# SPEC® CINT2006 Result

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## GIGA-BYTE Technology Co. Ltd.

(Test Sponsor: Advanced Micro Devices)

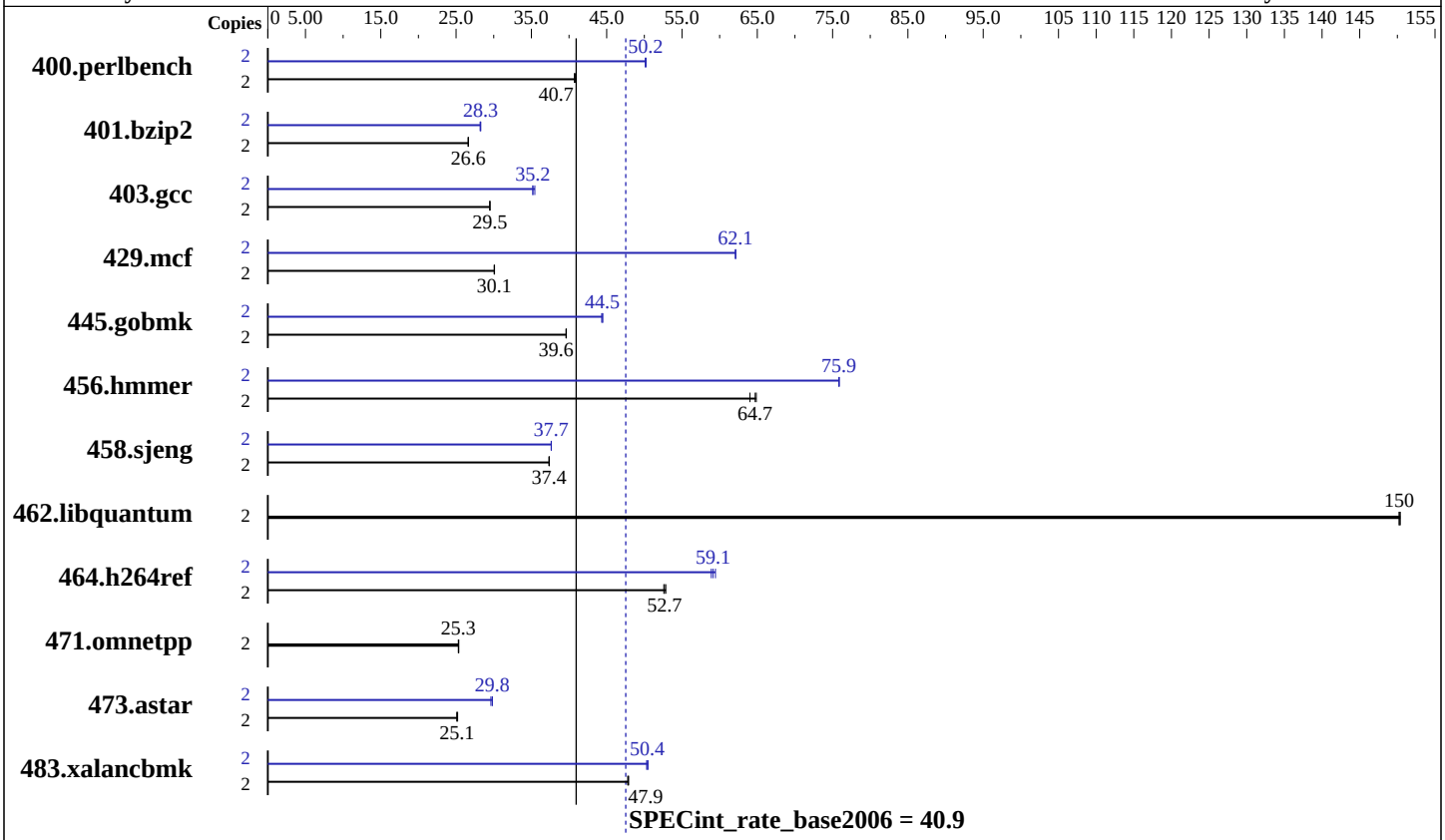
Gigabyte GA-880GMA-USB3,
AMD Athlon II X2 260

