# SPEC® CINT2006 Result

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## IBM Corporation

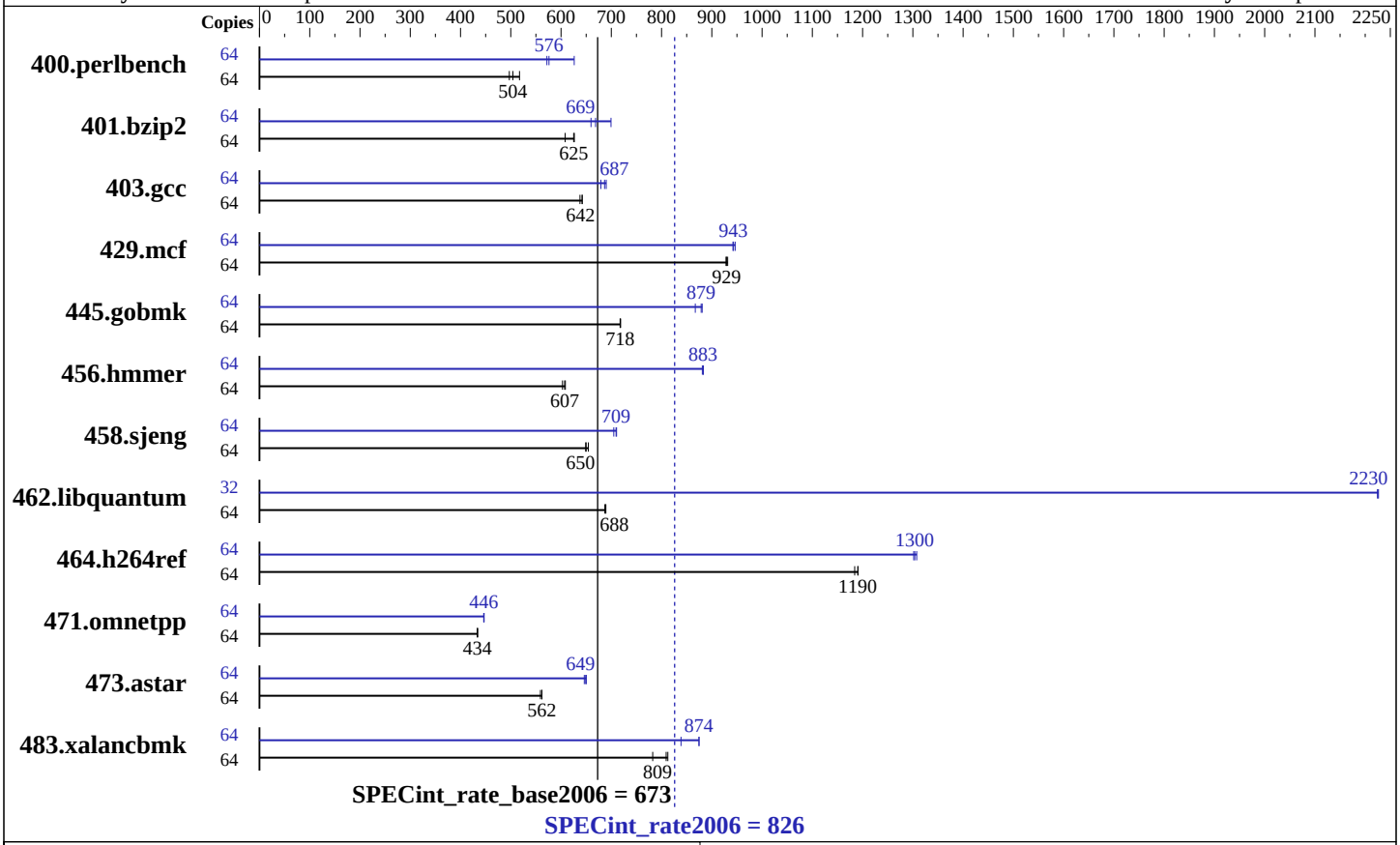
## IBM Power 570 ( 4.2 GHz, 32 core, RedHat)

