SPEC® CINT2006 Result

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IBM Corporation

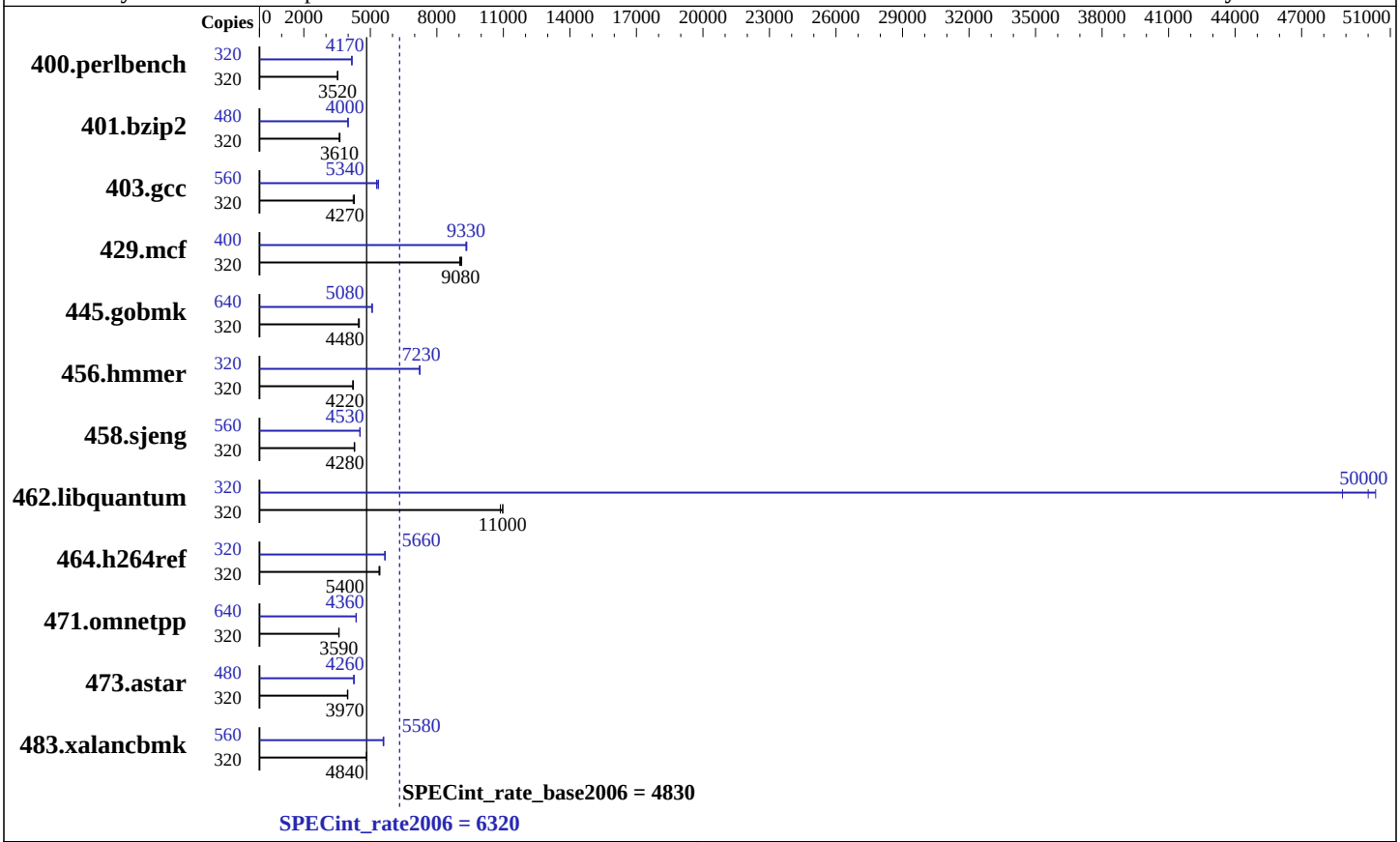
IBM Power E870 (4.19 GHz, 80 core)

SPECint®_rate2006 = 6320

SPECint_rate_base2006 = 4830

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

Test date: Sep-2014
Hardware Availability: Nov-2014
Software Availability: Nov-2014



Hardware

CPU Name:	POWER8
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 4.46 GHz
CPU MHz:	4192
FPU:	Integrated
CPU(s) enabled:	80 cores, 8 chips, 10 cores/chip, 8 threads/core
CPU(s) orderable:	4,8 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:	4 TB (64 x 64 GB CDIMMs) DDR3 1600 MHz
Disk Subsystem:	7 x 300 GB 15K RPM SAS SFF-2 Raid5
Other Hardware:	None

Software

Operating System:	IBM AIX V7.1
Compiler:	C/C++: Version 13.1 of IBM XL C/C++ for AIX
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	None

