SPEC® CFP2006 Result
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Acer Incorporated

Altos G5450 (AMD Opteron 2376)

$SPECfp^{®}\_rate2006 =$ 99.4

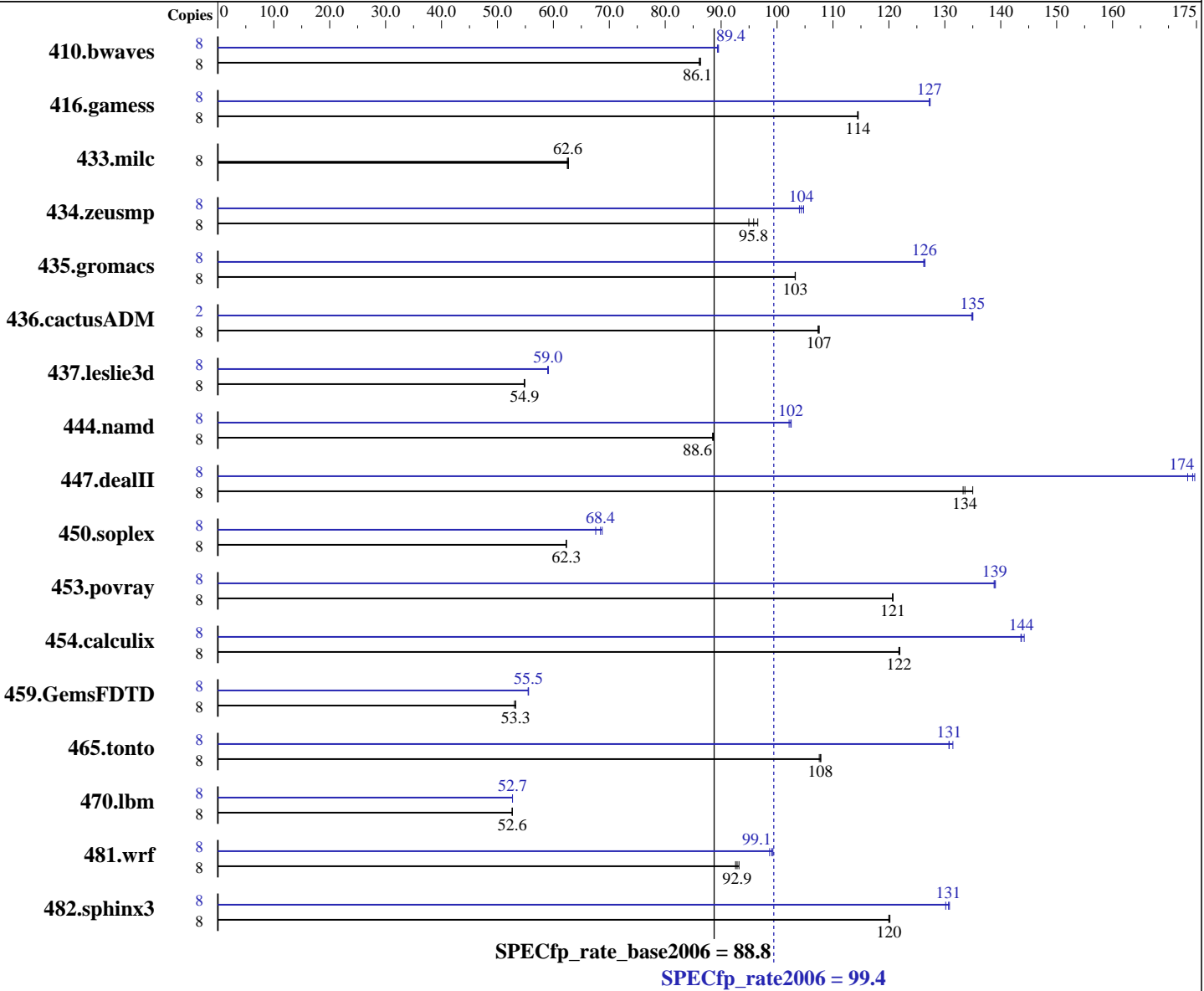SPECfp_rate_base2006 =   88.8

CPU2006 license: 97
Test sponsor: Acer Incorporated
Tested by: Acer Incorporated

Test date: Dec-2008
Hardware Availability: Nov-2008
Software Availability: Jun-2008

Benchmark	Copies	Value
410.bwaves	8 / 8	89.4 / 86.1
416.gamess	8 / 8	127 / 114
433.milc	8	62.6
434.zeusmp	8 / 8	104 / 95.8
435.gromacs	8 / 8	126 / 103
436.cactusADM	2 / 8	135 / 107
437.leslie3d	8 / 8	59.0 / 54.9
444.namd	8 / 8	102 / 88.6
447.dealII	8 / 8	174 / 134
450.soplex	8 / 8	68.4 / 62.3
453.povray	8 / 8	139 / 121
454.calculix	8 / 8	144 / 122
459.GemsFDTD	8 / 8	55.5 / 53.3
465.tonto	8 / 8	131 / 108
470.lbm	8 / 8	52.7 / 52.6
481.wrf	8 / 8	99.1 / 92.9
482.sphinx3	8 / 8	131 / 120

