



# SPEC<sup>®</sup> CINT2006 Result

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## Supermicro

Supermicro A+ Server 1012G-MTF  
(H8SGL-F, AMD Opteron 6276)

SPECint<sup>®</sup>\_rate2006 = 248

SPECint\_rate\_base2006 = 217

CPU2006 license: 001176

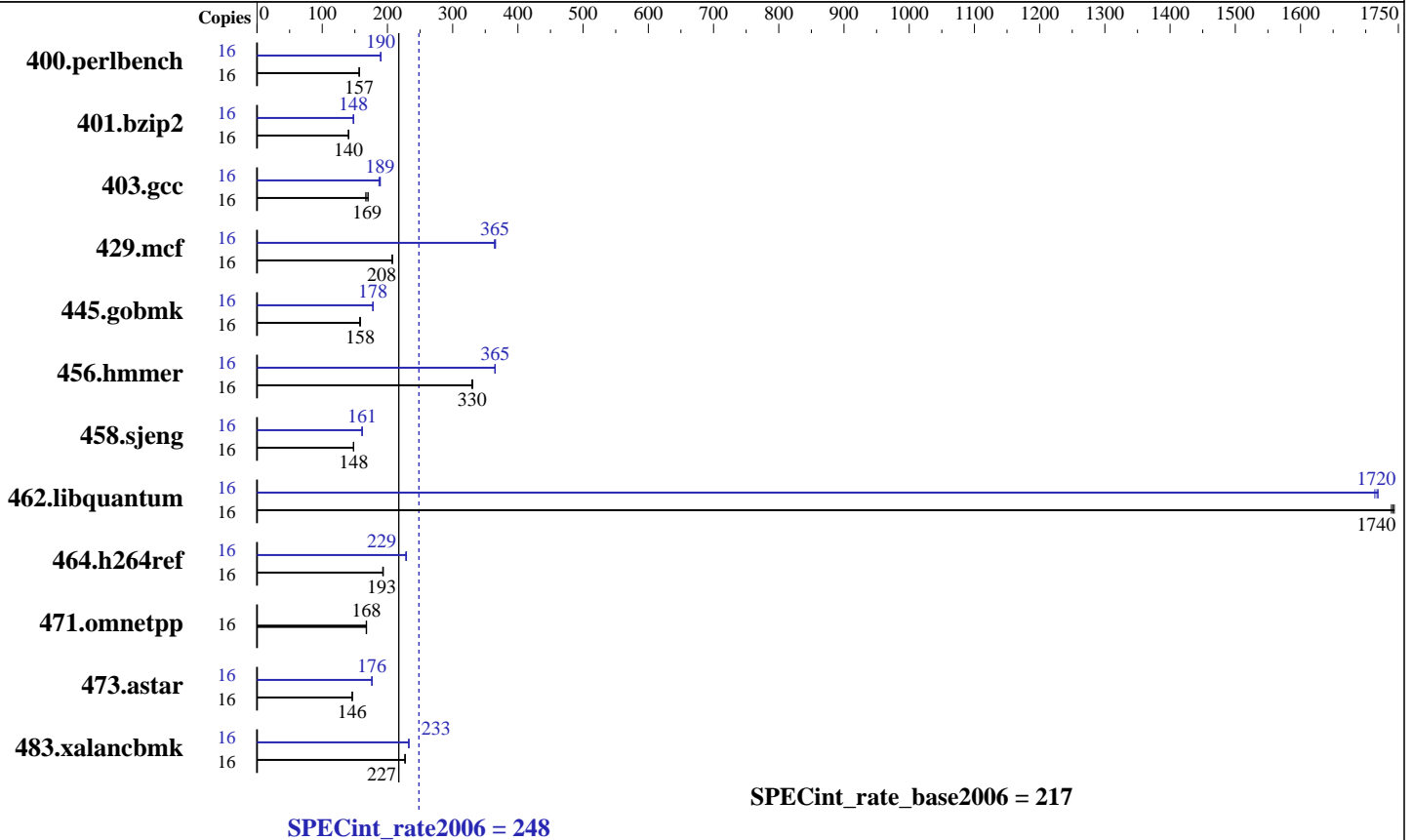
Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011



