



SPEC® CFP2006 Result

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Sugon

SPECfp®_rate2006 = 1770

Sugon A620-G30 (AMD EPYC 7451)

SPECfp_rate_base2006 = 1560

CPU2006 license: 9046

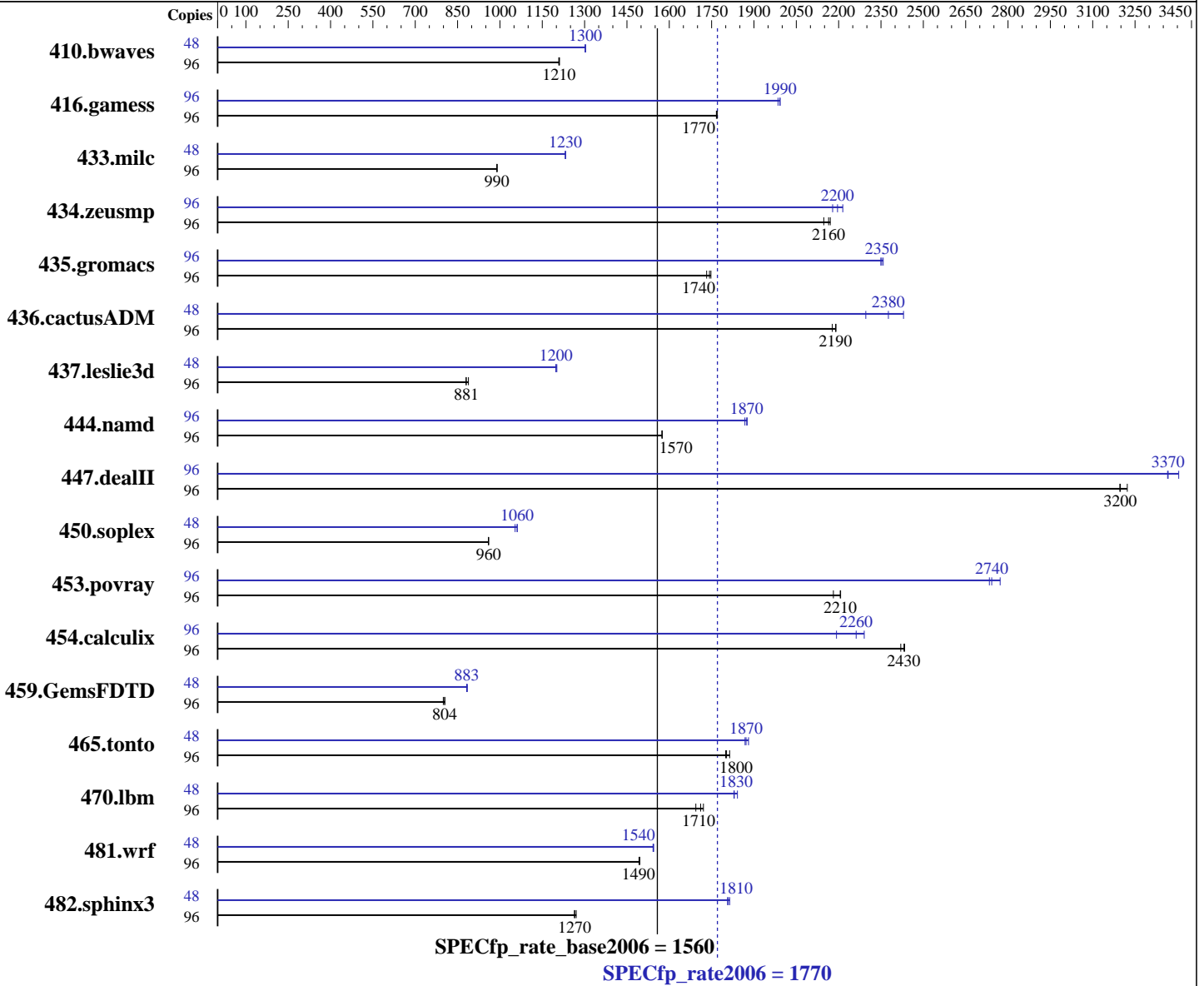
Test sponsor: Sugon

Tested by: Sugon

Test date: Dec-2017

Hardware Availability: Dec-2017

Software Availability: Oct-2017



Hardware

CPU Name: AMD EPYC 7451
 CPU Characteristics: AMD Turbo CORE technology up to 3.20 GHz
 CPU MHz: 2300
 FPU: Integrated
 CPU(s) enabled: 48 cores, 2 chips, 24 cores/chip, 2 threads/core
 CPU(s) orderable: 1,2 chips
 Primary Cache: 64 KB I + 32 KB D on chip per core
 Secondary Cache: 512 KB I+D on chip per core

