SPEC® CFP2006 Result

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IBM Corporation

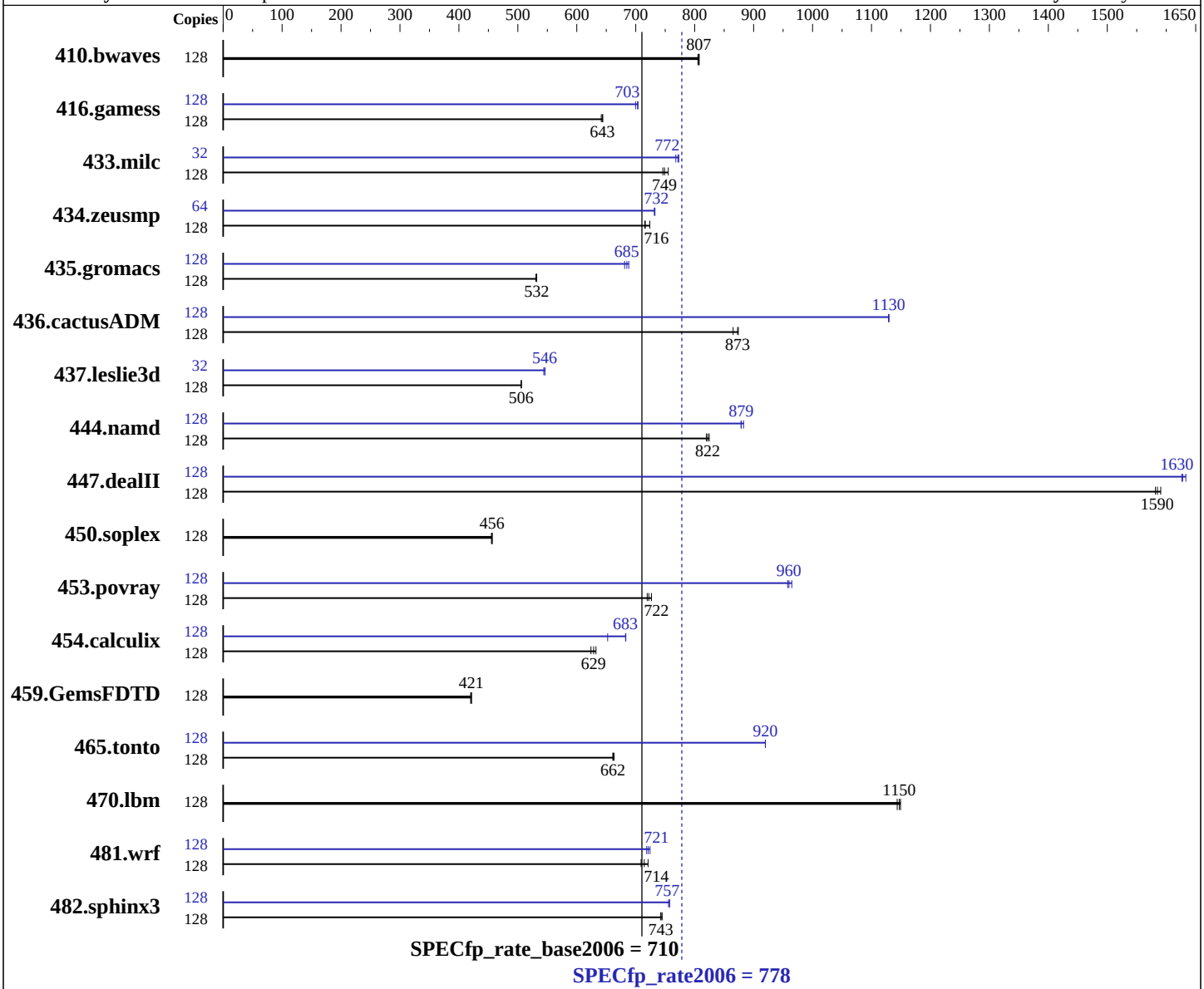
IBM BladeCenter PS704 Express (2.46 GHz, 32 core)

SPECfp®_rate2006 = 778

SPECfp_rate_base2006 = 710

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

Test date: Mar-2011
Hardware Availability: May-2011
Software Availability: May-2011



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization not enabled.
CPU MHz:	2464
FPU:	Integrated
CPU(s) enabled:	32 cores, 4 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	32 cores
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

Continued on next page

Software

Operating System:	IBM AIX V7.1 with Service Pack 3
Compiler:	IBM XL C/C++ for AIX, V11.1 Version: 11.01.0000.0005 IBM XL Fortran for AIX, V13.1 Version: 13.01.0000.0005
Auto Parallel:	No
File System:	AIX/JFS2