SPECint®_rate2006 = 47.5

SPECint_rate_base2006 = 40.9

**CPU2006 license:** 49
**Test sponsor:** Advanced Micro Devices
**Tested by:** Advanced Micro Devices

**Test date:** Apr-2011
**Hardware Availability:** May-2010
**Software Availability:** Jul-2010




## Hardware

| | |
|---|---|
| CPU Name: | AMD Athlon II X2 260 |
| CPU Characteristics: | |
| CPU MHz: | 3200 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 1 chip, 2 cores/chip |
| CPU(s) orderable: | 1 chip |
| 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: | 8 GB (4 x 2 GB 1Rx4 PC3-10600U-9) |
| Disk Subsystem: | 1 x 2 TB SATA, 7200 RPM |
| Other Hardware: | None |

## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default |
| Compiler: | x86 Open64 4.2.4 Compiler Suite (from AMD) |
| Auto Parallel: | No |
| File System: | ext3 |
| System State: | Run level 3 (Full multiuser with network) |
| Base Pointers: | 32/64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | SmartHeap 8.1 32-bit Library for Linux |

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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 | 2 | 478 | 40.8 | 480 | 40.7 | **480** | **40.7** | 2 | 390 | 50.1 | 389 | 50.2 | **390** | **50.2** |
| 401.bzip2 | 2 | 725 | 26.6 | 724 | 26.6 | **725** | **26.6** | 2 | 683 | 28.3 | 685 | 28.2 | **683** | **28.3** |
| 403.gcc | 2 | 546 | 29.5 | 546 | 29.5 | **546** | **29.5** | 2 | **457** | **35.2** | 454 | 35.5 | 457 | 35.2 |
| 429.mcf | 2 | 607 | 30.1 | **606** | **30.1** | 606 | 30.1 | 2 | **294** | **62.1** | 294 | 62.1 | 294 | 62.1 |
| 445.gobmk | 2 | 529 | 39.6 | **530** | **39.6** | 530 | 39.6 | 2 | 473 | 44.3 | 472 | 44.5 | **472** | **44.5** |
| 456.hmmer | 2 | 291 | 64.0 | **288** | **64.7** | 288 | 64.9 | 2 | **246** | **75.9** | 246 | 75.8 | 246 | 75.9 |
| 458.sjeng | 2 | 647 | 37.4 | 648 | 37.3 | **648** | **37.4** | 2 | **643** | **37.7** | 643 | 37.6 | 643 | 37.7 |
| 462.libquantum | 2 | **276** | **150** | 276 | 150 | 276 | 150 | 2 | **276** | **150** | 276 | 150 | 276 | 150 |
| 464.h264ref | 2 | 837 | 52.9 | **840** | **52.7** | 842 | 52.6 | 2 | 752 | 58.9 | **749** | **59.1** | 745 | 59.4 |
| 471.omnetpp | 2 | 493 | 25.4 | 494 | 25.3 | **494** | **25.3** | 2 | 493 | 25.4 | 494 | 25.3 | **494** | **25.3** |
| 473.astar | 2 | 559 | 25.1 | 557 | 25.2 | **559** | **25.1** | 2 | 474 | 29.6 | 471 | 29.8 | **471** | **29.8** |
| 483.xalancbmk | 2 | **288** | **47.9** | 288 | 47.9 | 289 | 47.8 | 2 | **274** | **50.4** | 274 | 50.3 | 273 | 50.5 |

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.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

## Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152'  was used to set environment locked pages in memory limit