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Software

Operating System: Red Hat Enterprise Linux Server 7.4
 Kernel 3.10.0-693.2.2
 Compiler: C/C++/Fortran: Version 4.5.2.1 of x86 Open64 Compiler Suite (from AMD)
 Auto Parallel: No
 File System: ext4
 System State: Run level 3 (Multi User)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 64 MB I+D on chip per chip, 8 MB shared / 3 cores
Other Cache: None
Memory: 1 TB (16 x 64 GB 2S2Rx4 PC4-2667V-R, running at 2400)
Disk Subsystem: 1 x 2000 GB SATA, 7200 RPM
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	96	1077	1210	1079	1210	1079	1210	48	501	1300	501	1300	500	1300		
416.gamess	96	1064	1770	1062	1770	1063	1770	96	947	1990	943	1990	943	1990		
433.milc	96	890	990	891	989	890	990	48	358	1230	358	1230	358	1230		
434.zeusmp	96	407	2150	403	2170	404	2160	96	401	2180	394	2210	398	2200		
435.gromacs	96	392	1750	393	1740	396	1730	96	291	2350	291	2360	292	2350		
436.cactusADM	96	524	2190	527	2180	524	2190	48	250	2300	236	2430	241	2380		
437.leslie3d	96	1016	889	1026	880	1024	881	48	377	1200	375	1200	376	1200		
444.namd	96	489	1570	489	1570	489	1580	96	412	1870	411	1870	410	1880		
447.dealII	96	343	3200	341	3220	344	3200	96	326	3370	326	3370	323	3400		
450.soplex	96	834	960	834	960	835	959	48	377	1060	380	1050	377	1060		
453.povray	96	231	2210	234	2180	232	2210	96	187	2730	184	2770	186	2740		
454.calculix	96	326	2430	325	2430	327	2420	96	350	2260	361	2190	346	2290		
459.GemsFDTD	96	1267	804	1274	799	1266	805	48	577	882	577	883	576	885		
465.tonto	96	521	1810	524	1800	525	1800	48	252	1870	251	1880	253	1870		
470.lbm	96	771	1710	766	1720	779	1690	48	361	1830	360	1830	358	1840		
481.wrf	96	718	1490	717	1500	718	1490	48	348	1540	347	1540	347	1540		
482.sphinx3	96	1473	1270	1479	1270	1480	1260	48	517	1810	516	1810	518	1810		

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

runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Set dirty_ratio=8 to limit dirty cache to 8% of memory

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Operating System Notes (Continued)

Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

Transparent huge pages were enabled for this run (OS default)

Set vm/nr_hugepages=86016 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

General Notes

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

HUGETLB_LIMIT = "896"

LD_LIBRARY_PATH = "/home/cpu2006/amd1603-rate-libs-revB/32:/home/cpu2006/amd1603-rate-libs-revB/64"

The binaries were built with the AMD supported x86 Open64 Compiler Suite,
which is only available from AMD at
<http://developer.amd.com/tools-and-sdks/cpu-development/x86-open64-compiler-suite/>
Binaries were compiled on a system with 2 x AMD Opteron 6378 chips + 128 GB Memory using RHEL 6.3

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

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Base 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_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
        -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

Base Optimization Flags

C benchmarks:

```

-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1 -mno-fma4 -mno-xop -mno-tbm
-WB, -Wl, -z,muldefs

```

C++ benchmarks:

```

-Ofast -static -CG:load_exe=0 -OPT:malloc_alg=1 -INLINE:aggressive=on
-HP:bd=2m:heap=2m -D__OPEN64_FAST_SET -march=bdver2 -mno-fma4
-mno-xop -mno-tbm -WB, -Wl, -z,muldefs

```

Fortran benchmarks:

```

-Ofast -LNO:blocking=off -LNO:simd_peel_align=on -OPT:rsqrt=2
-OPT:unroll_size=256 -HP:bd=2m:heap=2m -mso -march=bdver1 -mno-fma4
-mno-xop -mno-tbm -WB, -Wl, -z,muldefs

```

Benchmarks using both Fortran and C:

```

-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1 -mno-fma4 -mno-xop -mno-tbm
-WB, -Wl, -z,muldefs -LNO:blocking=off -LNO:simd_peel_align=on
-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
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_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
-fno-second-underscore

```

Peak Optimization Flags

C benchmarks:

```

433.milc: -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 -mso
-march=bdver1 -mno-fma4

```

```

470.lbm: -Ofast -CG:cmp_peep=on -OPT:keep_ext=on -HP:bdt=2m:heap=2m
-IPA:plimit=8000 -IPA:small_pu=100 -march=bdver1 -mno-fma4
-mso

