



# SPEC® CFP2006 Result

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## Supermicro

(Test Sponsor: Advanced Micro Devices)

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

SPECfp®\_rate2006 = 579

SPECfp\_rate\_base2006 = 549

CPU2006 license: 49

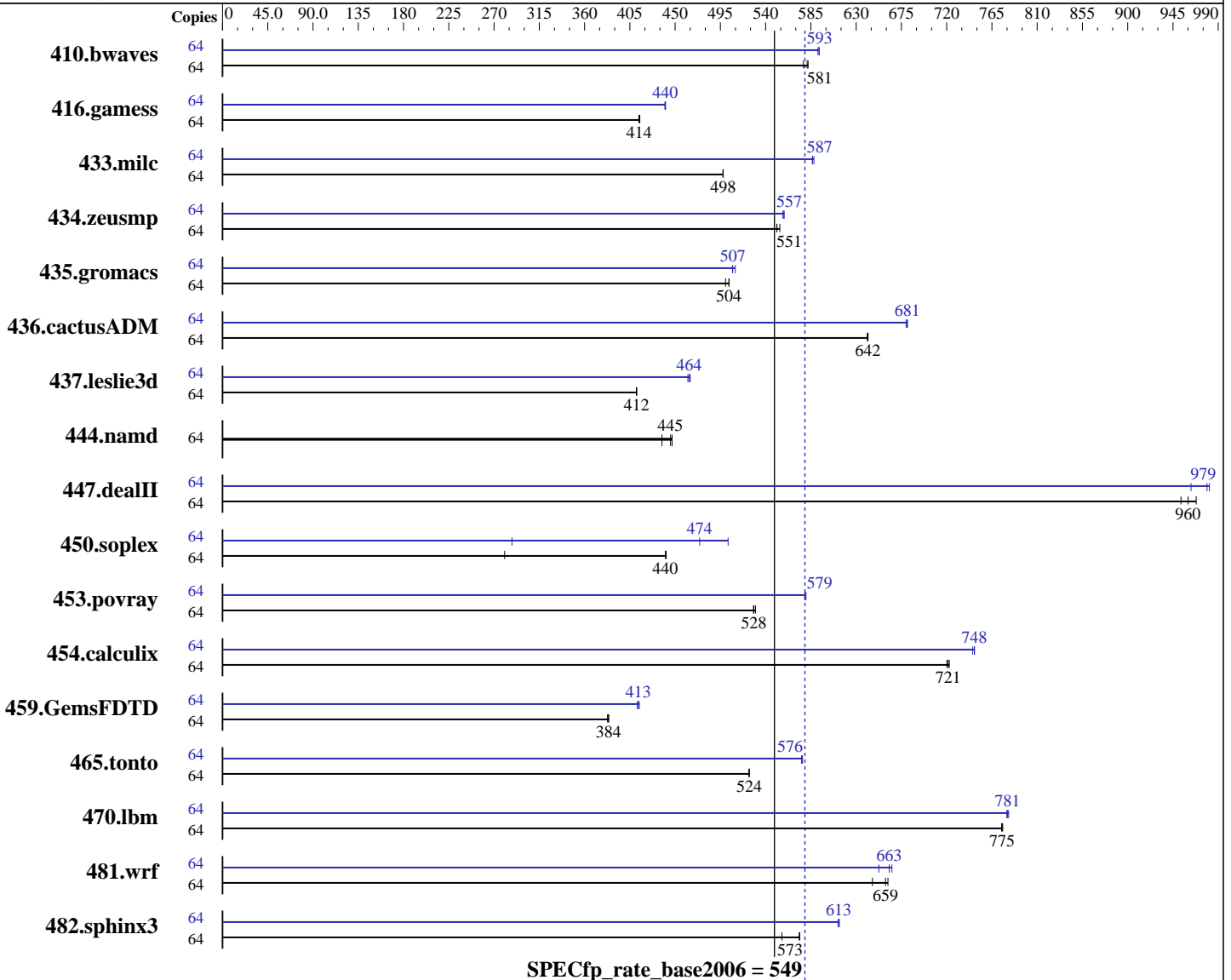
Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Sep-2011

Hardware Availability: Nov-2011

Software Availability: Jul-2011



SPECfp\_rate2006 = 579

### 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

Continued on next page

### Software

Operating System: Red Hat Enterprise Linux Server release 6.1, Kernel 2.6.32-131.0.15.el6.x86\_64  
 Compiler: C/C++/Fortran: 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: 64-bit  
 Peak Pointers: 32/64-bit

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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: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)

