SPEC® CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

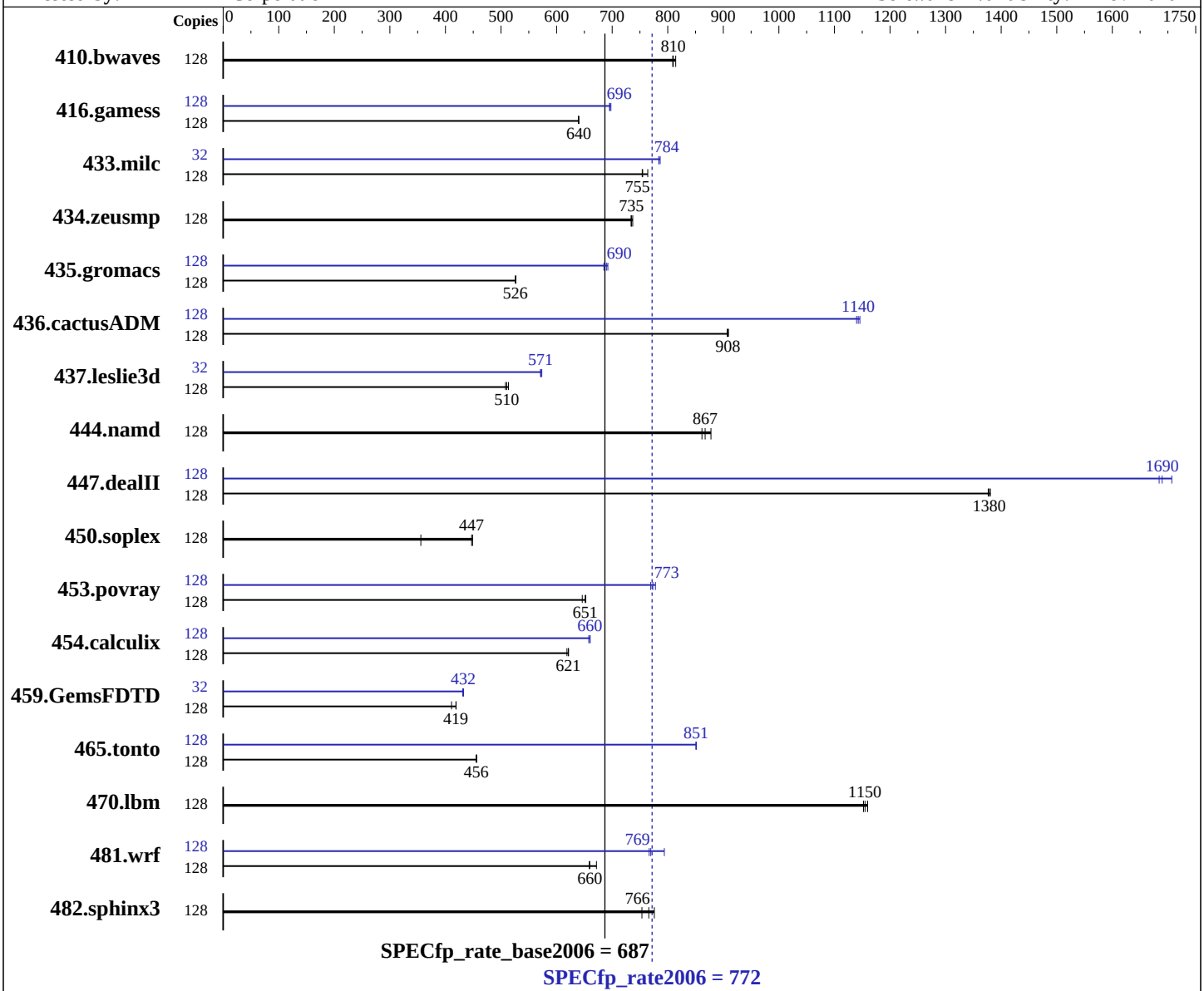
IBM BladeCenter PS704 Express (2.46 GHz, 32 core, RedHat)

