



# SPEC<sup>®</sup> CINT2006 Result

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## IBM Corporation

## SPECint<sup>®</sup>\_rate2006 = 124

## IBM Power 520 (4.7 GHz, 4 core)

## SPECint\_rate\_base2006 = 101

CPU2006 license: 11

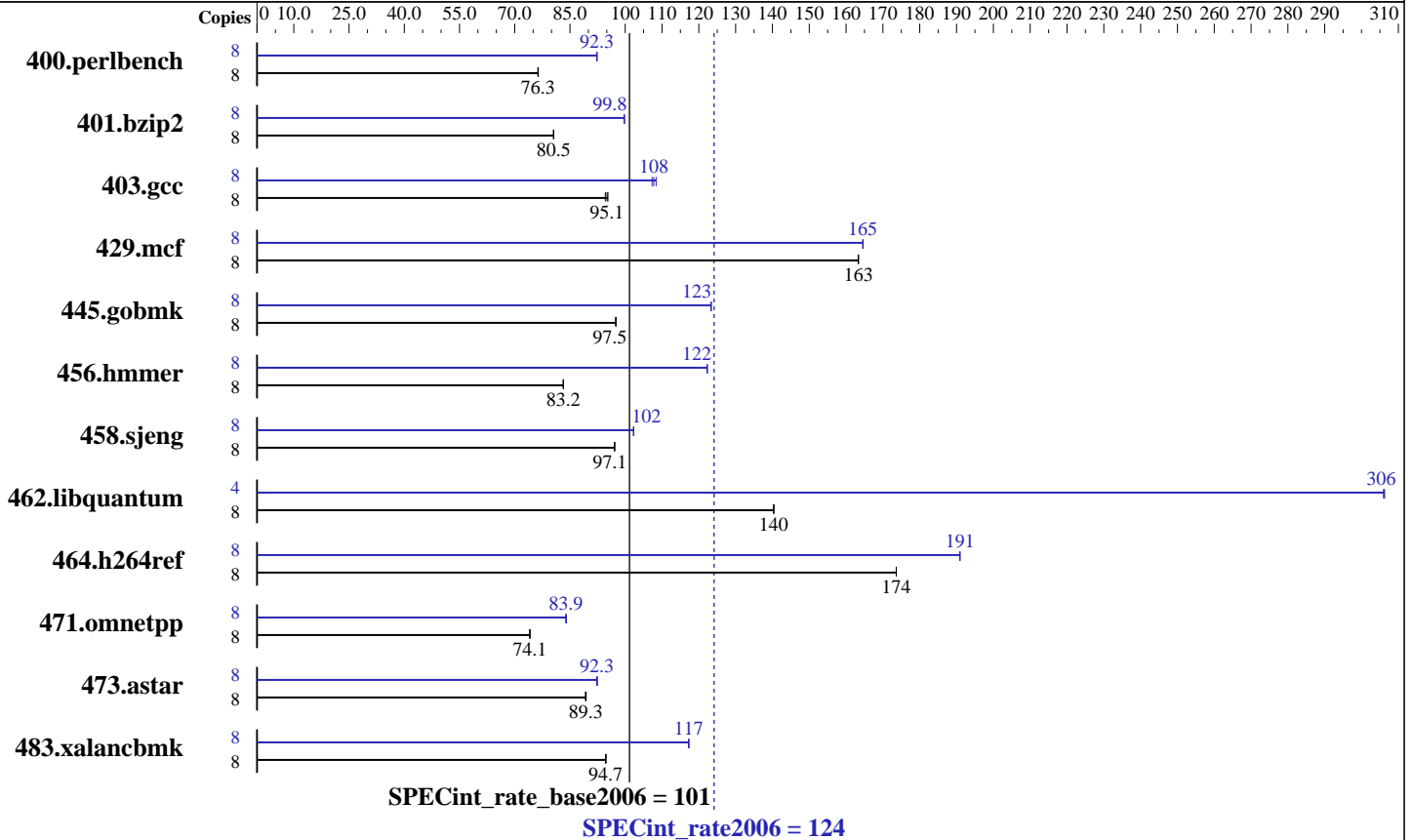
Test date: Apr-2009

Test sponsor: IBM Corporation

Hardware Availability: May-2009

Tested by: IBM Corporation

Software Availability: May-2009



### Hardware

CPU Name: POWER6+  
 CPU Characteristics:  
 CPU MHz: 4700  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 cores  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 4 MB I+D on chip per core  
 L3 Cache: 32 MB I+D off chip per chip  
 Other Cache: None  
 Memory: 32 GB (8x4 GB) DDR2 667 MHz  
 Disk Subsystem: 2x146 GB SAS 15K RPM  
 Other Hardware: None

