



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Sugon

### SPECfp<sup>®</sup>\_rate2006 = 1020

### Sugon A320-G30 (AMD EPYC 7551P)

### SPECfp\_rate\_base2006 = 891

CPU2006 license: 9046

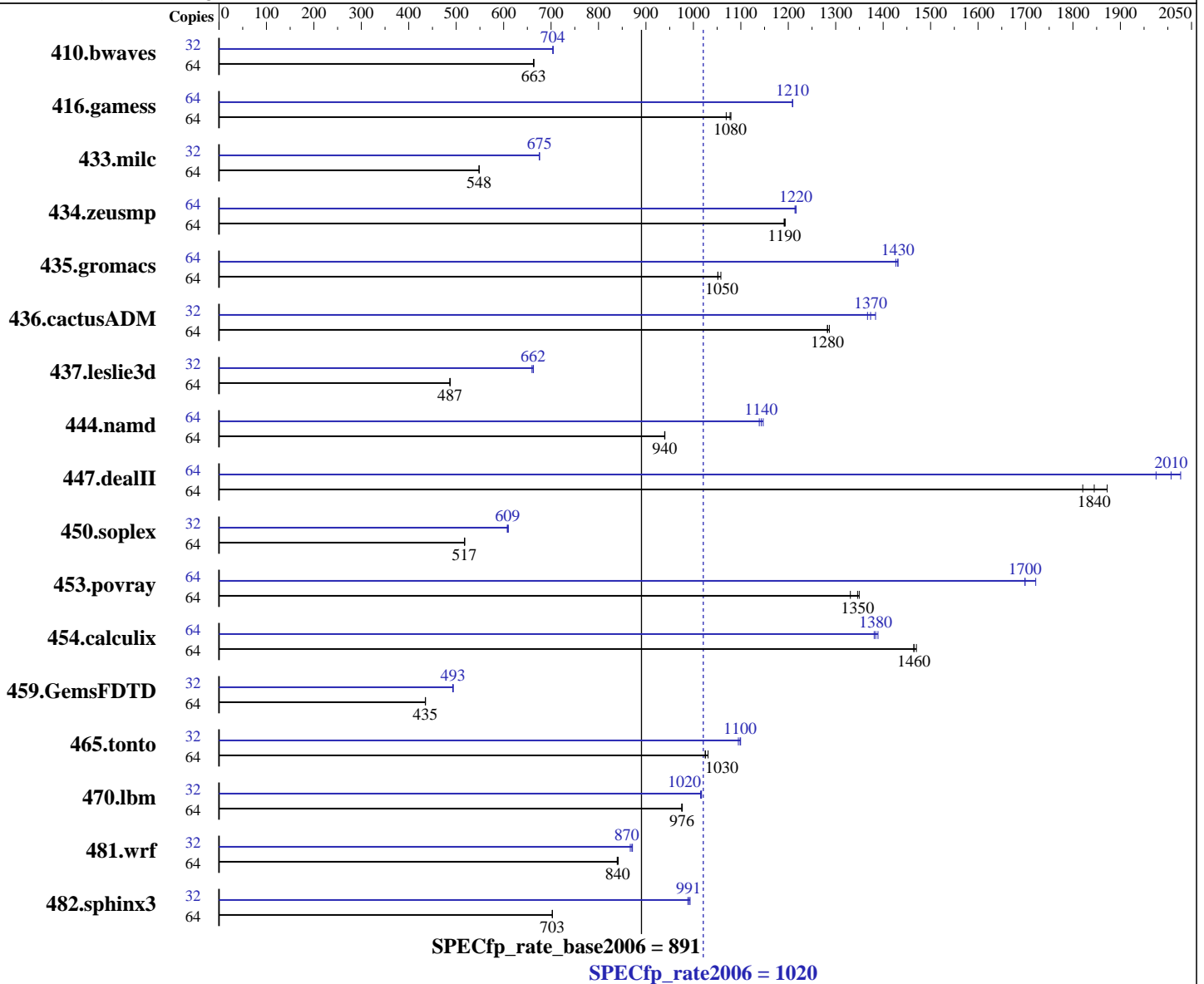
Test date: Dec-2017

Test sponsor: Sugon

Hardware Availability: Dec-2017

Tested by: Sugon

Software Availability: Oct-2017



#### Hardware

CPU Name: AMD EPYC 7551P  
 CPU Characteristics: AMD Turbo CORE technology up to 3.00 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 1 chip, 32 cores/chip, 2 threads/core  
 CPU(s) orderable: 1 chip  
 Primary Cache: 64 KB I + 32 KB D on chip per core  
 Secondary Cache: 512 KB I+D on chip per core

Continued on next page

#### 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: xfs  
 System State: Run level 3 (Multi User)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Sugon

