



SPEC® CINT2006 Result

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Sugon

SPECint®_rate2006 = 2400

Sugon A620-G30 (AMD EPYC 7601)

SPECint_rate_base2006 = 2150

CPU2006 license: 9046

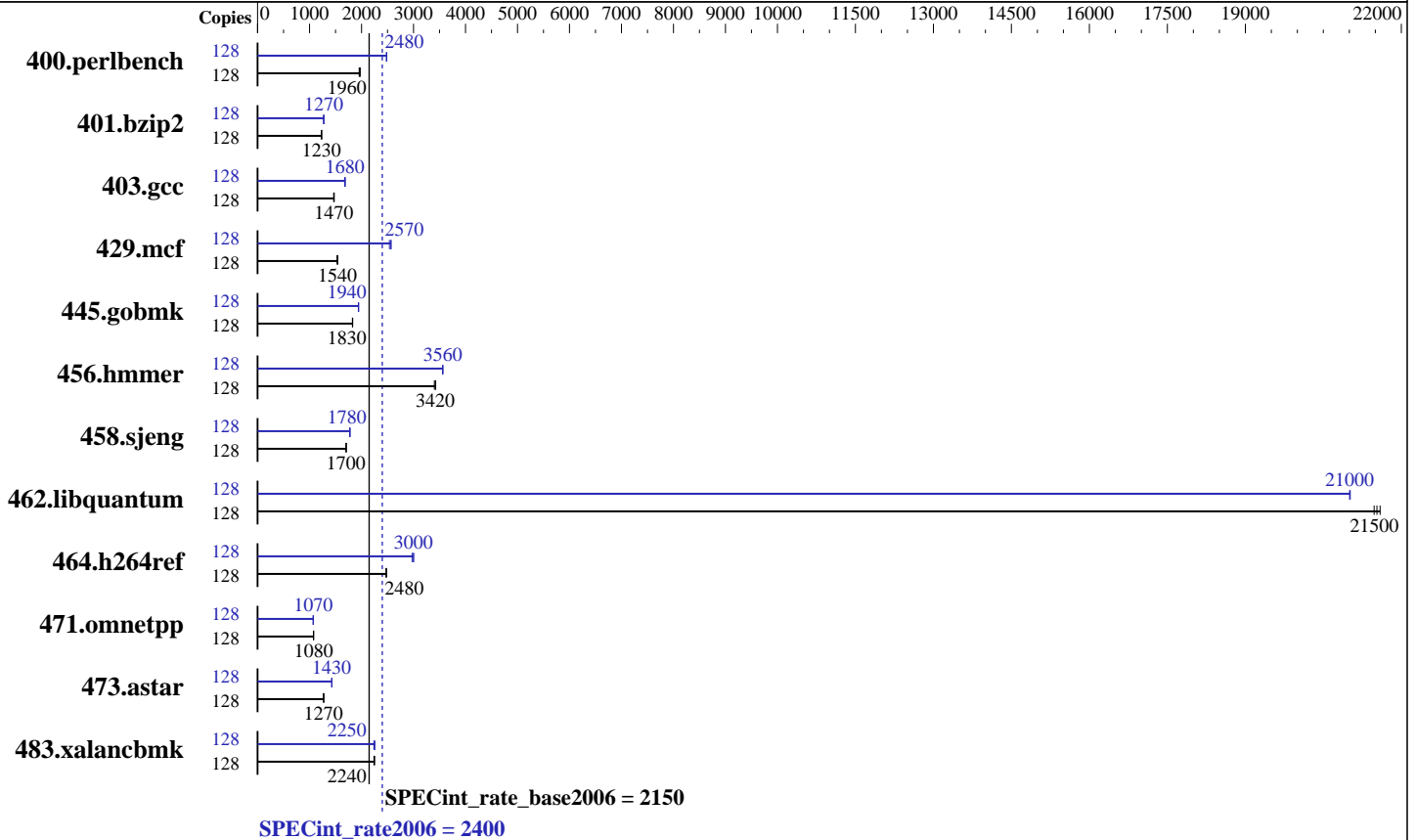
Test date: Aug-2017

Test sponsor: Sugon

Hardware Availability: Jul-2017

Tested by: Sugon

Software Availability: Apr-2017



Hardware

CPU Name: AMD EPYC 7601
 CPU Characteristics: AMD Turbo CORE technology up to 3.20 GHz
 CPU MHz: 2200
 FPU: Integrated
 CPU(s) enabled: 64 cores, 2 chips, 32 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
 L3 Cache: 64 MB I+D on chip per chip, 8 MB shared / 4 cores
 Other Cache: None
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2666V-R, running at 2400 MHz)
 Disk Subsystem: 1 x 1.0 TB SATA, 7200 RPM
 Other Hardware: None

