



SPEC[®] CFP2006 Result

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Supermicro

Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6378)
AMD Opteron 6378

SPECfp[®]_rate2006 = 818

SPECfp_rate_base2006 = 738

CPU2006 license: 001176

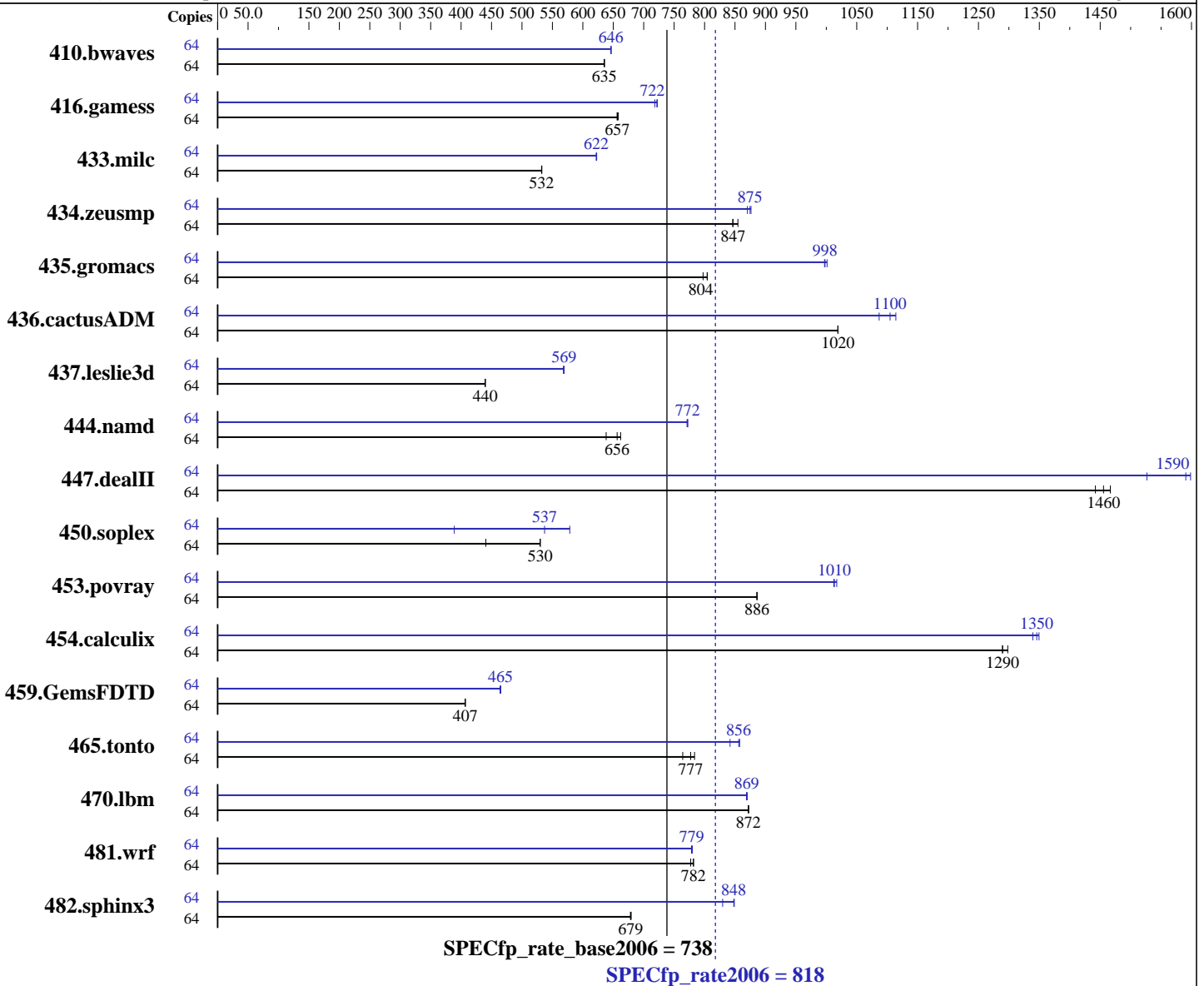
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Oct-2012

Hardware Availability: Nov-2012

Software Availability: Aug-2012



Hardware

CPU Name: AMD Opteron 6378
 CPU Characteristics: AMD Turbo CORE technology up to 3.30 GHz
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 64 cores, 4 chips, 16 cores/chip
 CPU(s) orderable: 2,4 chips

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Software

Operating System: Red Hat Enterprise Linux Server release 6.2, Kernel 2.6.32-220.el6.x86_64
 Compiler: C/C++/Fortran: Version 4.5.2 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: 256 GB (32 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	1369	635	1369	635	1369	635	64	1345	647	1346	646	1346	646
416.gamess	64	1908	657	1909	656	1904	658	64	1737	722	1745	718	1735	722
433.milc	64	1103	532	1103	533	1104	532	64	944	622	943	623	944	622
434.zeusmp	64	688	846	681	855	688	847	64	666	875	669	870	665	876
435.gromacs	64	568	804	573	798	568	805	64	458	997	458	998	456	1000
436.cactusADM	64	750	1020	750	1020	750	1020	64	704	1090	692	1100	686	1110
437.leslie3d	64	1368	440	1369	440	1368	440	64	1057	569	1059	568	1057	569
444.namd	64	782	656	804	638	775	662	64	665	772	665	772	666	771
447.dealII	64	499	1470	503	1460	508	1440	64	480	1530	458	1600	460	1590
450.soplex	64	1211	441	1007	530	1007	530	64	1373	389	994	537	923	579
453.povray	64	384	886	384	886	384	886	64	335	1020	336	1010	336	1010
454.calculix	64	407	1300	409	1290	409	1290	64	392	1350	394	1340	391	1350
459.GemsFDTD	64	1669	407	1669	407	1670	407	64	1460	465	1460	465	1464	464
465.tonto	64	804	784	810	777	824	764	64	736	856	748	842	734	858
470.lbm	64	1008	872	1008	872	1008	872	64	1012	869	1012	869	1011	870
481.wrf	64	914	782	915	782	920	777	64	918	779	918	779	917	780
482.sphinx3	64	1838	679	1839	678	1836	679	64	1469	849	1503	830	1471	848

