# SPEC® CINT2006 Result

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## IBM Corporation

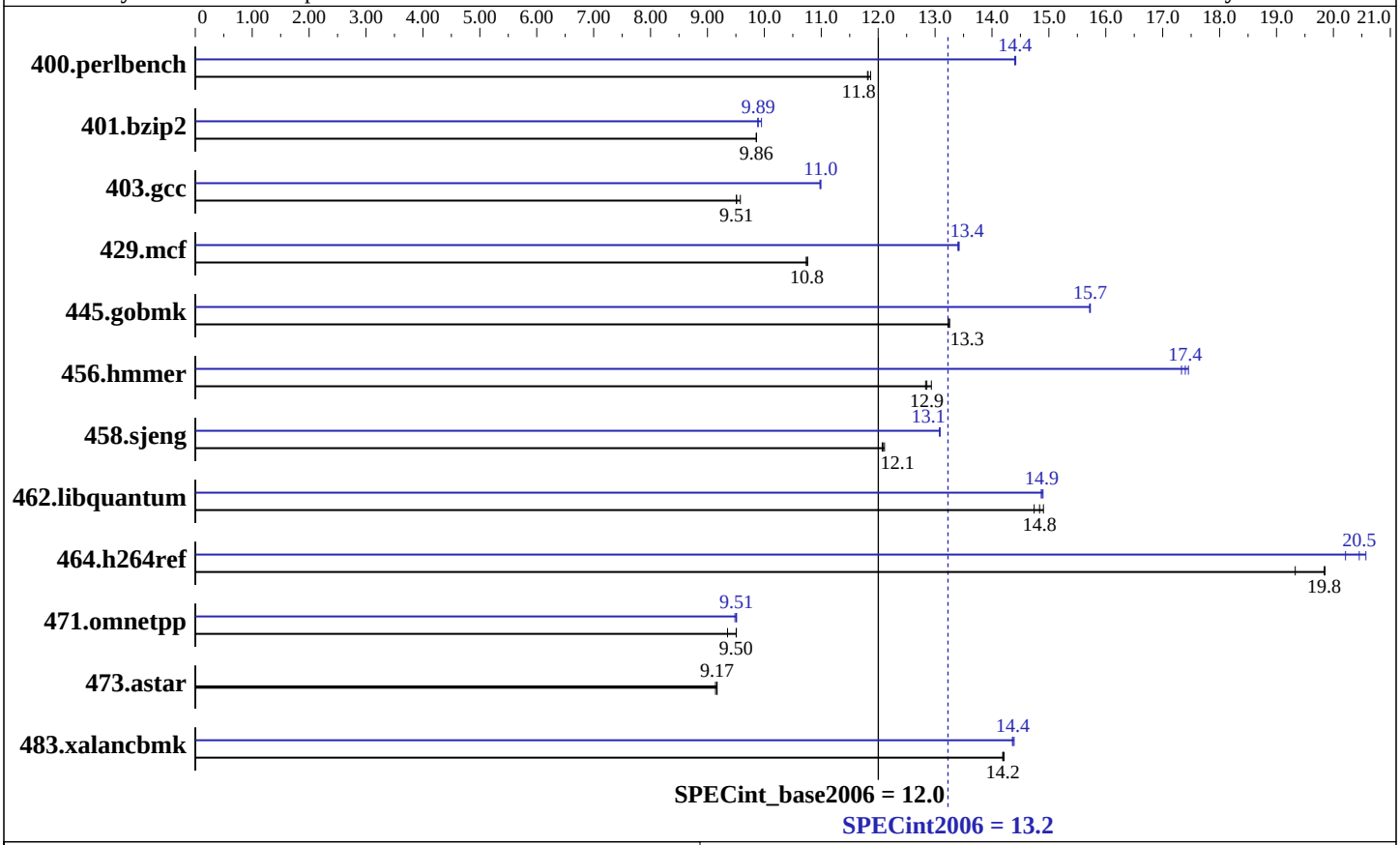
## IBM System x3655 (AMD Opteron 2218)

SPECint®2006 = 13.2

SPECint_base2006 = 12.0

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

**Test date:** Jul-2007
**Hardware Availability:** Oct-2006
**Software Availability:** Mar-2007




### Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 2218 |
| CPU Characteristics: | |
| CPU MHz: | 2600 |
| FPU: | Integrated |
| CPU(s) enabled: | 4 cores, 2 chips, 2 cores/chip |
| CPU(s) orderable: | 1, 2 chips |
| Primary Cache: | 64 KB I + 64 KB D on chip per core |
| Secondary Cache: | 1 MB I+D on chip per core |
| L3 Cache: | None |
| Other Cache: | None |
| Memory: | 16 GB (8 x 2GB DDR2-5300 ECC) |
| Disk Subsystem: | 1 x 36 GB SAS, 10000 RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | SLES 10 (x86_64), 2.6.16.21-0.8-smp |
| Compiler: | QLogic PathScale Compiler Suite, Release 3.0 |
| Auto Parallel: | No |
| File System: | ext3 |
| System State: | Multi-user, run level 3 |
| Base Pointers: | 64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | MicroQuill SmartHeap 8.1 |

