SPEC® CINT2006 Result

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Supermicro

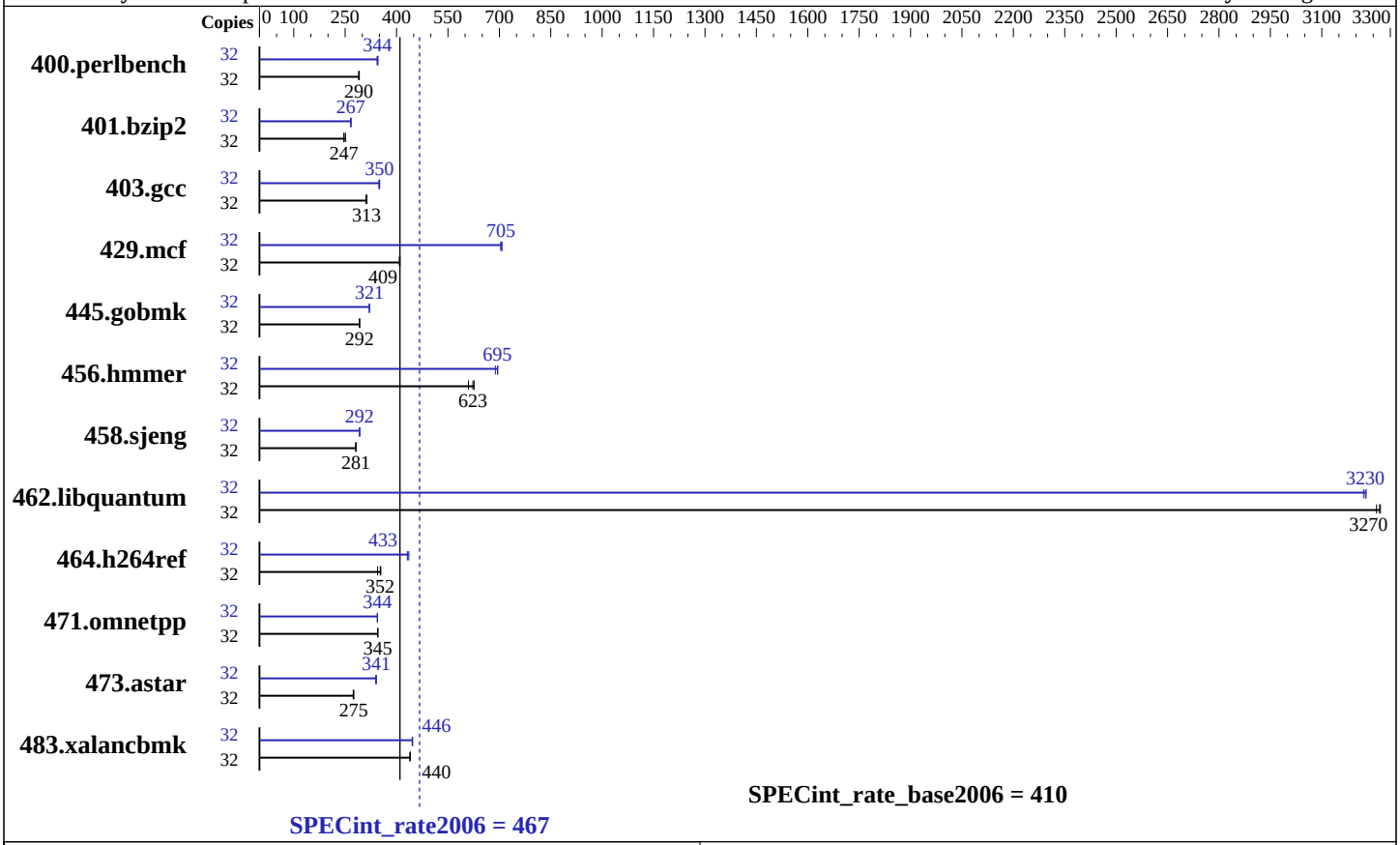
Supermicro A+ Server 2022G-URF4+
(H8DGU-LN4F+, AMD Opteron 6370P)

SPECint®_rate2006 = 467

SPECint_rate_base2006 = 410

CPU2006 license: 001176
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Dec-2013
Hardware Availability: Jan-2014
Software Availability: Aug-2012



Hardware

CPU Name:	AMD Opteron 6370P
CPU Characteristics:	AMD Turbo CORE technology up to 2.50 GHz
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	32 cores, 2 chips, 16 cores/chip
CPU(s) orderable:	1,2 chips
Primary Cache:	512 KB I on chip per chip, 64 KB I shared / 2 cores; 16 KB D on chip per core
Secondary Cache:	16 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 / 8 cores
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem:	1 x 500 GB SATAIII, 7200 RPM
Other Hardware:	None

Software

Operating System:	CentOS 6.4, Kernel 2.6.32-358.el6.x86_64
Compiler:	C/C++: Version 4.5.2 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:	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	32	1079	290	**1079**	**290**	1073	291	32	904	346	**908**	**344**	911	343
401.bzip2	32	1229	251	1254	246	**1250**	**247**	32	1162	266	**1157**	**267**	1155	267
403.gcc	32	829	311	822	313	**824**	**313**	32	734	351	**736**	**350**	740	348
429.mcf	32	712	410	715	408	**713**	**409**	32	415	704	412	708	**414**	**705**
445.gobmk	32	1149	292	1151	292	**1149**	**292**	32	1046	321	**1046**	**321**	1046	321
456.hmmer	32	**479**	**623**	490	610	477	626	32	429	695	**430**	**695**	434	688
458.sjeng	32	1375	282	**1377**	**281**	1377	281	32	**1325**	**292**	1326	292	1325	292
462.libquantum	32	203	3270	203	3260	**203**	**3270**	32	205	3230	206	3220	**205**	**3230**
464.h264ref	32	2000	354	2054	345	**2009**	**352**	32	**1635**	**433**	1641	431	1624	436
471.omnetpp	32	**579**	**345**	580	345	579	346	32	581	345	582	344	**581**	**344**
473.astar	32	**817**	**275**	821	274	817	275	32	659	341	662	339	**659**	**341**
483.xalancbmk	32	502	440	503	439	**502**	**440**	32	495	446	**495**	**446**	494	447

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

Set vm/nr_hugepages=28672 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/amd1206-rate-libs-revA/32:/home/cpu2006/amd1206-rate-libs-revA/64"

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 6386SE chips + 128GB Memory using RHEL 6.3
```

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

C++ benchmarks:
-Ofast -m32 -INLINE:aggressive=on -CG:cmp_peep=on -D__OPEN64_FAST_SET
-march=bdver1 -L/root/work/libraries/SmartHeap-10/lib -lsmartheap

Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64

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Peak Portability Flags (Continued)

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
-GRA:aggr_loop_splitting=off -GRA:loop_splitting=off

401.bzip2: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
-LNO:prefetch=2 -LNO:pf2=0 -OPT:alias=disjoint
-OPT:goto=off -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m
-march=bdver2

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

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

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

456.hmmer: -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:bdt=2m:heap=2m
-CG:p2align=0 -CG:load_exe=3 -CG:dsched=on -march=bdver1

Continued on next page

Peak Optimization Flags (Continued)

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`

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:bdt=2m:heap=2m,limit=300 -march=bdver2`

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:bdt=2m:heap=2m -march=bdver1`

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 -lsmartheap`

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:bdt=2m:heap=2m`
`-march=bdver1`

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 -lsmartheap`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/amd-Supermicro-platform-rate-revC-I.html
http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-III.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/amd-Supermicro-platform-rate-revC-I.xml
http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-III.xml

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

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