SPEC® CINT2006 Result

Copyright 2006-2015 Standard Performance Evaluation Corporation

IBM Corporation

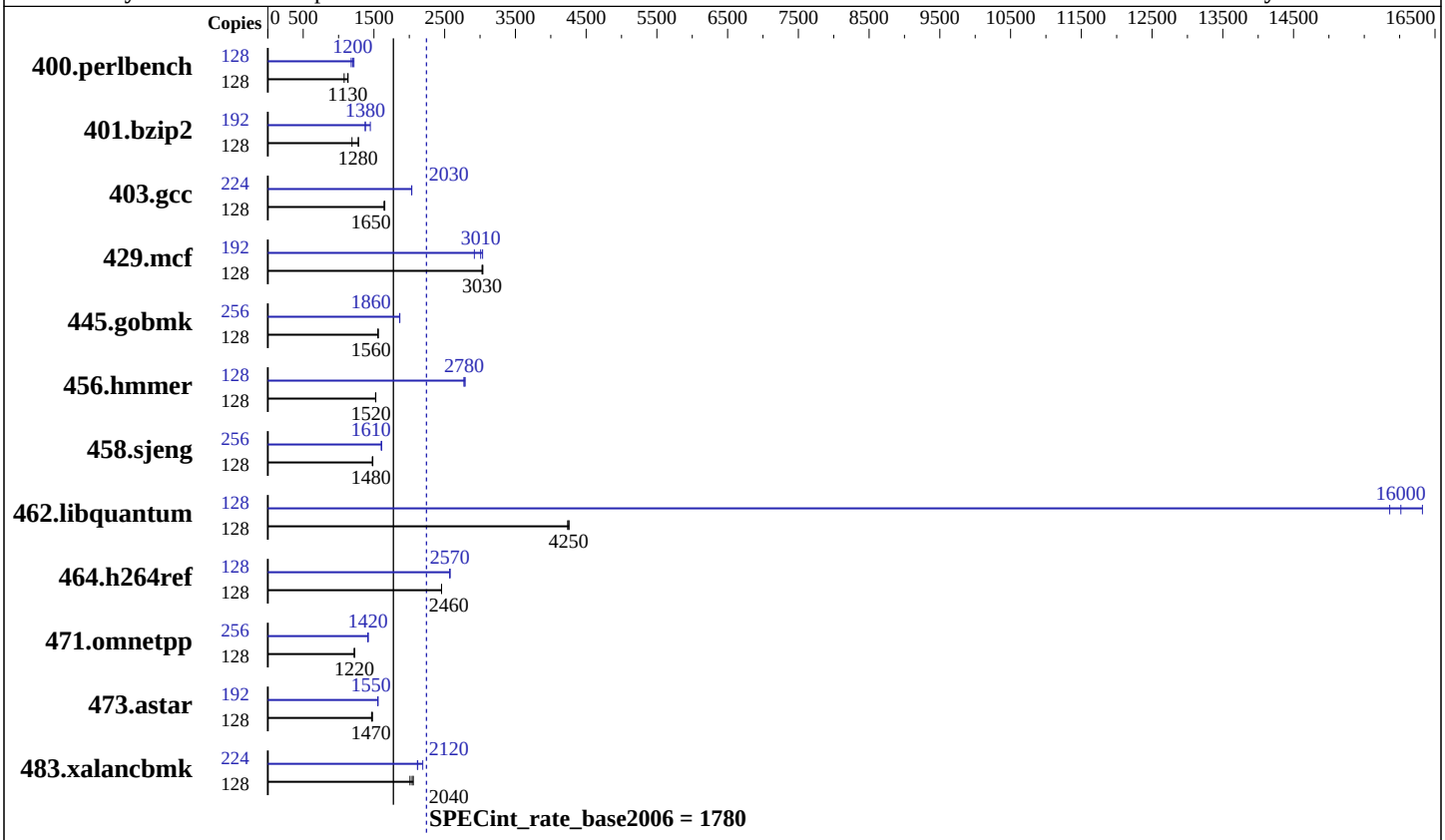
IBM Power E850 (3.72 GHz, 32 core, RHEL)