Software

Operating System: Ubuntu 17.04, Kernel 4.10.0-24-generic
 Compiler: C/C++: Version 4.5.2.1 of x86 Open64 Compiler Suite (from AMD)
 Auto Parallel: No
 File System: ext4
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit
 Other Software: MicroQuill SmartHeap 10.0 32-bit Library for Linux



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Results Table

| Benchmark | Base | | | | | | Peak | | | | | | | |
|----------------|--------|--------------------|---------------------|--------------------|--------------------|-------------------|--------------------|--------|-------------------|--------------------|-------------------|--------------------|-------------------|---------------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 128 | 633 | 1970 | <u>637</u> | <u>1960</u> | 640 | 1950 | 128 | <u>503</u> | <u>2480</u> | 505 | 2480 | 503 | 2490 |
| 401.bzip2 | 128 | 1002 | 1230 | <u>1003</u> | <u>1230</u> | 1006 | 1230 | 128 | 972 | 1270 | <u>970</u> | <u>1270</u> | 969 | 1270 |
| 403.gcc | 128 | 698 | 1480 | <u>701</u> | <u>1470</u> | 704 | 1460 | 128 | 611 | 1690 | 614 | 1680 | <u>612</u> | <u>1680</u> |
| 429.mcf | 128 | 763 | 1530 | 758 | 1540 | <u>759</u> | <u>1540</u> | 128 | <u>455</u> | <u>2570</u> | 455 | 2570 | 460 | 2540 |
| 445.gobmk | 128 | 734 | 1830 | <u>735</u> | <u>1830</u> | 736 | 1820 | 128 | 692 | 1940 | 690 | 1950 | <u>692</u> | <u>1940</u> |
| 456.hammer | 128 | 351 | 3400 | <u>349</u> | <u>3420</u> | 349 | 3430 | 128 | 335 | 3560 | <u>335</u> | <u>3560</u> | 335 | 3560 |
| 458.sjeng | 128 | 909 | 1700 | <u>909</u> | <u>1700</u> | 908 | 1710 | 128 | 874 | 1770 | 871 | 1780 | <u>872</u> | <u>1780</u> |
| 462.libquantum | 128 | <u>123</u> | <u>21500</u> | 123 | 21600 | 123 | 21500 | 128 | 126 | 21000 | 126 | 21000 | <u>126</u> | <u>21000</u> |
| 464.h264ref | 128 | <u>1144</u> | <u>2480</u> | 1145 | 2470 | 1143 | 2480 | 128 | 953 | 2970 | 944 | 3000 | <u>944</u> | <u>3000</u> |
| 471.omnetpp | 128 | 745 | 1070 | 742 | 1080 | <u>742</u> | <u>1080</u> | 128 | 748 | 1070 | 746 | 1070 | <u>747</u> | <u>1070</u> |
| 473.astar | 128 | <u>707</u> | <u>1270</u> | 708 | 1270 | 705 | 1270 | 128 | 629 | 1430 | 629 | 1430 | <u>629</u> | <u>1430</u> |
| 483.xalancbmk | 128 | <u>393</u> | <u>2240</u> | 394 | 2240 | 392 | 2250 | 128 | 391 | 2260 | <u>393</u> | <u>2250</u> | 395 | 2240 |

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
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runspec

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

vm.nr_hugepages=114688 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

Platform Notes

The Linux run level was 3; sysinfo run-level is incorrect.
Set "SMT Mode" in the BIOS as "Auto".



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General Notes

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

HUGETLB_LIMIT = "896"

LD_LIBRARY_PATH = "/home/tianyan/benchmarks/cpu2006/amd1603-rate-libs-revA/32:/home/tianyan/benchmarks/cpu2006/amd1603-rate-libs-revA/64"

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

Base Compiler Invocation

C benchmarks:

openc

C++ benchmarks:

openCC

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:

-Ofast -CG:local_sched_alg=1 -INLINE:aggressive=ON -IPA:plimit=8000
-IPA:small_pu=100 -HP:bd=2m:heap=2m -mso -LNO:prefetch=2
-march=bdver1 -mno-fma4 -mno-xop -mno-tbm

C++ benchmarks:

-Ofast -m32 -INLINE:aggressive=on -CG:cmp_peep=on -D__OPEN64_FAST_SET
-march=bdver1 -mno-fma4 -mno-xop -mno-tbm
-L/root/work/libraries/SmartHeap-10/lib -lsmartheap



