



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]_rate2006 = 481

IBM Power 740 Express (3.55 GHz, 16 core)

SPECfp_rate_base2006 = 450

CPU2006 license: 11

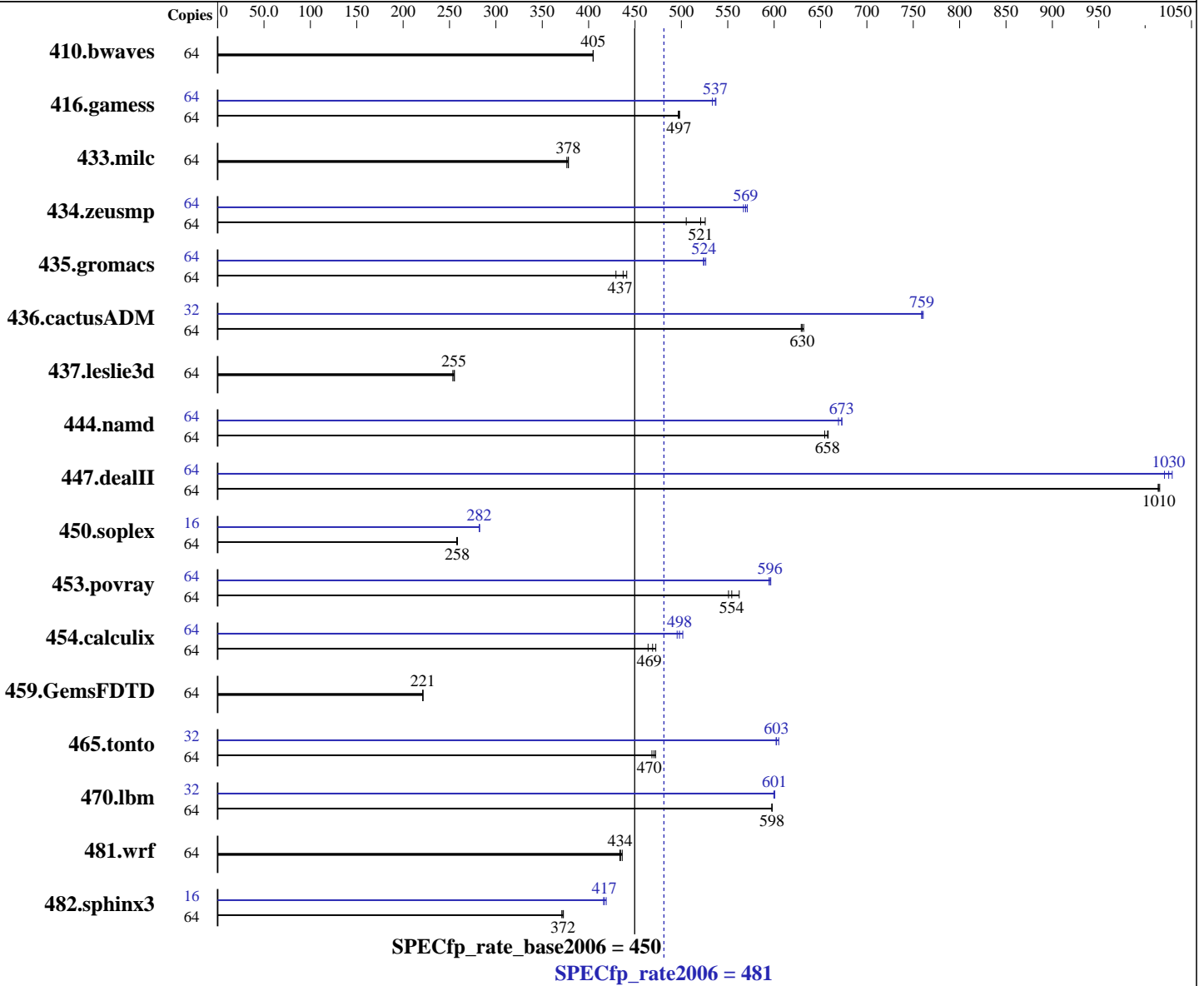
Test date: Aug-2010

Test sponsor: IBM Corporation

Hardware Availability: Sep-2010

Tested by: IBM Corporation

Software Availability: Sep-2010



Hardware

CPU Name: POWER7
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.86 GHz
 CPU MHz: 3556
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 4 threads/core
 CPU(s) orderable: 16 cores
 Primary Cache: 32 KB I + 32 KB D on chip per core

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Software

Operating System: IBM AIX V7.1
 Compiler: IBM XL C/C++ for AIX, V11.1
 Version: 11.01.0000.0002
 IBM XL Fortran for AIX, V13.1
 Version: 13.01.0000.0002
 Auto Parallel: No
 File System: AIX/JFS2
 System State: Multi-user

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Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 4 MB I+D on chip per core
 Other Cache: None
 Memory: 256 GB (32x8 GB) DDR3 1066 MHz
 Disk Subsystem: 2x146.8 GB SAS SFF 15K RPM
 Other Hardware: None