SPECfp\_rate2006 = 1020

### Sugon A320-G30 (AMD EPYC 7551P)

SPECfp\_rate\_base2006 = 891

CPU2006 license: 9046

Test sponsor: Sugon

Tested by: Sugon

Test date: Dec-2017

Hardware Availability: Dec-2017

Software Availability: Oct-2017

L3 Cache: 64 MB I+D on chip per chip, 8 MB shared / 4 cores  
Other Cache: None  
Memory: 512 GB (8 x 64 GB 4Rx4 PC4-2667V-L)  
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	64	1310	664	<u>1311</u>	<u>663</u>	1312	663	32	617	705	<u>618</u>	<u>704</u>	618	704
416.gamess	64	<u>1163</u>	<u>1080</u>	1161	1080	1172	1070	64	1037	1210	1036	1210	<u>1036</u>	<u>1210</u>
433.milc	64	1071	548	<u>1072</u>	<u>548</u>	1072	548	32	435	675	<u>435</u>	<u>675</u>	435	676
434.zeusmp	64	489	1190	<u>489</u>	<u>1190</u>	488	1190	64	<u>479</u>	<u>1220</u>	480	1210	479	1220
435.gromacs	64	432	1060	435	1050	<u>435</u>	<u>1050</u>	64	<u>319</u>	<u>1430</u>	319	1430	320	1430
436.cactusADM	64	<u>596</u>	<u>1280</u>	596	1280	594	1290	32	280	1370	276	1380	<u>278</u>	<u>1370</u>
437.leslie3d	64	1234	488	1236	487	<u>1236</u>	<u>487</u>	32	456	660	454	663	<u>454</u>	<u>662</u>
444.namd	64	546	940	546	939	<u>546</u>	<u>940</u>	64	451	1140	447	1150	<u>449</u>	<u>1140</u>
447.dealII	64	391	1870	402	1820	<u>397</u>	<u>1840</u>	64	361	2030	371	1980	<u>365</u>	<u>2010</u>
450.soplex	64	1030	518	<u>1032</u>	<u>517</u>	1032	517	32	<u>439</u>	<u>609</u>	438	610	439	608
453.povray	64	<u>253</u>	<u>1350</u>	252	1350	256	1330	64	<u>200</u>	<u>1700</u>	198	1720	200	1700
454.calculix	64	360	1460	<u>360</u>	<u>1460</u>	359	1470	64	<u>381</u>	<u>1380</u>	382	1380	380	1390
459.GemsFDTD	64	<u>1561</u>	<u>435</u>	1561	435	1561	435	32	687	494	689	493	<u>688</u>	<u>493</u>
465.tonto	64	614	1020	611	1030	<u>614</u>	<u>1030</u>	32	288	1090	<u>287</u>	<u>1100</u>	286	1100
470.lbm	64	<u>901</u>	<u>976</u>	902	975	900	977	32	<u>432</u>	<u>1020</u>	433	1020	432	1020
481.wrf	64	850	841	852	839	<u>851</u>	<u>840</u>	32	410	872	412	867	<u>411</u>	<u>870</u>
482.sphinx3	64	<u>1775</u>	<u>703</u>	1775	703	1775	703	32	631	988	628	993	<u>629</u>	<u>991</u>

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  
Set swappiness=1 to swap only if necessary

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

**Sugon**

**SPECfp\_rate2006 = 1020**

**Sugon A320-G30 (AMD EPYC 7551P)**

**SPECfp\_rate\_base2006 = 891**

**CPU2006 license:** 9046

**Test sponsor:** Sugon

**Tested by:** Sugon

**Test date:** Dec-2017

**Hardware Availability:** Dec-2017

**Software Availability:** Oct-2017

## Operating System Notes (Continued)

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=57344 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages

## Platform Notes

BIOS settings:  
Determinism Slider = Power  
cTDP Control = Manual  
cTDP = 200

## 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:  
openc

C++ benchmarks:  
openCC

Fortran benchmarks:  
openf95

Benchmarks using both Fortran and C:  
openc openf95

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
416.gamess: -DSPEC\_CPU\_LP64  
433.milc: -DSPEC\_CPU\_LP64

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Sugon

SPECfp\_rate2006 = 1020

Sugon A320-G30 (AMD EPYC 7551P)

SPECfp\_rate\_base2006 = 891

CPU2006 license: 9046

Test sponsor: Sugon

Tested by: Sugon

Test date: Dec-2017

Hardware Availability: Dec-2017

Software Availability: Oct-2017

## Base Portability Flags (Continued)

```

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.deallI: -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_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:

openc

C++ benchmarks:

openCC

Continued on next page

Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/

Page 4



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Sugon

SPECfp\_rate2006 = 1020

Sugon A320-G30 (AMD EPYC 7551P)

SPECfp\_rate\_base2006 = 891

CPU2006 license: 9046

Test sponsor: Sugon

Tested by: Sugon

Test date: Dec-2017

Hardware Availability: Dec-2017

Software Availability: Oct-2017

## Peak Compiler Invocation (Continued)

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
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

```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Sugon

SPECfp\_rate2006 = 1020

Sugon A320-G30 (AMD EPYC 7551P)

SPECfp\_rate\_base2006 = 891

CPU2006 license: 9046

Test sponsor: Sugon

Tested by: Sugon

Test date: Dec-2017

Hardware Availability: Dec-2017

Software Availability: Oct-2017

## Peak Optimization Flags (Continued)

444.namd (continued):

-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

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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

**Sugon**

**SPECfp\_rate2006 = 1020**

**Sugon A320-G30 (AMD EPYC 7551P)**

**SPECfp\_rate\_base2006 = 891**

**CPU2006 license:** 9046

**Test sponsor:** Sugon

**Tested by:** Sugon

**Test date:** Dec-2017

**Hardware Availability:** Dec-2017

**Software Availability:** Oct-2017

## Peak Optimization Flags (Continued)

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

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>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.

Report generated on Wed Dec 27 12:04:48 2017 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 26 December 2017.