SPEC® CFP2006 Result

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IBM Corporation

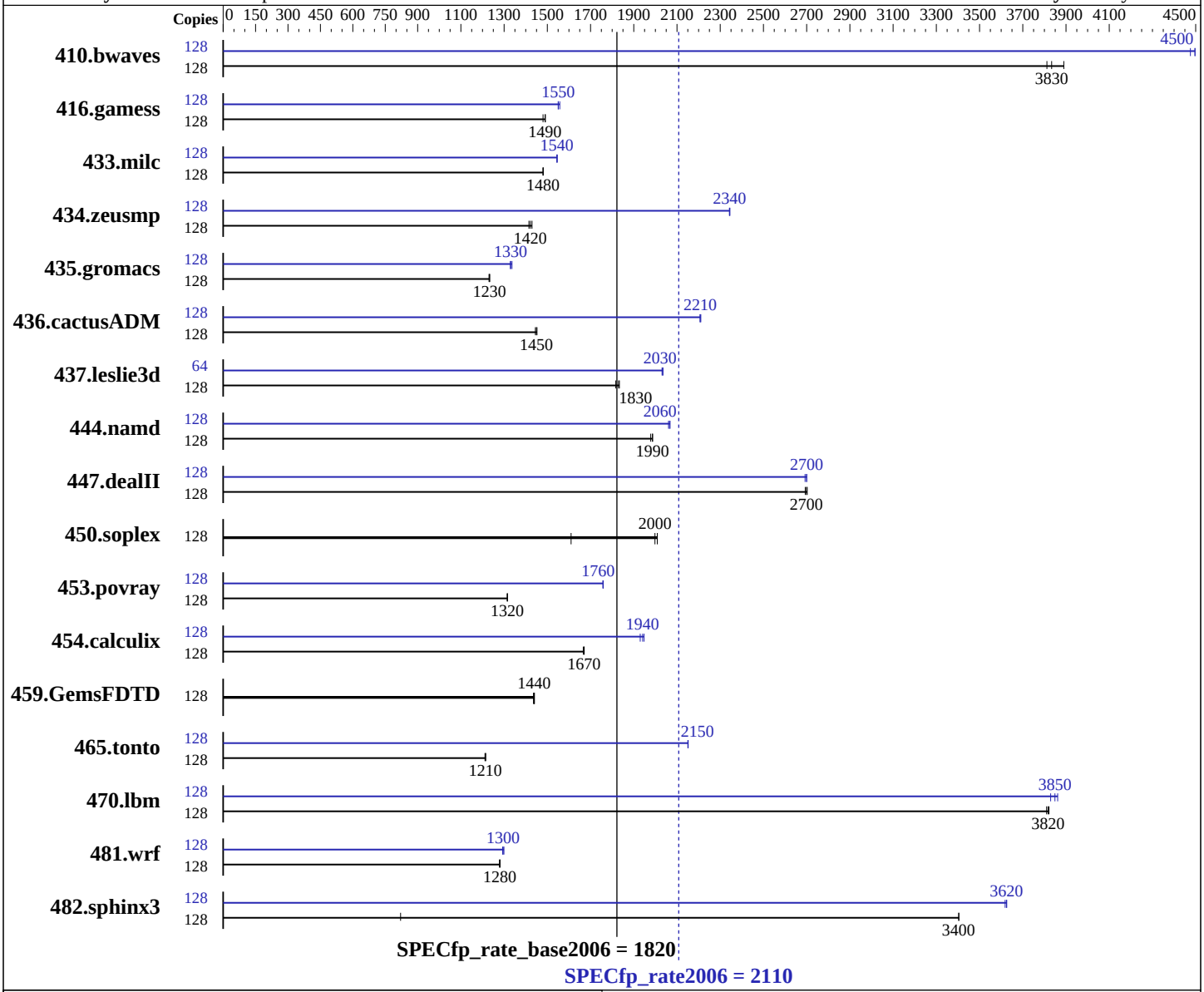
IBM Power 595 (5.0 GHz, 64 core)

