



SPEC[®] CFP2006 Result

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Supermicro

(Test Sponsor: Advanced Micro Devices)

Supermicro A+ Server 1022G-NTF,
AMD Opteron 6204

SPECfp[®]2006 = 41.3

SPECfp_base2006 = 36.7

CPU2006 license: 49

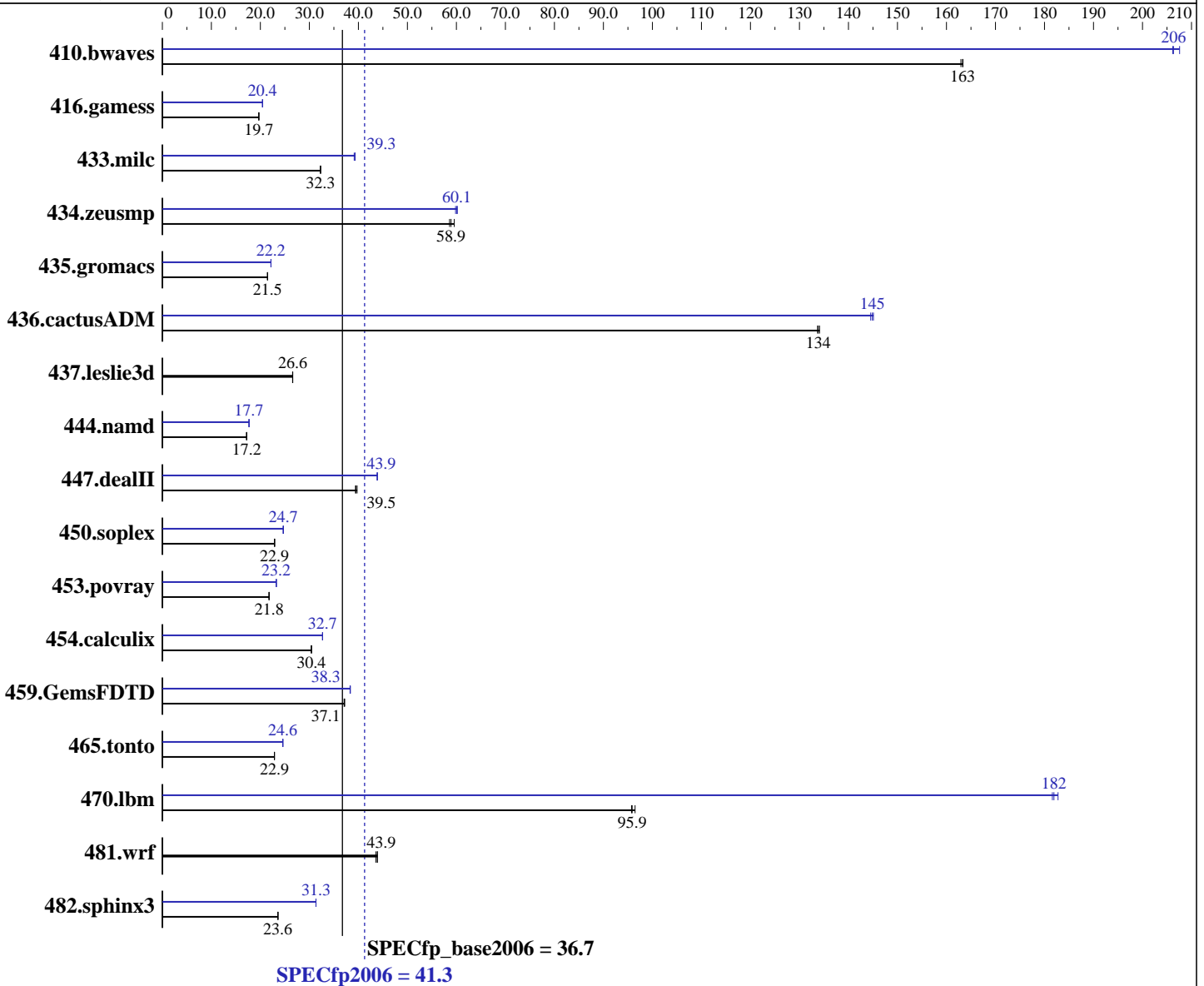
Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Jan-2012

Hardware Availability: Nov-2011

Software Availability: Jul-2011



Hardware

CPU Name: AMD Opteron 6204
 CPU Characteristics:
 CPU MHz: 3300
 FPU: Integrated
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
 CPU(s) orderable: 1,2 chips

