



# SPEC® CINT2006 Result

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## IBM Corporation

## SPECint®\_rate2006 = 122

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

## SPECint\_rate\_base2006 = 102

CPU2006 license: 11

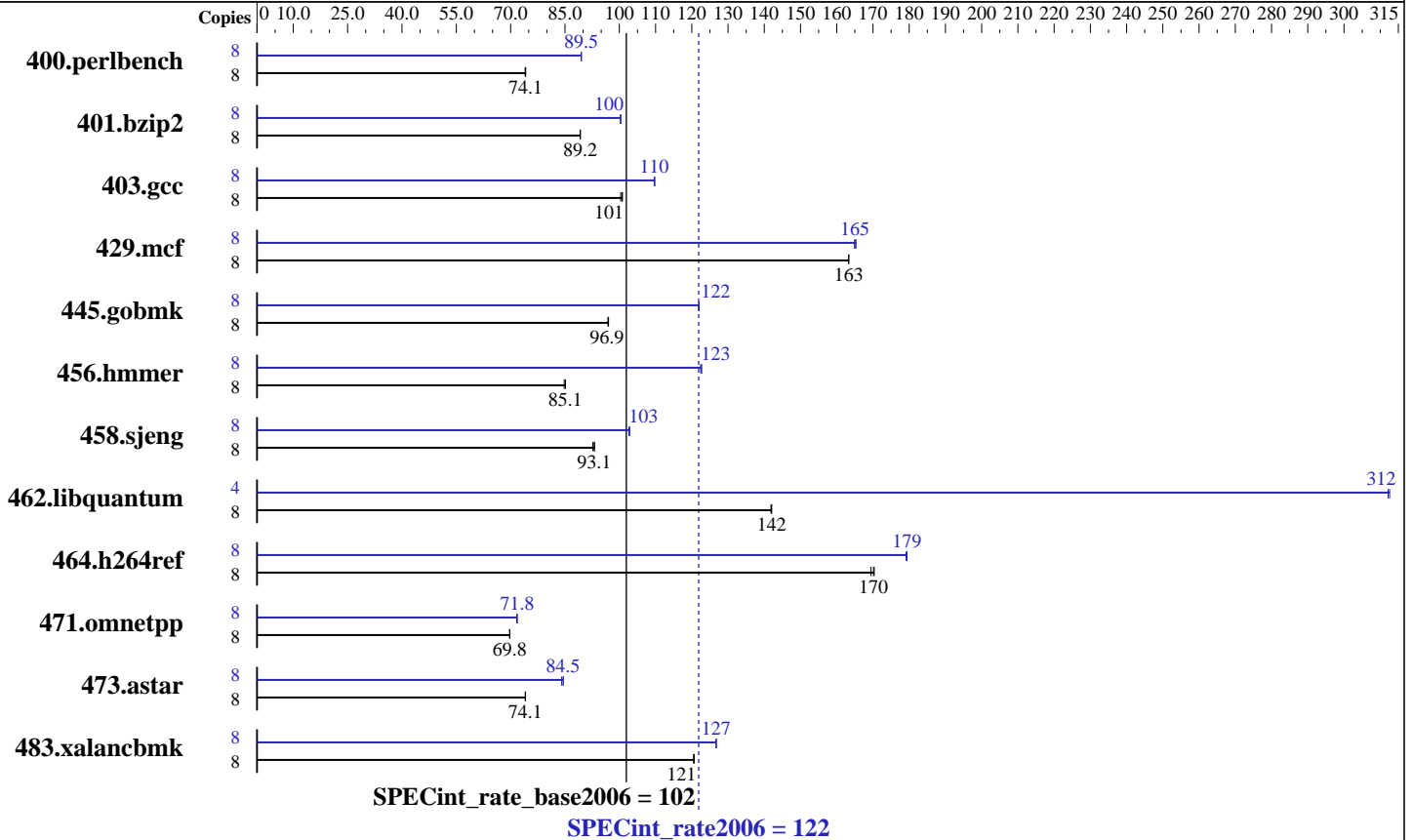
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Mar-2009

Hardware Availability: May-2009

Software Availability: Mar-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: SUSE Linux Enterprise Server 11  
 Compiler: IBM XL C/C++ for Linux, V10.1  
 Updated with the Mar2009 PTF.  
 Auto Parallel: No  
 File System: ext3  
 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 5.4.0-21  
 -MicroQuill SmartHeap 8.1



