SPEC® CFP2006 Result

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IBM Corporation

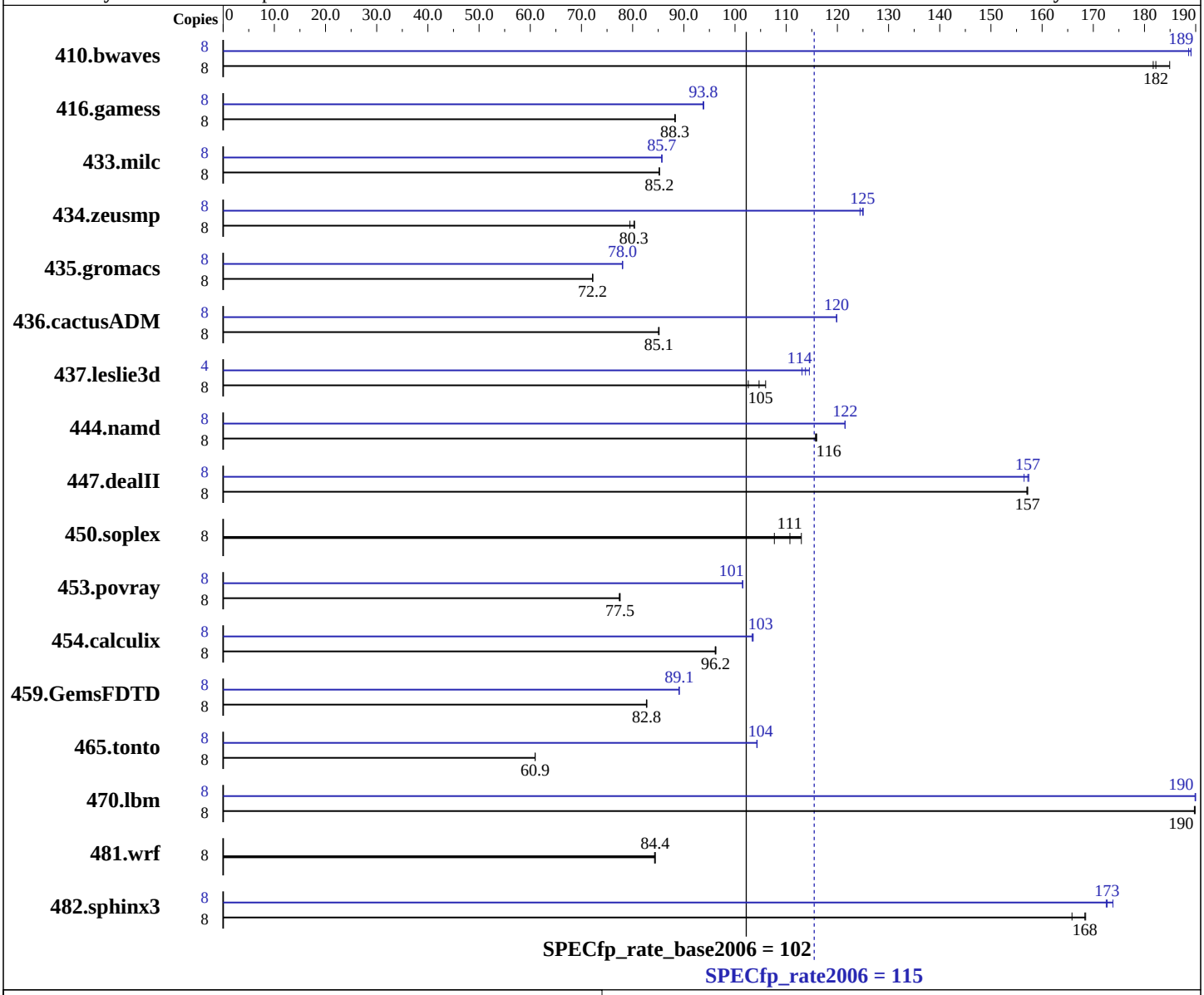
IBM System i 570 (4.7 GHz, 4 core)

SPECfp®_rate2006 = 115

SPECfp_rate_base2006 = 102

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

Test date: May-2007
Hardware Availability: Sep-2007
Software Availability: Jun-2007



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:	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:	IBM AIX 5L V5.3
Compiler:	XL C/C++ Enterprise Edition Version 9.0 for AIX XL Fortran Enterprise Edition Version 11.1 for AIX
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	--

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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: 1x73 GB 1x146 GB SAS 15K 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	8	588	185	**597**	**182**	598	182	8	**575**	**189**	576	189	575	189
416.gamess	8	1773	88.3	**1774**	**88.3**	1775	88.2	8	**1670**	**93.8**	1668	93.9	1670	93.8
433.milc	8	862	85.2	**862**	**85.2**	862	85.2	8	857	85.7	**857**	**85.7**	857	85.7
434.zeusmp	8	906	80.4	**907**	**80.3**	916	79.5	8	585	124	582	125	**583**	**125**
435.gromacs	8	**791**	**72.2**	791	72.2	791	72.2	8	**732**	**78.0**	732	78.1	732	78.0
436.cactusADM	8	1122	85.2	**1124**	**85.1**	1124	85.1	8	**798**	**120**	798	120	798	120
437.leslie3d	8	733	103	**718**	**105**	710	106	4	328	115	**331**	**114**	332	113
444.namd	8	553	116	554	116	**554**	**116**	8	**528**	**122**	528	121	528	122
447.dealII	8	583	157	582	157	**582**	**157**	8	585	156	**582**	**157**	581	157
450.soplex	8	591	113	**603**	**111**	620	108	8	591	113	**603**	**111**	620	108
453.povray	8	**549**	**77.5**	549	77.6	550	77.4	8	**419**	**101**	419	101	419	102
454.calculix	8	687	96.1	686	96.3	**686**	**96.2**	8	639	103	637	104	**638**	**103**
459.GemsFDTD	8	**1026**	**82.8**	1026	82.8	1027	82.7	8	953	89.1	**953**	**89.1**	953	89.1
465.tonto	8	1291	61.0	**1292**	**60.9**	1292	60.9	8	755	104	754	104	**755**	**104**
470.lbm	8	579	190	**579**	**190**	579	190	8	579	190	579	190	**579**	**190**
481.wrf	8	1060	84.3	**1059**	**84.4**	1059	84.4	8	1060	84.3	**1059**	**84.4**	1059	84.4
482.sphinx3	8	940	166	**926**	**168**	925	169	8	904	173	897	174	**903**	**173**