Disk Subsystem: 1 x 500 GB SATA, 7200 RPM

Other Hardware: None

Other Software: None

## Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	64	<b>1496</b>	<b>581</b>	1494	582	1506	578	64	1469	592	<b>1466</b>	<b>593</b>	1466	593		
416.gamess	64	3020	415	3027	414	<b>3024</b>	<b>414</b>	64	2845	441	2849	440	<b>2847</b>	<b>440</b>		
433.milc	64	1180	498	1181	498	<b>1180</b>	<b>498</b>	64	999	588	<b>1001</b>	<b>587</b>	1002	586		
434.zeusmp	64	1057	551	1051	554	<b>1057</b>	<b>551</b>	64	1043	558	<b>1045</b>	<b>557</b>	1045	557		
435.gromacs	64	914	500	907	504	<b>908</b>	<b>504</b>	64	<b>901</b>	<b>507</b>	901	507	896	510		
436.cactusADM	64	1192	642	<b>1192</b>	<b>642</b>	1193	641	64	<b>1123</b>	<b>681</b>	1125	680	1123	681		
437.leslie3d	64	1462	412	1461	412	<b>1461</b>	<b>412</b>	64	<b>1296</b>	<b>464</b>	1294	465	1300	463		
444.namd	64	1175	437	<b>1152</b>	<b>445</b>	1148	447	64	1175	437	<b>1152</b>	<b>445</b>	1148	447		
447.dealII	64	<b>763</b>	<b>960</b>	768	953	756	968	64	<b>748</b>	<b>979</b>	760	963	746	981		
450.soplex	64	1903	281	1210	441	<b>1212</b>	<b>440</b>	64	1855	288	<b>1125</b>	<b>474</b>	1062	503		
453.povray	64	<b>644</b>	<b>528</b>	642	530	645	528	64	<b>588</b>	<b>579</b>	587	580	588	579		
454.calculix	64	<b>732</b>	<b>721</b>	733	720	731	723	64	708	746	706	748	<b>706</b>	<b>748</b>		
459.GemsFDTD	64	1774	383	1768	384	<b>1769</b>	<b>384</b>	64	1646	412	1638	414	<b>1643</b>	<b>413</b>		
465.tonto	64	<b>1202</b>	<b>524</b>	1203	523	1202	524	64	1092	577	<b>1093</b>	<b>576</b>	1094	576		
470.lbm	64	1134	776	<b>1134</b>	<b>775</b>	1135	775	64	<b>1126</b>	<b>781</b>	1125	782	1128	780		
481.wrf	64	1106	646	1080	662	<b>1084</b>	<b>659</b>	64	1074	666	1095	653	<b>1078</b>	<b>663</b>		
482.sphinx3	64	2243	556	<b>2176</b>	<b>573</b>	2173	574	64	<b>2036</b>	<b>613</b>	2034	613	2038	612		

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  
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## Operating System Notes (Continued)

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

Huge pages were not configured for this run.

## General Notes

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

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

## Base Compiler Invocation

C benchmarks:  
openc

C++ benchmarks:  
openCC

Fortran benchmarks:  
openf95

Benchmarks using both Fortran and C:  
openc openf95

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
416.gamess: -DSPEC\_CPU\_LP64  
433.milc: -DSPEC\_CPU\_LP64  
434.zeusmp: -DSPEC\_CPU\_LP64  
435.gromacs: -DSPEC\_CPU\_LP64  
436.cactusADM: -DSPEC\_CPU\_LP64 -fno-second-underscore  
437.leslie3d: -DSPEC\_CPU\_LP64  
444.namd: -DSPEC\_CPU\_LP64  
447.dealII: -DSPEC\_CPU\_LP64  
450.soplex: -DSPEC\_CPU\_LP64  
453.povray: -DSPEC\_CPU\_LP64  
454.calculix: -DSPEC\_CPU\_LP64  
459.GemsFDTD: -DSPEC\_CPU\_LP64  
465.tonto: -DSPEC\_CPU\_LP64  
470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LINUX -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LP64  
-fno-second-underscore

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## Base Portability Flags (Continued)

482.sphinx3: -DSPEC\_CPU\_LP64

## Base Optimization Flags

### C benchmarks:

-march=bdver1 -Ofast -OPT:malloc\_alg=1 -HP:bd=2m:heap=2m  
-IPA:plimit=8000 -IPA:small\_pu=100 -mso

### C++ benchmarks:

-march=bdver1 -Ofast -static -CG:load\_exe=0 -OPT:malloc\_alg=1  
-INLINE:aggressive=on -HP:bd=2m:heap=2m -D\_\_OPEN64\_FAST\_SET

### Fortran benchmarks:

-march=bdver1 -Ofast -LNO:blocking=off -OPT:rsqrt=2  
-OPT:unroll\_size=256 -HP:bd=2m:heap=2m -mso

### Benchmarks using both Fortran and C:

-march=bdver1 -Ofast -OPT:malloc\_alg=1 -HP:bd=2m:heap=2m  
-IPA:plimit=8000 -IPA:small\_pu=100 -mso -LNO:blocking=off  
-OPT:rsqrt=2 -OPT:unroll\_size=256