SPECfp®_rate2006 = 772

SPECfp_rate_base2006 = 687

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

Test date: Apr-2011
Hardware Availability: May-2011
Software Availability: Nov-2010



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

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 Version: 11.01.0000.0001 IBM XL Fortran for Linux, V13.1 Version: 13.01.0000.0001
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:	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

Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	-Post-Link Optimization for Linux on POWER, Version 5.6.0-2 -MicroQuill SmartHeap 9 -Apache C++ Standard Library V4.2.1

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	2136	814	**2147**	**810**	2150	809	128	2136	814	**2147**	**810**	2150	809
416.gamess	128	**3917**	**640**	3921	639	3916	640	128	3604	695	3592	698	**3603**	**696**
433.milc	128	1538	764	**1557**	**755**	1558	754	32	374	786	375	784	**375**	**784**
434.zeusmp	128	1587	734	**1585**	**735**	1580	737	128	1587	734	**1585**	**735**	1580	737
435.gromacs	128	**1738**	**526**	1735	527	1738	526	128	1334	685	**1325**	**690**	1320	692
436.cactusADM	128	1687	907	1682	909	**1684**	**908**	128	1342	1140	**1339**	**1140**	1335	1150
437.leslie3d	128	2344	513	2368	508	**2358**	**510**	32	525	573	**526**	**571**	527	571
444.namd	128	**1184**	**867**	1192	862	1169	878	128	**1184**	**867**	1192	862	1169	878
447.dealII	128	**1062**	**1380**	1061	1380	1064	1380	128	858	1710	869	1680	**867**	**1690**
450.soplex	128	**2388**	**447**	3001	356	2378	449	128	**2388**	**447**	3001	356	2378	449
453.povray	128	1054	646	1043	653	**1045**	**651**	128	**881**	**773**	885	769	875	778
454.calculix	128	1707	619	**1700**	**621**	1699	622	128	1599	660	**1600**	**660**	1605	658
459.GemsFDTD	128	3305	411	3239	419	**3243**	**419**	32	**786**	**432**	785	433	788	431
465.tonto	128	2766	455	2760	456	**2765**	**456**	128	1479	851	1480	851	**1480**	**851**
470.lbm	128	1516	1160	**1523**	**1150**	1526	1150	128	1516	1160	**1523**	**1150**	1526	1150
481.wrf	128	2170	659	**2167**	**660**	2129	672	128	1865	767	**1858**	**769**	1801	794
482.sphinx3	128	**3257**	**766**	3311	754	3215	776	128	**3257**	**766**	3311	754	3215	776

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 -nodp -m power7" used for
  434.zeusmp
options "-O3 -lu -1 -nodp -sdp 9 -m power7" used for
  436.cactusADM
options "-O3 -lu -1 -nodp -sdp 9" used for
  437.leslied 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.

The Apache C++ Standard Library V4.2.1 was installed from
http://stdcxx.apache.org/download.html using:
    gmake BUILDTYPE=8d CONFIG=gcc.config
```

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 -qipa=threads -B/usr/share/libhugetlbfs/
-tl -Wl,--hugetlbfs-align
```

C++ benchmarks:
```
-O4 -qsimd -qrtti -lhugetlbfs -lsmartheap
```

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

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

Base Other Flags

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

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`

Continued on next page

Peak Portability Flags (Continued)

434.zeusmp: -qfixed
435.gromacs: -qfixed -qextname
436.cactusADM: -DSPEC_CPU_LP64 -qfixed -qextname
437.leslie3d: -qfixed
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 -qipa=threads -lhugetlbfs

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: basepeak = yes

447.dealII: -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -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: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsimd -lsmartheap

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

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

459.GemsFDTD: -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsimd -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

Continued on next page

Peak Optimization Flags (Continued)

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

Benchmarks using both Fortran and C:

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

436.cactusADM: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qnostrict -qsimd -q64 -lhugetlbfs`

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

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

Peak Other Flags

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20110426.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20110426.xml`

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Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 18:42:14 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 26 April 2011.