SPECint®_rate2006 = 2240

SPECint_rate_base2006 = 1780

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

Test date: May-2015
Hardware Availability: Jun-2015
Software Availability: Mar-2015



Hardware

CPU Name:	POWER8
CPU Characteristics:	Intelligent Energy Optimization not available.
CPU MHz:	3724
FPU:	Integrated
CPU(s) enabled:	32 cores, 8 chips, 4 cores/chip, 8 threads/core
CPU(s) orderable:	4 DCM Modules
Primary Cache:	32 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	8 MB I+D on chip per core
Other Cache:	16 MB I+D off chip per CDIMM
Memory:	500 GB (32 x 16 GB CDIMMs) DDR3 1600 MHz
Disk Subsystem:	2 x 600 GB 15K RPM SAS SFF-2 Raid5
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 7.1 (ppc64) kernel 3.10.0-229.4.2.el7.ppc64
Compiler:	C/C++: Version 13.1 of IBM XL C/C++ for Linux
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Post-Link Optimization for Linux on POWER, version 5.7.0 IBM Advance Toolchain 7.0-3

SPEC CINT2006 Result

Copyright 2006-2015 Standard Performance Evaluation Corporation

IBM Corporation

IBM Power E850 (3.72 GHz, 32 core, RHEL)

SPECint_rate2006 = 2240

SPECint_rate_base2006 = 1780

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

Test date: May-2015
Hardware Availability: Jun-2015
Software Availability: Mar-2015

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	128	1159	1080	1103	1130	**1105**	**1130**	128	1061	1180	**1042**	**1200**	1027	1220
401.bzip2	128	1038	1190	963	1280	**967**	**1280**	192	1346	1380	**1344**	**1380**	1279	1450
403.gcc	128	623	1650	627	1640	**624**	**1650**	224	**886**	**2030**	887	2030	886	2030
429.mcf	128	385	3030	384	3040	**385**	**3030**	192	**582**	**3010**	600	2920	577	3040
445.gobmk	128	862	1560	**862**	**1560**	862	1560	256	1442	1860	**1441**	**1860**	1439	1870
456.hmmer	128	784	1520	**784**	**1520**	782	1530	128	430	2770	428	2790	**430**	**2780**
458.sjeng	128	1044	1480	1048	1480	**1045**	**1480**	256	**1928**	**1610**	1931	1600	1925	1610
462.libquantum	128	623	4260	626	4240	**624**	**4250**	128	167	15900	162	16300	**166**	**16000**
464.h264ref	128	1154	2460	**1153**	**2460**	1153	2460	128	1100	2580	1102	2570	**1100**	**2570**
471.omnetpp	128	**654**	**1220**	654	1220	653	1230	256	1127	1420	**1130**	**1420**	1133	1410
473.astar	128	**609**	**1470**	608	1480	613	1470	192	865	1560	**867**	**1550**	868	1550
483.xalancbmk	128	439	2010	**433**	**2040**	429	2060	224	731	2110	**729**	**2120**	706	2190

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

Peak Tuning Notes

```
400.perlbench fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
401.bzip2 fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
403.gcc fdpr options: -O4 -m power8 -A 2 -sls -dir -vrox
429.mcf fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
456.hmmer fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
458.sjeng fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
462.libquantum fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
464.h264ref fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
471.omnetpp fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
473.astar fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
483.xalancbmk fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
```

Submit Notes

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

Operating System Notes

```
ulimit -s (stack) set to unlimited

21600 16M large pages defined with sysctl command
echo 21600 > /proc/sys/vm/nr_hugepages
```

