



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 1200

### IBM Power 750 Express (4.0 GHz, 32 core)

### SPECfp\_rate\_base2006 = 995

CPU2006 license: 11

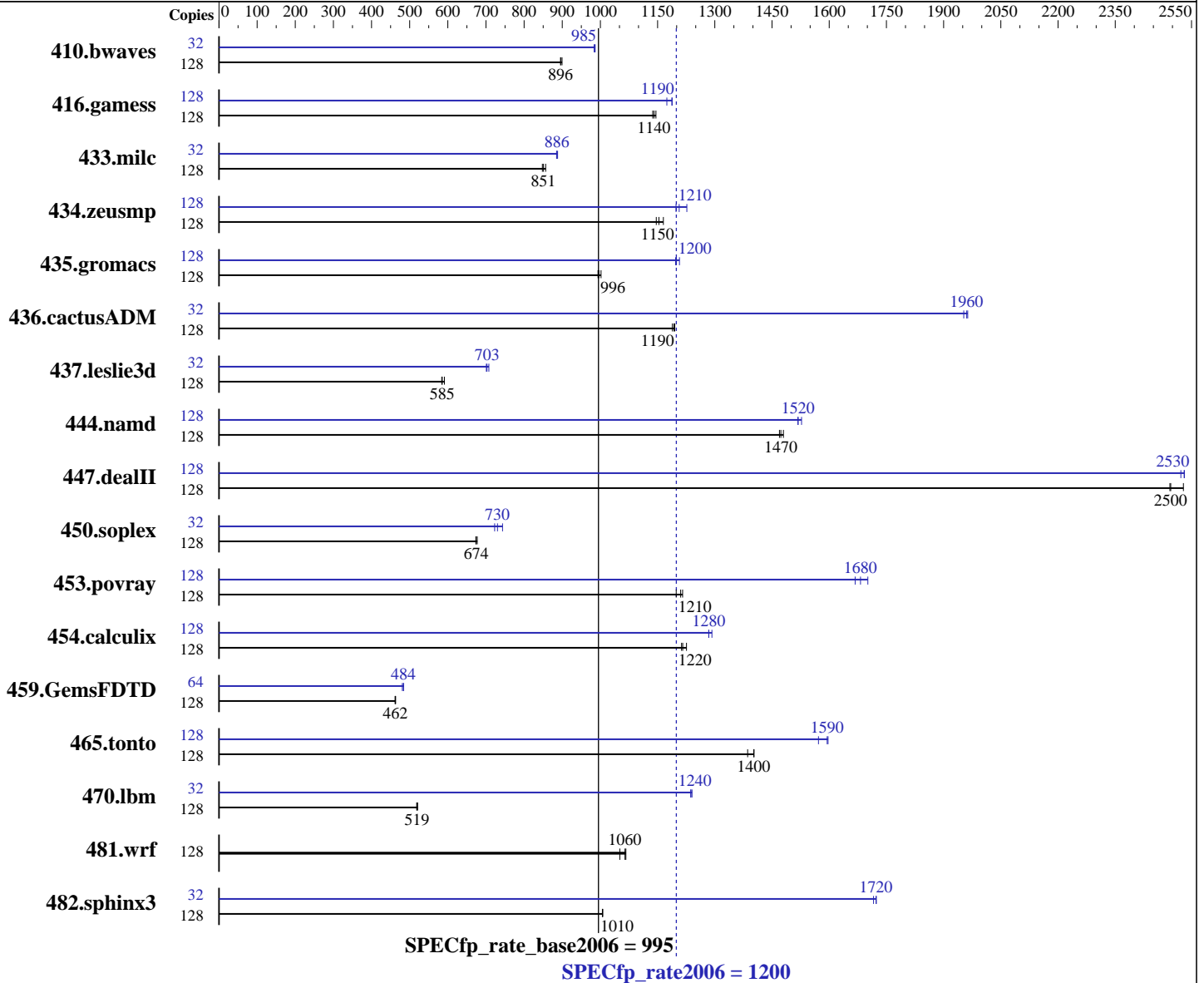
Test date: Jan-2013

Test sponsor: IBM Corporation

Hardware Availability: Mar-2013

Tested by: IBM Corporation

Software Availability: Feb-2013



#### Hardware

CPU Name: POWER7+  
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 4.431 GHz  
 CPU MHz: 4060  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 8 chips, 4 cores/chip, 4 threads/core  
 CPU(s) orderable: 8, 16, 24, 32 cores  
 Primary Cache: 32 KB I + 32 KB D on chip per core

#### Software

Operating System: IBM AIX V7.1  
 Compiler: C/C++: Version 12.1 of IBM XL C/C++ for AIX; Fortran: Version 14.1 of IBM XL Fortran for AIX  
 Auto Parallel: No  
 File System: AIX/JFS2  
 System State: Multi-user  
 Base Pointers: 32-bit  
 Peak Pointers: 32/64-bit  
 Other Software: None