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## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 827 | 11.8 | 823 | 11.9 | **826** | **11.8** | **678** | **14.4** | 678 | 14.4 | 678 | 14.4 |
| 401.bzip2 | 979 | 9.86 | 979 | 9.86 | **979** | **9.86** | 970 | 9.95 | **975** | **9.89** | 976 | 9.88 |
| 403.gcc | 847 | 9.51 | 840 | 9.58 | **846** | **9.51** | 732 | 11.0 | **732** | **11.0** | 733 | 11.0 |
| 429.mcf | **848** | **10.8** | 848 | 10.8 | 850 | 10.7 | **680** | **13.4** | 679 | 13.4 | 681 | 13.4 |
| 445.gobmk | **792** | **13.3** | 792 | 13.3 | 793 | 13.2 | 667 | 15.7 | 668 | 15.7 | **667** | **15.7** |
| 456.hmmer | **726** | **12.9** | 727 | 12.8 | 721 | 12.9 | **536** | **17.4** | 538 | 17.3 | 535 | 17.5 |
| 458.sjeng | 999 | 12.1 | **1001** | **12.1** | 1002 | 12.1 | 925 | 13.1 | 925 | 13.1 | **925** | **13.1** |
| 462.libquantum | 1406 | 14.7 | **1397** | **14.8** | 1390 | 14.9 | 1391 | 14.9 | **1392** | **14.9** | 1394 | 14.9 |
| 464.h264ref | 1115 | 19.9 | 1145 | 19.3 | **1116** | **19.8** | **1082** | **20.5** | 1076 | 20.6 | 1095 | 20.2 |
| 471.omnetpp | 657 | 9.51 | **658** | **9.50** | 668 | 9.35 | 657 | 9.51 | 659 | 9.48 | **657** | **9.51** |
| 473.astar | 766 | 9.17 | 768 | 9.14 | **766** | **9.17** | 766 | 9.17 | 768 | 9.14 | **766** | **9.17** |
| 483.xalancbmk | 485 | 14.2 | **486** | **14.2** | 486 | 14.2 | **480** | **14.4** | 481 | 14.4 | 480 | 14.4 |

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

## General Notes

```
taskset utility used to bind CPU(s) to processes
```

## Base Compiler Invocation

C benchmarks:
`pathcc`

C++ benchmarks:
`pathCC`

## Base Portability Flags

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-DSPEC_CPU_LP64`
403.gcc: `-DSPEC_CPU_LP64`
429.mcf: `-DSPEC_CPU_LP64`
445.gobmk: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
464.h264ref: `-DSPEC_CPU_LP64`
483.xalancbmk: `-DSPEC_CPU_LINUX`

## Base Optimization Flags

C benchmarks:
`-Ofast -OPT:malloc_alg=1`

C++ benchmarks:
`-Ofast -m32 -L/tools/SmartHeap_8.1/lib -lsmartheap`

## Base Other Flags

C benchmarks:
`-IPA:max_jobs=2`

C++ benchmarks:
`-IPA:max_jobs=2`

## Peak Compiler Invocation

C benchmarks:
`pathcc`

C++ benchmarks:
`pathCC`

## Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-DSPEC_CPU_LP64`
445.gobmk: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
464.h264ref: `-DSPEC_CPU_LP64`
483.xalancbmk: `-DSPEC_CPU_LINUX`

## Peak Optimization Flags

C benchmarks:

400.perlbench: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-Ofast -LNO:opt=0`

401.bzip2: `-O3 -LNO:ou_prod_max=10 -OPT:Ofast -OPT:alias=disjoint`

Continued on next page

## Peak Optimization Flags (Continued)

403.gcc: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-m32 -O3 -OPT:Ofast`

429.mcf: `-m32 -O3 -ipa -L/tools/SmartHeap_8.1/lib -lsmartheap`

445.gobmk: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-O3 -OPT:alias=disjoint -LNO:simd=0 -LNO:minvariant=off -WOPT:retype_expr=on`

456.hmmer: `-O2 -OPT:alias=disjoint -OPT:malloc_alg=1 -CG:cflow=0`

458.sjeng: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-O3 -IPA:plimit=50000 -IPA:pu_reorder=2`

462.libquantum: `-O3 -ipa -CG:local_fwd_sched=on -IPA:space=1000`

464.h264ref: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-O3 -IPA:plimit=20000 -OPT:alias=disjoint -LNO:prefetch=0`

C++ benchmarks:

471.omnetpp: `-Ofast -CG:gcm=off -m32 -L/tools/SmartHeap_8.1/lib -lsmartheap`

473.astar: `basepeak = yes`

483.xalancbmk: `-Ofast -m32 -OPT:unroll_times_max=8 -L/tools/SmartHeap_8.1/lib -lsmartheap`

## Peak Other Flags

C benchmarks:
`-IPA:max_jobs=2`

C++ benchmarks:
`-IPA:max_jobs=2`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.13.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.13.xml`

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Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 12:49:12 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 8 August 2007.