



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 22.4

### IBM System p 570 (4.7 GHz, 1 core, SLES)

SPECfp\_base2006 = 17.8

CPU2006 license: 11

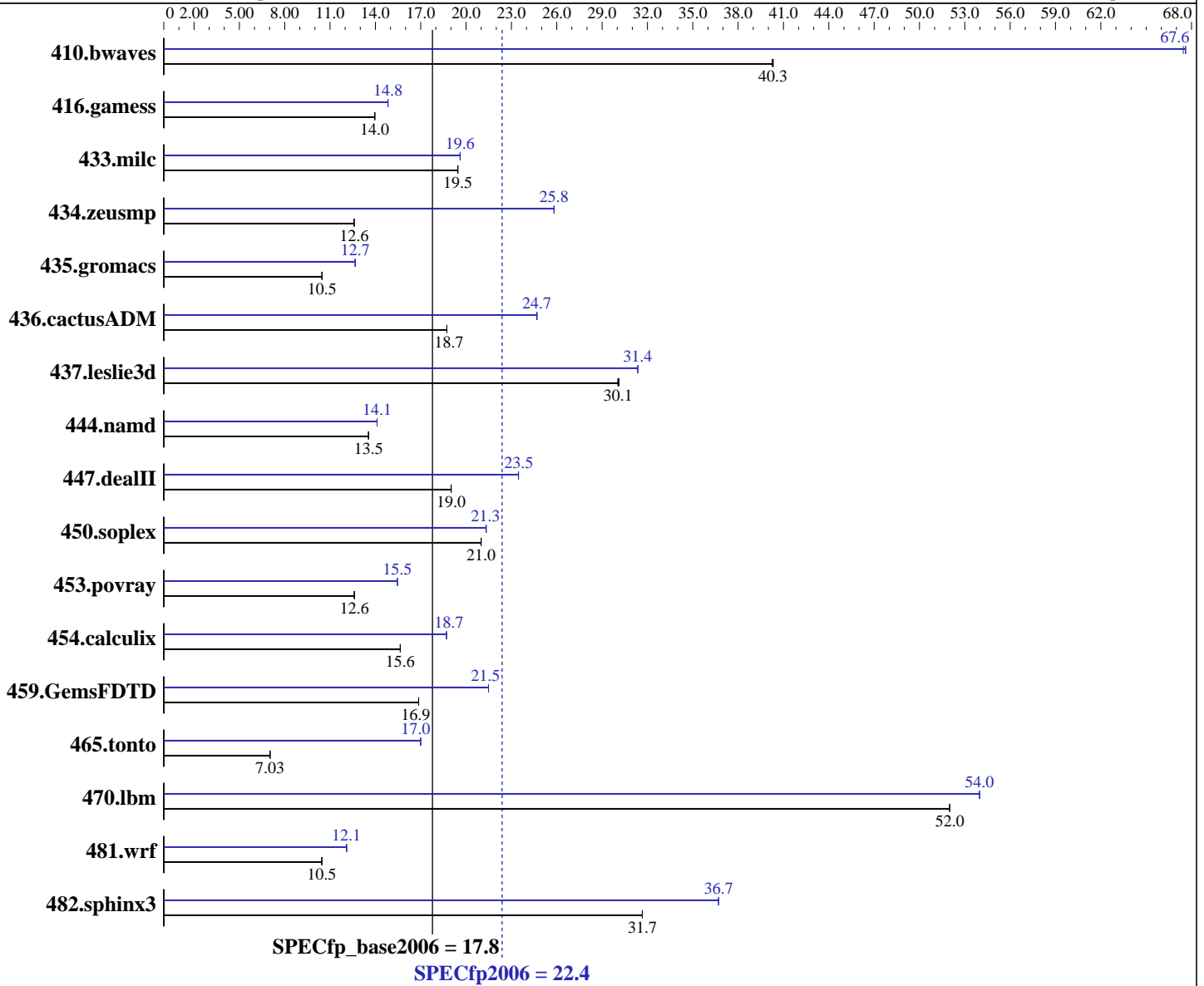
Test date: Jun-2007

Test sponsor: IBM Corporation

Hardware Availability: Jun-2007

Tested by: IBM Corporation

Software Availability: Sep-2007



### Hardware

CPU Name: POWER6  
 CPU Characteristics:  
 CPU MHz: 4700  
 FPU: Integrated  
 CPU(s) enabled: 1 core, 1 chip, 2 cores/chip  
 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

