SPEC® CINT2006 Result

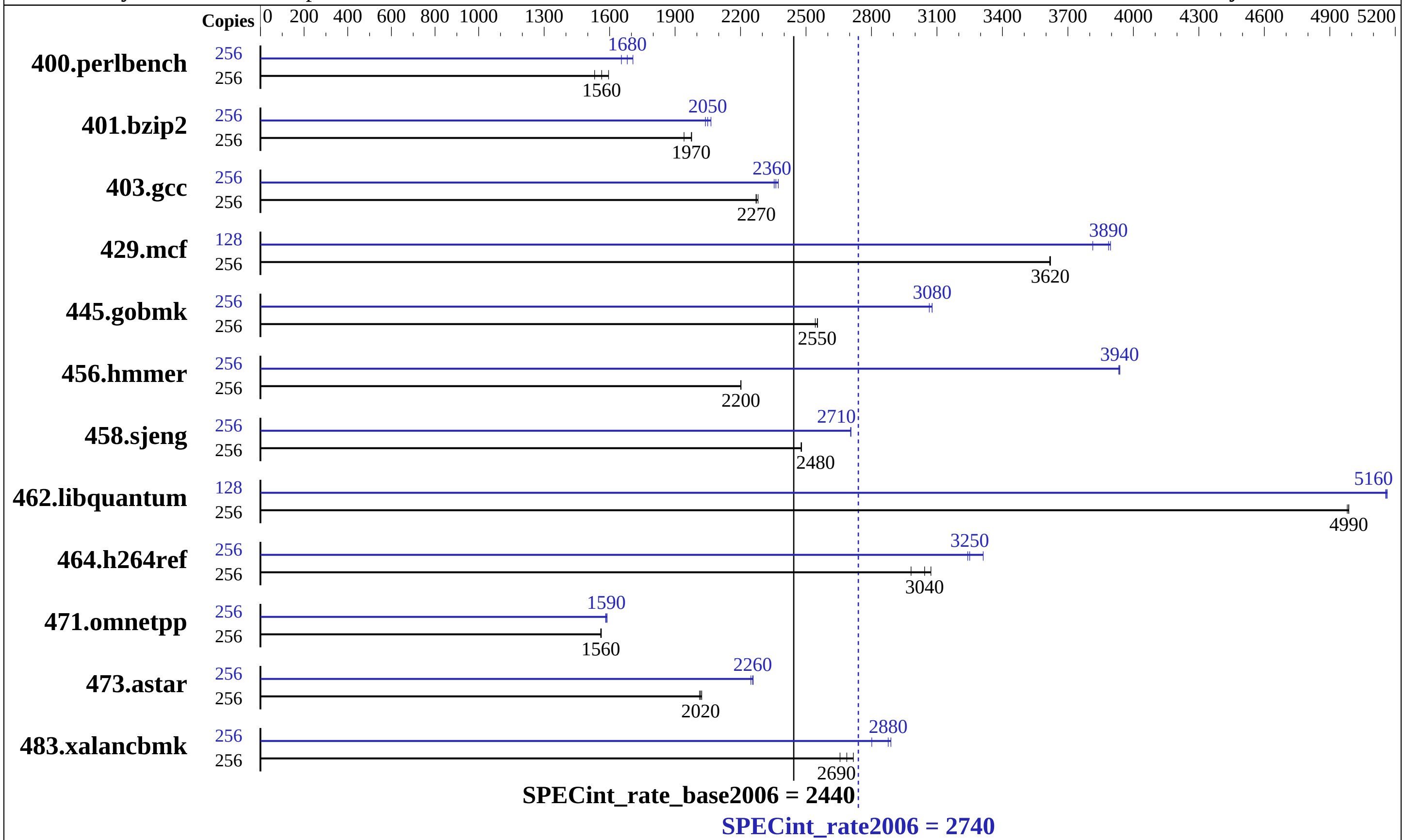
IBM Corporation

SPECint®_rate2006 = 2740

IBM Power 780 (3.86 GHz, 64 core, RedHat)

SPECint_rate_base2006 = 2440

CPU2006 license:	11	**Test date:**	Nov-2010
Test sponsor:	IBM Corporation	**Hardware Availability:**	Mar-2010
Tested by:	IBM Corporation	**Software Availability:**	Nov-2010