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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	320	884	3540	**887**	**3520**	889	3520	320	749	4170	**749**	**4170**	752	4160
401.bzip2	320	851	3630	**856**	**3610**	857	3600	480	1159	4000	1162	3990	**1159**	**4000**
403.gcc	320	602	4280	609	4230	**603**	**4270**	560	**844**	**5340**	840	5370	853	5280
429.mcf	320	**321**	**9080**	320	9120	323	9030	400	392	9310	390	9350	**391**	**9330**
445.gobmk	320	745	4500	751	4470	**750**	**4480**	640	**1322**	**5080**	1320	5090	1323	5070
456.hmmer	320	705	4240	**708**	**4220**	710	4210	320	**413**	**7230**	413	7230	414	7220
458.sjeng	320	901	4300	906	4270	**905**	**4280**	560	**1495**	**4530**	1495	4530	1495	4530
462.libquantum	320	610	10900	**605**	**11000**	604	11000	320	**133**	**50000**	136	48800	132	50300
464.h264ref	320	1304	5430	1312	5400	**1312**	**5400**	320	1253	5650	**1251**	**5660**	1248	5670
471.omnetpp	320	557	3590	**558**	**3590**	560	3570	640	917	4360	**917**	**4360**	918	4350
473.astar	320	**566**	**3970**	564	3990	566	3970	480	**790**	**4260**	790	4270	793	4250
483.xalancbmk	320	456	4840	**457**	**4840**	457	4830	560	**692**	**5580**	692	5580	689	5610

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 September 2014 PTF
      Version 13.01.0000.0001
```

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 -rcl 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 "bindprocessor" command (see flags file for details).
```

Operating System Notes

```
AIX updated to V7.1 TL3 SP4

All ulimits set to unlimited.
Set 8 threads per core via "smtctl -t 8 -w boot"

64000 16M large pages defined with vmo command
```

General Notes

```
Environment variables set by runspec before the start of the run:
MALLOCOPTIONS = "pool"
MEMORY_AFFINITY = "MCM"
XLFRTEOPTS = "intrinthds=1"
```

Base Compiler Invocation

C benchmarks:
```
/opt/IBM/xlc/13.1.0/bin/xlc -qlanglvl=extc99
```

C++ benchmarks:
```
/opt/IBM/xlC/13.1.0/bin/xlC
```

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
```
-qinline=40 -qipa=threads -bmaxdata:0x50000000 -qlargepage -O5
-qvecnvol -D_ILS_MACROS -qalias=noansi -qalloca -blpdata
```

C++ benchmarks:
```
-qinline=40 -qipa=threads -bmaxdata:0x20000000 -qlargepage -O5
-qvecnvol -D_ILS_MACROS -qrtti=all -D__IBM_FAST_SET_MAP_ITERATOR
-blpdata
```

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 -qlanglvl=extc99
```

C++ benchmarks:
```
/opt/IBM/xlC/13.1.0/bin/xlC
```

Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:

400.perlbench: -qinline=40 -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -D_ILS_MACROS
-qalias=noansi -qfdpr -blpdata -btextpsize:64K

401.bzip2: -qinline=40 -qipa=threads -bmaxdata:0x50000000
-qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd=noauto
-qlargepage -D_ILS_MACROS -qfdpr -blpdata -btextpsize:64K

403.gcc: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-O4 -qvecnvol -q64 -qlargepage -D_ILS_MACROS -qalloca
-qfdpr -blpdata -btextpsize:64K

429.mcf: -qinline=40 -qipa=threads -bmaxdata:0x50000000
-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qvecnvol -qlargepage
-D_ILS_MACROS -qfdpr -blpdata -btextpsize:64K

445.gobmk: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-O5 -qvecnvol -qlargepage -D_ILS_MACROS -blpdata
-btextpsize:64K

Continued on next page

Peak Optimization Flags (Continued)

456.hmmer: -qinline=40 -qipa=threads -O5 -qvecnvol -qlargepage
-qassert=refalign -D_ILS_MACROS -qfdpr -blpdata
-btextpsize:64K

458.sjeng: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-O3 -qarch=auto -qtune=auto -D_ILS_MACROS -qfdpr
-blpdata -btextpsize:64K

462.libquantum: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-O5 -qsimd=noauto -qinline=400 -q64 -qlargepage
-D_ILS_MACROS -qfdpr -blpdata -btextpsize:64K

464.h264ref: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-O5 -qvecnvol -qprefetch=dscr=84 -D_ILS_MACROS -qfdpr
-blpdata -btextpsize:64K

C++ benchmarks:

471.omnetpp: -qinline=40 -qipa=threads -bmaxdata:0x20000000
-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd=noauto
-qarch=pwr7 -qtune=pwr7 -D_ILS_MACROS -qfdpr
-qalign=natural -qrtti=all -qinlglue
-D__IBM_FAST_SET_MAP_ITERATOR -blpdata -btextpsize:64K

473.astar: -qinline=40 -qipa=threads -bmaxdata:0x20000000
-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qvecnvol -qlargepage
-D_ILS_MACROS -qfdpr -qinlglue -qalign=natural -blpdata
-btextpsize:64K

483.xalancbmk: -qinline=40 -qipa=threads -bmaxdata:0x20000000
-qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto
-qsimd -qvecnvol -qlargepage -qprefetch=dscr=84
-D_ILS_MACROS -qfdpr -qinlglue -D__IBM_FAST_VECTOR
-blpdata -btextpsize:64K

Peak Other Flags

C benchmarks (except as noted below):
-qipa=noobject -qsuppress=1500-036

400.perlbench: -qsuppress=1500-036

C++ benchmarks:
-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.V13.html
http://www.spec.org/cpu2006/flags/IBM-AIX.V7.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-XL.V13.xml
http://www.spec.org/cpu2006/flags/IBM-AIX.V7.xml

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