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 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 = "/home/spec/amd1206-rate-libs-revA/32:/home/spec/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
```

Fortran benchmarks:

```
openf95
```

Benchmarks using both Fortran and C:

```
opencc 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
```

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Base Portability Flags (Continued)

481.wrf: -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
-fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:

-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1

C++ benchmarks:

-Ofast -static -CG:load_exe=0 -OPT:malloc_alg=1 -INLINE:aggressive=on
-HP:bd=2m:heap=2m -D__OPEN64_FAST_SET -march=bdver1

Fortran benchmarks:

-Ofast -LNO:blocking=off -LNO:simd_peel_align=on -OPT:rsqrt=2
-OPT:unroll_size=256 -HP:bd=2m:heap=2m -mso -march=bdver1

Benchmarks using both Fortran and C:

-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1 -LNO:blocking=off
-LNO:simd_peel_align=on -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

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Peak Portability Flags (Continued)

435.gromacs: -DSPEC_CPU_LP64
 436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
 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

Peak Optimization Flags

C benchmarks:

433.milc: -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
 -march=bdver1

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

482.sphinx3: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
 -m32 -IPA:plimit=1000 -OPT:malloc_alg=2 -CG:cmp_peep=on
 -CG:p2align=0 -CG:load_exe=1 -CG:dsched=on
 -INLINE:aggressive=on -LNO:prefetch=2 -LNO:prefetch_ahead=4
 -mso -march=bdver2

C++ benchmarks:

444.namd: -Ofast -IPA:plimit=3000 -LNO:ignore_feedback=off
 -CG:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
 -fno-exceptions -HP:bdt=2m:heap=2m -LNO:if_select_conv=1
 -OPT:alias=disjoint -LNO:psimd_iso_unroll=ON -march=bdver1

447.dealIII: -Ofast -D__OPEN64_FAST_SET -static -INLINE:aggressive=on
 -LNO:opt=1 -LNO:simd=2 -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
 -march=bdver1

450.soplex: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
 -LNO:ignore_feedback=off -INLINE:aggressive=on -OPT:RO=1
 -OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
 -OPT:fold_unsigned_relops=on -fno-exceptions -CG:p2align=0
 -m32 -mno-fma4 -HP:bdt=2m:heap=2m -WOPT:sib=on

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Peak Optimization Flags (Continued)

450.soplex (continued):

-march=bdver1

453.povray: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast

-CG:pre_local_sched=off -CG:p2align=0 -CG:p2align_split=on

-CG:dsched=on -INLINE:aggressive=on -HP:bd=2m:heap=2m

-OPT:transform=2 -OPT:alias=disjoint -WOPT:aggcm=0

-march=bdver2

Fortran benchmarks:

410.bwaves: -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:bd=2m:heap=2m -CG:cmp_peep=on -march=bdver1

416.gamess: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast

-LNO:fu=6 -LNO:blocking=0 -LNO:simd=2 -OPT:ro=3

-OPT:recip=on -CG:local_sched_alg=1 -HP:bd=2m:heap=2m

-WOPT:sib=on -march=bdver1

434.zeusmp: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast

-LNO:blocking=off -LNO:interchange=off -IPA:plimit=1500

-HP:bd=2m:heap=2m -march=bdver1

437.leslie3d: -Ofast -CG:pre_minreg_level=2 -LNO:simd=0 -LNO:fusion=2

-HP:bd=2m:heap=2m -mso -march=bdver1

459.GemsFDTD: -Ofast -IPA:plimit=1500 -OPT:unroll_size=1024

-OPT:unroll_times_max=16 -LNO:fission=2

-CG:local_sched_alg=2 -HP -march=bdver1

465.tonto: -Ofast -OPT:alias=no_f90_pointer_alias -LNO:blocking=off

-CG:load_exe=1 -CG:local_sched_alg=3 -IPA:plimit=525

-HP:bd=2m:heap=2m -march=bdver1

Benchmarks using both Fortran and C:

435.gromacs: -Ofast -OPT:rsqrt=2 -HP:bd=2m:heap=2m

-CG:local_sched_alg=2 -CG:load_exe=3 -GRA:unspill=on

-march=bdver1 -LNO:simd=3

436.cactusADM: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast

-LNO:blocking=off -LNO:prefetch=2 -LNO:pf2=0

-LNO:prefetch_ahead=4 -HP -CG:locs_shallow_depth=1

-CG:load_exe=0 -CG:dsched=on -WOPT:sib=on -march=bdver1

454.calculix: -Ofast -OPT:unroll_size=256 -OPT:alias=disjoint

-GRA:optimize_boundary=on -CG:dsched=on -HP:bd=2m:heap=2m

-march=bdver1

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Peak Optimization Flags (Continued)

```
481.wrf: -Ofast -LNO:blocking=off -LANG:copyinout=off
        -IPA:callee_limit=5000 -GRA:prioritize_by_density=on -HP
        -WOPT:sib=on -march=bdver1
```

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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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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