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.94 GHz
CPU MHz:	3860
FPU:	Integrated
CPU(s) enabled:	64 cores, 8 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	8,16,24,32,48,64 cores
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	4 MB I+D on chip per core
Other Cache:	None
Memory:	512 GB (64x8 GB) DDR3 1066 MHz
Disk Subsystem:	3x146.8 GB Software RAID-0 SAS SFF 15K RPM
Other Hardware:	None

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
Auto Parallel:	No
File System:	ext2
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 5.5.0-3 -MicroQuill SmartHeap 9

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	256	1633	1530	1568	1600	**1599**	**1560**	256	1512	1650	**1488**	**1680**	1465	1710
401.bzip2	256	1250	1980	**1251**	**1970**	1273	1940	256	1197	2060	1211	2040	**1205**	**2050**
403.gcc	256	908	2270	**907**	**2270**	904	2280	256	**873**	**2360**	868	2370	875	2350
429.mcf	256	646	3620	645	3620	**645**	**3620**	128	300	3900	306	3810	**300**	**3890**
445.gobmk	256	1052	2550	1056	2540	**1052**	**2550**	256	872	3080	**872**	**3080**	876	3060
456.hmmer	256	**1085**	**2200**	1085	2200	1084	2200	256	607	3940	**607**	**3940**	607	3930
458.sjeng	256	1250	2480	1249	2480	**1250**	**2480**	256	1146	2700	**1145**	**2710**	1145	2710
462.libquantum	256	**1064**	**4990**	1065	4980	1064	4990	128	514	5160	**514**	**5160**	514	5160
464.h264ref	256	1900	2980	**1862**	**3040**	1844	3070	256	1711	3310	**1743**	**3250**	1748	3240
471.omnetpp	256	**1026**	**1560**	1026	1560	1024	1560	256	1011	1580	**1009**	**1590**	1007	1590
473.astar	256	893	2010	889	2020	**891**	**2020**	256	796	2260	**797**	**2260**	800	2250
483.xalancbmk	256	665	2660	650	2720	**657**	**2690**	256	631	2800	**614**	**2880**	611	2890

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 -omullX" used for
  400.perlbench
options "-O4 -vrox" used for
  401.bzip2
options "-O4 -nodp -rtb"
  403.gcc
options "-O3" used for
  429.mcf 445.gobmk 458.sjeng 473.astar
options "-O4 -nodp -m power7" used for
  456.hmmer
options "-O4 -vrox -nodp" used for
  462.libquantum
options "-O4 -vrox -nodp -rtb" used for
  464.h264ref
options "-O3 -lu -1 -nodp -sdp 9" used for
  471.omnetpp
options "-O3 -m power7" used for
  483.xalancbmk
Whenever option "-omullX" was used during the optimization phase,
option "-imullX" was also used during the instrumentation phase.
```

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 18000 > /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
```

Base Compiler Invocation

C benchmarks:
`xlc -qlanglvl=extc99`

C++ benchmarks:
`xlC`

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:
`-O5 -qarch=pwr7 -qtune=pwr7 -qalias=noansi -qalloca -lhugetlbfs`

C++ benchmarks:
`-O5 -qarch=pwr7 -qtune=pwr7 -qrtti -lsmartheap`

Base Other Flags

C benchmarks:
`-qipa=threads`

C++ benchmarks:
`-qipa=threads`

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483.xalancbmk: `-DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

400.perlbench: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -qalias=noansi -qipa=level=2 -lsmartheap`

401.bzip2: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O3 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs`

403.gcc: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -qalloca -lhugetlbfs`

429.mcf: `-Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs`

445.gobmk: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs`

456.hmmer: `-Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -qsimd -qassert=refalign -qipa=inline=threshold=2888 -qipa=inline=limit=11880 -lhugetlbfs`

458.sjeng: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs`

462.libquantum: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qarch=pwr7 -qtune=pwr7 -q64 -lhugetlbfs`

464.h264ref: Same as 458.sjeng

C++ benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

471.omnetpp: `-Wl,-q` `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5` `-qarch=pwr7` `-qtune=pwr7` `-qrtti` `-lsmartheap`

473.astar: `-Wl,-q` `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4` `-qarch=pwr7` `-qtune=pwr7` `-lhugetlbfs` `-lsmartheap`

483.xalancbmk: `-Wl,-q` `-O4` `-qarch=pwr7` `-qtune=pwr7` `-qipa=partition=large` `-lsmartheap`

Peak Other Flags

C benchmarks (except as noted below):
`-qipa=threads`

C++ benchmarks:
`-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

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

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