SPEC® CINT2006 Result

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IBM Corporation

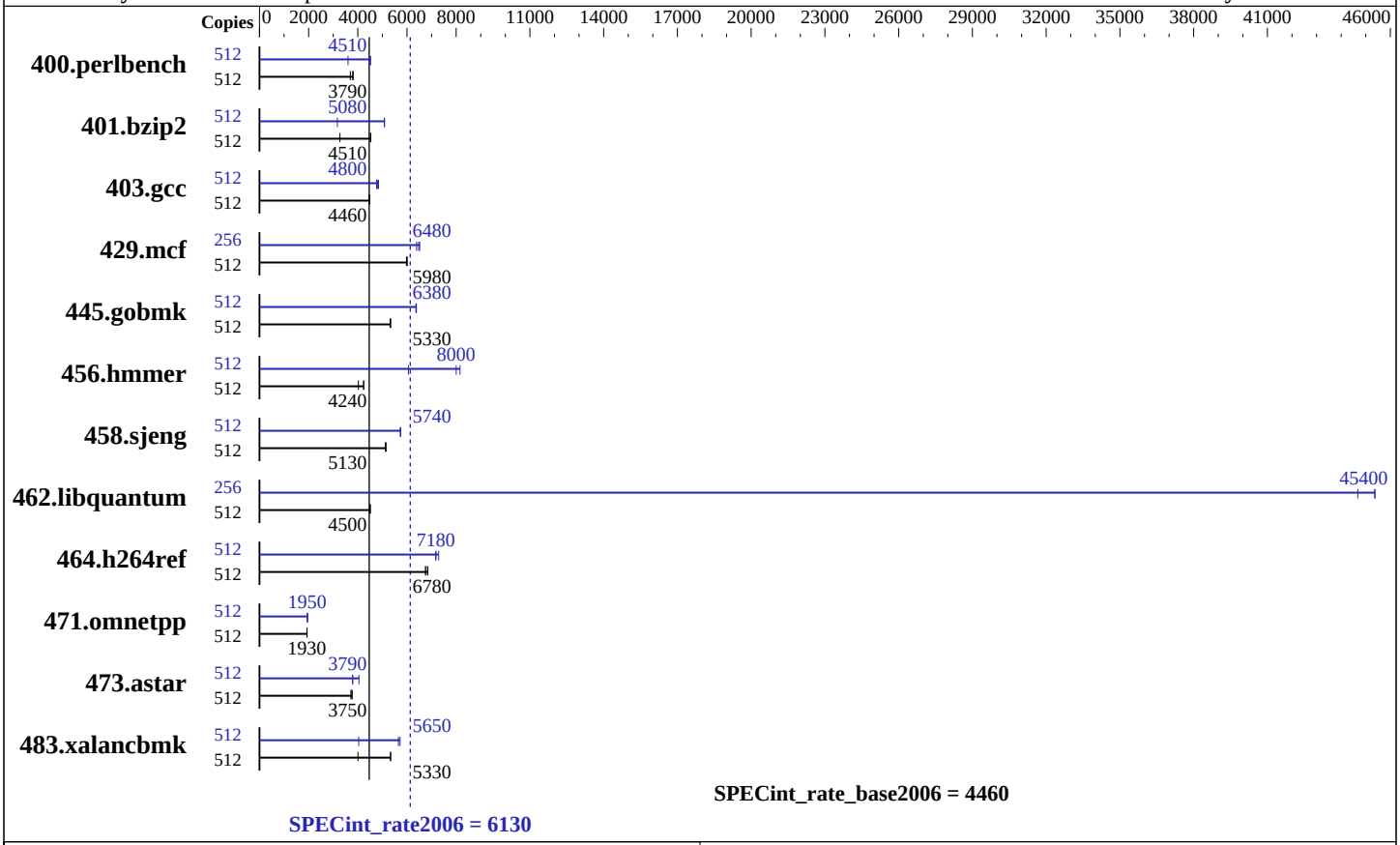
IBM Power 780 (3.7 GHz, 128 core, RHEL)

SPECint®_rate2006 = 6130

SPECint_rate_base2006 = 4460

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

Test date: Sep-2012
Hardware Availability: Oct-2012
Software Availability: Dec-2012