```

```

482.sphinx3: -Ofast -m32 -IPA:plimit=1000 -OPT:malloc_alg=2
-CG:cmp_peep=on -CG:p2align=0 -CG:load_exe=1 -CG:dsched=on
-INLINE:aggressive=on -LNO:prefetch=2 -LNO:prefetch_ahead=4
-mso -march=bdver2 -WB, -mno-fma4 -mno-tbm -mno-xop

```

C++ benchmarks:

```

444.namd: -Ofast -IPA:plimit=3000 -LNO:ignore_feedback=off
-CG:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
-fno-exceptions -HP:bdt=2m:heap=2m -LNO:if_select_conv=1
-OPT:alias=disjoint -LNO:psimd_iso_unroll=ON -march=bdver2
-mno-fma4 -WB, -mno-xop -mno-tbm

```

```

447.dealII: -Ofast -D__OPEN64_FAST_SET -static -INLINE:aggressive=on
-LNO:opt=1 -LNO:simd=2 -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 -CG:movext_icmp=off -TENV:frame_pointer=off
-march=bdver1 -mno-fma4

```

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Peak Optimization Flags (Continued)

450.soplex: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
 -LNO:ignore_feedback=off -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 -mno-fma4 -HP:bdt=2m:heap=2m -WOPT:sib=on
 -march=bdver1

453.povray: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -CG:pre_local_sched=off -CG:p2align=0 -CG:p2align_split=on
 -CG:dsched=on -INLINE:aggressive=on -HP:bd=2m:heap=2m
 -OPT:transform=2 -OPT:alias=disjoint -WOPT:aggcm=0
 -march=bdver2 -mno-fma4 -WB, -mno-xop -mno-tbm -Wl,
 -z,muldefs

Fortran benchmarks:

410.bwaves: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -OPT:Ofast -OPT:treeheight=on -LNO:blocking=off
 -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 -march=bdver2 -mno-fma4

416.gamess: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -LNO:fu=6 -LNO:blocking=0 -LNO:simd=2 -OPT:ro=3
 -OPT:recip=on -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m
 -WOPT:sib=on -march=bdver1 -mno-fma4

434.zeusmp: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -LNO:blocking=off -LNO:interchange=off -IPA:plimit=1500
 -HP:bdt=2m:heap=2m -march=bdver2 -mno-fma4

437.leslie3d: -Ofast -CG:pre_minreg_level=2 -LNO:simd=0 -LNO:fusion=2
 -HP:bdt=2m:heap=2m -mso -march=bdver1 -mno-fma4

459.GemsFDTD: -Ofast -IPA:plimit=1500 -OPT:unroll_size=1024
 -OPT:unroll_times_max=16 -LNO:fission=2
 -CG:local_sched_alg=2 -HP -march=bdver1 -mno-fma4

465.tonto: -Ofast -OPT:alias=no_f90_pointer_alias -LNO:blocking=off
 -CG:load_exe=1 -CG:local_sched_alg=3 -IPA:plimit=525
 -HP:bdt=2m:heap=2m -march=bdver2 -WB, -mno-fma4 -mno-tbm
 -mno-xop

Benchmarks using both Fortran and C:

435.gromacs: -Ofast -OPT:rsqrt=2 -HP:bdt=2m:heap=2m
 -CG:local_sched_alg=2 -CG:load_exe=3 -GRA:unspill=on
 -march=bdver2 -mno-fma4 -LNO:simd=3

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Peak Optimization Flags (Continued)

436.cactusADM: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -LNO:blocking=off -LNO:prefetch=2 -LNO:pf2=0
 -LNO:prefetch_ahead=4 -HP -CG:locs_shallow_depth=1
 -CG:load_exe=0 -CG:dsched=on -WOPT:sib=on -march=bdver2
 -mno-fma4

454.calculix: -Ofast -OPT:unroll_size=256 -OPT:alias=disjoint
 -GRA:optimize_boundary=on -CG:dsched=on -HP:bdt=2m:heap=2m
 -march=bdver1 -mno-fma4

481.wrf: -Ofast -LNO:blocking=off -LANG:copyinout=off
 -IPA:callee_limit=5000 -GRA:prioritize_by_density=on -HP
 -WOPT:sib=on -march=bdver1 -mno-fma4

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/x86-openflags-rate-revA-I.html>

<http://www.spec.org/cpu2006/flags/Sugon-Naples-Platform-Settings-revC-I.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/x86-openflags-rate-revA-I.xml>

<http://www.spec.org/cpu2006/flags/Sugon-Naples-Platform-Settings-revC-I.xml>

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

Tested with SPEC CPU2006 v1.2.

Report generated on Wed Dec 27 12:05:57 2017 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 26 December 2017.