SPECfp_rate_base2006 = 88.8

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Hardware

CPU Name: AMD Opteron 2376
CPU Characteristics:
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1,2 chips
Primary Cache: 64 KB I + 64 KB D on chip per core
Secondary Cache: 512 KB I+D on chip per core

Continued on next page

Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler: PGI Server Complete Version 7.2
PathScale Compiler Suite Version 3.2
Auto Parallel: Yes
File System: ReiserFS
System State: Run level 3 (Full multiuser with network)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit

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L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	32 GB (8x4 GB, DDR2-667, CL5, Reg, Dual Rank)
Disk Subsystem:	1 x 320 GB SATA, 7200 RPM
Other Hardware:	None

Other Software: binutils 2.18
                        32-bit and 64-bit libhugetlbfs libraries

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	**1262**	**86.1**	1259	86.3	1263	86.1	8	1214	89.5	1217	89.4	**1216**	**89.4**
416.gamess	8	1368	115	**1368**	**114**	1369	114	8	**1231**	**127**	1230	127	1231	127
433.milc	8	**1173**	**62.6**	1175	62.5	1171	62.7	8	**1173**	**62.6**	1175	62.5	1171	62.7
434.zeusmp	8	**760**	**95.8**	767	95.0	754	96.6	8	695	105	**698**	**104**	700	104
435.gromacs	8	553	103	553	103	**553**	**103**	8	**452**	**126**	452	126	453	126
436.cactusADM	8	**890**	**107**	889	108	891	107	2	**177**	**135**	177	135	177	135
437.leslie3d	8	1372	54.8	**1371**	**54.9**	1370	54.9	8	1272	59.1	1275	59.0	**1274**	**59.0**
444.namd	8	**725**	**88.6**	725	88.5	724	88.6	8	**626**	**102**	628	102	626	103
447.dealII	8	687	133	678	135	**685**	**134**	8	528	173	524	175	**525**	**174**
450.soplex	8	1071	62.3	1071	62.3	**1071**	**62.3**	8	987	67.6	**975**	**68.4**	971	68.7
453.povray	8	353	121	353	121	**353**	**121**	8	306	139	**306**	**139**	307	139
454.calculix	8	541	122	**542**	**122**	542	122	8	460	144	458	144	**459**	**144**
459.GemsFDTD	8	1600	53.0	1593	53.3	**1594**	**53.3**	8	1528	55.6	1530	55.5	**1528**	**55.5**
465.tonto	8	732	108	**730**	**108**	730	108	8	599	131	602	131	**602**	**131**
470.lbm	8	2088	52.6	**2088**	**52.6**	2087	52.7	8	2086	52.7	**2086**	**52.7**	2086	52.7
481.wrf	8	959	93.2	965	92.6	**962**	**92.9**	8	906	98.7	**902**	**99.1**	900	99.3
482.sphinx3	8	1299	120	1297	120	**1299**	**120**	8	**1193**	**131**	1198	130	1192	131

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
```

Operating System Notes

```
    The libhugetlbfs libraries were installed using the
    installation rpms that came with the distribution.

    '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=7168 in /etc/sysctl.conf
    mount -t hugetlbfs nodev /mnt/hugepages
```

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General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_MORECORE = "yes"
LD_LIBRARY_PATH = "/usr/cpu2006/amd909gh-libs/64:/usr/cpu2006/amd909gh-libs/32"
NCPUS = "4"
```

Base Compiler Invocation

C benchmarks:

    pgcc

C++ benchmarks:

    pgcpp

Fortran benchmarks:

    pgf95

Benchmarks using both Fortran and C:

    pgcc pgf95

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 -Mnomain`
    436.cactusADM: `-DSPEC_CPU_LP64 -Mnomain`
    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 -Mnomain`
    459.GemsFDTD: `-DSPEC_CPU_LP64`
    465.tonto: `-DSPEC_CPU_LP64`
    470.lbm: `-DSPEC_CPU_LP64`
    481.wrf: `-DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX`
    482.sphinx3: `-DSPEC_CPU_LP64`

Base Optimization Flags

C benchmarks:

    `-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed`
    `-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi`

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Base Optimization Flags (Continued)

