SPEC® CFP2006 Result
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Tyan
(Test Sponsor: Advanced Micro Devices)

Thunder K8QW (S4881) Opteron 890

$SPECfp^{®}2006 =$ 13.5

$SPECfp\_base2006 =$ 12.7
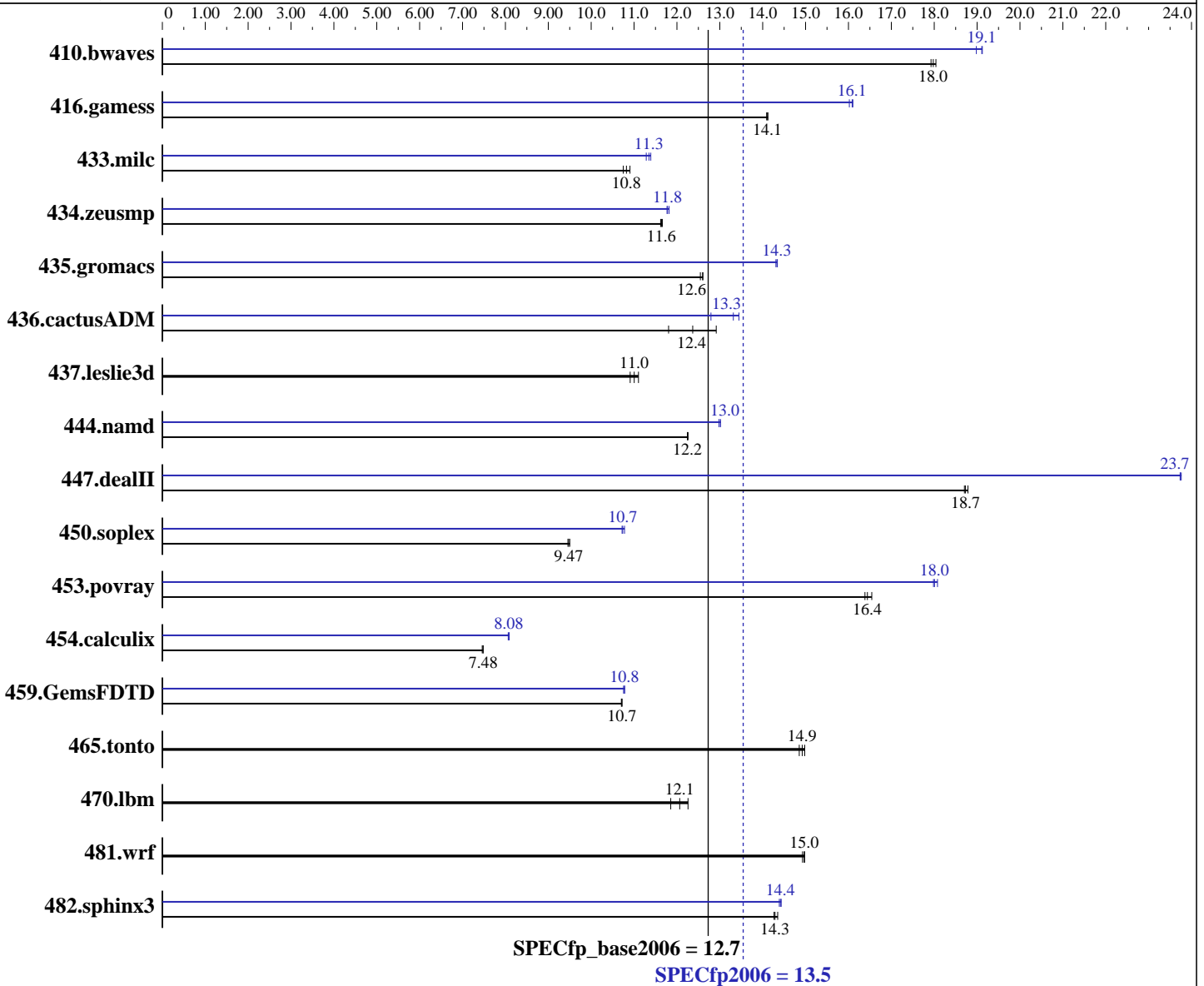
CPU2006 license: 49
Test sponsor: Advanced Micro Devices
Tested by: Advanced Micro Devices

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

Benchmark	Peak	Base
410.bwaves	19.1	18.0
416.gamess	16.1	14.1
433.milc	11.3	10.8
434.zeusmp	11.8	11.6
435.gromacs	14.3	12.6
436.cactusADM	13.3	12.4
437.leslie3d		11.0
444.namd	13.0	12.2
447.dealII	23.7	18.7
450.soplex	10.7	9.47
453.povray	18.0	16.4
454.calculix	8.08	7.48
459.GemsFDTD	10.8	10.7
465.tonto		14.9
470.lbm		12.1
481.wrf		15.0
482.sphinx3	14.4	14.3

SPECfp_base2006 = 12.7
SPECfp2006 = 13.5

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
Continued on next page

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					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	753	18.0	**756**	**18.0**	758	17.9	716	19.0	711	19.1	**711**	**19.1**
416.gamess	**1388**	**14.1**	1390	14.1	1387	14.1	1222	16.0	**1217**	**16.1**	1216	16.1
433.milc	854	10.7	**848**	**10.8**	842	10.9	814	11.3	**809**	**11.3**	806	11.4
434.zeusmp	**782**	**11.6**	780	11.7	783	11.6	770	11.8	**772**	**11.8**	773	11.8
435.gromacs	569	12.5	566	12.6	**567**	**12.6**	499	14.3	**498**	**14.3**	498	14.3
436.cactusADM	**966**	**12.4**	1012	11.8	925	12.9	889	13.4	934	12.8	**897**	**13.3**
437.leslie3d	847	11.1	**854**	**11.0**	862	10.9	847	11.1	**854**	**11.0**	862	10.9
444.namd	654	12.3	**655**	**12.2**	655	12.2	**618**	**13.0**	616	13.0	618	13.0
447.dealII	**611**	**18.7**	609	18.8	612	18.7	481	23.8	482	23.7	**482**	**23.7**
450.soplex	878	9.50	882	9.46	**880**	**9.47**	**777**	**10.7**	778	10.7	774	10.8
453.povray	325	16.4	**324**	**16.4**	322	16.5	296	18.0	294	18.1	**295**	**18.0**
454.calculix	1106	7.46	1103	7.48	**1103**	**7.48**	1020	8.09	1023	8.07	**1021**	**8.08**
459.GemsFDTD	**990**	**10.7**	991	10.7	990	10.7	**985**	**10.8**	987	10.8	984	10.8
465.tonto	**659**	**14.9**	657	15.0	663	14.9	**659**	**14.9**	657	15.0	663	14.9
470.lbm	1121	12.3	**1139**	**12.1**	1159	11.9	1121	12.3	**1139**	**12.1**	1159	11.9
481.wrf	**746**	**15.0**	748	14.9	746	15.0	**746**	**15.0**	748	14.9	746	15.0
482.sphinx3	1366	14.3	**1364**	**14.3**	1358	14.3	1351	14.4	**1352**	**14.4**	1355	14.4

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

General Notes

```
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

C++ benchmarks:
     pathCC

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Base Compiler Invocation (Continued)

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
```

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Peak Compiler Invocation (Continued)

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

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

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Peak Optimization Flags (Continued)

```
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

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

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