SPEC® CFP2006 Result
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Supermicro

Supermicro A+ Server AS-2022G-URF,
AMD Opteron 6176 SE

$SPECfp^{®}2006 =$ 31.6
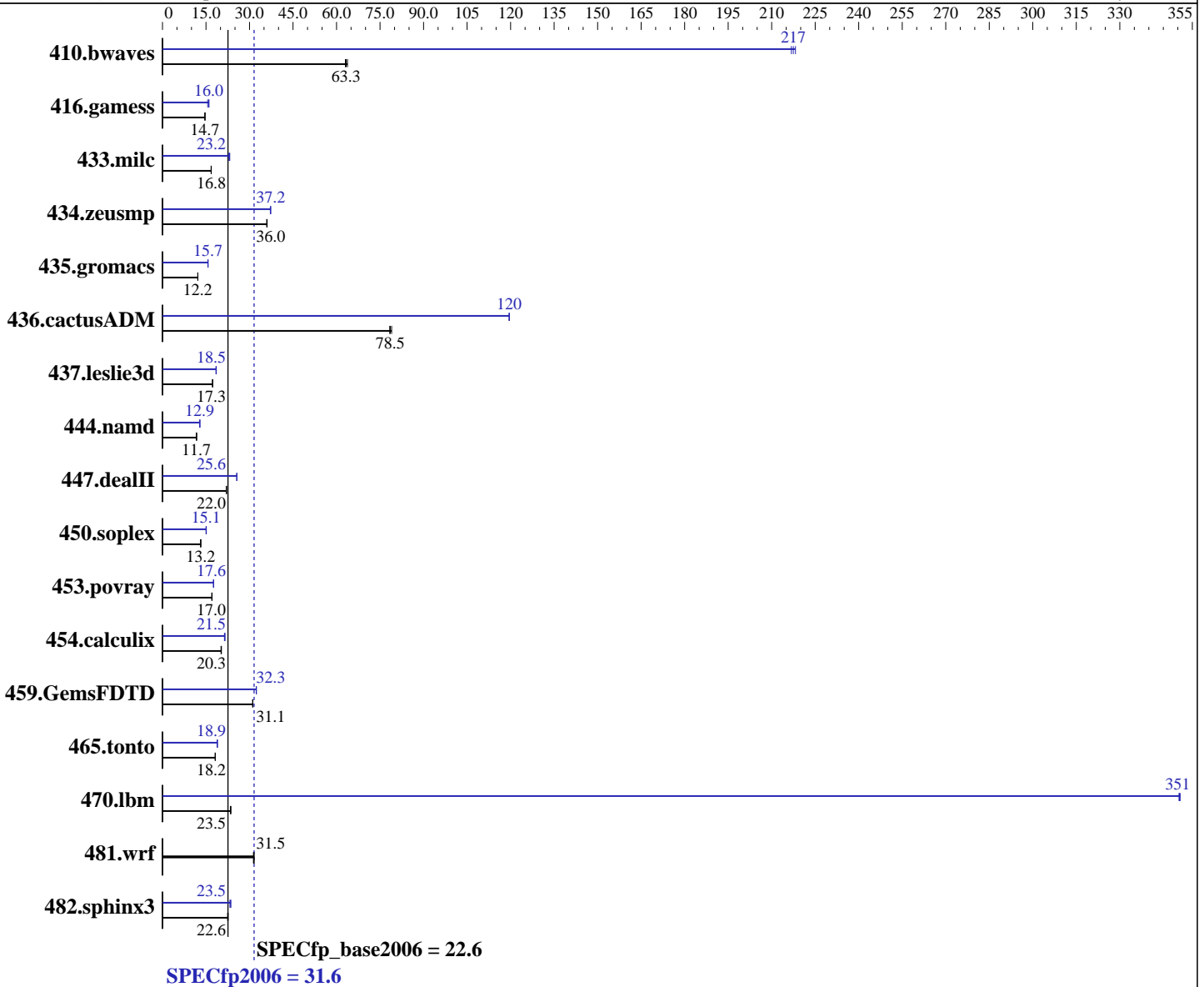
$SPECfp\_base2006 =$ 22.6

CPU2006 license: 001176
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Dec-2010
Hardware Availability: Mar-2010
Software Availability: May-2010

Benchmark	Peak	Base
410.bwaves	217	63.3
416.gamess	16.0	14.7
433.milc	23.2	16.8
434.zeusmp	37.2	36.0
435.gromacs	15.7	12.2
436.cactusADM	120	78.5
437.leslie3d	18.5	17.3
444.namd	12.9	11.7
447.dealII	25.6	22.0
450.soplex	15.1	13.2
453.povray	17.6	17.0
454.calculix	21.5	20.3
459.GemsFDTD	32.3	31.1
465.tonto	18.9	18.2
470.lbm	351	23.5
481.wrf		31.5
482.sphinx3	23.5	22.6