C++ benchmarks:
```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
--zc_eh -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Fortran benchmarks:
```
-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc=huge
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Benchmarks using both Fortran and C:
```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Base Other Flags

C benchmarks:
```
-Mipa=jobs:4
```

C++ benchmarks:
```
-Mipa=jobs:4
```

Fortran benchmarks:
```
-Mipa=jobs:4
```

Benchmarks using both Fortran and C:
```
-Mipa=jobs:4
```

Peak Compiler Invocation

C benchmarks:
```
pgcc
```

C++ benchmarks (except as noted below):
```
pathCC
```

    444.namd: `pgcpp`

Fortran benchmarks (except as noted below):
```
pathf95
```

  410.bwaves: `pgf95`

  434.zeusmp: `pgf95`

  437.leslie3d: `pgf95`

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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C (except as noted below):
```
pgcc pgf95
```

435.gromacs: `pathcc pathf95`

481.wrf: `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 -Mnomain
      437.leslie3d: -DSPEC_CPU_LP64
         444.namd: -DSPEC_CPU_LP64
       453.povray: -DSPEC_CPU_LP64
      454.calculix: -DSPEC_CPU_LP64 -Mnomain
     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: `basepeak = yes`

470.lbm: `-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge`
`-Mprefetch=t0 -Mloop32 -Mfprelaxed -Mipa=fast -Mipa=inline`
`-tp barcelona-64 -Bstatic_pgi`

482.sphinx3: `-Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)`
`-Mipa=fast(pass 2) -Mipa=inline(pass 2)`
`-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc`
`-tp barcelona-64 -Bstatic_pgi`

C++ benchmarks:

444.namd: `-Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)`
`-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse`
`-Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepchk`
`-Mfprelaxed --zc_eh -tp barcelona-64 -Bstatic_pgi`

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Peak Optimization Flags (Continued)

447.dealII: `-march=barcelona -Ofast -static -INLINE:aggressive=on`
`-fno-exceptions -m32`

450.soplex: `-march=barcelona -fb_create fbdata(pass 1)`
`-fb_opt fbdata(pass 2) -L/usr/lib -lhugetlbfs(pass 2) -O3`
`-INLINE:aggressive=on -OPT:IEEE_arith=3`
`-OPT:IEEE_NaN_Inf=off -OPT:fold_unsigned_relops=on`
`-OPT:malloc_alg=1 -CG:load_exe=0 -fno-exceptions -m32`

453.povray: `-march=barcelona -fb_create fbdata(pass 1)`
`-fb_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on`

Fortran benchmarks:

410.bwaves: `-Mvect=cachesize:6291456 -fastsse -Msmartalloc`
`-Mprefetch=nta -Mfprelaxed -Mipa=fast -Mipa=inline`
`-tp barcelona-64 -Bstatic_pgi`

416.gamess: `-march=barcelona -fb_create fbdata(pass 1)`
`-fb_opt fbdata(pass 2)`
`-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)`
`-L/usr/lib64 -lhugetlbfs(pass 2) -O2 -OPT:Ofast -OPT:ro=3`
`-OPT:unroll_size=256`

434.zeusmp: `-Mvect=cachesize:6291456 -fastsse -Mfprelaxed`
`-Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge`
`-Msmartalloc=hugebss -Mipa=fast -Mipa=inline`
`-tp barcelona-64 -Bstatic_pgi`

437.leslie3d: `-Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)`
`-Mipa=fast(pass 2) -Mipa=inline(pass 2)`
`-Mvect=cachesize:6291456 -fastsse -Mvect=fuse`
`-Msmartalloc=huge -Mprefetch=distance:8 -Mprefetch=t0`
`-Mfprelaxed -tp barcelona-64 -Bstatic_pgi`

459.GemsFDTD: `-march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2`
`-LNO:prefetch_ahead=1 -CG:load_exe=0 -CG:prefer_lru_reg=off`
`-OPT:malloc_alg=1`
`-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT`
`-L/usr/lib64 -lhugetlbfs`

465.tonto: `-march=barcelona -Ofast -OPT:alias=no_f90_pointer_alias`
`-LNO:blocking=off -CG:load_exe=1 -IPA:plimit=525`
`-OPT:malloc_alg=1`
`-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT`
`-L/usr/lib64 -lhugetlbfs`

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

```
   435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -OPT:malloc_alg=1
                -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
                -L/usr/lib64 -lhugetlbfs

  436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Mconcur
                 -Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline
                 -tp barcelona-64 -Bstatic_pgi

   454.calculix: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
                 -Mipa=fast(pass 2) -Mipa=inline(pass 2)
                 -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
                 -Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64
                 -Bstatic_pgi

       481.wrf: -march=barcelona -Ofast -LNO:blocking=off
                -LNO:prefetch_ahead=10 -LANG:copyinout=off
                -IPA:callee_limit=5000 -GRA:prioritize_by_density=on
                -OPT:malloc_alg=1 -m3dnow
                -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
                -L/usr/lib64 -lhugetlbfs
```

Peak Other Flags

C benchmarks:

```
-Mipa=jobs:4(pass 2)
```

C++ benchmarks:

```
   444.namd: -Mipa=jobs:4(pass 2)
```

Fortran benchmarks (except as noted below):

```
-Mipa=jobs:4(pass 2)
```

```
   416.gamess: No flags used
```

```
459.GemsFDTD: No flags used
```

```
    465.tonto: No flags used
```

Benchmarks using both Fortran and C (except as noted below):

```
-Mipa=jobs:4(pass 2)
```

```
435.gromacs: No flags used
```

```
    481.wrf: No flags used
```

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The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.html
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.html
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.xml
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.xml
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.xml

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

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