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Secondary Cache: 256 KB I+D on chip per core  
L3 Cache: 10 MB I+D on chip per core  
Other Cache: None  
Memory: 256 GB (64 x 4 GB) DDR3 1066 MHz  
Disk Subsystem: 5 x 300 GB 15K RPM Raid0 SFF SAS  
Other Hardware: None

## Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	128	1934	900	<b><u>1942</u></b>	<b><u>896</u></b>	1942	896	32	441	986	<b><u>442</u></b>	<b><u>985</u></b>	442	984		
416.gamess	128	2188	1150	<b><u>2197</u></b>	<b><u>1140</u></b>	2204	1140	128	2134	1170	<b><u>2111</u></b>	<b><u>1190</u></b>	2109	1190		
433.milc	128	1372	857	1386	848	<b><u>1381</u></b>	<b><u>851</u></b>	32	331	888	<b><u>332</u></b>	<b><u>886</u></b>	332	885		
434.zeusmp	128	1016	1150	<b><u>1010</u></b>	<b><u>1150</u></b>	1000	1170	128	972	1200	949	1230	<b><u>965</u></b>	<b><u>1210</u></b>		
435.gromacs	128	920	994	<b><u>917</u></b>	<b><u>996</u></b>	912	1000	128	<b><u>762</u></b>	<b><u>1200</u></b>	757	1210	763	1200		
436.cactusADM	128	1287	1190	<b><u>1282</u></b>	<b><u>1190</u></b>	1280	1200	32	195	1960	<b><u>195</u></b>	<b><u>1960</u></b>	196	1950		
437.leslie3d	128	2036	591	2060	584	<b><u>2055</u></b>	<b><u>585</u></b>	32	<b><u>428</u></b>	<b><u>703</u></b>	429	701	425	708		
444.namd	128	694	1480	699	1470	<b><u>697</u></b>	<b><u>1470</u></b>	128	<b><u>676</u></b>	<b><u>1520</u></b>	676	1520	672	1530		
447.dealII	128	579	2530	<b><u>587</u></b>	<b><u>2500</u></b>	587	2490	128	578	2530	<b><u>579</u></b>	<b><u>2530</u></b>	581	2520		
450.soplex	128	<b><u>1583</u></b>	<b><u>674</u></b>	1585	673	1577	677	32	359	743	369	723	<b><u>365</u></b>	<b><u>730</u></b>		
453.povray	128	560	1220	<b><u>563</u></b>	<b><u>1210</u></b>	568	1200	128	408	1670	400	1700	<b><u>405</u></b>	<b><u>1680</u></b>		
454.calculix	128	871	1210	<b><u>869</u></b>	<b><u>1220</u></b>	861	1230	128	<b><u>822</u></b>	<b><u>1280</u></b>	822	1280	817	1290		
459.GemsFDTD	128	2941	462	<b><u>2938</u></b>	<b><u>462</u></b>	2932	463	64	1403	484	<b><u>1404</u></b>	<b><u>484</u></b>	1413	481		
465.tonto	128	<b><u>898</u></b>	<b><u>1400</u></b>	898	1400	909	1390	128	789	1600	801	1570	<b><u>790</u></b>	<b><u>1590</u></b>		
470.lbm	128	3377	521	3393	518	<b><u>3386</u></b>	<b><u>519</u></b>	32	<b><u>355</u></b>	<b><u>1240</u></b>	355	1240	354	1240		
481.wrf	128	1360	1050	1340	1070	<b><u>1343</u></b>	<b><u>1060</u></b>	128	1360	1050	1340	1070	<b><u>1343</u></b>	<b><u>1060</u></b>		
482.sphinx3	128	2482	1010	2479	1010	<b><u>2480</u></b>	<b><u>1010</u></b>	32	363	1720	362	1720	<b><u>362</u></b>	<b><u>1720</u></b>		

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

## Compiler Invocation Notes

C/C++ compiler updated to November 2012 PTF  
Version: 12.01.0000.0002  
Fortran compiler updated to November 2012 PTF  
Version: 14.01.0000.0002

## Peak Tuning Notes

416.gamess fdpr options: -O4 -cbpth -1 -sdp -1  
433.milc fdpr options: -O4 -nodp  
435.gromacs fdpr options: -O  
436.cactusADM fdpr options: -O3 -lu -1 -nodp -sdp 9  
437.leslie3d fdpr options: -O3  
450.soplex fdpr options: -O4 -nodp

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## Peak Tuning Notes (Continued)

453.povray fdpr options: -O3 -cbpth -1  
459.GemsFDTD fdpr options: -O3 -cbpth -1  
465.tonto fdpr options: -O4  
482.sphinx3 fdpr options: -O4 -rcctf 0 -sdp 9 -vrox

## Submit Notes

The config file option 'submit' was used to assign benchmark copy to specific kernel thread using the "bindprocessor" command (see flags file for details).