## Peak Compiler Invocation

### C benchmarks:

opencc

### C++ benchmarks:

openCC

### Fortran benchmarks:

openf95

### Benchmarks using both Fortran and C:

opencc openf95

## Peak Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
416.gamess: -DSPEC\_CPU\_LP64  
433.milc: -DSPEC\_CPU\_LP64  
434.zeusmp: -DSPEC\_CPU\_LP64  
435.gromacs: -DSPEC\_CPU\_LP64  
436.cactusADM: -DSPEC\_CPU\_LP64 -fno-second-underscore

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## Peak Portability Flags (Continued)

```

437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
        -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

## Peak Optimization Flags

### C benchmarks:

```

433.milc: -march=bdver1 -Ofast -CG:movnti=1 -CG:locs_best=on
        -HP:bdt=2m:heap=2m -IPA:plimit=7000 -IPA:callee_limit=1200
        -OPT:struct_array_copy=2 -OPT:alias=field_sensitive -mso

470.lbm: -march=bdver1 -Ofast -CG:cmp_peep=on
        -OPT:unroll_times_max=8 -OPT:unroll_size=256
        -OPT:unroll_level=2 -OPT:keep_ext=on -HP:bdt=2m:heap=2m
        -IPA:plimit=8000 -IPA:small_pu=100 -mso

482.sphinx3: -march=bdver1 -fb_create fbdata(pass 1)
        -fb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=2
        -CG:cmp_peep=on -CG:local_sched_alg=2 -INLINE:aggressive=on
        -LNO:prefetch=2 -LNO:prefetch_ahead=4 -mso

```

### C++ benchmarks:

```

444.namd: basepeak = yes

447.dealII: -march=bdver1 -Ofast -D__OPEN64_FAST_SET -static
        -INLINE:aggressive=on -LNO:opt=0 -LNO:simd=0
        -fno-emit-exceptions -m32 -OPT:unroll_times_max=8
        -OPT:unroll_size=256 -OPT:unroll_level=2 -HP:bdt=2m:heap=2m
        -GRA:unspill=on -CG:cmp_peep=on -CG:movext_icmp=off
        -TENV:frame_pointer=off

450.soplex: -march=bdver1 -fb_create fbdata(pass 1)
        -fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on -OPT:RO=1
        -OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
        -OPT:fold_unsigned_relops=on -fno-exceptions -m32
        -HP:bdt=2m:heap=2m -WOPT:sib=on

453.povray: -march=bdver1 -fb_create fbdata(pass 1)
        -fb_opt fbdata(pass 2) -Ofast -CG:pre_local_sched=off
        -INLINE:aggressive=on -HP:bd=2m:heap=2m -OPT:transform=2

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## Peak Optimization Flags (Continued)

453.povray (continued):

-OPT:alias=disjoint -WOPT:aggcm=0

Fortran benchmarks:

410.bwaves: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -OPT:Ofast -OPT:treeheight=on  
-LNO:blocking=off -LNO:ignore\_feedback=off -LNO:fu=4  
-LNO:loop\_model\_simd=on -LNO:simd\_rm\_unity\_remainder=on  
-WOPT:aggstr=0 -HP:bdt=2m:heap=2m -CG:cmp\_peep=on

416.gamess: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0  
-LNO:simd=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll\_size=256  
-OPT:unroll\_times\_max=2 -CG:local\_sched\_alg=1  
-HP:bdt=2m:heap=2m -WOPT:sib=on

434.zeusmp: -march=bdver1 -Ofast -LNO:blocking=off -LNO:interchange=off  
-HP:bdt=2m:heap=2m

437.leslie3d: -march=bdver1 -Ofast -CG:pre\_minreg\_level=2 -LNO:simd=0  
-LNO:fusion=2 -HP:bdt=2m:heap=2m -mso

459.GemsFDTD: -march=bdver1 -Ofast -OPT:unroll\_size=0 -LNO:fission=2  
-CG:load\_exe=0 -CG:local\_sched\_alg=2 -HP

465.tonto: -march=bdver1 -Ofast -OPT:alias=no\_f90\_pointer\_alias  
-LNO:blocking=off -CG:load\_exe=1 -IPA:plimit=525  
-HP:bdt=2m:heap=2m

Benchmarks using both Fortran and C:

435.gromacs: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -OPT:rsqrt=2  
-HP:bdt=2m:heap=2m

436.cactusADM: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -LNO:blocking=off  
-LNO:prefetch=2 -HP -CG:locs\_shallow\_depth=1 -CG:load\_exe=0  
-WOPT:sib=on

454.calculix: -march=bdver1 -Ofast -OPT:unroll\_size=256  
-GRA:optimize\_boundary=on -HP:bdt=2m:heap=2m

481.wrf: -march=bdver1 -Ofast -LNO:blocking=off -LANG:copyinout=off  
-IPA:callee\_limit=5000 -GRA:prioritize\_by\_density=on  
-CG:load\_exe=1 -HP -WOPT:sib=on



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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>

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

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

Tested with SPEC CPU2006 v1.1.  
Report generated on Thu Jul 24 00:57:01 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 14 November 2011.