SPECint®_rate2006 = 826

SPECint_rate_base2006 = 673

**CPU2006 license:** 11
**Test sponsor:** IBM Corporation
**Tested by:** IBM Corporation

**Test date:** Sep-2008
**Hardware Availability:** Nov-2008
**Software Availability:** Sep-2008




### Hardware

| | |
|---|---|
| CPU Name: | POWER6+ |
| CPU Characteristics: | |
| CPU MHz: | 4200 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 16 chips, 2 cores/chip, 2 threads/core |
| CPU(s) orderable: | 4,8,16,24,32 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: | 128 GB (64x2 GB) DDR2 667 MHz |
| Disk Subsystem: | 2x73 GB SAS 15K RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 5.2, Kernel 2.6.18-92.el5 |
| Compiler: | IBM XL C/C++ for Linux, V10.1 |
| Auto Parallel: | No |
| File System: | ext3 |
| System State: | Run Level 3 (Multi-User) |
| Base Pointers: | 32-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | -IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-18<br>-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 | 64 | 1258 | 497 | **1240** | **504** | 1209 | 517 | 64 | **1086** | **576** | 1093 | 572 | 998 | 626 |
| 401.bzip2 | 64 | 1015 | 608 | **988** | **625** | 986 | 626 | 64 | 936 | 660 | 883 | 699 | **924** | **669** |
| 403.gcc | 64 | 802 | 642 | **802** | **642** | 808 | 638 | 64 | 758 | 679 | 747 | 690 | **750** | **687** |
| 429.mcf | 64 | 627 | 932 | **628** | **929** | 629 | 928 | 64 | 617 | 946 | **619** | **943** | 620 | 942 |
| 445.gobmk | 64 | 934 | 718 | **935** | **718** | 936 | 718 | 64 | 762 | 881 | **764** | **879** | 774 | 867 |
| 456.hmmer | 64 | 981 | 609 | 990 | 603 | **983** | **607** | 64 | 678 | 881 | 676 | 883 | **676** | **883** |
| 458.sjeng | 64 | **1192** | **650** | 1184 | 654 | 1193 | 649 | 64 | 1099 | 705 | 1090 | 710 | **1092** | **709** |
| 462.libquantum | 64 | 1929 | 687 | **1927** | **688** | 1924 | 689 | 32 | **298** | **2230** | 298 | 2220 | 298 | 2230 |
| 464.h264ref | 64 | 1196 | 1180 | **1190** | **1190** | 1189 | 1190 | 64 | **1086** | **1300** | 1088 | 1300 | 1083 | 1310 |
| 471.omnetpp | 64 | 923 | 434 | 922 | 434 | **922** | **434** | 64 | 896 | 446 | **896** | **446** | 895 | 447 |
| 473.astar | 64 | 804 | 559 | **800** | **562** | 799 | 562 | 64 | 695 | 646 | **692** | **649** | 691 | 650 |
| 483.xalancbmk | 64 | 564 | 782 | 544 | 812 | **546** | **809** | 64 | 527 | 839 | 505 | 875 | **505** | **874** |

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

```
 See flags file for details on following settings.

 ulimit -s (stack) set to 1048576.

 Large pages reserved as follows by root user:
     echo 3840 > /proc/sys/vm/nr_hugepages
 System configured with libhugetlbfs library for application access to large pages
 Environment variables set before executing benchmarks.
     export HUGETLB_VERBOSE=0
     export HUGETLB_MORECORE=yes
     export XLFRTEOPTS=intrinthds=1

 IBM Post-Link Optimization tool with
   options "-q -O4 -A 32 -shci 90 -sdp 9" used for
       400.perlbench 401.bzip2 403.gcc 429.mcf 456.hmmer 458.sjeng
       464.h264ref 473.astar 483.xalancbmk
   options "-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 -sdpms 128 -shci 65 -si -sidf 45" used for
       429.mcf
   options "-q -O3 -A 32" used for
       445.gobmk
   options "-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" used for
462.libquantum
```

## Base Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

## 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 -lsmartheap
```

## Base Other Flags

C benchmarks:
```
-qipa=noobject -qipa=threads
```

C++ benchmarks:
```
-qipa=noobject -qipa=threads
```

## Peak Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

Continued on next page

## Peak Compiler Invocation (Continued)

C++ benchmarks:
xlC

## 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

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## Peak Optimization Flags (Continued)

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`

## 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.20090713.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20090713.xml`


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