



# SPEC<sup>®</sup> CINT2006 Result

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## IBM Corporation

IBM PowerLinux 7R4 (4.0 GHz, 32 core, RHEL, GCC)

SPECint<sup>®</sup>\_rate2006 = 1170

SPECint\_rate\_base2006 = 1170

CPU2006 license: 11

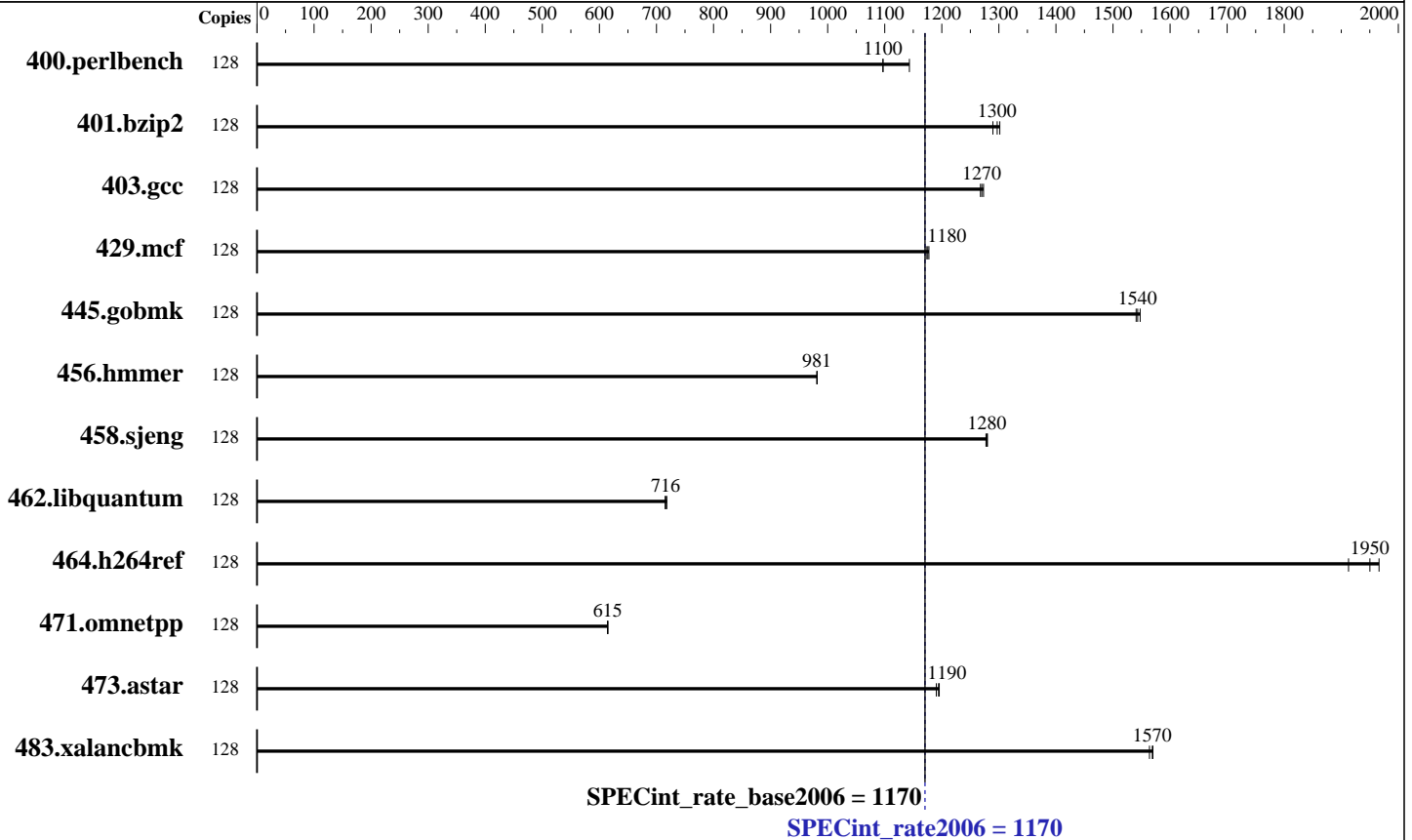
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: May-2013

Hardware Availability: Aug-2013

Software Availability: May-2013



### Hardware

CPU Name: POWER7+  
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 4.431 GHz  
 CPU MHz: 4060  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 8 chips, 4 cores/chip, 4 threads/core  
 CPU(s) orderable: 16, 32 cores  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 10 MB I+D on chip per core  
 Other Cache: None  
 Memory: 256 GB (64 x 4 GB) DDR3 1066 MHz  
 Disk Subsystem: 1 x 300 GB SAS SFF 15K RPM  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 6.4 (ppc64) kernel 2.6.32-358.6.1.el6.ppc64  
 Compiler: C/C++: Version 4.7.3 of IBM Advance Toolchain 6.0-4 gcc/g++ compiler  
 Auto Parallel: No  
 File System: ext4  
 System State: Run level 3 (multi-user)  
 Base Pointers: 32-bit  
 Peak Pointers: 32-bit  
 Other Software: -IBM Advance Toolchain 6.0-4  
 -IBM Mathematical Acceleration Subsystem (MASS) libraries 7.1.0.2



