



SPEC® CINT2006 Result

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IBM Corporation

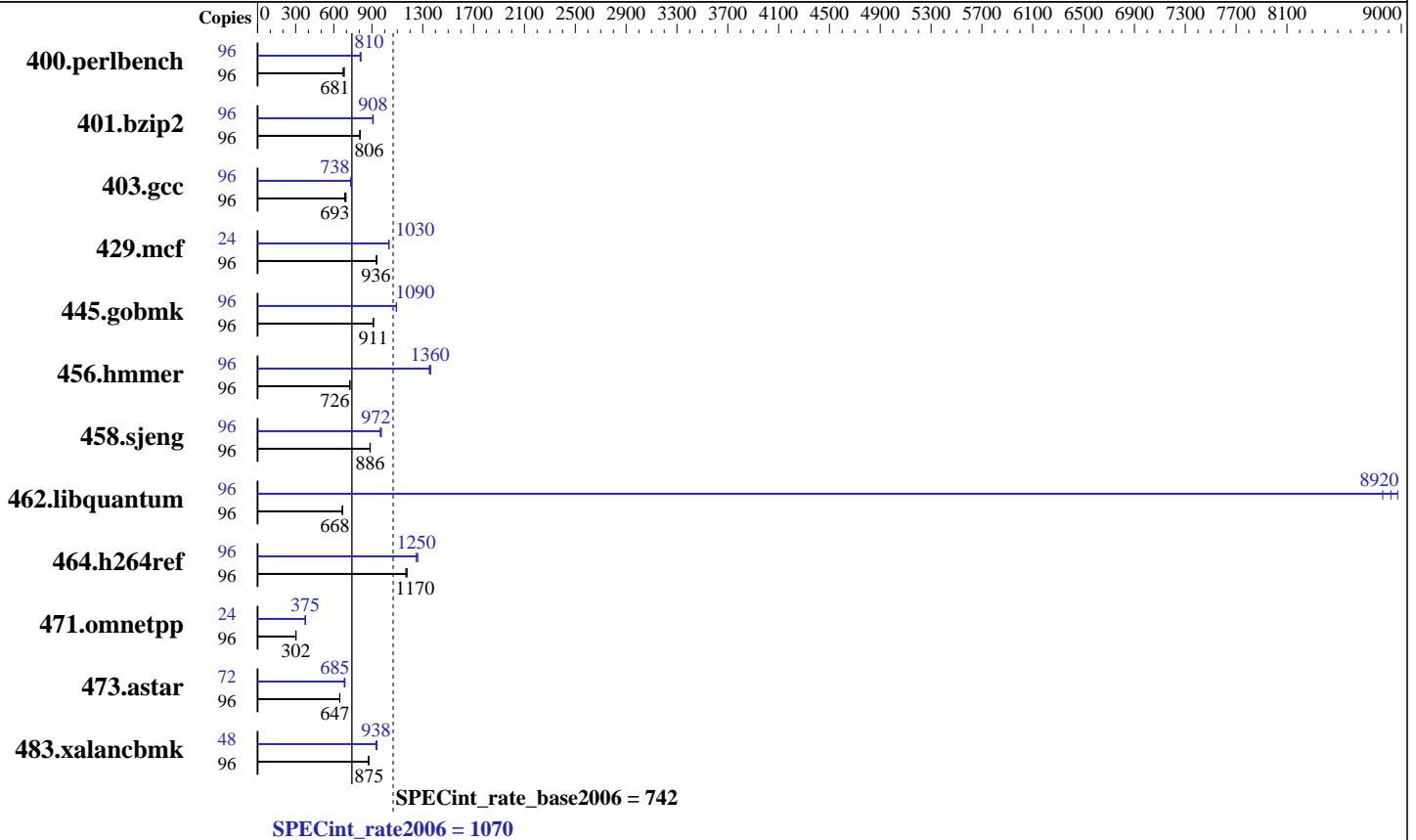
SPECint®_rate2006 = 1070

IBM Flex System p270 (3.4 GHz, 24 core, RHEL)

SPECint_rate_base2006 = 742

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

Test date: Jun-2013
Hardware Availability: Sep-2013
Software Availability: Apr-2013