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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><u>1055</u></b>	<b><u>74.1</u></b>	1056	74.0	1054	74.2	8	874	89.5	<b><u>873</u></b>	<b><u>89.5</u></b>	873	89.5
401.bzip2	8	865	89.2	<b><u>865</u></b>	<b><u>89.2</u></b>	865	89.2	8	<b><u>769</u></b>	<b><u>100</u></b>	770	100	769	100
403.gcc	8	<b><u>639</u></b>	<b><u>101</u></b>	638	101	642	100	8	586	110	<b><u>587</u></b>	<b><u>110</u></b>	587	110
429.mcf	8	447	163	447	163	<b><u>447</u></b>	<b><u>163</u></b>	8	442	165	<b><u>442</u></b>	<b><u>165</u></b>	441	165
445.gobmk	8	865	97.0	<b><u>866</u></b>	<b><u>96.9</u></b>	866	96.9	8	688	122	<b><u>688</u></b>	<b><u>122</u></b>	688	122
456.hmmer	8	877	85.1	880	84.8	<b><u>877</u></b>	<b><u>85.1</u></b>	8	<b><u>608</u></b>	<b><u>123</u></b>	610	122	608	123
458.sjeng	8	1044	92.7	<b><u>1040</u></b>	<b><u>93.1</u></b>	1039	93.1	8	943	103	<b><u>942</u></b>	<b><u>103</u></b>	941	103
462.libquantum	8	<b><u>1167</u></b>	<b><u>142</u></b>	1167	142	1169	142	4	<b><u>265</u></b>	<b><u>312</u></b>	265	312	265	313
464.h264ref	8	1039	170	<b><u>1041</u></b>	<b><u>170</u></b>	1045	169	8	<b><u>987</u></b>	<b><u>179</u></b>	987	179	988	179
471.omnetpp	8	717	69.7	717	69.8	<b><u>717</u></b>	<b><u>69.8</u></b>	8	698	71.7	<b><u>696</u></b>	<b><u>71.8</u></b>	696	71.8
473.astar	8	758	74.0	<b><u>758</u></b>	<b><u>74.1</u></b>	758	74.1	8	668	84.1	664	84.5	<b><u>665</u></b>	<b><u>84.5</u></b>
483.xalanbmk	8	458	121	<b><u>458</u></b>	<b><u>121</u></b>	458	121	8	<b><u>436</u></b>	<b><u>127</u></b>	436	127	436	127

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

## Submit Notes

The config file option 'submit' was used.  
Benchmarks bound to a processor using numactl on the submit command.

## General Notes

kernel release 2.6.27.19-5-ppc64.  
 See flags file for details on following settings.  
 ulimit -s (stack) set to 1048576.  
 System configured with libhugetlbfs library for application access to large pages  
 Large pages reserved as follows by root user:  
 echo 530 > /proc/sys/vm/nr\_hugepages  
 Environment variables set before executing benchmarks.  
 export HUGETLB\_VERBOSE=0  
 export HUGETLB\_MORECORE=yes  
 export XLFRTEOPTS=intrinthds=1  
 IBM Post-Link Optimization tool was used for these benchmarks, with options:  
 400.perlbench : "-imullX" (instrumentation phase), "-O4 -omullX" (optimization phase)  
 401.bzip2 : same as 400.perlbench  
 403.gcc : same as 400.perlbench  
 456.hmmer : same as 400.perlbench  
 458.sjeng : same as 400.perlbench  
 483.xalanbmk : same as 400.perlbench  
 429.mcf : "-imullX" (instrumentation phase), "-bf -dp -hr -las -pca -RC -RD  
 -rmte -si -tlo -A 64 -isf 104 -lu 8 -rt 0.16  
 -hrf 0.18 -ihf 40 -sdp 6 -sdpsms 128 -shci 65 -si -sidf 45 -omullX" (optimization phase)  
 445.gobmk : "-imullX" (instrumentation phase), "-q -O3 -A 32 -omullX" (optimization phase)  
 462.libquantum : "-imullX" (instrumentation phase), "-bf -dp -lro -nop -RC -RD -tb -tlo -vro -A 4

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## General Notes (Continued)

-isf 88 -lu 8 -hrf 0.10 -sdp 4 -lun 27 -omullX" (optimization phase)  
473.astar : "-imullX" (instrumentation phase), "-O4 -omullX -see 1" (optimization phase)  
464.h264ref : "-O4" (optimization phase)

## Base Compiler Invocation

C benchmarks:

xlc -qlanglvl=extc99

C++ benchmarks:

x1C

## 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=pwr6 -qtune=pwr6 -qalias=noansi -qalloca -lhugetlbfs

C++ benchmarks:

-O5 -qarch=pwr6 -qtune=pwr6 -qrtti -lsmarheap

## Base Other Flags

C benchmarks:

-qipa=noobject -qipa=threads

C++ benchmarks:

-qipa=noobject -qipa=threads

## Peak Compiler Invocation

C benchmarks:

xlc -qlanglvl=extc99

C++ benchmarks:

x1C



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## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_LINUX\_PPC  
 403.gcc: -DSPEC\_CPU\_LP64  
 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 -qarch=pwr6  
 -qtune=pwr6 -qalias=noansi -lsmartheap

401.bzip2: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6  
 -qtune=pwr6 -lhugetlbfs

403.gcc: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6  
 -qtune=pwr6 -qalloca -q64 -lhugetlbfs

429.mcf: -Wl,-q -O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx  
 -lhugetlbfs

445.gobmk: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6  
 -qtune=pwr6 -qnoenablevmx -lhugetlbfs

456.hmmer: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6  
 -qtune=pwr6 -lhugetlbfs

458.sjeng: -Wl,-q -O5 -qarch=pwr6 -qtune=pwr6 -lhugetlbfs

462.libquantum: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6  
 -qtune=pwr6 -qnoenablevmx -q64 -lhugetlbfs

464.h264ref: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6  
 -qtune=pwr6 -q64 -lhugetlbfs

C++ benchmarks:

471.omnetpp: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6 -qtune=pwr6  
 -qrtti -lsmartheap

473.astar: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6  
 -qtune=pwr6 -qnoenablevmx -lsmartheap

483.xalancbmk: -Wl,-q -O5 -qarch=pwr6 -qtune=pwr6 -lsmartheap



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## Peak Other Flags

C benchmarks:

-qipa=noobject -qipa=threads

C++ benchmarks:

-qipa=noobject -qipa=threads

The flags file that was used to format this result can be browsed at

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

You can also download the XML flags source by saving the following link:

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

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

Tested with SPEC CPU2006 v1.1.  
Report generated on Tue Jul 22 23:46:05 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 12 May 2009.