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Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:prefetch=2 -LNO:opt=0 -IPA:plimit=20000
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -OPT:keep_ext=on -WOPT:if_conv=0
-WOPT:sib=on -CG:local_sched_alg=1 -CG:unroll_fb_req=on
-CG:movext_icmp=off -HP:bd=2m:heap=2m -march=bdver1
-mno-fma4 -GRA:aggr_loop_splitting=off
-GRA:loop_splitting=off

401.bzip2: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:prefetch=2 -LNO:pf2=0 -OPT:alias=disjoint
-OPT:goto=off -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m
-march=bdver2 -WB, -mno-fma4 -mno-tbm -mno-xop

403.gcc: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:trip_count=256 -CG:cmp_peep=on -CG:pre_minreg_level=2
-m32 -HP:bdt=2m:heap=2m -GRA:unspill=on -IPA:small_pu=200
-WOPT:sib=on -march=bdver2 -mno-fma4 -WB, -mno-tbm
-mno-xop

429.mcf: -O3 -OPT:unroll_times_max=5 -ipa -INLINE:aggressive=on
-CG:gcm=off -CG:dsched=on -GRA:prioritize_by_density=on
-m32 -HP:bdt=2m:heap=2m -mso -march=bdver1 -mno-fma4

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Peak Optimization Flags (Continued)

445.gobmk: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -OPT:unroll_size=256 -OPT:unroll_times_max=8
 -OPT:keep_ext=on -IPA:plimit=750 -IPA:min_hotness=300
 -IPA:pu_reorder=1 -LNO:ignore_feedback=off -WOPT:if_conv=2
 -HP:bd=2m:heap=2m -march=bdver1 -mno-fma4

456.hmmcr: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -LNO:prefetch=2 -OPT:alias=disjoint
 -OPT:unroll_times_max=16 -OPT:unroll_size=512
 -OPT:unroll_level=2 -OPT:keep_ext=on -CG:cflow=0
 -CG:cmp_peep=on -CG:pre_local_sched=off -HP:bd=2m:heap=2m
 -CG:p2align=0 -CG:load_exe=3 -CG:dsched=on -march=bdver1
 -mno-fma4

458.sjeng: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -CG:ptr_load_use=0 -CG:divrem_opt=on -CG:movext_icmp=off
 -CG:locs_best=on -LNO:full_unroll=10 -IPA:pu_reorder=2
 -HP:heap=2m:bd=2m -WOPT:sib=on -march=bdver1 -mno-fma4

462.libquantum: -Ofast -mso -OPT:unroll_size=512 -OPT:unroll_times_max=16
 -LNO:prefetch=2 -LNO:prefetch_ahead=4 -LNO:pf2=0
 -CG:local_sched_alg=1 -CG:p2align=0 -INLINE:aggressive=ON
 -IPA:plimit=15000 -IPA:small_pu=100
 -HP:bd=2m:heap=2m,limit=300 -march=bdver2 -mno-fma4

464.h264ref: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
 -OPT:unroll_size=256 -OPT:unroll_times_max=2
 -IPA:plimit=20000 -OPT:alias=disjoint -CG:ptr_load_use=0
 -CG:local_sched_alg=1 -HP:bd=2m:heap=2m -march=bdver1
 -mno-fma4

C++ benchmarks:

471.omnetpp: -Ofast -m32 -INLINE:aggressive=on -CG:cmp_peep=on
 -WOPT:sib=on -D__OPEN64_FAST_SET -march=bdver2 -mno-fma4
 -L/root/work/libraries/SmartHeap-10/lib -lsmarheap

473.astar: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -WOPT:if_conv=0 -WOPT:sib=on -CG:divrem_opt=on
 -CG:p2align=1 -CG:dsched=on -GRA:optimize_boundary=on
 -OPT:alias=disjoint -INLINE:aggressive=on
 -IPA:small_pu=3000 -IPA:plimit=3000 -HP:bd=2m:heap=2m
 -march=bdver1 -mno-fma4

483.xalancbmk: -Ofast -LNO:prefetch=2 -OPT:unroll_size=512
 -OPT:unroll_times_max=8 -D__OPEN64_FAST_SET
 -INLINE:aggressive=on -m32 -CG:cmp_peep=on
 -CG:local_sched=off -CG:p2align=1 -GRA:unspill=on
 -TENV:frame_pointer=off -fno-emit-exceptions -march=bdver2
 -mno-fma4
 -L/root/work/libraries/SmartHeap-10/lib -lsmarheap



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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-revA-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-revA-I.xml>

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

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