



# SPEC® CINT2006 Result

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## Supermicro

Supermicro A+ Server 1012G-MTF  
(H8SGL-F, AMD Opteron 6320)

SPECint®\_rate2006 = 166

SPECint\_rate\_base2006 = 147

CPU2006 license: 001176

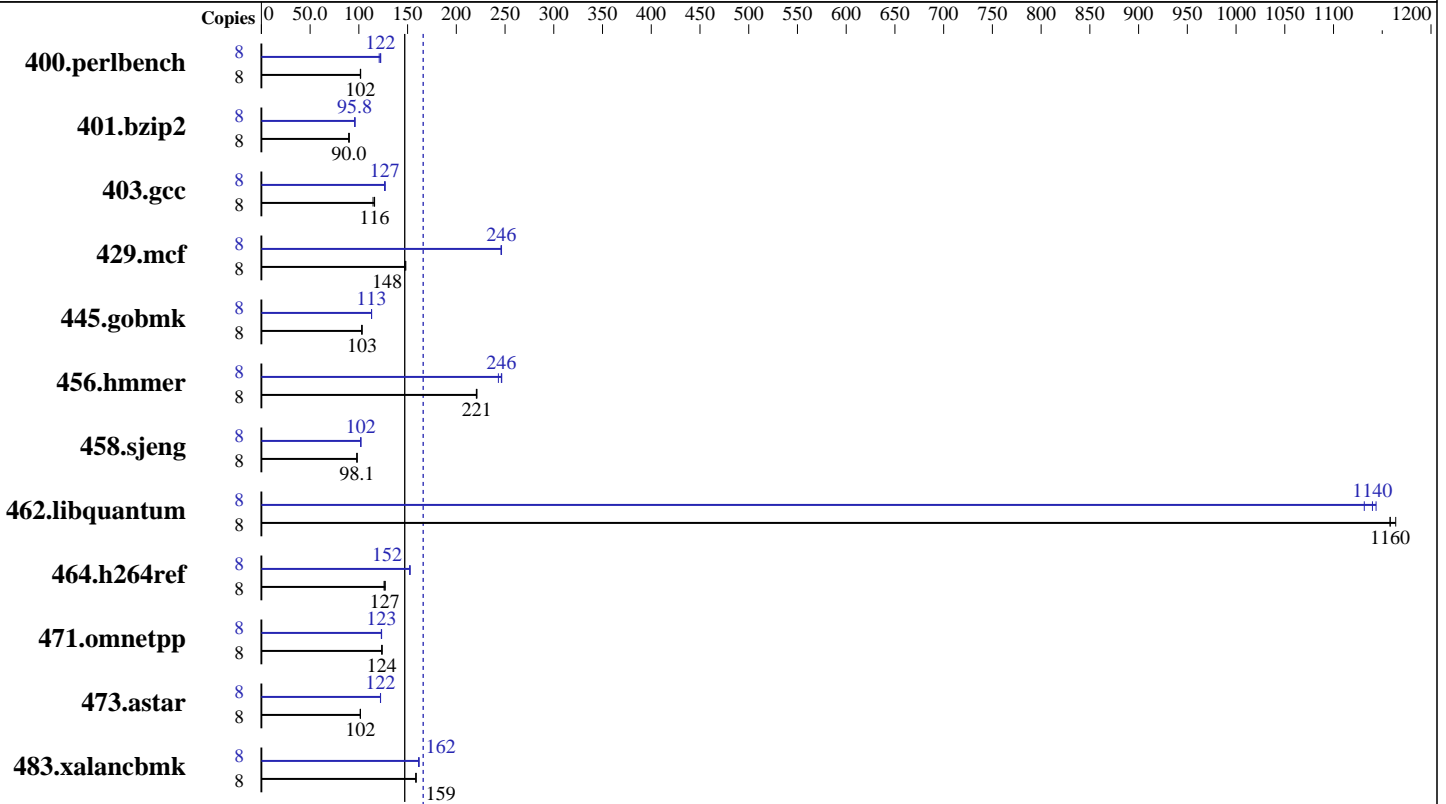
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Sep-2012

Hardware Availability: Nov-2012

Software Availability: Aug-2012



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### Hardware

CPU Name: AMD Opteron 6320  
 CPU Characteristics: AMD Turbo CORE technology up to 3.30 GHz  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 1 chip, 8 cores/chip  
 CPU(s) orderable: 1 chip  
 Primary Cache: 256 KB I on chip per chip,  
64 KB I shared / 2 cores;  
16 KB D on chip per core  
 Secondary Cache: 8 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 / 4 cores  
 Other Cache: None  
 Memory: 64 GB (8 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 1 x 2048 GB SATA, 7200 RPM  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 6.3,  
Kernel 2.6.32-279.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	8	770	102	<b><u>769</u></b>	<b><u>102</u></b>	767	102	8	647	121	<b><u>639</u></b>	<b><u>122</u></b>	639	122
401.bzip2	8	861	89.6	<b><u>858</u></b>	<b><u>90.0</u></b>	857	90.1	8	<b><u>806</u></b>	<b><u>95.8</u></b>	803	96.1	806	95.8
403.gcc	8	<b><u>555</u></b>	<b><u>116</u></b>	555	116	562	115	8	510	126	507	127	<b><u>508</u></b>	<b><u>127</u></b>
429.mcf	8	492	148	496	147	<b><u>494</u></b>	<b><u>148</u></b>	8	<b><u>296</u></b>	<b><u>246</u></b>	297	246	296	246
445.gobmk	8	816	103	812	103	<b><u>813</u></b>	<b><u>103</u></b>	8	743	113	742	113	<b><u>743</u></b>	<b><u>113</u></b>
456.hammer	8	338	221	<b><u>338</u></b>	<b><u>221</u></b>	338	221	8	<b><u>303</u></b>	<b><u>246</u></b>	303	247	307	243
458.sjeng	8	985	98.2	<b><u>987</u></b>	<b><u>98.1</u></b>	988	98.0	8	950	102	948	102	<b><u>949</u></b>	<b><u>102</u></b>
462.libquantum	8	<b><u>143</u></b>	<b><u>1160</u></b>	143	1160	142	1160	8	146	1130	<b><u>145</u></b>	<b><u>1140</u></b>	145	1140
464.h264ref	8	1393	127	1407	126	<b><u>1399</u></b>	<b><u>127</u></b>	8	1160	153	1163	152	<b><u>1163</u></b>	<b><u>152</u></b>
471.omnetpp	8	405	124	<b><u>404</u></b>	<b><u>124</u></b>	404	124	8	405	123	<b><u>406</u></b>	<b><u>123</u></b>	406	123
473.astar	8	553	102	<b><u>553</u></b>	<b><u>102</u></b>	553	102	8	460	122	<b><u>459</u></b>	<b><u>122</u></b>	459	122
483.xalancbmk	8	348	159	348	159	<b><u>348</u></b>	<b><u>159</u></b>	8	341	162	<b><u>342</u></b>	<b><u>162</u></b>	342	161

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=7168 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/amd1206-rate-libs-revA/32:/usr/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



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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:  
-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 -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  
 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:bd=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:bd=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:bd=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:bd=2m:heap=2m  
 -CG:p2align=0 -CG:load\_exe=3 -CG:dsched=on -march=bdver1

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## 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:bd=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:bd=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 -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

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-open64-452-flags-rate-revA-I.html>

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

<http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-I.xml>



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