# SPEC® CFP2006 Result



Tyan
(Test Sponsor: Advanced Micro Devices)

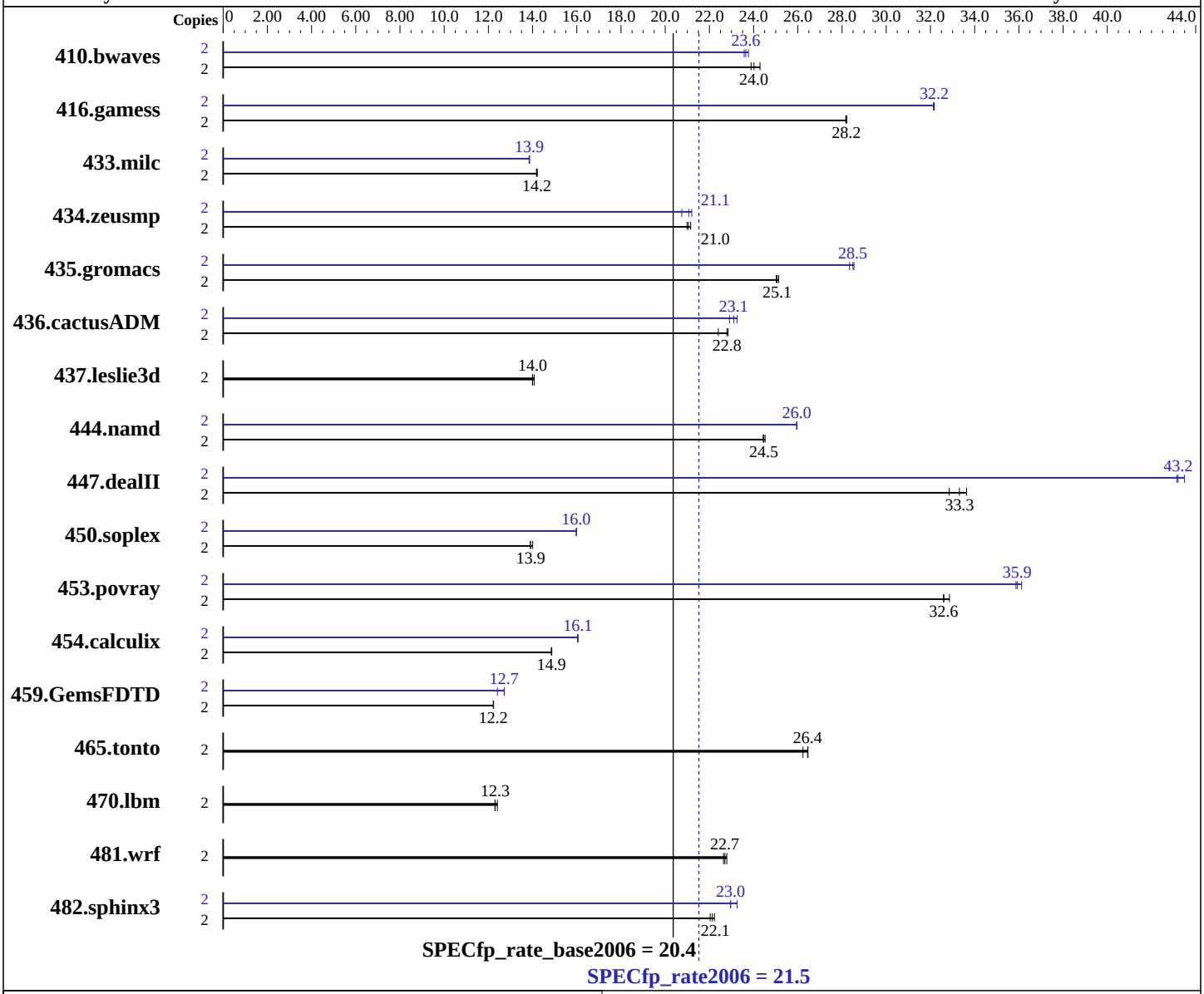
Thunder K8QW (S4881) Opteron 890

SPECfp®_rate2006 = 21.5

SPECfp_rate_base2006 = 20.4

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

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




## Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 890 |
| CPU Characteristics: | |
| CPU MHz: | 2800 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 1 chip, 2 cores/chip |
| CPU(s) orderable: | 1,2,4 chips |
| Primary Cache: | 64 KB I + 64 KB D on chip per core |
| Secondary Cache: | 1 MB I+D on chip per core |

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## Software

| | |
|---|---|
| Operating System: | SuSE Linux Enterprise Server 10 64-bit kernel |
| 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 |

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L3 Cache: None
Other Cache: None
Memory: 4 GB (4x1GB, DDR-400 CL3 ECC Reg Dual Rank)
Disk Subsystem: SATA, 250 GB
Other Hardware: None

Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 2 | 1119 | 24.3 | **1132** | **24.0** | 1138 | 23.9 | 2 | **1150** | **23.6** | 1153 | 23.6 | 1144 | 23.8 |
| 416.gamess | 2 | 1390 | 28.2 | **1388** | **28.2** | 1388 | 28.2 | 2 | **1217** | **32.2** | 1217 | 32.2 | 1219 | 32.1 |
| 433.milc | 2 | 1292 | 14.2 | 1295 | 14.2 | **1294** | **14.2** | 2 | 1327 | 13.8 | **1325** | **13.9** | 1324 | 13.9 |
| 434.zeusmp | 2 | 860 | 21.2 | **865** | **21.0** | 867 | 21.0 | 2 | **864** | **21.1** | 877 | 20.7 | 858 | 21.2 |
| 435.gromacs | 2 | 571 | 25.0 | **570** | **25.1** | 568 | 25.1 | 2 | 500 | 28.5 | 504 | 28.3 | **501** | **28.5** |
| 436.cactusADM | 2 | 1046 | 22.8 | 1067 | 22.4 | **1049** | **22.8** | 2 | 1043 | 22.9 | **1035** | **23.1** | 1028 | 23.2 |
| 437.leslie3d | 2 | 1336 | 14.1 | 1344 | 14.0 | **1343** | **14.0** | 2 | 1336 | 14.1 | 1344 | 14.0 | **1343** | **14.0** |
| 444.namd | 2 | 654 | 24.5 | 657 | 24.4 | **656** | **24.5** | 2 | **618** | **26.0** | 618 | 26.0 | 618 | 25.9 |
| 447.dealII | 2 | 680 | 33.6 | **687** | **33.3** | 697 | 32.8 | 2 | 526 | 43.5 | 530 | 43.1 | **530** | **43.2** |
| 450.soplex | 2 | 1191 | 14.0 | **1199** | **13.9** | 1200 | 13.9 | 2 | 1043 | 16.0 | 1044 | 16.0 | **1044** | **16.0** |
| 453.povray | 2 | 324 | 32.9 | 326 | 32.6 | **326** | **32.6** | 2 | 297 | 35.9 | 295 | 36.1 | **296** | **35.9** |
| 454.calculix | 2 | 1110 | 14.9 | 1111 | 14.8 | **1111** | **14.9** | 2 | 1029 | 16.0 | **1028** | **16.1** | 1028 | 16.1 |
| 459.GemsFDTD | 2 | 1734 | 12.2 | **1735** | **12.2** | 1736 | 12.2 | 2 | **1669** | **12.7** | 1668 | 12.7 | 1710 | 12.4 |
| 465.tonto | 2 | 750 | 26.2 | **744** | **26.4** | 744 | 26.5 | 2 | 750 | 26.2 | **744** | **26.4** | 744 | 26.5 |
| 470.lbm | 2 | 2215 | 12.4 | **2233** | **12.3** | 2234 | 12.3 | 2 | 2215 | 12.4 | **2233** | **12.3** | 2234 | 12.3 |
| 481.wrf | 2 | 980 | 22.8 | **984** | **22.7** | 987 | 22.6 | 2 | 980 | 22.8 | **984** | **22.7** | 987 | 22.6 |
| 482.sphinx3 | 2 | 1769 | 22.0 | **1761** | **22.1** | 1754 | 22.2 | 2 | 1698 | 23.0 | 1677 | 23.3 | **1698** | **23.0** |

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

## General Notes

```
taskset utility used to bind cores to processes
All memory slots filled on all used CPU sockets.
Memory bank interleave is enabled.
The tested system can be assembled using an SSI-MEB case and
a Emacs PSL-6701P 700 watt ATX 12V Power Supply.
```

## Base Compiler Invocation

C benchmarks:
pathcc

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## Base Compiler Invocation (Continued)

C++ benchmarks:
pathCC

Fortran benchmarks:
pathf95

Benchmarks using both Fortran and C:
pathcc pathf95

## Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

## Base Optimization Flags

C benchmarks:
-Ofast

C++ benchmarks:
-Ofast

Fortran benchmarks:
-Ofast -OPT:malloc_alg=1

Benchmarks using both Fortran and C:
-Ofast -OPT:malloc_alg=1

## Peak Compiler Invocation

C benchmarks:
pathcc

C++ benchmarks:
pathCC

Fortran benchmarks:
pathf95

Benchmarks using both Fortran and C:
pathcc pathf95

## Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

## Peak Optimization Flags

C benchmarks:

433.milc: -Ofast -CG:cflow=off -LNO:prefetch=1 -OPT:malloc_alg=1

470.lbm: basepeak = yes

482.sphinx3: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
-OPT:Ofast -WOPT:aggstr=0 -m32

C++ benchmarks:

444.namd: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-fno-exceptions

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## Peak Optimization Flags (Continued)

447.dealII: `-Ofast -static -INLINE:aggressive=on -OPT:malloc_alg=1 -m32 -fno-exceptions`

450.soplex: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-m32 -O3 -OPT:IEEE_arith=3 -CG:load_exe=0 -CG:movnti=1 -LNO:minvariant=off -LNO:prefetch=1 -fno-exceptions`

453.povray: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-Ofast -fno-fast-math`

Fortran benchmarks:

410.bwaves: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-O3 -OPT:Ofast -OPT:IEEE_arith=3 -LNO:blocking=off -LNO:ignore_feedback=off`

416.gamess: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-O2 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256`

434.zeusmp: `-Ofast -CG:local_fwd_sched=on -LNO:blocking=off -LNO:interchange=off -LNO:fu=10 -LNO:full_unroll_outer=on`

437.leslie3d: `basepeak = yes`

459.GemsFDTD: `-Ofast -LNO:fission=2 -LNO:prefetch=0`

465.tonto: `basepeak = yes`

Benchmarks using both Fortran and C:

435.gromacs: `-O3 -OPT:rsqrt=2 -OPT:ro=3`

436.cactusADM: `-fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-O3 -LNO:prefetch=3 -LNO:prefetch_ahead=5 -LNO:ou_prod_max=10 -LNO:full_unroll=5 -ipa`

454.calculix: `-Ofast -LNO:simd=0 -WOPT:mem_opnds=on`

481.wrf: `basepeak = yes`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.06.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.06.xml`

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

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