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 6.1,
 Kernel 2.6.32-131.0.15.el6.x86_64
 Compiler: C/C++/Fortran: Version 4.2.5.2 of x86 Open64
 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

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Primary Cache: 128 KB I on chip per chip,
64 KB I shared / 2 cores;
16 KB D on chip per core
Secondary Cache: 4 MB I+D on chip per chip, 2 MB shared / 2 cores
L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 2 cores
Other Cache: None
Memory: 64 GB (8 x 8 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM
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	<u>83.2</u>	<u>163</u>	83.4	163	83.2	163	65.9	206	65.5	208	<u>65.9</u>	<u>206</u>
416.gamess	995	19.7	<u>995</u>	<u>19.7</u>	995	19.7	<u>958</u>	<u>20.4</u>	958	20.4	958	20.4
433.milc	284	32.3	<u>284</u>	<u>32.3</u>	285	32.3	233	39.3	<u>233</u>	<u>39.3</u>	235	39.1
434.zeusmp	155	58.6	<u>154</u>	<u>58.9</u>	153	59.6	152	59.8	151	60.2	<u>151</u>	<u>60.1</u>
435.gromacs	333	21.5	<u>333</u>	<u>21.5</u>	333	21.5	322	22.2	<u>322</u>	<u>22.2</u>	322	22.2
436.cactusADM	<u>89.3</u>	<u>134</u>	89.1	134	89.4	134	82.4	145	82.7	145	<u>82.5</u>	<u>145</u>
437.leslie3d	<u>353</u>	<u>26.6</u>	353	26.6	354	26.6	<u>353</u>	<u>26.6</u>	353	26.6	354	26.6
444.namd	466	17.2	466	17.2	<u>466</u>	<u>17.2</u>	454	17.7	453	17.7	<u>453</u>	<u>17.7</u>
447.dealII	288	39.7	<u>290</u>	<u>39.5</u>	290	39.4	<u>261</u>	<u>43.9</u>	261	43.9	261	43.8
450.soplex	364	22.9	365	22.9	<u>364</u>	<u>22.9</u>	<u>338</u>	<u>24.7</u>	338	24.7	339	24.6
453.povray	<u>244</u>	<u>21.8</u>	244	21.8	244	21.8	<u>229</u>	<u>23.2</u>	229	23.3	229	23.2
454.calculix	<u>271</u>	<u>30.4</u>	271	30.4	271	30.4	<u>252</u>	<u>32.7</u>	252	32.7	252	32.7
459.GemsFDTD	<u>286</u>	<u>37.1</u>	286	37.1	285	37.2	277	38.3	<u>277</u>	<u>38.3</u>	277	38.4
465.tonto	430	22.9	<u>430</u>	<u>22.9</u>	430	22.9	400	24.6	400	24.6	<u>400</u>	<u>24.6</u>
470.lbm	144	95.7	<u>143</u>	<u>95.9</u>	142	96.5	75.7	182	75.2	183	<u>75.5</u>	<u>182</u>
481.wrf	255	43.9	<u>255</u>	<u>43.9</u>	256	43.6	255	43.9	<u>255</u>	<u>43.9</u>	256	43.6
482.sphinx3	826	23.6	826	23.6	<u>826</u>	<u>23.6</u>	<u>622</u>	<u>31.3</u>	622	31.3	622	31.4

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 transparent_hugepage=never as a boot parameter in /boot/grub/menu.lst
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Operating System Notes (Continued)

Set kernel/randomize_va_space=0 in /etc/sysctl.conf
cpuspeed stop was used to set the CPU frequency to its maximum.

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

General Notes

Environment variables set by runspec before the start of the run:

LD_LIBRARY_PATH = "/root/work/cpu2006v1.2/amd1104-speed-libs-revA/32:/root/work/cpu2006v1.2/amd1104-speed-libs-revA/64"

O64_OMP_AFFINITY_MAP = "0,1,2,3,4,5,6,7"

O64_OMP_SPIN_COUNT = "800000"

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>

Binaries were compiled on a system with 2x AMD Opteron 6220 chips + 64GB Memory using RHEL 6.1

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

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info@spec.org

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Base Portability Flags (Continued)

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

Base Optimization Flags

C benchmarks:

-march=bdver1 -Ofast -HP:bdt=2m:heap=2m -apo -mso
 -OPT:alias=restricted -OPT:malloc_alg=2 -LNO:parallel_overhead=10000

C++ benchmarks:

-march=bdver1 -Ofast -static -CG:load_exe=0 -CG:p2align=0
 -INLINE:aggressive=on -HP:bdt=2m:heap=2m -D__OPEN64_FAST_SET

Fortran benchmarks:

-march=bdver1 -Ofast -LNO:blocking=off -LNO:fusion_peeling_limit=0
 -LNO:parallel_overhead=10000 -OPT:rsqrt=2 -OPT:unroll_size=256
 -HP:bdt=2m:heap=2m -apo

Benchmarks using both Fortran and C:

-march=bdver1 -Ofast -HP:bdt=2m:heap=2m -apo -mso
 -OPT:alias=restricted -OPT:malloc_alg=2 -LNO:parallel_overhead=10000
 -LNO:blocking=off -LNO:fusion_peeling_limit=0 -OPT:rsqrt=2
 -OPT:unroll_size=256

Peak Compiler Invocation

C benchmarks:

opencc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

opencc openf95



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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
447.dealII: -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
482.sphinx3: -DSPEC_CPU_LP64

```

Peak Optimization Flags

C benchmarks:

```

433.milc: -march=bdver1 -Ofast -CG:movnti=1 -CG:locs_best=on
-HP:bdt=2m:heap=2m -IPA:plimit=7000 -IPA:callee_limit=1200
-OPT:struct_array_copy=2 -OPT:alias=field_sensitive

470.lbm: -march=bdver1 -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=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:loop_model_simd=on
-LNO:simd_rm_unity_remainder=on -OPT:malloc_alg=2
-CG:cmp_peep=on -CG:local_sched_alg=2 -CG:use_incdec=off
-INLINE:aggressive=on -WOPT:sib=on -HP

```

C++ benchmarks:

```

444.namd: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:ignore_feedback=off
-CG:local_sched_alg=2 -CG:load_exe=0 -OPT:unroll_size=256
-fno-exceptions -HP:bdt=2m:heap=2m

447.dealII: -march=bdver1 -Ofast -LNO:simd=0 -D__OPEN64_FAST_SET
-static -INLINE:aggressive=on -OPT:alias=disjoint
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -HP:bdt=2m:heap=2m

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Peak Optimization Flags (Continued)

450.soplex: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on -OPT:RO=1
-OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
-OPT:fold_unsigned_relops=on -fno-exceptions -CG:p2align=0
-m32 -HP:bdt=2m:heap=2m -WOPT:sib=on

453.povray: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -CG:pre_local_sched=off
-INLINE:aggressive=on -HP:bdt=2m:heap=2m -OPT:transform=2
-OPT:alias=disjoint -WOPT:aggcm=0

Fortran benchmarks:

410.bwaves: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -apo -OPT:Ofast
-OPT:treeheight=on -LNO:blocking=off -LNO:prefetch=2
-LNO:pf2=0 -LNO:prefetch_ahead=3 -LNO:ignore_feedback=off
-LNO:fu=4 -LNO:loop_model_simd=on
-LNO:simd_rm_unity_remainder=on -WOPT:aggstr=0
-HP:bdt=2m:heap=2m -CG:cmp_peep=on -CG:p2align=0

416.gamess: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0
-LNO:simd=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256
-OPT:unroll_times_max=2 -CG:local_sched_alg=1
-HP:bdt=2m:heap=2m -WOPT:sib=on

434.zeusmp: -march=bdver1 -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: basepeak = yes

459.GemsFDTD: -march=bdver1 -Ofast -OPT:unroll_size=0 -LNO:fission=2
-CG:load_exe=0 -CG:local_sched_alg=2 -HP -apo

465.tonto: -march=bdver1 -Ofast -OPT:alias=no_f90_pointer_alias
-LNO:blocking=off -CG:load_exe=1 -CG:local_sched_alg=1
-IPA:plimit=525 -HP

Benchmarks using both Fortran and C:

435.gromacs: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -OPT:rsqrt=2
-HP:bdt=2m:heap=2m

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Peak Optimization Flags (Continued)

436.cactusADM: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:blocking=off
-LNO:prefetch=2 -HP:bdt=2m:heap=2m -CG:locs_shallow_depth=1
-CG:load_exe=0 -WOPT:sib=on -apo

454.calculix: -march=bdver1 -Ofast -OPT:unroll_size=256
-GRA:optimize_boundary=on -HP:bdt=2m:heap=2m

481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/x86-open64-425-flags-speed-revA.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/x86-open64-425-flags-speed-revA.xml>

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For other inquiries, please contact webmaster@spec.org.

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