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

General Notes

```
AIX 5L V5.3 updated with the 5300-06 Technology Level.
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
1536 16M pages defined on systems with vmo command
fdpr binary optimization tool used for
  410.bwaves 434.zeusmp 453.povray 470.lbm 482.sphinx3
submit used to bind benchmark to a processor using "bindprocessor"
The "IBM System p 570" and "IBM System i 570" are electronicly equivalent.
The results have been measured on the "IBM System p 570" model.
```

Base Compiler Invocation

C benchmarks:
/usr/vac/bin/xlc

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

Fortran benchmarks:
/usr/bin/xlf95

Benchmarks using both Fortran and C:
/usr/vac/bin/xlc /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:
-O5 -qlargepage -D_ILS_MACROS -blpdata

C++ benchmarks:
-O5 -qlargepage -D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR
-blpdata

Fortran benchmarks:
-O5 -qlargepage -qsmallstack=dynlenonheap -blpdata

Benchmarks using both Fortran and C:
-O5 -qlargepage -D_ILS_MACROS -qsmallstack=dynlenonheap -blpdata

Base Other Flags

C benchmarks:
-qlanglvl=extc99 -bmaxdata:0x40000000 -qipa=noobject -qipa=threads
-qsuppress=1500-036

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Base Other Flags (Continued)

C++ benchmarks:
```
-bmaxdata:0x50000000 -qipa=noobject -qipa=threads -qsuppress=1500-036
```

Fortran benchmarks:
```
-bmaxdata:0x60000000 -qalias=nostd -qipa=noobject -qsuppress=1500-010
-qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036
```

Benchmarks using both Fortran and C:
```
-qlanglvl=extc99 -bmaxdata:0x60000000 -qalias=nostd -qipa=noobject
-qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads
-qsuppress=1500-036
```

Peak Compiler Invocation

C benchmarks:
```
/usr/vac/bin/xlc
```

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

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

Benchmarks using both Fortran and C:
```
/usr/vac/bin/xlc /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:

433.milc: `-O5 -qlargepage -D_ILS_MACROS -qalign=natural -blpdata`

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Peak Optimization Flags (Continued)

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

482.sphinx3: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qlargepage -qenablevmx -qvecnvol -D_ILS_MACROS -blpdata`

C++ benchmarks:

444.namd: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qlargepage -qenablevmx -qvecnvol -D_ILS_MACROS -blpdata`

447.dealII: `-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 -blpdata`

Fortran benchmarks:

410.bwaves: `-O5 -qlargepage -qenablevmx -qvecnvol -qsmallstack=dynlenonheap -blpdata`

416.gamess: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qlargepage -blpdata`

434.zeusmp: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qlargepage -qenablevmx -qvecnvol -qxlf90=nosignedzero -blpdata`

437.leslie3d: `-O5 -qlargepage -q64 -blpdata`

459.GemsFDTD: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qlargepage -qenablevmx -qvecnvol -blpdata`

465.tonto: `Same as 416.gamess`

Benchmarks using both Fortran and C:

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

436.cactusADM: `-D_ILS_MACROS -blpdata`

454.calculix: `-O4 -qlargepage -q64 -D_ILS_MACROS -blpdata`

481.wrf: `basepeak = yes`

Peak Other Flags

C benchmarks (except as noted below):
```
-qlanglvl=extc99 -qipa=noobject -qipa=threads -qsuppress=1500-036
```

433.milc: `-qlanglvl=extc99 -bmaxdata:0x40000000 -qipa=noobject -qipa=threads -qsuppress=1500-036`

C++ benchmarks (except as noted below):
```
-bmaxdata:0x50000000 -qipa=noobject -qipa=threads -qsuppress=1500-036
```

444.namd: `-qipa=noobject -qipa=threads -qsuppress=1500-036`

453.povray: `-qipa=noobject -qipa=threads -qsuppress=1500-036`

Fortran benchmarks (except as noted below):
```
-bmaxdata:0x50000000 -qipa=noobject -qsuppress=1500-010
-qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036
```

416.gamess: `-bmaxdata:0x40000000 -qalias=nostd -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

434.zeusmp: `-bmaxdata:0x40000000 -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

437.leslie3d: `-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

465.tonto: `-bmaxdata:0x20000000 -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

Benchmarks using both Fortran and C (except as noted below):
```
-qlanglvl=extc99 -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qipa=threads -qsuppress=1500-036
```

436.cactusADM: `-qlanglvl=extc99 -bmaxdata:0x60000000 -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qipa=threads -qsuppress=1500-036`

481.wrf: `-qlanglvl=extc99 -bmaxdata:0x60000000 -qalias=nostd -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/CPU2006_flags.20090714.12.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.12.xml`

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