



# SPEC® CINT2006 Result

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## Supermicro

(Test Sponsor: Advanced Micro Devices)

Supermicro A+ Server 2042G-6RF,  
AMD Opteron 6262 HE

SPECint®\_rate2006 = 734

SPECint\_rate\_base2006 = 649

CPU2006 license: 49

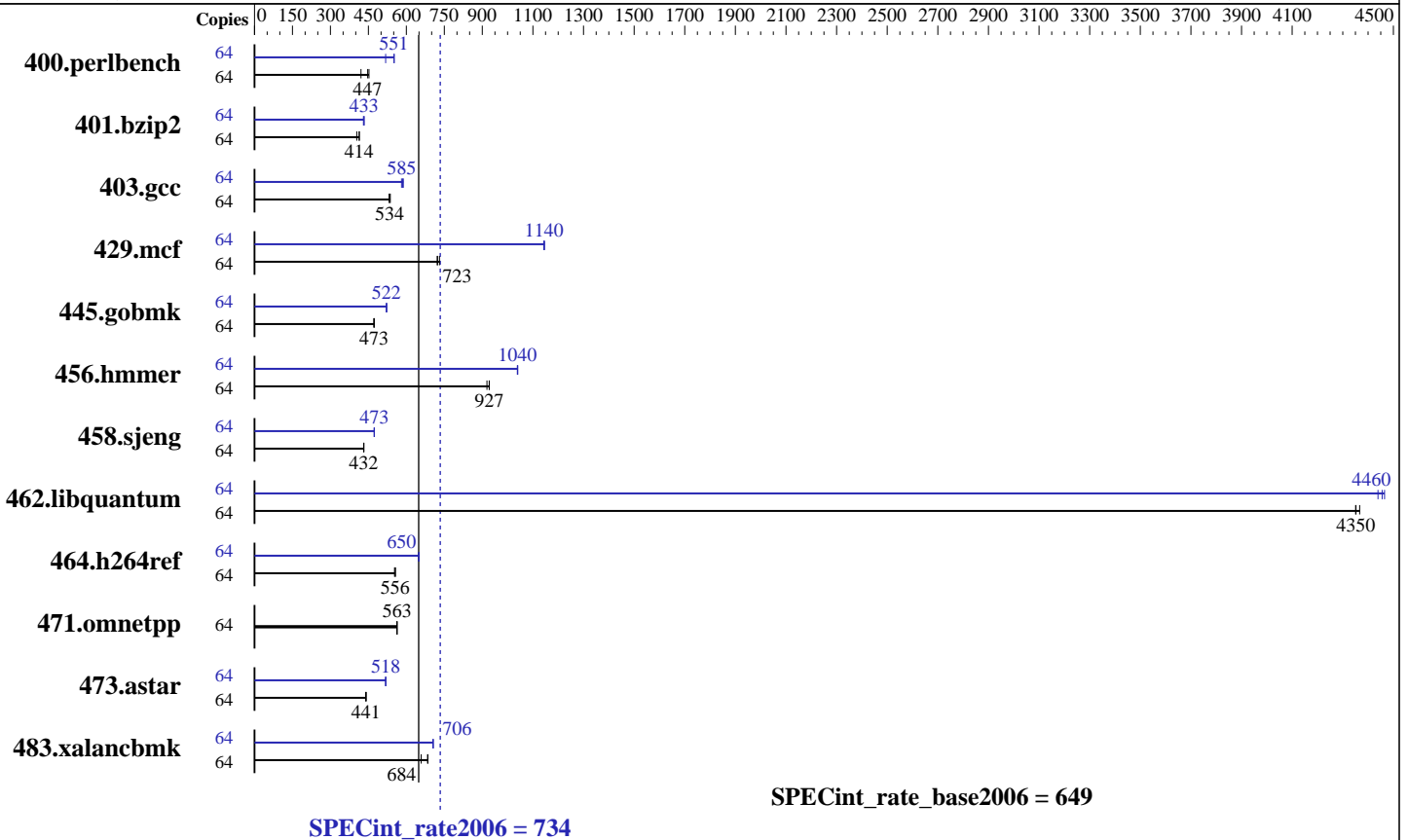
Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Sep-2011

Hardware Availability: Nov-2011

Software Availability: Jul-2011



### Hardware

CPU Name: AMD Opteron 6262 HE  
 CPU Characteristics: AMD Turbo CORE technology up to 2.90 GHz  
 CPU MHz: 1600  
 FPU: Integrated  
 CPU(s) enabled: 64 cores, 4 chips, 16 cores/chip  
 CPU(s) orderable: 2,4 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 (32 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
 Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 6.1,  
Kernel 2.6.32-131.0.15.el6.x86\_64  
 Compiler: C/C++: Version 4.2.5.2 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	64	1486	421	<u>1398</u>	<u>447</u>	1382	452	64	1207	518	<u>1135</u>	<u>551</u>	1132	552
401.bzip2	64	1529	404	1491	414	<u>1494</u>	<u>414</u>	64	1435	430	<u>1427</u>	<u>433</u>	1426	433
403.gcc	64	<u>965</u>	<u>534</u>	960	536	968	532	64	887	581	876	588	<u>880</u>	<u>585</u>
429.mcf	64	798	731	<u>807</u>	<u>723</u>	809	722	64	509	1150	<u>510</u>	<u>1140</u>	511	1140
445.gobmk	64	<u>1420</u>	<u>473</u>	1420	473	1423	472	64	1289	521	<u>1287</u>	<u>522</u>	1285	522
456.hammer	64	650	918	644	928	<u>644</u>	<u>927</u>	64	575	1040	<u>574</u>	<u>1040</u>	574	1040
458.sjeng	64	1792	432	1796	431	<u>1793</u>	<u>432</u>	64	1637	473	<u>1637</u>	<u>473</u>	1636	473
462.libquantum	64	304	4370	<u>305</u>	<u>4350</u>	305	4350	64	299	4440	297	4470	<u>298</u>	<u>4460</u>
464.h264ref	64	<u>2546</u>	<u>556</u>	2560	553	2545	556	64	2179	650	<u>2180</u>	<u>650</u>	2183	649
471.omnetpp	64	710	563	<u>710</u>	<u>563</u>	711	563	64	710	563	<u>710</u>	<u>563</u>	711	563
473.astar	64	1023	439	1019	441	<u>1019</u>	<u>441</u>	64	866	519	<u>867</u>	<u>518</u>	867	518
483.xalancbmk	64	671	658	645	685	<u>646</u>	<u>684</u>	64	626	706	626	705	<u>626</u>	<u>706</u>

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 kernel/randomize\_va\_space=0 in /etc/sysctl.conf

Set vm/nr\_hugepages=57344 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 = "/root/work/cpu2006v1.1/amd1104-rate-libs-revA/32:/root/work/cpu2006v1.1/amd1104-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 6276 chips + 128GB 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  
 -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:bd=2m:heap=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  
-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  
-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 -GRA:unspill=on -TENV:frame\_pointer=off  
-fno-emit-exceptions  
-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/x86-open64-425-flags-rate-revA.html>

<http://www.spec.org/cpu2006/flags/amd1104-platform-rate-revA.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/x86-open64-425-flags-rate-revA.xml>

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

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