SPEC® CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

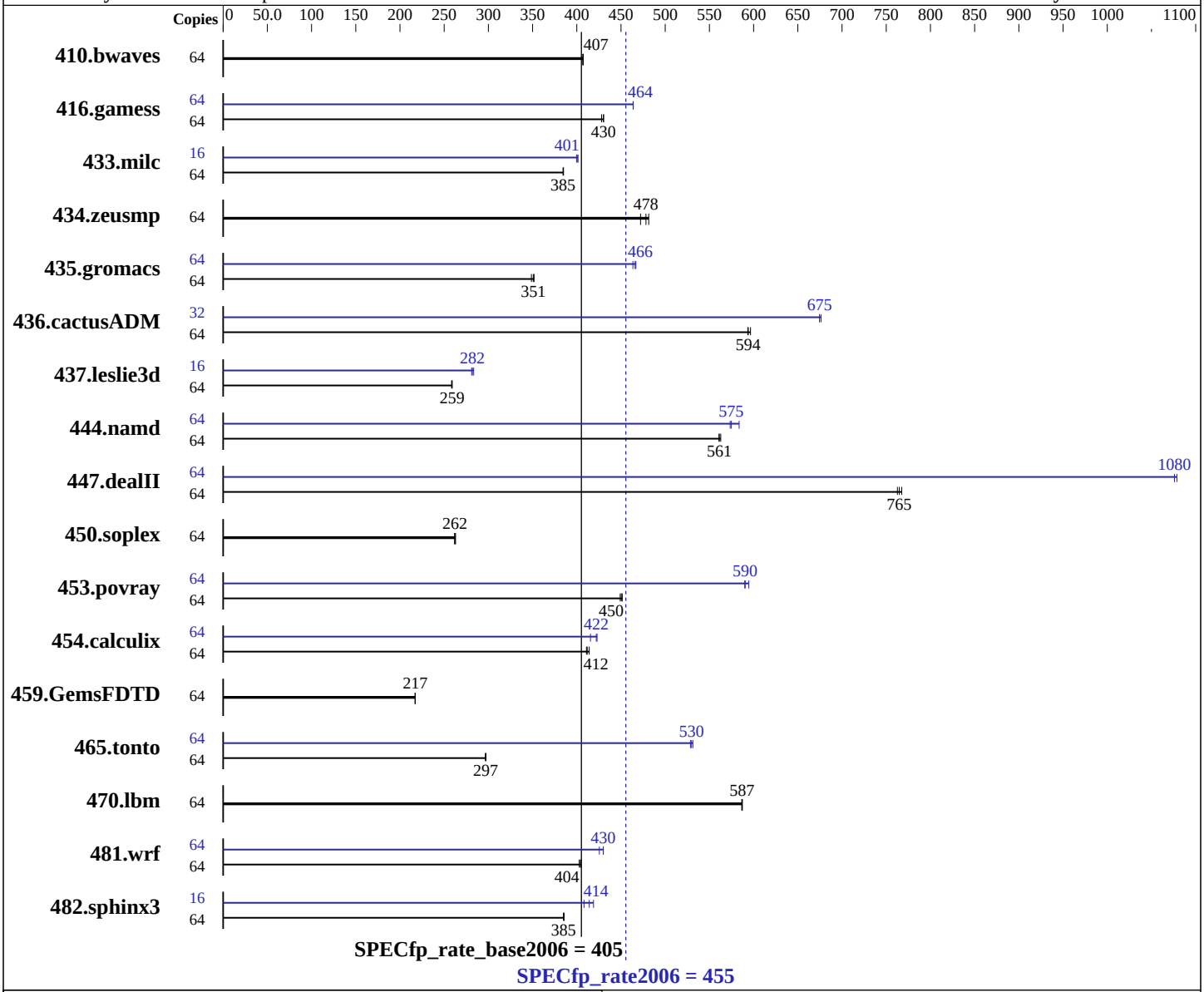
IBM BladeCenter PS702 Express (3.0 GHz, 16 core, RedHat)

SPECfp®_rate2006 = 455

SPECfp_rate_base2006 = 405

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

Test date: Oct-2010
Hardware Availability: Jun-2010
Software Availability: Nov-2010



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.30 GHz
CPU MHz:	3000
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

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.0 (ppc64), Kernel 2.6.32-71.el6.ppc64
Compiler:	IBM XL C/C++ for Linux, V11.1 Updated with the Nov2010 PTF IBM XL Fortran for Linux, V13.1 Updated with the Nov2010 PTF
Auto Parallel:	No
File System:	ext3
System State:	Run Level 3 (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:	128 GB (32x4 GB) DDR3 1066 MHz
Disk Subsystem:	1x300 GB SAS SFF 10K RPM
Other Hardware:	None

Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	-Post-Link Optimization for Linux on POWER, Version 5.5.0-3 -MicroQuill SmartHeap 9 -Apache C++ Standard Library 4.2.1