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L3 Cache: 4 MB I+D on chip per core
Other Cache: None
Memory: 256 GB (32 x 8 GB) DDR3 1066 MHz
Disk Subsystem: 1 x 600 GB SAS SFF 10K RPM
Other Hardware: Installed in BladeCenter H

System State: Multi-user
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	128	2154	808	2160	805	**2155**	**807**	128	2154	808	2160	805	**2155**	**807**
416.gamess	128	3907	641	**3896**	**643**	3891	644	128	3582	700	3561	704	**3565**	**703**
433.milc	128	1556	755	**1569**	**749**	1575	746	32	**381**	**772**	380	773	382	768
434.zeusmp	128	**1626**	**716**	1609	724	1628	715	64	796	732	**795**	**732**	795	733
435.gromacs	128	1723	530	1718	532	**1718**	**532**	128	1342	681	1328	688	**1334**	**685**
436.cactusADM	128	1750	874	**1752**	**873**	1768	865	128	**1355**	**1130**	1355	1130	1354	1130
437.leslie3d	128	**2379**	**506**	2378	506	2380	506	32	**551**	**546**	551	546	553	544
444.namd	128	1245	825	**1249**	**822**	1252	820	128	1163	883	1168	879	**1168**	**879**
447.dealII	128	926	1580	**924**	**1590**	921	1590	128	897	1630	900	1630	**899**	**1630**
450.soplex	128	2345	455	**2340**	**456**	2338	457	128	2345	455	**2340**	**456**	2338	457
453.povray	128	**943**	**722**	947	719	937	727	128	**709**	**960**	706	965	711	958
454.calculix	128	**1680**	**629**	1692	624	1669	633	128	1619	652	**1547**	**683**	1546	683
459.GemsFDTD	128	**3225**	**421**	3223	421	3234	420	128	**3225**	**421**	3223	421	3234	420
465.tonto	128	**1904**	**662**	1899	663	1905	661	128	**1369**	**920**	1369	920	1369	920
470.lbm	128	1530	1150	**1533**	**1150**	1538	1140	128	1530	1150	**1533**	**1150**	1538	1140
481.wrf	128	2016	709	**2001**	**714**	1983	721	128	1990	718	1974	724	**1982**	**721**
482.sphinx3	128	**3359**	**743**	3360	743	3349	745	128	3293	758	3302	755	**3294**	**757**

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:
 433.milc with options:
  -O4 -nodp -m power7
 434.zeusmp with options:
  -O4 -vrox -nodp -m power7
 436.cactusADM 450.soplex with options:
  -O3 -lu -1 -nodp -sdp 9 -m power7
 437.leslie3d with options:
  -O4 -vrox -m power7
 465.tonto with options:
  -O4 -m power7
 482.sphinx3 with options:
  -O4 -sdp 9 -vrox -m power7
```

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

```
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`
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 -qvecnvol
-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
```

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 -qrestrict -qprefetch=aggressive
-qalign=natural -blpdata -btextpsize:64K

470.lbm: basepeak = yes

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

C++ benchmarks:

444.namd: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64
-qsimd -qvecnvol -qlargepage -D_ILS_MACROS -blpdata
-btextpsize:64K

447.dealII: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O4 -qsimd -qvecnvol -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR
-blpdata -btextpsize:64K

450.soplex: basepeak = yes

453.povray: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd
-qvecnvol -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 -qarch=pwr5 -qlargepage -qalias=nostd
-blpdata -btextpsize:64K

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Peak Optimization Flags (Continued)

434.zeusmp: -bmaxdata:0x40000000 -O3 -qarch=auto -qtune=auto
-qlargepage -qxlf90=nosignedzero -blpdata -btextpsize:64K

437.leslie3d: -O5 -q64 -blpdata -btextpsize:64K

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

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

436.cactusADM: -qipa=threads -bmaxdata:0x60000000 -O4 -qsimd -qvecnvol
-D_ILS_MACROS -qnostrict -blpdata -btextpsize:64K

454.calculix: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd
-qvecnvol -qlargepage -D_ILS_MACROS -blpdata
-btextpsize:64K

481.wrf: -bmaxdata:0x30000000 -O3 -qarch=auto -qtune=auto
-D_ILS_MACROS -blpdata -btextpsize:64K

Peak Other Flags

C benchmarks:
-qipa=noobject -qsuppress=1500-036

C++ benchmarks:
-qipa=noobject -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

437.leslie3d: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

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

481.wrf: -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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