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### Software

Operating System: SUSE Linux Enterprise 10 SP1  
 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: ReiserFS  
 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 Cache: None  
 Memory: 32 GB (16x2 GB) DDR2 667 MHz  
 Disk Subsystem: 2x73 GB SAS 15K RPM  
 Other Hardware: None

Other Software:  
 -Post-Link Optimization for Linux on POWER, Version 5.4.0  
 -MicroQuill SmartHeap 7.3  
 -Engineering and Scientific Subroutine Library for Linux on POWER, Version 4.3

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	338	40.3	337	40.3	<b>337</b>	<b>40.3</b>	201	67.5	<b>201</b>	<b>67.6</b>	201	67.6
416.gamess	1403	14.0	1402	14.0	<b>1403</b>	<b>14.0</b>	1320	14.8	<b>1320</b>	<b>14.8</b>	1321	14.8
433.milc	472	19.5	472	19.5	<b>472</b>	<b>19.5</b>	<b>468</b>	<b>19.6</b>	468	19.6	468	19.6
434.zeusmp	<b>722</b>	<b>12.6</b>	722	12.6	723	12.6	<b>352</b>	<b>25.8</b>	352	25.8	352	25.8
435.gromacs	<b>682</b>	<b>10.5</b>	682	10.5	682	10.5	564	12.7	<b>564</b>	<b>12.7</b>	564	12.7
436.cactusADM	638	18.7	<b>638</b>	<b>18.7</b>	638	18.7	484	24.7	<b>484</b>	<b>24.7</b>	484	24.7
437.leslie3d	313	30.0	<b>313</b>	<b>30.1</b>	312	30.1	<b>300</b>	<b>31.4</b>	300	31.4	300	31.4
444.namd	<b>592</b>	<b>13.5</b>	592	13.5	592	13.5	568	14.1	<b>568</b>	<b>14.1</b>	568	14.1
447.dealII	602	19.0	<b>602</b>	<b>19.0</b>	602	19.0	487	23.5	<b>487</b>	<b>23.5</b>	487	23.5
450.soplex	<b>397</b>	<b>21.0</b>	397	21.0	397	21.0	<b>391</b>	<b>21.3</b>	391	21.3	391	21.3
453.povray	422	12.6	422	12.6	<b>422</b>	<b>12.6</b>	344	15.5	<b>344</b>	<b>15.5</b>	344	15.5
454.calculix	527	15.6	527	15.6	<b>527</b>	<b>15.6</b>	441	18.7	441	18.7	<b>441</b>	<b>18.7</b>
459.GemsFDTD	<b>629</b>	<b>16.9</b>	629	16.9	629	16.9	<b>494</b>	<b>21.5</b>	494	21.5	494	21.5
465.tonto	1400	7.03	<b>1399</b>	<b>7.03</b>	1399	7.03	<b>579</b>	<b>17.0</b>	579	17.0	579	17.0
470.lbm	264	52.0	<b>264</b>	<b>52.0</b>	264	52.0	255	54.0	255	54.0	<b>255</b>	<b>54.0</b>
481.wrf	<b>1068</b>	<b>10.5</b>	1068	10.5	1068	10.5	<b>924</b>	<b>12.1</b>	924	12.1	923	12.1
482.sphinx3	616	31.7	<b>616</b>	<b>31.7</b>	616	31.7	<b>531</b>	<b>36.7</b>	531	36.7	531	36.7

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

## General Notes

kernel release 2.6.16.46-0.12-ppc64.

See flags file for details on following settings.

ulimit -s (stack) set to unlimited.

System set to Enhanced mode when defining partition on HMC

Large pages reserved as follows by root user:

```
echo 200 > /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 HUGETLB_MORECORE_HEAPBASE=0x50000000
export XLFRTEOPTS=intrinths=1
Linux booted with the options:
    maxcpus=1 smt-enabled=off
```

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

Benchmarks bound to a processor using taskset 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 -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-link=BDT
```

C++ benchmarks:

```
-O5 -qrtti -qnoenablevmx -lhugetlbfs
```

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## Base Optimization Flags (Continued)

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

## 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
```

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## Peak Portability Flags (Continued)

437.leslie3d: -qfixed  
454.calculix: -qfixed -qextname  
481.wrf: -DNOUNDERSCORE  
482.sphinx3: -qchars=signed

## Peak Optimization Flags

### C benchmarks:

433.milc: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qnoenablevmx  
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

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/libhugetlbfs.a  
-Wl,--no-whole-archive

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qstrict  
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

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

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## Peak Optimization Flags (Continued)

465.tonto: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -less1 -lhugetlbfs  
-lx1f90\_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

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.20090714.01.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/lop-xl-flags.20090714.01.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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