Set vm/nr_hugepages=1792 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

Binaries were compiled on SLES10 SP2 with binutils 2.18
```

## General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "1792"
LD_LIBRARY_PATH = "/root/work/cpu2006v1.1/amd1002-rate-libs-revC/64:/root/work/cpu2006v1.1/amd1002-rate-libs-revC/32"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
http://developer.amd.com/cpu/open64
```

## Base Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

## 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:
-march=barcelona -mso -Ofast -CG:local_sched_alg=1
-INLINE:aggressive=on -IPA:plimit=8000 -IPA:small_pu=100
-HP:bdt=2m:heap=2m

C++ benchmarks:
-march=barcelona -mso -Ofast -m32 -INLINE:aggressive=on
-CG:cmp_peep=on -L/root/work/libraries/SmartHeap-8.1/lib -lsmartheap

## Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

## Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64

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## Peak Portability Flags (Continued)

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: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -IPA:plimit=20000 -LNO:opt=0
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -OPT:keep_ext=on -WOPT:if_conv=0
-CG:local_sched_alg=1 -CG:unroll_fb_req=on
-HP:bdt=2m:heap=2m

401.bzip2: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -OPT:alias=disjoint
-OPT:goto=off -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

403.gcc: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:trip_count=256
-LNO:prefetch_ahead=10 -CG:cmp_peep=on -m32
-HP:bdt=2m:heap=2m -GRA:unspill=on -IPA:small_pu=200

429.mcf: -march=barcelona -mso -O3 -ipa -INLINE:aggressive=on
-CG:gcm=off -GRA:prioritize_by_density=on -m32
-HP:bdt=2m:heap=2m

445.gobmk: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -OPT:keep_ext=on -ipa -IPA:plimit=750
-IPA:min_hotness=300 -IPA:pu_reorder=1 -LNO:prefetch=1
-LNO:ignore_feedback=off -CG:p2align=on
-CG:unroll_fb_req=on -HP:bdt=2m:heap=2m

456.hmmer: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:prefetch=0
-OPT:alias=disjoint -OPT:unroll_times_max=8
-OPT:unroll_size=256 -OPT:unroll_level=2 -OPT:keep_ext=on
-CG:local_sched_alg=1 -CG:cflow=0
-CG:push_pop_int_saved_regs=off -CG:cmp_peep=on
-HP:bdt=2m:heap=2m

Continued on next page

## Peak Optimization Flags (Continued)

458.sjeng: `-march=barcelona -mso -fb_create fbdata`(pass 1)
`-fb_opt fbdata`(pass 2) `-O3 -ipa -LNO:ignore_feedback=off`
`-LNO:full_unroll=10 -LNO:fusion=0 -LNO:fission=2`
`-IPA:pu_reorder=2 -CG:ptr_load_use=0`
`-OPT:unroll_times_max=8 -INLINE:aggressive=on`

462.libquantum: `basepeak = yes`

464.h264ref: `-march=barcelona -mso -fb_create fbdata`(pass 1)
`-fb_opt fbdata`(pass 2) `-O3 -IPA:plimit=20000`
`-OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr_load_use=0`
`-CG:push_pop_int_saved_regs=off`

C++ benchmarks:

471.omnetpp: `basepeak = yes`

473.astar: `-march=barcelona -mso -fb_create fbdata`(pass 1)
`-fb_opt fbdata`(pass 2) `-Ofast -TENV:frame_pointer=off`
`-WOPT:if_conv=0 -GRA:optimize_boundary=on`
`-OPT:alias=disjoint -INLINE:aggressive=on`
`-IPA:small_pu=3000 -IPA:plimit=3000 -m32`
`-HP:bdt=2m:heap=2m`

483.xalancbmk: `-march=barcelona -mso -Ofast -INLINE:aggressive=on -m32`
`-CG:cmp_peep=on -GRA:unspill=on -TENV:frame_pointer=off`
`-fno-emit-exceptions`
`-L/root/work/libraries/SmartHeap-8.1/lib -lsmartheap`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.20101109.html`
`http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.20110119.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.20101109.xml`
`http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.20110119.xml`


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