SPEC® CFP2006 Result

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IBM Corporation

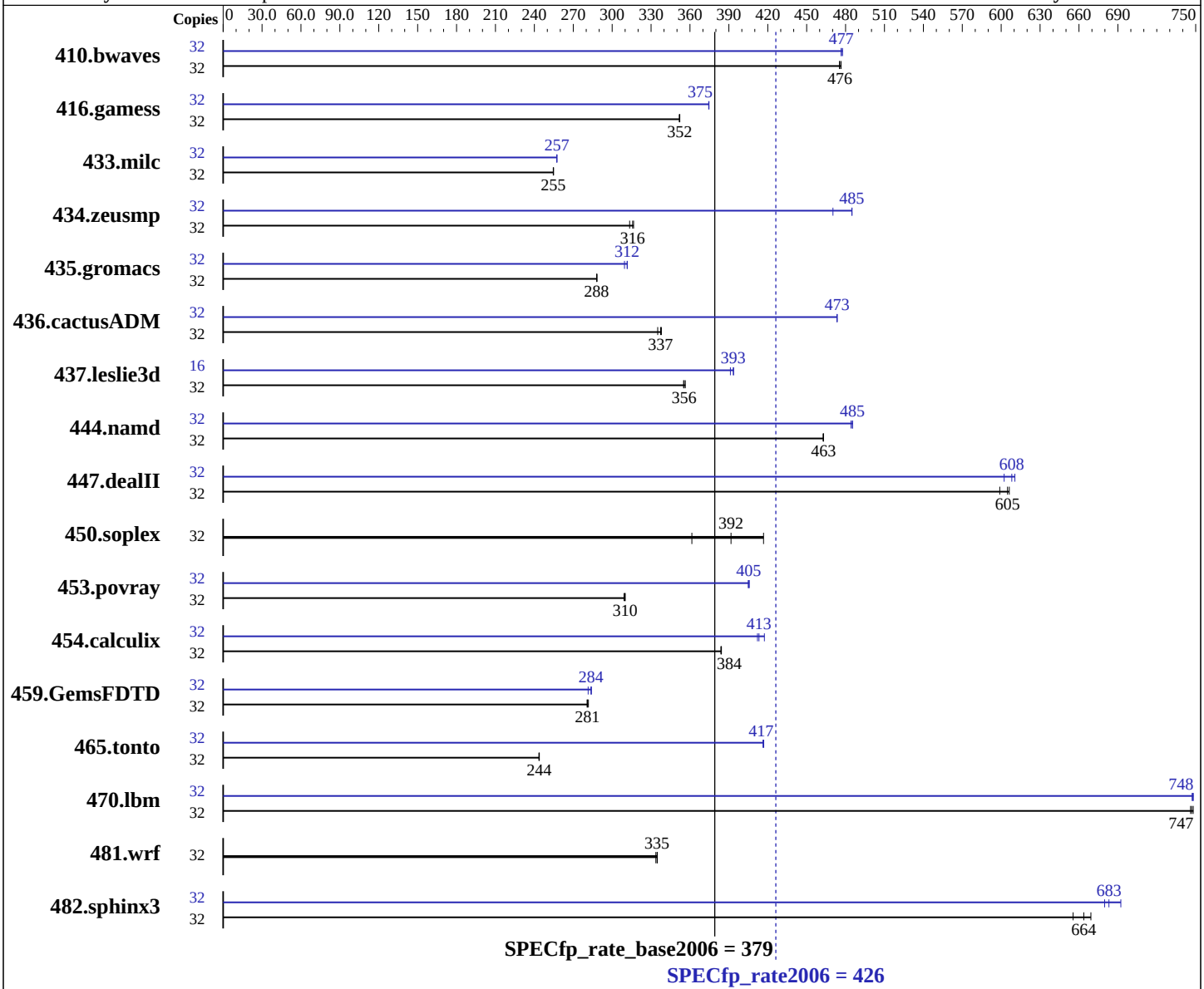
IBM System i 570 (4.7 GHz, 16 core)

SPECfp®_rate2006 = 426

SPECfp_rate_base2006 = 379

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:	16 cores, 8 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: 128 GB (64x2 GB) DDR2 667 MHz
Disk Subsystem: 2x73 GB 2x146 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	32	912	477	**914**	**476**	915	475	32	913	477	**912**	**477**	910	478
416.gamess	32	**1779**	**352**	1779	352	1781	352	32	**1673**	**375**	1673	374	1672	375
433.milc	32	1154	255	**1153**	**255**	1153	255	32	**1142**	**257**	1141	257	1142	257
434.zeusmp	32	929	313	**922**	**316**	920	317	32	**601**	**485**	600	485	619	470
435.gromacs	32	792	288	793	288	**793**	**288**	32	738	310	**733**	**312**	733	312
436.cactusADM	32	1131	338	**1133**	**337**	1141	335	32	**808**	**473**	808	474	808	473
437.leslie3d	32	844	356	847	355	**846**	**356**	16	382	394	**382**	**393**	384	391
444.namd	32	554	463	555	463	**554**	**463**	32	529	485	530	484	**529**	**485**
447.dealII	32	604	606	611	599	**605**	**605**	32	608	602	600	611	**602**	**608**
450.soplex	32	**681**	**392**	738	361	640	417	32	**681**	**392**	738	361	640	417
453.povray	32	**549**	**310**	549	310	551	309	32	**420**	**405**	420	406	420	405
454.calculix	32	**687**	**384**	687	384	688	384	32	**639**	**413**	632	417	641	412
459.GemsFDTD	32	1210	281	1205	282	**1208**	**281**	32	1206	281	**1197**	**284**	1195	284
465.tonto	32	1293	243	1291	244	**1292**	**244**	32	756	416	**756**	**417**	755	417
470.lbm	32	589	746	**589**	**747**	588	748	32	**588**	**748**	588	747	588	748
481.wrf	32	1071	334	1067	335	**1068**	**335**	32	1071	334	1067	335	**1068**	**335**
482.sphinx3	32	**940**	**664**	952	655	932	669	32	917	680	**913**	**683**	901	692

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
6144 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`

Continued on next page

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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Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 12:45:12 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 8 August 2007.