



# SPEC® CINT2006 Result

Copyright 2006-2018 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

(Test Sponsor: Advanced Micro Devices)

Asus RS700A-E9,  
AMD EPYC 7451

SPECint®\_rate2006 = 2030

SPECint\_rate\_base2006 = 1820

CPU2006 license: 49

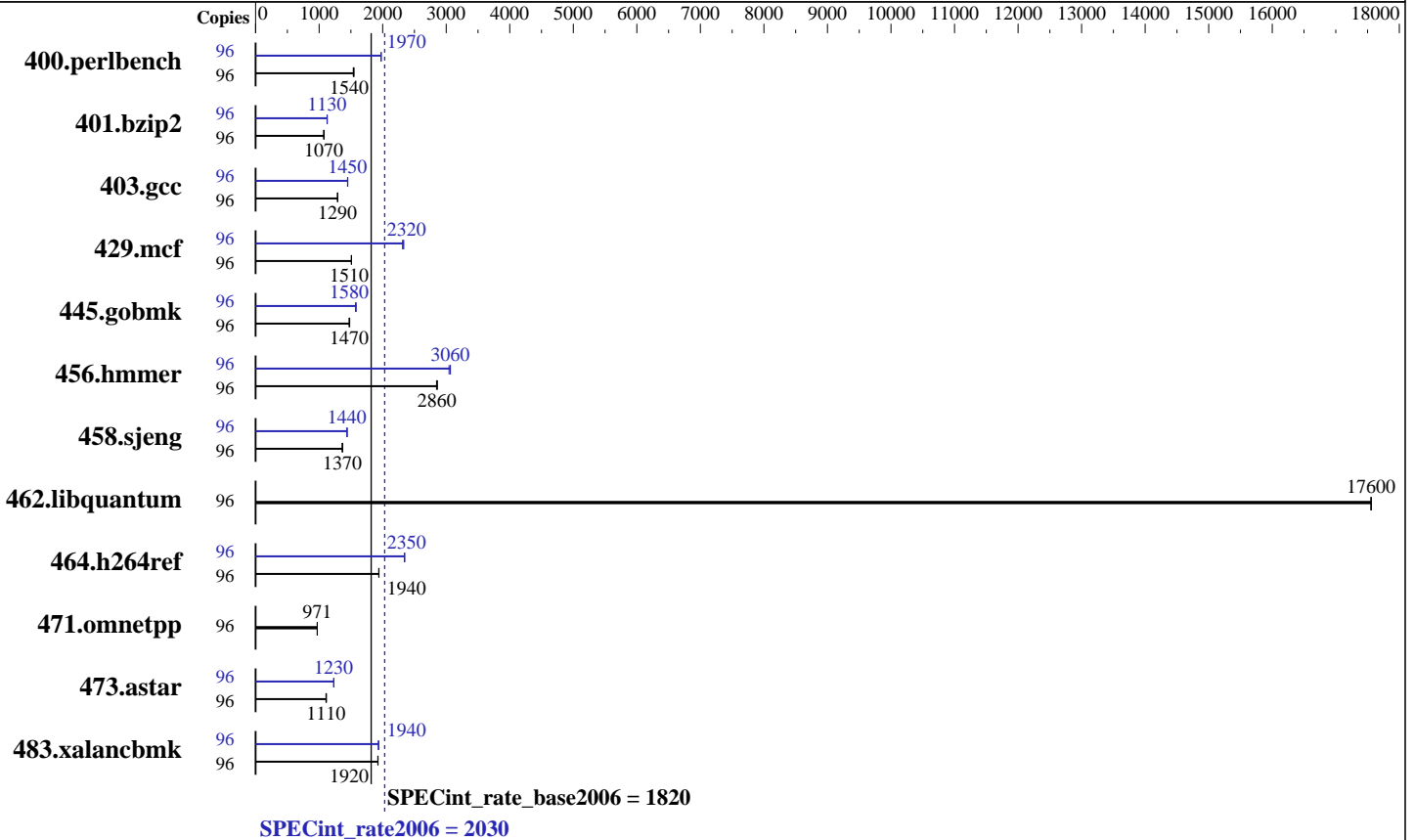
Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Jul-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2016



## 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  
 L3 Cache: 64 MB I+D on chip per chip, 8 MB shared / 3 cores  
 Other Cache: None  
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2667V-R, running at 2400)  
 Disk Subsystem: 1 x 1 TB SSD  
 Other Hardware: None

## Software

Operating System: Ubuntu 16.04.2 LTS,  
Kernel 4.4.0-87-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



# SPEC CINT2006 Result

Copyright 2006-2018 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

(Test Sponsor: Advanced Micro Devices)

Asus RS700A-E9,  
AMD EPYC 7451

SPECint\_rate2006 = 2030

SPECint\_rate\_base2006 = 1820

CPU2006 license: 49

Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Jul-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2016

