# SPEC® CINT2006 Result



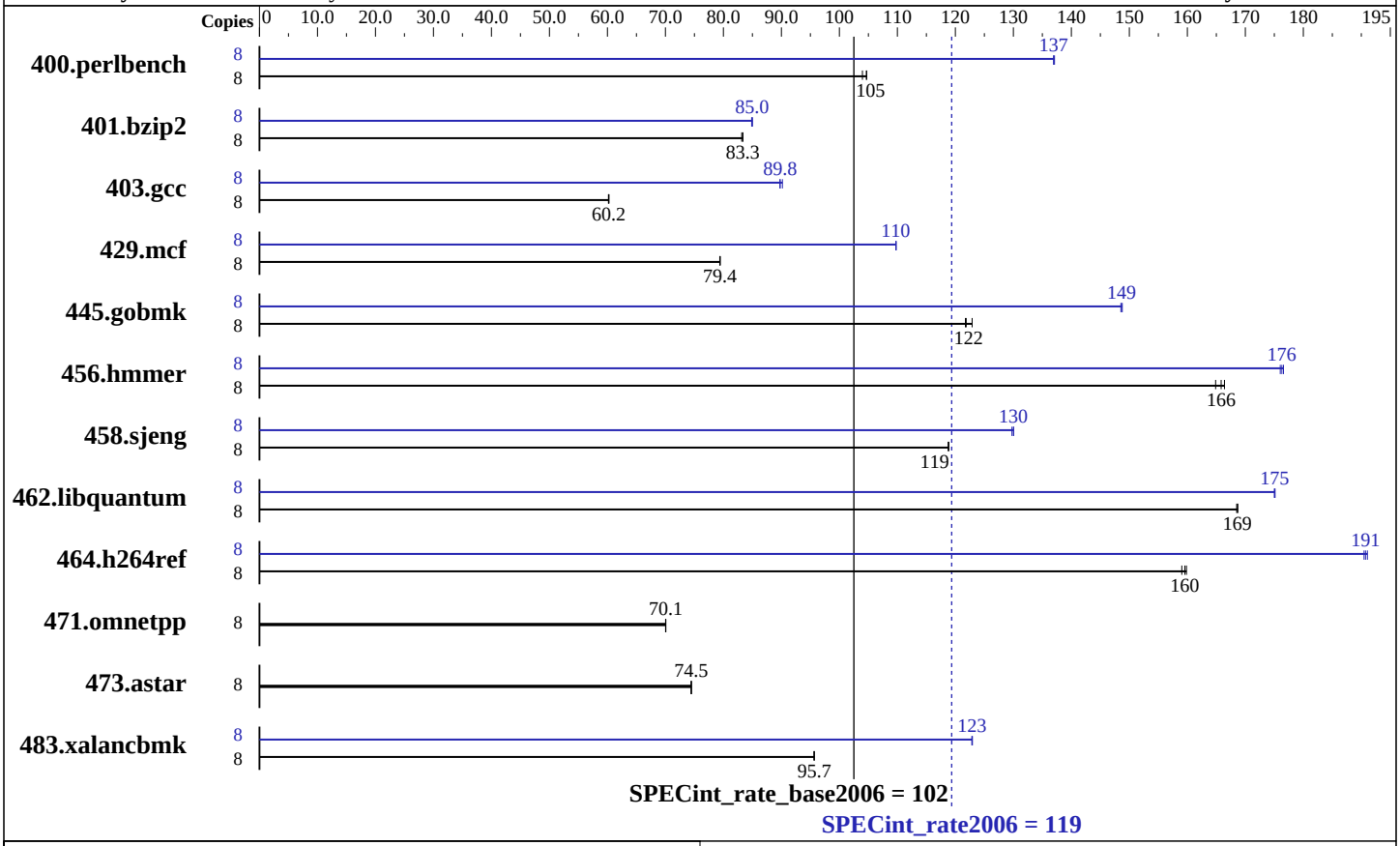
## Sun Microsystems
## Sun Fire X4440

SPECint®_rate2006 = 119

SPECint_rate_base2006 = 102

**CPU2006 license:** 6
**Test sponsor:** Sun Microsystems
**Tested by:** Sun Microsystems

**Test date:** Feb-2008
**Hardware Availability:** Apr-2008
**Software Availability:** Dec-2007




### Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 8224 SE |
| CPU Characteristics: | |
| CPU MHz: | 3200 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 4 chips, 2 cores/chip |
| CPU(s) orderable: | 2-4 (order by number of 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: | 64 GB (16x4GB, DDR2-667 CL5 Reg Dual Rank) |
| Disk Subsystem: | SAS, 72 GB,10 K RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | SuSE Linux Enterprise Server 10 SP1 64-bit kernel |
| Compiler: | The Portland Group (PGI)<br>PGI pgcc 7.1-3 C Compiler<br>PGI pgCC 7.1-3 C++ Compiler<br>The PathScale Compiler v3.0<br>PathScale pathcc 3.0 C Compiler<br>PathScale pathCC 3.0 C++ Compiler |
| Auto Parallel: | No |
| File System: | ReiserFS |
| System State: | Multi-user, run level 3 |
| Base Pointers: | 32/64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | SmartHeap 8.1 32-bit Library for Linux |