### Software

Operating System: IBM AIX V6.1  
 with the 6100-03 Technology Level  
 Compiler: XL C/C++ Enterprise Edition V10.1.0.2 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  | 8      | <b>1024</b> | <b>76.3</b> | 1024        | 76.3        | 1023        | 76.4        | 8      | 846        | 92.4        | 847        | 92.3        | <b>846</b> | <b>92.3</b> |
| 401.bzip2      | 8      | 958         | 80.6        | 959         | 80.5        | <b>958</b>  | <b>80.5</b> | 8      | <b>774</b> | <b>99.8</b> | 774        | 99.8        | 774        | 99.7        |
| 403.gcc        | 8      | 681         | 94.6        | <b>677</b>  | <b>95.1</b> | 676         | 95.3        | 8      | <b>598</b> | <b>108</b>  | 594        | 108         | 600        | 107         |
| 429.mcf        | 8      | <b>447</b>  | <b>163</b>  | 447         | 163         | 447         | 163         | 8      | <b>443</b> | <b>165</b>  | 443        | 165         | 443        | 165         |
| 445.gobmk      | 8      | <b>861</b>  | <b>97.5</b> | 861         | 97.5        | 861         | 97.4        | 8      | 680        | 123         | <b>680</b> | <b>123</b>  | 681        | 123         |
| 456.hammer     | 8      | <b>897</b>  | <b>83.2</b> | 897         | 83.2        | 897         | 83.2        | 8      | <b>610</b> | <b>122</b>  | 611        | 122         | 610        | 122         |
| 458.sjeng      | 8      | 997         | 97.1        | <b>997</b>  | <b>97.1</b> | 996         | 97.1        | 8      | 946        | 102         | 947        | 102         | <b>946</b> | <b>102</b>  |
| 462.libquantum | 8      | 1182        | 140         | <b>1181</b> | <b>140</b>  | 1181        | 140         | 4      | 271        | 306         | <b>271</b> | <b>306</b>  | 271        | 306         |
| 464.h264ref    | 8      | 1020        | 174         | 1020        | 174         | <b>1020</b> | <b>174</b>  | 8      | 928        | 191         | <b>927</b> | <b>191</b>  | 927        | 191         |
| 471.omnetpp    | 8      | 675         | 74.1        | <b>675</b>  | <b>74.1</b> | 675         | 74.1        | 8      | 596        | 83.9        | 595        | 84.0        | <b>596</b> | <b>83.9</b> |
| 473.astar      | 8      | <b>629</b>  | <b>89.3</b> | 630         | 89.2        | 628         | 89.4        | 8      | 609        | 92.3        | <b>608</b> | <b>92.3</b> | 607        | 92.5        |
| 483.xalancbmk  | 8      | 583         | 94.7        | 582         | 94.8        | <b>583</b>  | <b>94.7</b> | 8      | <b>471</b> | <b>117</b>  | 470        | 117         | 471        | 117         |

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

## Peak Tuning Notes

fdpr binary optimization tool used for 400.perlbench  
 401.bzip2 403.gcc 456.hammer 458.sjeng 464.h264ref  
 471.omnetpp 473.astar 483.xalancbmk  
 with options -O4 -vrox -pbsi  
 fdpr binary optimization tool used for 429.mcf  
 with options -kr -lap -lro -nop -nopr -RC -tb -tlo  
 -vro -lu 9 -rt 0.95 -sdpla 8 -sdpms 512 -shci 15 -si  
 -sidf 45 -siht 10 -lun 13 -m ppc405 -vrox -gcpyp  
 fdpr binary optimization tool used for 445.gobmk  
 with options -O3 -vrox -sdp 9  
 fdpr binary optimization tool used for 462.libquantum  
 with options -bf -bp -dp -hr -kr -las -lro -nop -RC  
 -RD -tlo -vro -A 32 -isf 12 -lu 9 -rt 0.00 -ihf 20  
 -sdp 9 -shci 90 -si -sidf 50 -vrox -dce

## 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

all ulimits set to unlimited.  
1000 16M large pages defined with vmo command



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## Platform Notes

System set to "Enhanced" mode when defining partition on HMC.