## Results Table

Benchmark	Base						Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	96	605	1550	<b>609</b>	<b>1540</b>	610	1540	96	475	1970	<b>475</b>	<b>1970</b>	474	1980
401.bzip2	96	858	1080	<b>862</b>	<b>1070</b>	865	1070	96	<b>822</b>	<b>1130</b>	824	1120	822	1130
403.gcc	96	600	1290	<b>598</b>	<b>1290</b>	598	1290	96	534	1450	<b>533</b>	<b>1450</b>	533	1450
429.mcf	96	<b>580</b>	<b>1510</b>	581	1510	580	1510	96	375	2330	379	2310	<b>377</b>	<b>2320</b>
445.gobmk	96	680	1480	<b>683</b>	<b>1470</b>	683	1470	96	641	1570	636	1580	<b>639</b>	<b>1580</b>
456.hammer	96	315	2850	313	2860	<b>314</b>	<b>2860</b>	96	<b>292</b>	<b>3060</b>	292	3070	294	3040
458.sjeng	96	<b>849</b>	<b>1370</b>	853	1360	847	1370	96	806	1440	808	1440	<b>807</b>	<b>1440</b>
462.libquantum	96	<b>113</b>	<b>17600</b>	113	17600	113	17600	96	<b>113</b>	<b>17600</b>	113	17600	113	17600
464.h264ref	96	<b>1095</b>	<b>1940</b>	1096	1940	1094	1940	96	908	2340	905	2350	<b>906</b>	<b>2350</b>
471.omnetpp	96	619	969	<b>618</b>	<b>971</b>	618	972	96	619	969	<b>618</b>	<b>971</b>	618	972
473.astar	96	<b>606</b>	<b>1110</b>	608	1110	605	1110	96	<b>548</b>	<b>1230</b>	547	1230	548	1230
483.xalancbmk	96	344	1930	344	1920	<b>344</b>	<b>1920</b>	96	342	1940	<b>342</b>	<b>1940</b>	343	1930

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 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

## Platform Notes

The Linux run level was 3; sysinfo run-level is incorrect.  
The dmidecode memory speed information is incorrect.



# SPEC CINT2006 Result

Copyright 2006-2018 Standard Performance Evaluation Corporation

**ASUSTeK Computer Inc.**

(Test Sponsor: Advanced Micro Devices)

Asus RS700A-E9,  
AMD EPYC 7451

**SPECint\_rate2006 = 2030**

**SPECint\_rate\_base2006 = 1820**

**CPU2006 license:** 49

**Test sponsor:** Advanced Micro Devices

**Tested by:** Advanced Micro Devices

**Test date:** Jul-2017

**Hardware Availability:** Sep-2017

**Software Availability:** Apr-2016

## General Notes

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

HUGETLB\_LIMIT = "896"

LD\_LIBRARY\_PATH = "/root/work/cpu2006/amd1603-rate-libs-revA/32:/root/work/cpu2006/amd1603-rate-libs-revA/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 2x AMD Opteron 6378 chips + 128GB Memory using RHEL 6.3

Submitted\_by: "Smith, Van" <Van.Smith@amd.com>

Submitted: Mon Aug 7 23:12:47 EDT 2017

Submission: cpu2006-20170807-48147.sub

## Base Compiler Invocation

C benchmarks:  
opencc

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.hmmer: -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



# SPEC CINT2006 Result

Copyright 2006-2018 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

(Test Sponsor: Advanced Micro Devices)

Asus RS700A-E9,  
AMD EPYC 7451

SPECint\_rate2006 = 2030

SPECint\_rate\_base2006 = 1820

CPU2006 license: 49

Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Jul-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2016

## 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:bd=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:bd=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:bd=2m:heap=2m -mso -march=bdver1 -mno-fma4
```

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2018 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

(Test Sponsor: Advanced Micro Devices)

Asus RS700A-E9,  
AMD EPYC 7451

SPECint\_rate2006 = 2030

SPECint\_rate\_base2006 = 1820

CPU2006 license: 49

Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Jul-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2016

## 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.hmmr: -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: basepeak = yes

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: basepeak = yes

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

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

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



# SPEC CINT2006 Result

Copyright 2006-2018 Standard Performance Evaluation Corporation

**ASUSTeK Computer Inc.**

(Test Sponsor: Advanced Micro Devices)

Asus RS700A-E9,  
AMD EPYC 7451

**SPECint\_rate2006 = 2030**

**SPECint\_rate\_base2006 = 1820**

**CPU2006 license:** 49

**Test sponsor:** Advanced Micro Devices

**Tested by:** Advanced Micro Devices

**Test date:** Jul-2017

**Hardware Availability:** Sep-2017

**Software Availability:** Apr-2016

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

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

SPEC and SPECint 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 Thu Feb 8 13:30:33 2018 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 22 August 2017.