SPECfp_base2006 = 22.6
SPECfp2006 = 31.6

Hardware

CPU Name:	AMD Opteron 6176 SE
CPU Characteristics:	
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 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

Software

Operating System:	Red Hat Enterprise Linux Server release 5.5, Kernel 2.6.18-194.el5
Compiler:	x86 Open64 4.2.3.2 Compiler Suite (from AMD)
Auto Parallel:	Yes
File System:	ext3
System State:	Run level 3 (Full multiuser with network)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	binutils 2.18

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L3 Cache:	12 MB I+D on chip per chip, 6 MB shared / 6 cores
Other Cache:	None
Memory:	64 GB (16 x 4 GB 2Rx8 PC3-10600R-9, ECC)
Disk Subsystem:	1 x 500 GB SATA, 7200 RPM
Other Hardware:	None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	216	63.0	**215**	**63.3**	213	63.8	62.7	217	**62.5**	**217**	62.3	218
416.gamess	1336	14.7	**1336**	**14.7**	1337	14.6	1223	16.0	1258	15.6	**1225**	**16.0**
433.milc	548	16.8	**546**	**16.8**	546	16.8	396	23.2	**396**	**23.2**	401	22.9
434.zeusmp	253	35.9	252	36.1	**253**	**36.0**	244	37.3	**244**	**37.2**	245	37.2
435.gromacs	**586**	**12.2**	587	12.2	585	12.2	455	15.7	**455**	**15.7**	455	15.7
436.cactusADM	151	79.0	153	78.3	**152**	**78.5**	**100**	**120**	100	119	99.9	120
437.leslie3d	**545**	**17.3**	545	17.2	542	17.3	**507**	**18.5**	507	18.6	510	18.4
444.namd	682	11.8	**684**	**11.7**	685	11.7	**623**	**12.9**	622	12.9	624	12.9
447.dealII	**519**	**22.0**	519	22.0	519	22.0	446	25.6	446	25.6	**446**	**25.6**
450.soplex	**632**	**13.2**	631	13.2	633	13.2	555	15.0	552	15.1	**554**	**15.1**
453.povray	311	17.1	313	17.0	**312**	**17.0**	301	17.7	303	17.6	**302**	**17.6**
454.calculix	409	20.2	406	20.3	**407**	**20.3**	386	21.4	383	21.5	**384**	**21.5**
459.GemsFDTD	341	31.1	341	31.1	**341**	**31.1**	328	32.3	**328**	**32.3**	328	32.3
465.tonto	542	18.2	**541**	**18.2**	540	18.2	521	18.9	**521**	**18.9**	519	19.0
470.lbm	**585**	**23.5**	582	23.6	587	23.4	**39.2**	**351**	39.2	350	39.2	351
481.wrf	353	31.6	**355**	**31.5**	356	31.4	353	31.6	**355**	**31.5**	356	31.4
482.sphinx3	861	22.6	**864**	**22.6**	868	22.4	**831**	**23.5**	827	23.6	838	23.2

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=4000 in /etc/sysctl.conf
    mount -t hugetlbfs nodev /mnt/hugepages

    cpuspeed stop was used to set the CPU frequency to its maximum.

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Platform Notes

```
Fan speed set to Full Speed in BIOS Setup.
The system uses a Supermicro H8DGU-F motherboard.
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/usr/cpu2006/amd1002-speed-libs-revA/64:/usr/cpu2006/amd1002-speed-libs-revA/32"
O64_OMP_AFFINITY_MAP = "0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23"
O64_OMP_SPIN_USER_LOCK = "true"

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

Fortran benchmarks:
        openf95

Benchmarks using both Fortran and C:
        opencc openf95

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 -DSPEC_CPU_CASE_FLAG
              -fno-second-underscore
```

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Base Portability Flags (Continued)

482.sphinx3: `-DSPEC_CPU_LP64`

Base Optimization Flags

C benchmarks:
`-march=barcelona -Ofast -HP:bdt=2m:heap=2m`

C++ benchmarks:
`-march=barcelona -Ofast -static -INLINE:aggressive=on`
`-HP:bdt=2m:heap=2m`

Fortran benchmarks:
`-march=barcelona -Ofast -apo -LNO:parallel_overhead=10000`
`-LNO:fusion_peeling_limit=0 -HP:bdt=2m:heap=2m`

Benchmarks using both Fortran and C:
`-march=barcelona -Ofast -HP:bdt=2m:heap=2m -apo`
`-LNO:parallel_overhead=10000 -LNO:fusion_peeling_limit=0`

Peak Compiler Invocation

C benchmarks:
`opencc`

C++ benchmarks:
`openCC`

Fortran benchmarks:
`openf95`

Benchmarks using both Fortran and C:
`opencc openf95`

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`

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Peak Portability Flags (Continued)

```
    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 -DSPEC_CPU_CASE_FLAG
                 -fno-second-underscore
    482.sphinx3: -DSPEC_CPU_LP64
```

