



# SPEC® CINT2006 Result

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## IBM Corporation

SPECint®\_rate2006 = 1750

## IBM Power S824 (3.5 GHz, 24 core)

SPECint\_rate\_base2006 = 1280

CPU2006 license: 11

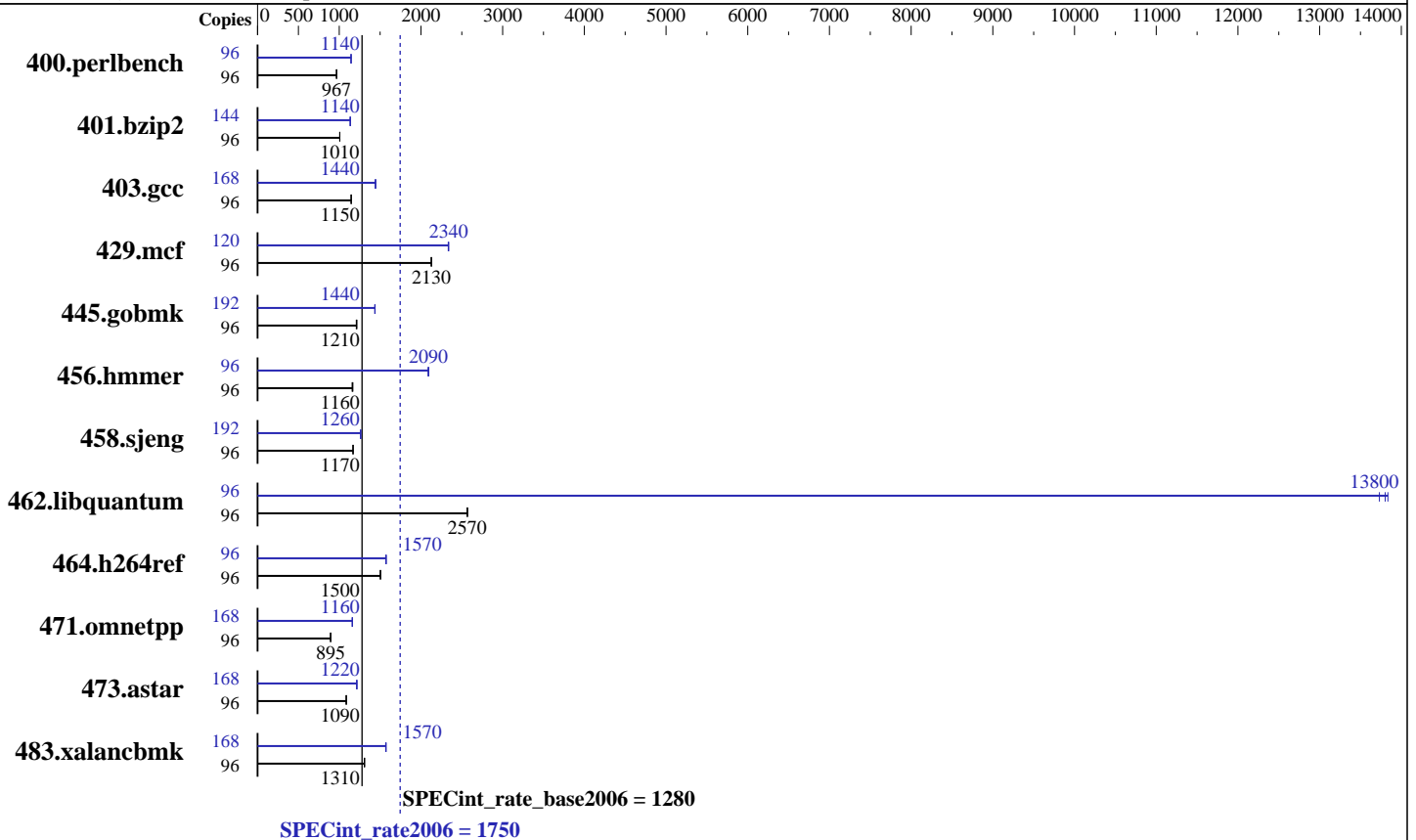
Test date: Apr-2014

Test sponsor: IBM Corporation

Hardware Availability: Jun-2014

Tested by: IBM Corporation

Software Availability: Jun-2014



### Hardware

CPU Name: POWER8  
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.92 GHz  
 CPU MHz: 3525  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip, 8 threads/core  
 CPU(s) orderable: 2 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: 512 GB (16 x 32 GB CDIMMs) DDR3 1600 MHz  
 Disk Subsystem: 5 x 300 GB 15K RPM SAS SFF-2 Raid0  
 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	96	971	966	969	968	<b>970</b>	<b>967</b>	96	818	1150	820	1140	<b>819</b>	<b>1140</b>
401.bzip2	96	920	1010	922	1010	<b>920</b>	<b>1010</b>	144	1222	1140	1228	1130	<b>1223</b>	<b>1140</b>
403.gcc	96	674	1150	<b>674</b>	<b>1150</b>	675	1150	168	<b>937</b>	<b>1440</b>	935	1450	938	1440
429.mcf	96	<b>412</b>	<b>2130</b>	411	2130	412	2130	120	469	2330	468	2340	<b>468</b>	<b>2340</b>
445.gobmk	96	828	1220	<b>831</b>	<b>1210</b>	833	1210	192	1404	1430	<b>1401</b>	<b>1440</b>	1400	1440
456.hammer	96	768	1170	773	1160	<b>772</b>	<b>1160</b>	96	428	2100	429	2090	<b>428</b>	<b>2090</b>
458.sjeng	96	<b>993</b>	<b>1170</b>	996	1170	992	1170	192	1842	1260	<b>1840</b>	<b>1260</b>	1839	1260
462.libquantum	96	774	2570	775	2570	<b>775</b>	<b>2570</b>	96	<b>144</b>	<b>13800</b>	145	13700	144	13800
464.h264ref	96	1412	1500	1413	1500	<b>1412</b>	<b>1500</b>	96	<b>1352</b>	<b>1570</b>	1348	1580	1353	1570
471.omnetpp	96	670	896	672	893	<b>670</b>	<b>895</b>	168	906	1160	903	1160	<b>906</b>	<b>1160</b>
473.astar	96	620	1090	<b>621</b>	<b>1090</b>	622	1080	168	<b>970</b>	<b>1220</b>	970	1220	973	1210
483.xalancbmk	96	506	1310	507	1310	<b>506</b>	<b>1310</b>	168	<b>738</b>	<b>1570</b>	737	1570	739	1570

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

## 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.hammer 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 SP3

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

19200 16M large pages defined with vmo command



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## General Notes

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

```
MALLOCOPTIONS = "pool"  
MEMORY_AFFINITY = "MCM"  
XLFRTEOPTS = "intrinths=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  
-qvecnvml -D_ILS_MACROS -qalias=noansi -qalloca -blpdata
```

C++ benchmarks:

```
-qinline=40 -qipa=threads -bmaxdata:0x20000000 -qlargepage -O5  
-qvecnvml -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
```



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## 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  
-qprefetch=dscr=84 -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

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 -qprefetch=dscr=84  
-D\_ILS\_MACROS -qfdpr -blpdata -btextpsize:64K

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## Peak Optimization Flags (Continued)

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 -qvecnvols -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 -qprefetch=dscr=84 -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 -qvecnvols -qlargepage  
-qprefetch=dscr=147 -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 -qvecnvols -qlargepage -qprefetch=dscr=147  
-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>

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