## General Notes

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

MALLOCOPTIONS = "pool"

MEMORY\_AFFINITY = "MCM"

XLFRTEOPTS = "intrinthds=1"

See the flags file for details on settings.

## Base Compiler Invocation

C benchmarks:

/usr/vac/bin/xlc -qlanglvl=extc99

C++ benchmarks:

/usr/vacpp/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:

-bmaxdata:0x50000000 -O5 -qlargepage -D\_ILS\_MACROS -qalias=noansi  
-qalloca -blpdata

C++ benchmarks:

-bmaxdata:0x20000000 -O5 -qlargepage -D\_ILS\_MACROS -qrtti=all  
-D\_\_IBM\_FAST\_SET\_MAP\_ITERATOR -blpdata

## Base Other Flags

C benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-036

C++ benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-036



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## Peak Compiler Invocation

C benchmarks:

/usr/vac/bin/xlc -qlanglvl=extc99

C++ benchmarks:

/usr/vacpp/bin/xlC

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_AIX  
462.libquantum: -DSPEC\_CPU\_AIX  
464.h264ref: -DSPEC\_CPU\_AIX -qchars=signed  
483.xalanbmk: -DSPEC\_CPU\_AIX

## Peak Optimization Flags

C benchmarks:

400.perlbench: -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5  
-D\_ILS\_MACROS -qalias=noansi -qfdpr -bdatapsize:64K  
-bstacksize:64K -btextpsize:64K  
401.bzip2: -bmaxdata:0x4fffffff -qpdf1(pass 1) -qpdf2(pass 2) -O4  
-qlargepage -D\_ILS\_MACROS -qfdpr -blpdata  
403.gcc: -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O4  
-qlargepage -D\_ILS\_MACROS -qalloca -qfdpr -blpdata  
429.mcf: -bmaxdata:0x50000000 -O5 -qlargepage -D\_ILS\_MACROS -qfdpr  
-blpdata  
445.gobmk: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto  
-qlargepage -D\_ILS\_MACROS -qfdpr -blpdata  
456.hmmr: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qenablevmx -qvecnv1  
-D\_ILS\_MACROS -qfdpr -bdatapsize:64K -bstacksize:64K  
-btextpsize:64K  
458.sjeng: -O5 -qlargepage -qenablevmx -qvecnv1 -D\_ILS\_MACROS  
-qfdpr -blpdata  
462.libquantum: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -q64  
-D\_ILS\_MACROS -qfdpr -blpdata  
464.h264ref: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -D\_ILS\_MACROS -qfdpr  
-bdatapsize:64K -bstacksize:64K -btextpsize:64K

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## Peak Optimization Flags (Continued)

C++ benchmarks:

```
471.omnetpp: -bmaxdata:0x20000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5
             -qlargepage -D_ILS_MACROS -qfdpr -qalign=natural
             -qrtti=all -qinlglue -D__IBM_FAST_SET_MAP_ITERATOR
             -blpdata -btextpsize:64K
```

```
473.astar: -bmaxdata:0x20000000 -O5 -qlargepage -D_ILS_MACROS -qfdpr
           -qenablevmx -qvecnvml -qinlglue -qalign=natural -blpdata
```

```
483.xalancbmk: -bmaxdata:0x20000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5
              -qlargepage -D_ILS_MACROS -qfdpr -qinlglue
              -D__IBM_FAST_VECTOR -blpdata -btextpsize:64K
```

## Peak Other Flags

C benchmarks:

```
-qipa=threads -qipa=noobject -qsuppress=1500-036
```

C++ benchmarks:

```
-qipa=threads -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.html>

<http://www.spec.org/cpu2006/flags/IBM-AIX.html>

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

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

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

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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