General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_MORECORE = "yes"
HUGETLB_VERBOSE = "0"
TCMALLOC_MEMFS_MALLOC_PATH = "/dev/hugepages/"
XLFRTEOPTS = "intrinthds=1"
```

Base Compiler Invocation

C benchmarks:
```
/opt/ibm/xlC/13.1.0/bin/xlc_at -qlanglvl=extc99
```

C++ benchmarks:
```
/opt/ibm/xlC/13.1.0/bin/xlC_at
```

Base Portability Flags

400.perlbench: `-DSPEC_CPU_LINUX_PPC`
462.libquantum: `-DSPEC_CPU_LINUX`
464.h264ref: `-qchars=signed`
483.xalancbmk: `-DSPEC_CPU_LINUX`

Base Optimization Flags

C benchmarks:
```
-qinline=40 -qipa=threads -qlargepage -O5 -qalias=noansi -qalloca
-lhugetlbfs
```

C++ benchmarks:
```
-qinline=40 -qipa=threads -qlargepage -O5 -qrtti -ltcmalloc
```

Base Other Flags

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

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

Peak Compiler Invocation

C benchmarks:
/opt/ibm/xlC/13.1.0/bin/xlc_at -qlanglvl=extc99

C++ benchmarks:
/opt/ibm/xlC/13.1.0/bin/xlC_at

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_PPC
403.gcc: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LINUX
464.h264ref: -qchars=signed
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -qinline=40 -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qfdpr -qalias=noansi -lhugetlbfs -Wl,-q

401.bzip2: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd=noauto -qlargepage -qfdpr -lhugetlbfs -Wl,-q

403.gcc: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -q64 -qlargepage -qfdpr -qalloca -lhugetlbfs -Wl,-q

429.mcf: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qnoprefetch -qfdpr -lhugetlbfs -Wl,-q

445.gobmk: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -lhugetlbfs

456.hmmer: -qinline=40 -qipa=threads -O5 -qlargepage -qassert=refalign -qfdpr -lhugetlbfs -Wl,-q

458.sjeng: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qprefetch=dscr=0x54 -qfdpr -lhugetlbfs -Wl,-q

462.libquantum: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd=noauto -qinline=400 -q64 -qlargepage -qfdpr -lhugetlbfs -Wl,-q

464.h264ref: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qfdpr -lhugetlbfs -Wl,-q

Continued on next page

Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: `-qinline=40 -qipa=threads -qpdf1`(pass 1) `-qpdf2`(pass 2)
`-O5 -qsimd=noauto -qarch=pwr7 -qtune=pwr7`
`-qprefetch=dscr=0x54 -qfdpr -qrtti -lhugetlbfs -Wl,-q`
`-ltcmalloc`

473.astar: `-qinline=40 -qipa=threads -qpdf1`(pass 1) `-qpdf2`(pass 2)
`-O5 -qlargepage -qprefetch=dscr=0x93 -qfdpr -lhugetlbfs`
`-Wl,-q -ltcmalloc`

483.xalancbmk: `-qinline=40 -qipa=threads -qpdf1`(pass 1) `-qpdf2`(pass 2)
`-O3 -qarch=auto -qtune=auto -qsimd -qlargepage`
`-qprefetch=dscr=0x93 -qipa=partition=large -qfdpr`
`-lhugetlbfs -Wl,-q -ltcmalloc`

Peak Other Flags

C benchmarks (except as noted below):
`-qsuppress=1586-476`(pass 2) `-qipa=noobject -qsuppress=1500-036`

400.perlbench: `-qsuppress=1586-476`(pass 2) `-qsuppress=1500-036`

456.hmmer: `-qipa=noobject -qsuppress=1500-036`

C++ benchmarks:
`-qsuppress=1586-476`(pass 2) `-qipa=noobject -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.V13La.html
http://www.spec.org/cpu2006/flags/IBM-Linux-V7.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-XL.V13La.xml
http://www.spec.org/cpu2006/flags/IBM-Linux-V7.xml

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Jun 17 10:49:35 2015 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 16 June 2015.