Base Pointers: 32-bit
 Peak Pointers: 32/64-bit
 Other Software: None

Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	64	2148	405	2148	405	2148	405	64	2148	405	2148	405	2148	405		
416.gamess	64	2519	497	2523	497	2516	498	64	2335	537	2333	537	2349	533		
433.milc	64	1561	376	1553	378	1554	378	64	1561	376	1553	378	1554	378		
434.zeusmp	64	1108	526	1153	505	1118	521	64	1027	567	1020	571	1023	569		
435.gromacs	64	1045	437	1036	441	1064	429	64	871	524	868	526	872	524		
436.cactusADM	64	1216	629	1213	630	1210	632	32	504	759	503	761	504	759		
437.leslie3d	64	2361	255	2356	255	2372	254	64	2361	255	2356	255	2372	254		
444.namd	64	781	658	780	658	784	655	64	763	673	767	669	763	673		
447.dealII	64	722	1010	722	1010	721	1020	64	717	1020	714	1030	711	1030		
450.soplex	64	2071	258	2065	259	2065	258	16	472	282	473	282	473	282		
453.povray	64	614	554	605	562	618	551	64	572	596	573	595	571	596		
454.calculix	64	1126	469	1118	472	1138	464	64	1053	502	1060	498	1066	495		
459.GemsFDTD	64	3070	221	3068	221	3069	221	64	3070	221	3068	221	3069	221		
465.tonto	64	1345	468	1334	472	1339	470	32	523	602	523	603	520	605		
470.lbm	64	1470	598	1472	597	1471	598	32	733	600	732	601	732	601		
481.wrf	64	1646	434	1648	434	1639	436	64	1646	434	1648	434	1639	436		
482.sphinx3	64	3346	373	3351	372	3362	371	16	748	417	749	416	744	419		

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

Peak Tuning Notes

fdpr binary optimization tool used for:
 450.soplex 470.lbm
 with options -O4 -sdp 9 -vrox -kr -m power7
 fdpr binary optimization tool used for:
 435.gromacs 444.namd
 with options -O3 -lu -1 -nodp -sdp 9 -m power7
 fdpr binary optimization tool used for 434.zeusmp
 with options -RD -O4 -sdp 9 -vrox -nodp -m power7
 fdpr binary optimization tool used for 436.cactusADM
 with options -O3 -m power7
 fdpr binary optimization tool used for:
 453.povray 454.calculix
 with options -O4 -sdp 9 -vrox -rtb -nodp -m power7

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Peak Tuning Notes (Continued)

fdpr binary optimization tool used for 447.dealII
with options -O4 -sdp 9 -vrox -m power7 -RD -dp
fdpr binary optimization tool used for 482.sphinx3
with options -O4 -nodp -m power7 -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

Environment variables set by runspec before the start of the run:

```
MALLOCOPTIONS = "pool"
MEMORY_AFFINITY = "MCM"
XLFRTEOPTS = "intrinthds=1"
```

All ulimits set to unlimited.
12800 16M large pages defined with vmo command

See the flags file for details on settings.

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
```

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Base Portability Flags (Continued)

454.calculix: -qfixed -qextname
481.wrf: -DSPEC_CPU_AIX -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Base Optimization Flags

C benchmarks:

-qipa=threads -bmaxdata:0x40000000 -O5 -qlargepage -O4 -D_ILS_MACROS
-blpdata

C++ benchmarks:

-qipa=threads -bmaxdata:0x50000000 -O5 -qlargepage -O4 -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata

Fortran benchmarks:

-qipa=threads -bmaxdata:0x60000000 -O5 -qlargepage -O4
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

Benchmarks using both Fortran and C:

-qipa=threads -bmaxdata:0x60000000 -O5 -qlargepage -O4 -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

Peak Compiler Invocation

C benchmarks:

/usr/vac/bin/xlc -qlanglvl=extc99

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Peak Compiler Invocation (Continued)

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 -DSPEC_CPU_LP64
 437.leslie3d: -qfixed
 454.calculix: -qfixed -qextname
 481.wrf: -DSPEC_CPU_AIX -DNOUNDERSCORE
 482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

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

482.sphinx3: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4
-qlargepage -D_ILS_MACROS -bdatapsize:64K -bstackpsize:64K
-btextpsize:64K

C++ benchmarks:

444.namd: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd
-qvecnv01 -qlargepage -D_ILS_MACROS -bdatapsize:64K
-bstackpsize:64K -btextpsize:64K

447.dealIII: -qipa=threads -bmaxdata:0x50000000 -O4 -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: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3
-qarch=auto -qtune=auto -q64 -qlargepage -D_ILS_MACROS
-blpdata -btextpsize:64K

453.povray: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64
-qsimd -qvecnvml -qlargepage -D_ILS_MACROS -qalign=natural
-blpdata -btextpsize:64K

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -qsimd -qvecnvml -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: basepeak = yes

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd
-qvecnvml -D_ILS_MACROS -bdatapsize:64K -bstackpsize:64K
-btextpsize:64K

436.cactusADM: -qipa=threads -O4 -q64 -qsimd -qvecnvml -D_ILS_MACROS
-qnostrict -blpdata -btextpsize:64K

454.calculix: -qipa=threads -O5 -qsimd -qvecnvml -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K

481.wrf: basepeak = yes

Peak Other Flags

C benchmarks (except as noted below):

-qipa=noobject -qsuppress=1500-036

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Peak Other Flags (Continued)

470.lbm: -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.20100901.html>

<http://www.spec.org/cpu2006/flags/IBM-AIX.20100303.html>

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

<http://www.spec.org/cpu2006/flags/IBM-XL.20100901.xml>

<http://www.spec.org/cpu2006/flags/IBM-AIX.20100303.xml>

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For other inquiries, please contact webmaster@spec.org.

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