Peak Optimization Flags

C benchmarks:

```
      433.milc: -march=barcelona -Ofast -apo -CG:movnti=1
                -CG:local_sched_alg=1 -CG:locs_shallow_depth=1
                -CG:compute_to=on -HP:bdt=2m:heap=2m -LNO:prefetch=3

       470.lbm: -march=barcelona -Ofast -mso -apo -CG:sse_cse_regs=0
                -LNO:prefetch_ahead=4 -CG:locs_shallow_depth=1
                -CG:cmp_peep=on -CG:compute_to=on -OPT:unroll_times_max=8
                -OPT:unroll_size=256 -OPT:unroll_level=2 -OPT:keep_ext=on
                -OPT:alias=restricted -m3dnow -IPA:inline=off

    482.sphinx3: -march=barcelona -fb_create fbdata(pass 1)
                -fb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=2
                -CG:sse_cse_regs=0 -CG:locs_shallow_depth=1 -CG:cmp_peep=on
                -CG:local_sched_alg=1 -INLINE:aggressive=on
```

C++ benchmarks:

```
      444.namd: -march=barcelona -fb_create fbdata(pass 1)
                -fb_opt fbdata(pass 2) -Ofast -LNO:ignore_feedback=off
                -CG:local_sched_alg=2 -CG:load_exe=0 -CG:compute_to=on
                -OPT:unroll_size=256 -fno-exceptions -HP:bdt=2m:heap=2m

     447.dealII: -march=barcelona -Ofast -static -INLINE:aggressive=on
                -LNO:opt=0 -fno-emit-exceptions -m32
                -OPT:unroll_times_max=8 -OPT:unroll_size=256
                -OPT:unroll_level=2 -HP:bdt=2m:heap=2m -GRA:unspill=on
                -CG:cmp_peep=on -TENV:frame_pointer=off

     450.soplex: -march=barcelona -fb_create fbdata(pass 1)
                -fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on
                -OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
                -OPT:fold_unsigned_relops=on -CG:load_exe=0 -fno-exceptions
                -m32 -HP:bdt=2m:heap=2m
```

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Peak Optimization Flags (Continued)

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

Fortran benchmarks:

410.bwaves: -march=barcelona -Ofast -apo -OPT:malloc_alg=2
-CG:use_prefetchnta=on -CG:cmp_peep=on -LNO:blocking=off
-LNO:prefetch=3 -LNO:prefetch_ahead=5
-LNO:ignore_feedback=off -LNO:apo_use_feedback=on
-WOPT:aggstr=0

416.gamess: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0
-LNO:prefetch=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256
-HP:bdt=2m:heap=2m

434.zeusmp: -march=barcelona -Ofast -apo -LNO:blocking=off
-LNO:interchange=off -LNO:fusion_peeling_limit=0
-OPT:treeheight=on -OPT:unroll_size=256 -CG:cmp_peep=on
-CG:compute_to=on -GRA:prioritize_by_density=on
-HP:bdt=2m:heap=2m

437.leslie3d: -march=barcelona -Ofast -apo -OPT:unroll_size=256
-LNO:prefetch_ahead=4 -LNO:parallel_overhead=32768
-GRA:prioritize_by_density=on -m3dnow -HP:bdt=2m:heap=2m

459.GemsFDTD: -march=barcelona -Ofast -apo -LNO:fission=2
-LNO:prefetch_ahead=1 -CG:load_exe=0 -CG:local_sched_alg=1
-HP

465.tonto: -march=barcelona -Ofast -apo
-OPT:alias=no_f90_pointer_alias -LNO:blocking=off
-CG:load_exe=1 -IPA:plimit=525 -HP

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -apo -OPT:rsqrt=2
-HP:bdt=2m:heap=2m

436.cactusADM: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -apo
-LANG:heap_allocation_threshold=1000 -LNO:prefetch_ahead=1
-HP:bdt=2m:heap=2m

454.calculix: -march=barcelona -Ofast -LNO:prefetch_ahead=30
-CG:load_exe=0 -CG:ptr_load_use=0 -CG:local_sched_alg=2
-CG:compute_to=on -WOPT:unroll=2 -GRA:optimize_boundary=on
-HP:bdt=2m:heap=2m -apo

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Peak Optimization Flags (Continued)

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/x86-open64-423-flags-speed-revA.20101207.html
http://www.spec.org/cpu2006/flags/amd-platform-speed-revA.20101207.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/x86-open64-423-flags-speed-revA.20101207.xml
http://www.spec.org/cpu2006/flags/amd-platform-speed-revA.20101207.xml

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

Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 16:56:00 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 18 January 2011.