeak = yes

    470.lbm: -O3 -qarch=pwr6e -qtune=pwr6 -B/usr/share/libhugetlbfs/
             -tl -Wl,--hugetlbfs-link=BDT -q64

    482.sphinx3: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -lhugetlbfs

C++ benchmarks:

    444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6e -qtune=pwr6

    447.dealII: -O5 -qrtti -qnoenablevmx -qstaticlink
                -Wl,--whole-archive /usr/lib/libsmartheap.a
                -Wl,--no-whole-archive

    450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qstrict -lhugetlbfs

    453.povray: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -lsmartheap

Fortran benchmarks:

    410.bwaves: -O5 -qsmallstack=dynlenonheap -lhugetlbfs

    416.gamess: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qalias=nostd
                -qnoenablevmx

    434.zeusmp: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6e -qtune=pwr6
                -qxlf90=nosignedzero -B/usr/share/libhugetlbfs/ -tl
                -Wl,--hugetlbfs-link=BDT

    437.leslie3d: -O3 -qarch=pwr6e -qtune=pwr6 -B/usr/share/libhugetlbfs/
                  -tl -Wl,--hugetlbfs-link=BDT -q64

    459.GemsFDTD: -qpdf1(pass 1) -qpdf2(pass 2) -O5
                  -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
                  -q64

    465.tonto: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -lessl -lsmartheap
               -lxlf90_r

Benchmarks using both Fortran and C:

    435.gromacs: -Wl,-q -O2 -qarch=pwr6e -qtune=pwr6 -lhugetlbfs

    436.cactusADM: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O2 -qarch=pwr6e
                   -qtune=pwr6 -lhugetlbfs

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Peak Optimization Flags (Continued)

```
454.calculix: -qpdf1(pass 1) -qpdf2(pass 2) -O4
              -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

   481.wrf: -O5 -qnoenablevmx -qalias=nostd -lhugetlbfs
```

Peak Other Flags

C benchmarks:
```
-qipa=noobject -qipa=threads
```

C++ benchmarks:
```
-qipa=noobject -qipa=threads
```

Fortran benchmarks:
```
-qipa=noobject -qipa=threads
```

Benchmarks using both Fortran and C:
```
-qipa=noobject -qipa=threads
```

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/lop-xl-flags.20090714.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/lop-xl-flags.20090714.xml`