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 date:** Sep-2014
Test sponsor: IBM Corporation	**Hardware Availability:** Nov-2014
Tested by: IBM Corporation	**Software Availability:** Nov-2014

Copies

benchmark	peak copies	peak	base copies	base
400.perlbench	320	4170	320	3520
401.bzip2	480	4000	320	3610
403.gcc	560	5340	320	4270
429.mcf	400	9330	320	9080
445.gobmk	640	5080	320	4480
456.hmmer	320	7230	320	4220
458.sjeng	560	4530	320	4280
462.libquantum	320	50000	320	11000
464.h264ref	320	5660	320	5400
471.omnetpp	640	4360	320	3590
473.astar	480	4260	320	3970
483.xalancbmk	560	5580	320	4840

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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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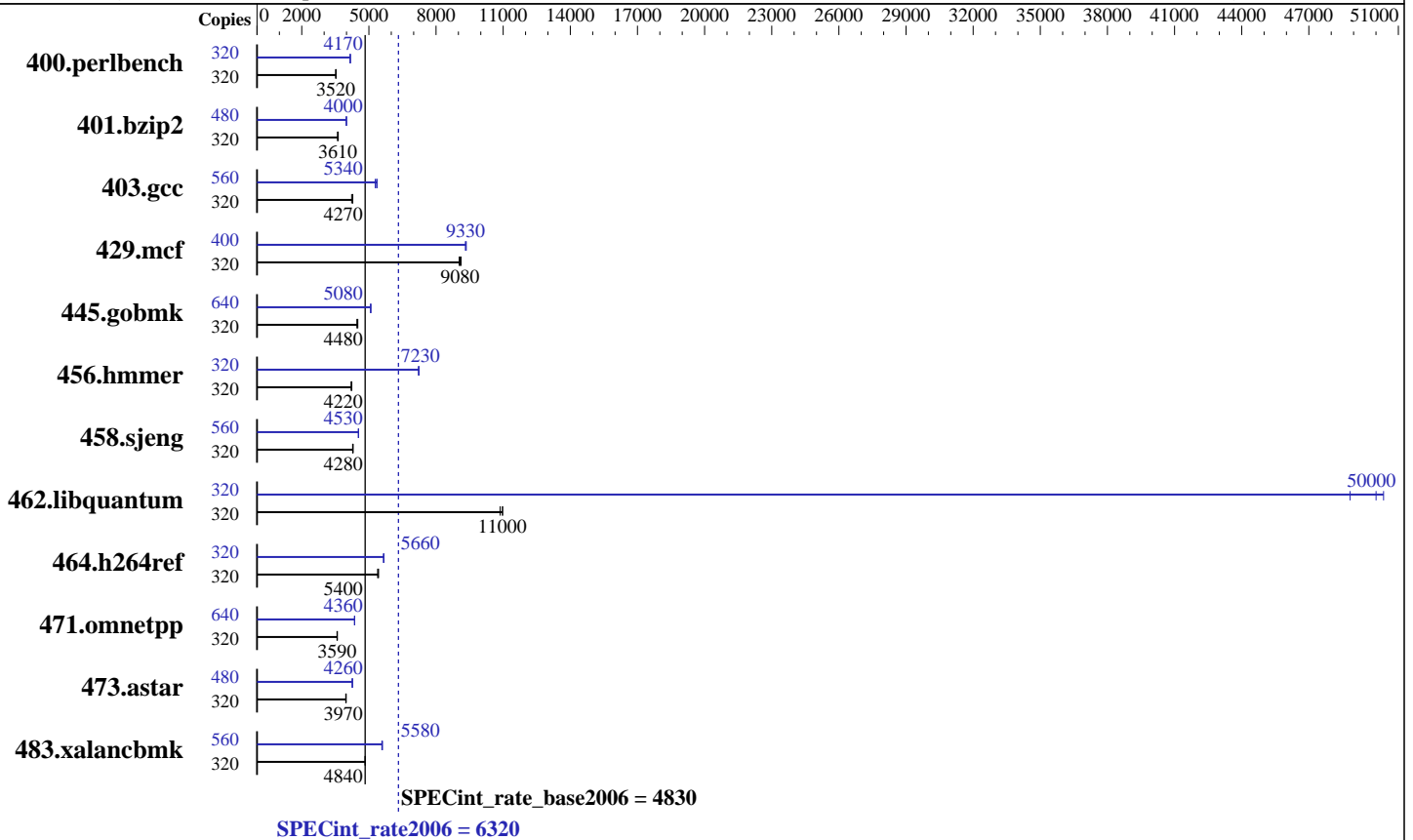SPECint_rate_base2006 = 4830

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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).
```

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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
```

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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
```

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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
```

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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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