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 8 | **747** | **105** | 752 | 104 | 747 | 105 | 8 | **571** | **137** | 570 | 137 | 571 | 137 |
| 401.bzip2 | 8 | 928 | 83.2 | **926** | **83.3** | 926 | 83.3 | 8 | **909** | **85.0** | 908 | 85.0 | 910 | 84.9 |
| 403.gcc | 8 | **1070** | **60.2** | 1068 | 60.3 | 1070 | 60.2 | 8 | 714 | 90.2 | 718 | 89.7 | **717** | **89.8** |
| 429.mcf | 8 | 919 | 79.4 | 918 | 79.4 | **919** | **79.4** | 8 | 665 | 110 | 665 | 110 | **665** | **110** |
| 445.gobmk | 8 | **689** | **122** | 689 | 122 | 683 | 123 | 8 | 564 | 149 | **565** | **149** | 565 | 149 |
| 456.hmmer | 8 | 453 | 165 | **450** | **166** | 449 | 166 | 8 | **423** | **176** | 423 | 177 | 424 | 176 |
| 458.sjeng | 8 | 814 | 119 | 815 | 119 | **815** | **119** | 8 | 744 | 130 | **745** | **130** | 746 | 130 |
| 462.libquantum | 8 | **983** | **169** | 983 | 169 | 984 | 169 | 8 | 946 | 175 | **947** | **175** | 947 | 175 |
| 464.h264ref | 8 | **1110** | **160** | 1108 | 160 | 1113 | 159 | 8 | **928** | **191** | 929 | 190 | 927 | 191 |
| 471.omnetpp | 8 | **714** | **70.1** | 714 | 70.1 | 714 | 70.0 | 8 | **714** | **70.1** | 714 | 70.1 | 714 | 70.0 |
| 473.astar | 8 | 754 | 74.5 | 754 | 74.4 | **754** | **74.5** | 8 | 754 | 74.5 | 754 | 74.4 | **754** | **74.5** |
| 483.xalancbmk | 8 | **577** | **95.7** | 577 | 95.6 | 577 | 95.7 | 8 | **449** | **123** | 449 | 123 | 449 | 123 |

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

## Operating System Notes

```
'ulimit -s unlimited' used to set environment stack size
'ulimit -l 2457600' was used to set environment lock pages quantity
'numactl' was used to bind copies to the cores
Set vm/nr_hugepages=2400 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
Environment variable PGI_HUGE_PAGES set to 150
```

## Platform Notes

```
Default BIOS settings were used.
```

## Base Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks:
pgcpp

## Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64

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## Base Portability Flags (Continued)

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:
-fast -Mipa=fast -Mipa=inline -Mipa=noarg -Mfprelaxed
-Msmartalloc=huge:840 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-fastsse -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:448
--zc_eh -tp barcelona -Bstatic_pgi

## Base Other Flags

C benchmarks:
-w

C++ benchmarks:
-w

## Peak Compiler Invocation

C benchmarks (except as noted below):
pgcc

400.perlbench: pathcc

403.gcc: pathcc

445.gobmk: pathcc

464.h264ref: pathcc

C++ benchmarks (except as noted below):
pgcpp

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## Peak Compiler Invocation (Continued)

483.xalancbmk: 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: -Mpfi(pass 1) -Mpfo(pass 2) -fast -O4
-Msmartalloc=huge:448 -tp barcelona-64 -Bstatic_pgi

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

429.mcf: -fastsse -Mipa=fast -Mipa=inline:1 -Msmartalloc=huge:420
-tp barcelona -Bstatic_pgi

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: -fast -Msmartalloc=huge:448 -Mfprelaxed -Msafeptr
-Mipa=const -Mipa=ptr -Mipa=arg -tp barcelona-64
-Bstatic_pgi

458.sjeng: -Mpfi(pass 1) -Mipa=fast(pass 2) -Mipa=inline:1(pass 2)
-Mipa=noarg(pass 2) -Mpfo(pass 2) -fast
-Msmartalloc=huge:448 -Mfprelaxed -tp barcelona-64
-Bstatic_pgi

462.libquantum: -fast -Mfprelaxed -Msmartalloc=huge:448 -Munroll=m:4
-Mipa=fast -Mipa=inline -Mipa=noarg -Bstatic_pgi

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## Peak Optimization Flags (Continued)

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: `basepeak = yes`

473.astar: `basepeak = yes`

483.xalancbmk: `-Ofast -m32 -OPT:unroll_times_max=8 -L/data1/SmartHeap_8.1/lib -lsmartheap`

## Peak Other Flags

C benchmarks (except as noted below):
`-W`

400.perlbench: `No flags used`

403.gcc: `No flags used`

445.gobmk: `No flags used`

464.h264ref: `No flags used`

C++ benchmarks (except as noted below):
`-W`

483.xalancbmk: `No flags used`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/amd814GH-flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/amd814GH-flags.xml`



For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.0.
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