SPECfp®_rate2006 = 2110

SPECfp_rate_base2006 = 1820

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

Test date: Mar-2008
Hardware Availability: Jun-2008
Software Availability: May-2008



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	5000
FPU:	Integrated
CPU(s) enabled:	64 cores, 32 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	8,16,24,32,40,48,56,64 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:	IBM AIX V6.1 with the 6100-01 Technology Level
Compiler:	XL C/C++ Enterprise Edition V9 for AIX Updated with the Oct2007 PTF. XL Fortran Enterprise Edition V11.1 for AIX Updated with the Oct2007 PTF.
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user

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L3 Cache: 32 MB I+D off chip per chip
Other Cache: None
Memory: 512 GB (256x2 GB) DDR2 667 MHz
Disk Subsystem: 4x146 GB SCSI 15K RPM
Other Hardware: None

Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: --

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	447	3890	**454**	**3830**	456	3810	128	389	4480	387	4500	**387**	**4500**
416.gamess	128	**1682**	**1490**	1681	1490	1693	1480	128	1609	1560	**1616**	**1550**	1616	1550
433.milc	128	794	1480	**794**	**1480**	794	1480	128	760	1550	**761**	**1540**	761	1540
434.zeusmp	128	823	1410	**819**	**1420**	815	1430	128	497	2340	497	2340	**497**	**2340**
435.gromacs	128	**741**	**1230**	741	1230	743	1230	128	688	1330	**687**	**1330**	684	1340
436.cactusADM	128	1053	1450	1059	1440	**1055**	**1450**	128	692	2210	**693**	**2210**	693	2210
437.leslie3d	128	**658**	**1830**	662	1820	656	1830	64	296	2030	296	2040	**296**	**2030**
444.namd	128	**517**	**1990**	517	1990	519	1980	128	496	2070	**497**	**2060**	498	2060
447.dealII	128	**543**	**2700**	544	2690	542	2700	128	544	2690	**542**	**2700**	542	2700
450.soplex	128	663	1610	**534**	**2000**	531	2010	128	663	1610	**534**	**2000**	531	2010
453.povray	128	**518**	**1320**	518	1310	518	1320	128	**387**	**1760**	388	1760	387	1760
454.calculix	128	**632**	**1670**	632	1670	634	1670	128	**544**	**1940**	542	1950	547	1930
459.GemsFDTD	128	943	1440	946	1440	**944**	**1440**	128	943	1440	946	1440	**944**	**1440**
465.tonto	128	**1037**	**1210**	1037	1210	1040	1210	128	**585**	**2150**	586	2150	585	2150
470.lbm	128	**461**	**3820**	460	3820	462	3810	128	**457**	**3850**	455	3860	459	3830
481.wrf	128	1118	1280	1116	1280	**1117**	**1280**	128	1106	1290	1100	1300	**1103**	**1300**
482.sphinx3	128	733	3400	3039	821	**733**	**3400**	128	**688**	**3620**	688	3630	689	3620

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

General Notes

```
See flags file of details on following settings.
all ulimits set to unlimited.
Envionment variables set before executing benchmarks:
  MALLOCOPTIONS=pool
  MEMORY_AFFINITY=MCM
  XLFRTEOPTS=intrinthds=1
System set to "Enhanced" mode when defining partition on HMC.
bindprocessor command used on submit to bind each copy to a
  unique processor.
12800 16M large pages defined with vmo command
Remote console disabled in /etc/inittab.
fdpr binary optimization tool used for:
  410.bwaves 433.milc 435.gromacs 436.cactusADM
  453.povray 470.lbm 482.sphinx3
```