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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	128	<b>1140</b>	<b>1100</b>	1140	1100	1094	1140	128	<b>1140</b>	<b>1100</b>	1140	1100	1094	1140
401.bzip2	128	958	1290	949	1300	<b>952</b>	<b>1300</b>	128	958	1290	949	1300	<b>952</b>	<b>1300</b>
403.gcc	128	813	1270	<b>811</b>	<b>1270</b>	809	1270	128	813	1270	<b>811</b>	<b>1270</b>	809	1270
429.mcf	128	<b>993</b>	<b>1180</b>	995	1170	991	1180	128	<b>993</b>	<b>1180</b>	995	1170	991	1180
445.gobmk	128	<b>870</b>	<b>1540</b>	872	1540	868	1550	128	<b>870</b>	<b>1540</b>	872	1540	868	1550
456.hammer	128	1217	981	1217	982	<b>1217</b>	<b>981</b>	128	1217	981	1217	982	<b>1217</b>	<b>981</b>
458.sjeng	128	1210	1280	<b>1211</b>	<b>1280</b>	1212	1280	128	1210	1280	<b>1211</b>	<b>1280</b>	1212	1280
462.libquantum	128	3693	718	<b>3703</b>	<b>716</b>	3708	715	128	3693	718	<b>3703</b>	<b>716</b>	3708	715
464.h264ref	128	<b>1453</b>	<b>1950</b>	1441	1970	1481	1910	128	<b>1453</b>	<b>1950</b>	1441	1970	1481	1910
471.omnetpp	128	1302	614	1301	615	<b>1302</b>	<b>615</b>	128	1302	614	1301	615	<b>1302</b>	<b>615</b>
473.astar	128	752	1200	755	1190	<b>752</b>	<b>1190</b>	128	752	1200	755	1190	<b>752</b>	<b>1190</b>
483.xalancbmk	128	565	1560	563	1570	<b>563</b>	<b>1570</b>	128	565	1560	563	1570	<b>563</b>	<b>1570</b>

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

## Compiler Invocation Notes

For more information about IBM Advance Toolchain, including support, see [ftp://ftp.unicamp.br/pub/linuxpatch/toolchain/at/redhat/RHEL6/at6.0/release\\_notes.at6.0-6.0-4.html](ftp://ftp.unicamp.br/pub/linuxpatch/toolchain/at/redhat/RHEL6/at6.0/release_notes.at6.0-6.0-4.html)

## Submit Notes

The config file option 'submit' was used to assign benchmark copy to specific kernel thread using the "numactl" command (see flags file for details).

## Operating System Notes

ulimit -s (stack) set to 1048576.

Large pages reserved as follows by root user:  
echo 8448 > /proc/sys/vm/nr\_hugepages

The Mathematical Acceleration Subsystem libraries are shipped with IBM XL C/C++ version 12.1 and IBM XL Fortran version 14.1 compiler products.

## General Notes

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

HUGETLB\_ELFMAP = "RW"  
HUGETLB\_MORECORE = "yes"

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## General Notes (Continued)

HUGETLB\_VERBOSE = "0"  
TCMALLOC\_MEMFS\_MALLOCC\_PATH = "/libhugetlbfs"  
XLFRTIOPTS = "intrinths=1"

## Base Compiler Invocation

C benchmarks:  
/opt/at6.0/bin/gcc

C++ benchmarks:  
/opt/at6.0/bin/g++

## Base Portability Flags

400.perlbench: -DSPEC\_CPU\_LINUX\_PPC  
462.libquantum: -DSPEC\_CPU\_LINUX  
464.h264ref: -fsigned-char  
483.xalancbmk: -DSPEC\_CPU\_LINUX

## Base Optimization Flags

C benchmarks:  
-ffast-math -O3 -mcpu=power7 -mtune=power7 -mrecip=rsqrt  
-fpeel-loops -funroll-loops -mpopcntd -m32 -flto -fwhole-program  
-fuse-linker-plugin -Wl,-q -Wl,-Map=link.map,--cref -L /opt/at6.0/lib  
-L /opt/ibmcmp/xlmass/7.1/lib -Wl,-rpath,/opt/at6.0/lib  
-Wl,-rpath,/opt/ibmcmp/xlmass/7.1/lib -lhugetlbfs -lmassvp7  
-lmass\_simdp7 -lmass

C++ benchmarks:  
-ffast-math -O3 -mcpu=power7 -mtune=power7 -mrecip=rsqrt  
-fpeel-loops -funroll-loops -mpopcntd -m32  
--param max-inline-insns-auto=200 -Wl,-q -Wl,-Map=link.map,--cref  
-L /opt/at6.0/lib -L /opt/ibmcmp/xlmass/7.1/lib  
-Wl,-rpath,/opt/at6.0/lib -Wl,-rpath,/opt/ibmcmp/xlmass/7.1/lib  
-lhugetlbfs -lmassvp7 -lmass\_simdp7 -lmass -ltcmalloc  
-lstdc++ -lpthread

## Peak Optimization Flags

C benchmarks:

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## Peak Optimization Flags (Continued)

400.perlbench: basepeak = yes

401.bzip2: basepeak = yes

403.gcc: basepeak = yes

429.mcf: basepeak = yes

445.gobmk: basepeak = yes

456.hmmmer: basepeak = yes

458.sjeng: basepeak = yes

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

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

<http://www.spec.org/cpu2006/flags/IBM-Linux-AT.20130813.html>

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

<http://www.spec.org/cpu2006/flags/IBM-Linux-AT.20130813.xml>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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