



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

### SPECfp<sup>®</sup>\_rate2006 = 426

## IBM System i 570 (4.7 GHz, 16 core)

### SPECfp\_rate\_base2006 = 379

CPU2006 license: 11

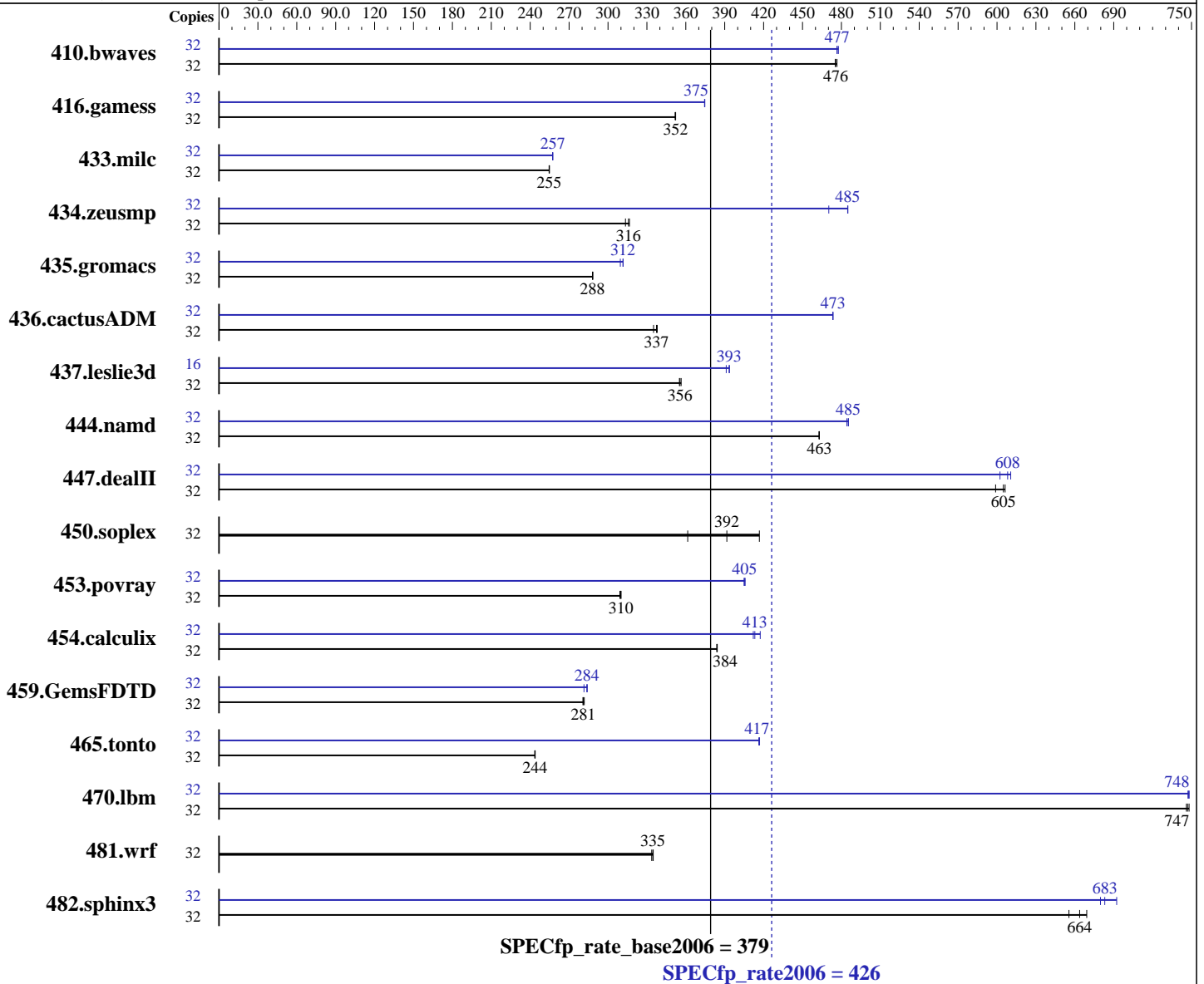
Test date: May-2007

Test sponsor: IBM Corporation

Hardware Availability: Sep-2007

Tested by: IBM Corporation

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

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

Environment variables set before executing benchmarks:

MALLOCOPTIONS=pool

MEMORY\_AFFINITY=MCM

XLFRTEOPTS=intrinths=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 electronically equivalent.

The results have been measured on the "IBM System p 570" model.



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## 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  
-qvecnv1 -D\_ILS\_MACROS -blpdata

### C++ benchmarks:

444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qenablevmx  
-qvecnv1 -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  
-qvecnv1 -D\_ILS\_MACROS -qalign=natural -blpdata

### Fortran benchmarks:

410.bwaves: -O5 -qlargepage -qenablevmx -qvecnv1  
-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  
-qvecnv1 -qxlf90=nosignedzero -blpdata

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

459.GemsFDTD: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qenablevmx  
-qvecnv1 -blpdata

465.tonto: Same as 416.gamess

### Benchmarks using both Fortran and C:

435.gromacs: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qenablevmx  
-qvecnv1 -D\_ILS\_MACROS -blpdata

436.cactusADM: -D\_ILS\_MACROS -blpdata

454.calculix: -O4 -qlargepage -q64 -D\_ILS\_MACROS -blpdata

481.wrf: basepeak = yes



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## 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](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](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.12.xml)



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

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