## Operating System Notes

AIX updated to V7.1 TL 2 SP2  
All ulimits set to unlimited.  
12800 16M large pages defined with vmo command

## General Notes

Environment variables set by runspec before the start of the run:  
MALLOCOPTIONS = "pool"  
MEMORY\_AFFINITY = "MCM"  
XLFRTEOPTS = "intrinthds=1"

## 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

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## Base Portability Flags (Continued)

```

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:

```

-qipa=threads -bmaxdata:0x40000000 -qlargepage -O5 -D_ILS_MACROS
-blpdata

```

C++ benchmarks:

```

-qipa=threads -bmaxdata:0x50000000 -qlargepage -O5 -qsimd -qvecnvml
-D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR
-D__IBM_FAST_SET_MAP_ITERATOR -blpdata

```

Fortran benchmarks:

```

-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

```

Benchmarks using both Fortran and C:

```

-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5 -D_ILS_MACROS
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

```

## Base Other Flags

C benchmarks:

```

-qipa=noobject -qsuppress=1500-036

```

C++ benchmarks:

```

-qipa=noobject -qsuppress=1500-036

```

Fortran benchmarks:

```

-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

```

Benchmarks using both Fortran and C:

```

-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

```



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## 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:

```
433.milc: -qipa=threads -bmaxdata:0x40000000 -O5 -qlargepage
-D_ILS_MACROS -qalign=natural -blpdata -btextpsize:64K
```

```
470.lbm: -qipa=threads -bmaxdata:0x30000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -D_ILS_MACROS -blpdata -btextpsize:64K
```

```
482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K
```

C++ benchmarks:

```
444.namd: -qipa=threads -O4 -q64 -qlargepage -D_ILS_MACROS
-D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata
-btextpsize:64K
```

```
447.deallI: -qipa=threads -bmaxdata:0x50000000 -O5 -qsimd -qvecvol
-D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR
-D__IBM_FAST_SET_MAP_ITERATOR -blpdata -btextpsize:64K
```

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## Peak Optimization Flags (Continued)

450.soplex: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)  
-qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -D\_ILS\_MACROS  
-D\_\_IBM\_FAST\_VECTOR -D\_\_IBM\_FAST\_SET\_MAP\_ITERATOR -blpdata  
-btextpsize:64K

453.povray: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd  
-qvecnv1 -qlargepage -D\_ILS\_MACROS -qalign=natural  
-blpdata -btextpsize:64K

### Fortran benchmarks:

410.bwaves: -qipa=threads -bmaxdata:0x50000000 -O5 -qlargepage  
-qsmallstack=dynlenonheap -blpdata -btextpsize:64K

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)  
-qpdf2(pass 2) -O5 -qarch=pwr5 -qlargepage -qalias=nostd  
-blpdata -btextpsize:64K

434.zeusmp: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3  
-qarch=auto -qtune=auto -qlargepage -qxlf90=nosignedzero  
-blpdata -btextpsize:64K

437.leslie3d: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -blpdata  
-btextpsize:64K

459.GemsFDTD: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -q64 -qlargepage  
-blpdata -btextpsize:64K

465.tonto: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)  
-qpdf2(pass 2) -O5 -qsimd -qvecnv1 -blpdata  
-btextpsize:64K

### Benchmarks using both Fortran and C:

435.gromacs: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5  
-D\_ILS\_MACROS -blpdata -btextpsize:64K

436.cactusADM: -qipa=threads -bmaxdata:0x60000000 -O4 -qsimd -qvecnv1  
-D\_ILS\_MACROS -qnostrict -blpdata -btextpsize:64K

454.calculix: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd  
-qvecnv1 -qlargepage -D\_ILS\_MACROS -blpdata  
-btextpsize:64K

481.wrf: basepeak = yes



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## Peak Other Flags

C benchmarks:

-qipa=noobject -qsuppress=1500-036

C++ benchmarks (except as noted below):

-qipa=noobject -qsuppress=1500-036

450.soplex: -qsuppress=1500-036

Fortran benchmarks (except as noted below):

-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg  
-qsuppress=1500-036

434.zeusmp: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

Benchmarks using both Fortran and C:

-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg  
-qsuppress=1500-036

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/IBM-XL.20110613.html>

<http://www.spec.org/cpu2006/flags/IBM-AIX.20110613.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/IBM-XL.20110613.xml>

<http://www.spec.org/cpu2006/flags/IBM-AIX.20110613.xml>

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

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