Hardware

CPU Name:	POWER7+
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 4.144 GHz
CPU MHz:	3724
FPU:	Integrated
CPU(s) enabled:	128 cores, 16 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	32,64,96,128 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:	10 MB I+D on chip per core
Other Cache:	None
Memory:	1 TB (64 x 16 GB) DDR3 1066 MHz
Disk Subsystem:	12x146.8 GB SAS SFF 15K RPM
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.3 (ppc64) kernel 2.6.32-279.el6.ppc64
Compiler:	C/C++: Version 12.1 of IBM XL C/C++ for Linux
Auto Parallel:	No
File System:	ext4
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 5.6.1-7 -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	512	1354	3690	1313	3810	**1318**	**3790**	512	1389	3600	**1110**	**4510**	1108	4520
401.bzip2	512	**1095**	**4510**	1510	3270	1091	4530	512	1560	3170	**973**	**5080**	971	5090
403.gcc	512	**924**	**4460**	919	4490	925	4450	512	865	4760	**859**	**4800**	851	4840
429.mcf	512	777	6010	781	5980	**780**	**5980**	256	365	6390	**360**	**6480**	358	6520
445.gobmk	512	**1009**	**5330**	1008	5330	1009	5330	512	842	6380	844	6360	**842**	**6380**
456.hmmer	512	1127	4240	1187	4020	**1128**	**4240**	512	789	6060	586	8160	**597**	**8000**
458.sjeng	512	1207	5130	1205	5140	**1207**	**5130**	512	1080	5740	1080	5740	**1080**	**5740**
462.libquantum	512	**2358**	**4500**	2358	4500	2356	4500	256	119	44700	**117**	**45400**	117	45400
464.h264ref	512	1679	6750	1654	6850	**1671**	**6780**	512	1554	7290	1581	7170	**1578**	**7180**
471.omnetpp	512	1658	1930	1654	1930	**1654**	**1930**	512	1640	1950	1643	1950	**1642**	**1950**
473.astar	512	**957**	**3750**	967	3720	953	3770	512	888	4050	**948**	**3790**	949	3790
483.xalancbmk	512	**663**	**5330**	882	4010	662	5340	512	875	4040	**625**	**5650**	618	5720

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

Compiler Invocation Notes

```
C/C++ compiler updated to December 2012 PTF
Version: 12.01.0000.0002
```

Peak Tuning Notes

```
Post-Link optimization tool used for:
400.perlbench
     with options -O4 -omullX for optimization phase,
     and -imullX for instrumentation phase
401.bzip2
     with options -O4 -vrox
403.gcc
    with options -O4 -nodp -rtb
429.mcf 445.gobmk 458.sjeng 473.astar
    with options -O3
456.hmmer
    with options -O4 -nodp -m power7
462.libquantum
    with options -O4 -vrox -nodp
464.h264ref
    with options -O4 -vrox -nodp -rtb
471.omnetpp
    with options -O3 -lu -1 -nodp -sdp 9
483.xalancbmk
    with options -O3 -m power7
```

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 1048576.
ulimit -n (open files) set to 500000.
Large pages reserved as follows by root user:
echo 30000 > /proc/sys/vm/nr_hugepages
echo 6000 > /proc/sys/vm/nr_overcommit_hugepages
```

Platform Notes

```
Service processor memory mirroring property disabled.
```

General Notes

```
The following environment varibles were set before the runspec command:
  export HUGETLB_VERBOSE=0
  export HUGETLB_MORECORE=yes
  export XLFRTEOPTS=intrinthds=1
```

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 -q32 -qipa=threads -qalias=noansi
-qalloca -lhugetlbfs
```

Continued on next page

Base Optimization Flags (Continued)

C++ benchmarks:
-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads -qrtti -lsmartheap

Base Other Flags

C benchmarks:

C++ benchmarks:

Peak Compiler Invocation

C benchmarks:
xlc -qlanglvl=extc99

C++ benchmarks:
xlC

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_PPC
462.libquantum: -DSPEC_CPU_LINUX
464.h264ref: -qchars=signed
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 -qipa=threads -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 -qipa=threads -qalloca -lhugetlbfs

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

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Peak Optimization Flags (Continued)

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

456.hmmer: `-Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -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 -qipa=threads -lhugetlbfs`

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

464.h264ref: `Same as 458.sjeng`

C++ benchmarks:

471.omnetpp: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qrtti -lsmartheap`

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

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

Peak Other Flags

C benchmarks:

C++ benchmarks:

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.html`
`http://www.spec.org/cpu2006/flags/IBM-Power.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.xml`
`http://www.spec.org/cpu2006/flags/IBM-Power.xml`

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Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 13:47:59 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 23 October 2012.