Hardware

CPU Name: POWER7+
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.787 GHz
 CPU MHz: 3416
 FPU: Integrated
 CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip, 4 threads/core
 CPU(s) orderable: 24 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: 256 GB (16 x 16 GB) DDR3 1066 MHz
 Disk Subsystem: 2 x 177 GB Raid0 SATA SSD 1.8"
 Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 6.4 (ppc64) kernel 2.6.32-358.6.2.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 5.6.2-1
 -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	96	1395	673	<u>1378</u>	<u>681</u>	1376	682	96	1152	814	1162	807	<u>1158</u>	<u>810</u>
401.bzip2	96	1150	805	1149	806	<u>1149</u>	<u>806</u>	96	1017	911	1022	906	<u>1020</u>	<u>908</u>
403.gcc	96	1110	696	<u>1115</u>	<u>693</u>	1127	686	96	1046	739	<u>1047</u>	<u>738</u>	1055	732
429.mcf	96	934	938	936	936	<u>935</u>	<u>936</u>	24	<u>212</u>	<u>1030</u>	212	1030	212	1030
445.gobmk	96	1105	911	<u>1105</u>	<u>911</u>	1106	911	96	923	1090	<u>921</u>	<u>1090</u>	921	1090
456.hammer	96	1233	726	<u>1233</u>	<u>726</u>	1233	726	96	663	1350	657	1360	<u>660</u>	<u>1360</u>
458.sjeng	96	<u>1312</u>	<u>886</u>	1309	887	1313	885	96	<u>1195</u>	<u>972</u>	1204	965	1193	974
462.libquantum	96	2980	668	<u>2980</u>	<u>668</u>	2979	668	96	<u>223</u>	<u>8920</u>	222	8970	225	8850
464.h264ref	96	1807	1180	1821	1170	<u>1809</u>	<u>1170</u>	96	<u>1698</u>	<u>1250</u>	1685	1260	1699	1250
471.omnetpp	96	<u>1987</u>	<u>302</u>	1986	302	1988	302	24	<u>400</u>	<u>375</u>	400	375	397	378
473.astar	96	1040	648	1043	646	<u>1042</u>	<u>647</u>	72	<u>737</u>	<u>685</u>	734	688	741	682
483.xalancbmk	96	759	872	<u>757</u>	<u>875</u>	757	875	48	353	939	<u>353</u>	<u>938</u>	356	931

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 April 2013 PTF
Version: 12.01.0000.0003

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

462.libquantum
with options -O4 -vrox -nodp

464.h264ref
with options -O4 -vrox -nodp -rtb

471.omnetpp
with options -O3 -lu -l -nodp -sdp 9

483.xalancbmk
with options -O3 -m power7



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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.

Large pages reserved as follows by root user:
echo 6336 > /proc/sys/vm/nr_hugepages

Platform Notes

This Compute Node is housed in an "IBM Flex System Enterprise Chassis"

The Maximum Power Limit for this Compute Node was set according to recommendation on "IBM Chassis Management Module"

General Notes

Environment variables set by runspec before the start of the run:

```
HUGETLB_ELFMAP = "RW"
HUGETLB_MORECORE = "yes"
HUGETLB_VERBOSE = "0"
XLFRTOPTIONS = "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
```



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Base Optimization Flags

C benchmarks:

-O5 -qarch=auto -qtune=auto -qipa=threads -qalias=noansi -qalloca
-lhugetlbfs

C++ benchmarks:

-O5 -qarch=auto -qtune=auto -qipa=threads -qrtti -lsmartheap

Base Other Flags

C benchmarks:

C++ benchmarks:

Peak Compiler Invocation

C benchmarks:

xlc -qlanglvl=extc99

C++ benchmarks:

x1C

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 -qipa=threads
-qalias=noansi -qipa=level=2 -lsmartheap

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

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

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Peak Optimization Flags (Continued)

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

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

456.hmmr: -Wl,-q -O5 -qarch=auto -qtune=auto -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=auto
-qtune=auto -qipa=threads -lhugetlbfs

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

464.h264ref: Same as 458.sjeng

C++ benchmarks:

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

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

483.xalancbmk: -Wl,-q -O4 -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-Power.20130828.html>

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/IBM-Power.20130828.xml>

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.xml>



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