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	**2135**	**407**	2135	407	2139	407	64	**2135**	**407**	2135	407	2139	407
416.gamess	64	**2913**	**430**	2928	428	2912	430	64	2702	464	**2702**	**464**	2701	464
433.milc	64	1526	385	1528	385	**1528**	**385**	16	366	401	367	400	**366**	**401**
434.zeusmp	64	**1218**	**478**	1234	472	1210	481	64	**1218**	**478**	1234	472	1210	481
435.gromacs	64	**1303**	**351**	1299	352	1311	349	64	979	467	**981**	**466**	986	463
436.cactusADM	64	1282	597	**1288**	**594**	1289	593	32	565	676	567	674	**567**	**675**
437.leslie3d	64	2329	258	**2323**	**259**	2323	259	16	**533**	**282**	535	281	531	283
444.namd	64	915	561	**915**	**561**	912	563	64	895	573	**893**	**575**	879	584
447.dealII	64	**957**	**765**	960	763	954	768	64	679	1080	**680**	**1080**	680	1080
450.soplex	64	2030	263	**2036**	**262**	2039	262	64	2030	263	**2036**	**262**	2039	262
453.povray	64	758	449	754	451	**756**	**450**	64	**577**	**590**	577	590	573	595
454.calculix	64	1285	411	**1282**	**412**	1275	414	64	**1251**	**422**	1248	423	1271	415
459.GemsFDTD	64	3125	217	3128	217	**3125**	**217**	64	3125	217	3128	217	**3125**	**217**
465.tonto	64	**2120**	**297**	2123	297	2119	297	64	1185	531	**1189**	**530**	1191	529
470.lbm	64	**1498**	**587**	1499	587	1497	587	64	**1498**	**587**	1499	587	1497	587
481.wrf	64	**1769**	**404**	1775	403	1767	405	64	1680	425	**1663**	**430**	1662	430
482.sphinx3	64	3240	385	3235	386	**3238**	**385**	16	764	408	**753**	**414**	744	419

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

Peak Tuning Notes

```
IBM Post-Link Optimization tool with
options "-O4 -nodp" used for
  433.milc 435.gromacs 450.soplex 482.sphinx3
options "-O4 -vrox -nodp" used for
  434.zeusmp
options "-O3 -lu -1 -nodp -sdp 9"  used for
  437.leslie3d 444.namd
options "-O4"  used for
  465.tonto
```

Submit Notes

```
The config file option 'submit' was used.
 Benchmarks bound to a processor using numactl on the submit command.
```

Operating System Notes

```
ulimit -s (stack) set to 1048576.
Large pages reserved as follows by root user:
  echo 4224 > /proc/sys/vm/nr_hugepages
The following environment varibles were set before the runspec command:
  XLFRTEOPTS=intrinthds=1
  HUGETLB_VERBOSE=0
  HUGETLB_MORECORE=yes
  HUGETLB_ELFMAP=RW
447.dealII (peak): "apache_stdcxx_4_2_1" src.alt was used.
447.dealII (base): "apache_stdcxx_4_2_1" src.alt was used.
```

Base Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

Fortran benchmarks:
```
xlf95
```

Benchmarks using both Fortran and C:
```
xlc -qlanglvl=extc99 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: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Base Optimization Flags

C benchmarks:
```
-O5 -qarch=pwr7 -qtune=pwr7 -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-align
```

C++ benchmarks:
```
-O5 -qarch=pwr7 -qtune=pwr7 -qrtti -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-align
```

Fortran benchmarks:
```
-O5 -qarch=pwr7 -qtune=pwr7 -qsmallstack=dynlenonheap -qalias=nostd
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
```

Benchmarks using both Fortran and C:
```
-O5 -qarch=pwr7 -qtune=pwr7 -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-align -qsmallstack=dynlenonheap -qalias=nostd
```

Base Other Flags

C benchmarks:
```
-qipa=threads
```

C++ benchmarks:
```
-qipa=threads
```

Fortran benchmarks:
```
-qipa=threads
```

Benchmarks using both Fortran and C:
```
-qipa=threads
```

Peak Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

Fortran benchmarks:
```
xlf95
```

Benchmarks using both Fortran and C:
```
xlc -qlanglvl=extc99 xlf95
```

Peak Portability Flags

410.bwaves: -qfixed
416.gamess: -qfixed
434.zeusmp: -qfixed
435.gromacs: -qfixed -qextname
436.cactusADM: -DSPEC_CPU_LP64 -qfixed -qextname
437.leslie3d: -qfixed
453.povray: -DSPEC_CPU_LP64
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: -Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs

470.lbm: basepeak = yes

482.sphinx3: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7
-qtune=pwr7 -lhugetlbfs

C++ benchmarks:

444.namd: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7
-qtune=pwr7 -lhugetlbfs

447.dealII: -O4 -qarch=pwr7 -qtune=pwr7 -qrtti
-qcpp_stdinc=/autobench/sources/stdcxx-4.2.1/dist/include/ansi:/autobench/sources/stdcxx-4.2.1/dist/include:/opt/ibmcmp/vacpp/11.1/incl
-lsmartheap -L/autobench/sources/stdcxx-4.2.1/dist/lib
-R/autobench/sources/stdcxx-4.2.1/dist/lib -lstd8d

450.soplex: basepeak = yes

453.povray: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7
-qtune=pwr7 -qsimd -q64 -lsmartheap64

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7
-qalias=nostd -lhugetlbfs

434.zeusmp: basepeak = yes

437.leslie3d: -Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -q64
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

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Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

465.tonto: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -qsimd -lhugetlbfs

Benchmarks using both Fortran and C:

435.gromacs: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7 -qtune=pwr7 -qsimd -lhugetlbfs

436.cactusADM: -O4 -qarch=pwr7 -qtune=pwr7 -qsimd -qnostrict -q64 -lhugetlbfs

454.calculix: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

481.wrf: -O3 -qarch=pwr7 -qtune=pwr7 -q64 -lhugetlbfs

Peak Other Flags

C benchmarks:
-qipa=threads

C++ benchmarks:
-qipa=threads

Fortran benchmarks:
-qipa=threads

Benchmarks using both Fortran and C (except as noted below):
-qipa=threads

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20101123.01.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20101123.01.xml

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