Base Compiler Invocation

C benchmarks:
```
/usr/vac/bin/xlc -qlanglvl=extc99
```

C++ benchmarks:
```
/usr/vacpp/bin/xlC
```

Fortran benchmarks:
```
/usr/bin/xlf95
```

Benchmarks using both Fortran and C:
```
/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/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: `-DSPEC_CPU_AIX -DNOUNDERSCORE`
482.sphinx3: `-qchars=signed`

Base Optimization Flags

C benchmarks:
```
-bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS -blpdata
```

C++ benchmarks:
```
-bmaxdata:0x50000000 -O5 -qlargepage -D_ILS_MACROS -qrtti=all
-D__IBM_FAST_VECTOR -blpdata
```

Fortran benchmarks:
```
-bmaxdata:0x60000000 -O5 -qlargepage -qsmallstack=dynlenonheap
-qalias=nostd -blpdata
```

Benchmarks using both Fortran and C:
```
-bmaxdata:0x60000000 -O5 -qlargepage -D_ILS_MACROS
-qsmallstack=dynlenonheap -qalias=nostd -blpdata
```

Base Other Flags

C benchmarks:
```
-qipa=noobject -qipa=threads -qsuppress=1500-036
```

C++ benchmarks:
```
-qipa=noobject -qipa=threads -qsuppress=1500-036
```

Fortran benchmarks:
```
-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads
-qsuppress=1500-036
```

Benchmarks using both Fortran and C:
```
-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads
-qsuppress=1500-036
```

Peak Compiler Invocation

C benchmarks:
```
/usr/vac/bin/xlc -qlanglvl=extc99
```

C++ benchmarks:
```
/usr/vacpp/bin/xlC
```

Fortran benchmarks:
```
/usr/bin/xlf95
```

Benchmarks using both Fortran and C:
```
/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/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: `-DSPEC_CPU_AIX -DNOUNDERSCORE`
482.sphinx3: `-qchars=signed`

Peak Optimization Flags

C benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

433.milc: -bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS
-qalign=natural -qfdpr -blpdata

470.lbm: -O5 -qlargepage -D_ILS_MACROS -qfdpr -q64 -blpdata

482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qlargepage -qenablevmx
-qvecnvol -D_ILS_MACROS -qfdpr -blpdata

C++ benchmarks:

444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -D_ILS_MACROS

447.dealII: -bmaxdata:0x50000000 -O5 -qlargepage -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_VECTOR -blpdata

450.soplex: basepeak = yes

453.povray: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qenablevmx
-qvecnvol -D_ILS_MACROS -qalign=natural -qfdpr -blpdata

Fortran benchmarks:

410.bwaves: -bmaxdata:0x50000000 -O5 -qlargepage -qenablevmx -qvecnvol
-qfdpr -qsmallstack=dynlenonheap -blpdata

416.gamess: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5
-qalias=nostd

434.zeusmp: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3
-qarch=auto -qtune=auto -qlargepage -qenablevmx -qvecnvol
-qxlf90=nosignedzero -blpdata

437.leslie3d: -O4 -qlargepage -q64 -blpdata

459.GemsFDTD: basepeak = yes

465.tonto: -bmaxdata:0x20000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5
-qlargepage -blpdata

Benchmarks using both Fortran and C:

435.gromacs: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qenablevmx
-qvecnvol -qfdpr -D_ILS_MACROS -blpdata

436.cactusADM: -bmaxdata:0x60000000 -qpdf1(pass 1) -qpdf2(pass 2) -O2
-qarch=auto -qtune=auto -qlargepage -qenablevmx -qvecnvol
-qfdpr -qnostrict -D_ILS_MACROS -blpdata

454.calculix: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qlargepage
-D_ILS_MACROS -blpdata

Continued on next page

Peak Optimization Flags (Continued)

481.wrf: `-bmaxdata:0x30000000 -O5 -qlargepage -qalias=nostd -D_ILS_MACROS -blpdata`

Peak Other Flags

C benchmarks:
`-qipa=noobject -qipa=threads -qsuppress=1500-036`

C++ benchmarks:
`-qipa=noobject -qipa=threads -qsuppress=1500-036`

Fortran benchmarks:
`-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

Benchmarks using both Fortran and C:
`-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

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

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

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