SPEC® CINT2006 Result

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IBM Corporation

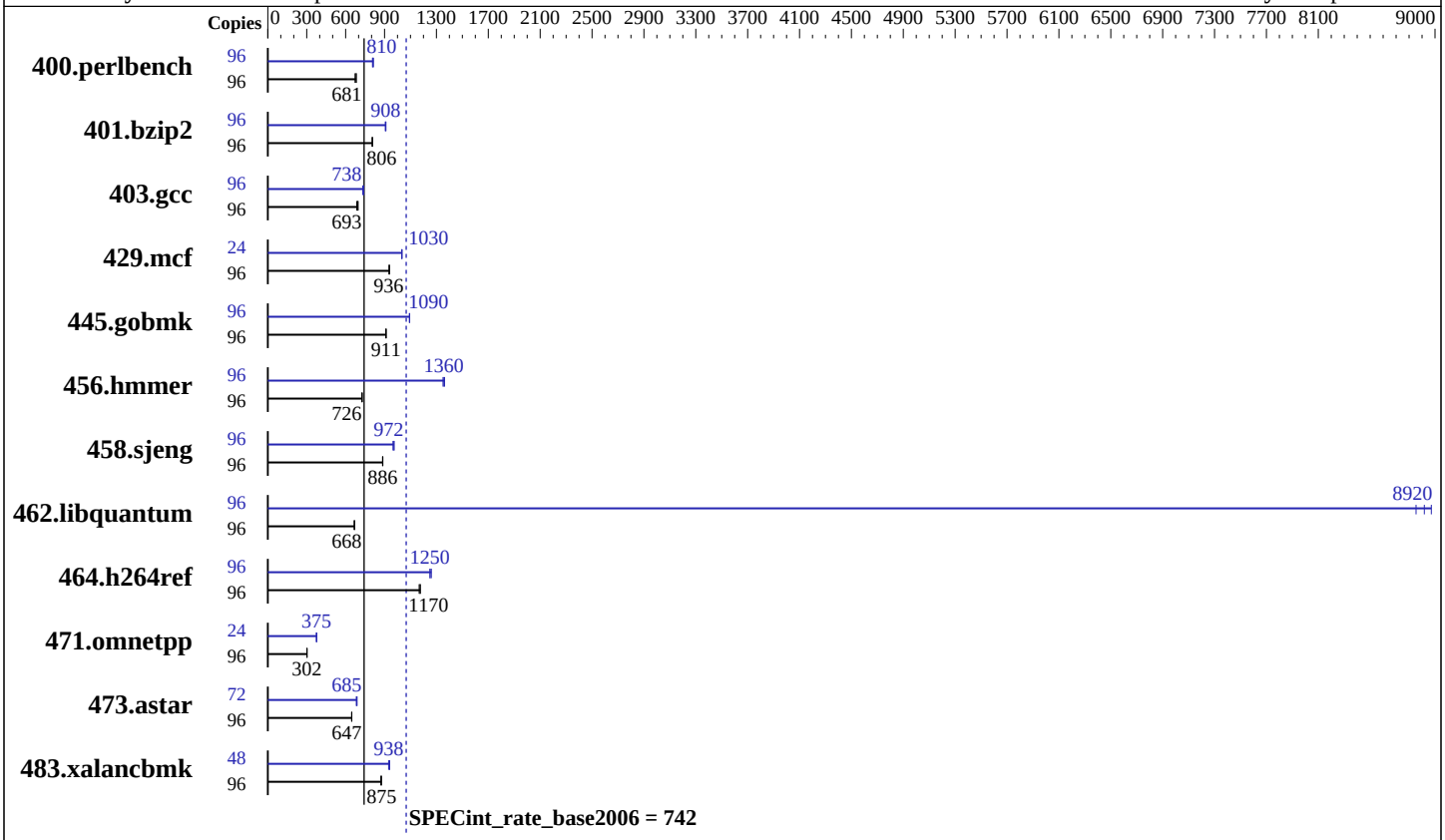
IBM Flex System p270 (3.4 GHz, 24 core, RHEL)

SPECint®_rate2006 = 1070

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

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"
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=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:
`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 -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`

Continued on next page

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.hmmer: -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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