### Hardware

CPU Name: AMD Opteron 6276  
 CPU Characteristics: AMD Turbo CORE technology up to 3.20 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 1 chip, 16 cores/chip  
 CPU(s) orderable: 1 chip  
 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: 64 GB (8 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 1 x 300 GB SATA, 10000 RPM  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 6.2,  
Kernel 2.6.32-220.el6.x86\_64  
 Compiler: C/C++: Version 4.5.1 of x86 Open64 Compiler Suite  
(from AMD)  
 Auto Parallel: No  
 File System: ext3  
 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	16	999	157	996	157	<b>998</b>	<b>157</b>	16	<b>823</b>	<b>190</b>	825	189	823	190
401.bzip2	16	1098	141	<b>1100</b>	<b>140</b>	1102	140	16	1045	148	1042	148	<b>1045</b>	<b>148</b>
403.gcc	16	755	171	773	167	<b>764</b>	<b>169</b>	16	<b>682</b>	<b>189</b>	681	189	689	187
429.mcf	16	<b>703</b>	<b>208</b>	704	207	703	208	16	399	366	401	364	<b>400</b>	<b>365</b>
445.gobmk	16	<b>1060</b>	<b>158</b>	1066	158	1059	158	16	946	177	943	178	<b>944</b>	<b>178</b>
456.hammer	16	<b>452</b>	<b>330</b>	451	331	453	330	16	409	365	<b>409</b>	<b>365</b>	409	365
458.sjeng	16	1306	148	<b>1307</b>	<b>148</b>	1310	148	16	<b>1201</b>	<b>161</b>	1203	161	1199	161
462.libquantum	16	191	1740	190	1740	<b>190</b>	<b>1740</b>	16	<b>193</b>	<b>1720</b>	193	1710	193	1720
464.h264ref	16	1836	193	<b>1834</b>	<b>193</b>	1827	194	16	1553	228	1545	229	<b>1546</b>	<b>229</b>
471.omnetpp	16	<b>596</b>	<b>168</b>	597	167	595	168	16	<b>596</b>	<b>168</b>	597	167	595	168
473.astar	16	<b>769</b>	<b>146</b>	769	146	769	146	16	<b>638</b>	<b>176</b>	637	176	638	176
483.xalancbmk	16	486	227	487	227	<b>486</b>	<b>227</b>	16	<b>474</b>	<b>233</b>	474	233	475	233

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=14336 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 = "/usr/cpu2006/amd1104-rate-libs-revC/32:/usr/cpu2006/amd1104-rate-libs-revC/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 6274 chips + 64GB Memory using RHEL 6.1



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## 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:  
-march=bdver1 -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

C++ benchmarks:  
-march=bdver1 -Ofast -m32 -INLINE:aggressive=on -CG:cmp\_peep=on  
-D\_\_OPEN64\_FAST\_SET -L/root/work/libraries/SmartHeap-10/lib -lsmarheap

## 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  
 483.xalancbmk: -DSPEC\_CPU\_LINUX

## Peak Optimization Flags

C benchmarks:

400.perlbench: -march=bdver1 -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

401.bzip2: -march=bdver1 -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:bd=2m:heap=2m

403.gcc: -march=bdver1 -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

429.mcf: -march=bdver1 -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

445.gobmk: -march=bdver1 -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

456.hmmer: -march=bdver1 -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

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## Peak Optimization Flags (Continued)

458.sjeng: -march=bdver1 -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

462.libquantum: -march=bdver1 -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

464.h264ref: -march=bdver1 -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

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -TENV:frame\_pointer=off  
-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 -m32  
-HP:bd=2m:heap=2m

483.xalancbmk: -march=bdver1 -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  
-L/root/work/libraries/SmartHeap-10/lib -lsmartheap

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

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC-I.html>

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

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC-I.xml>



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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