



SPEC[®] CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp[®]_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11

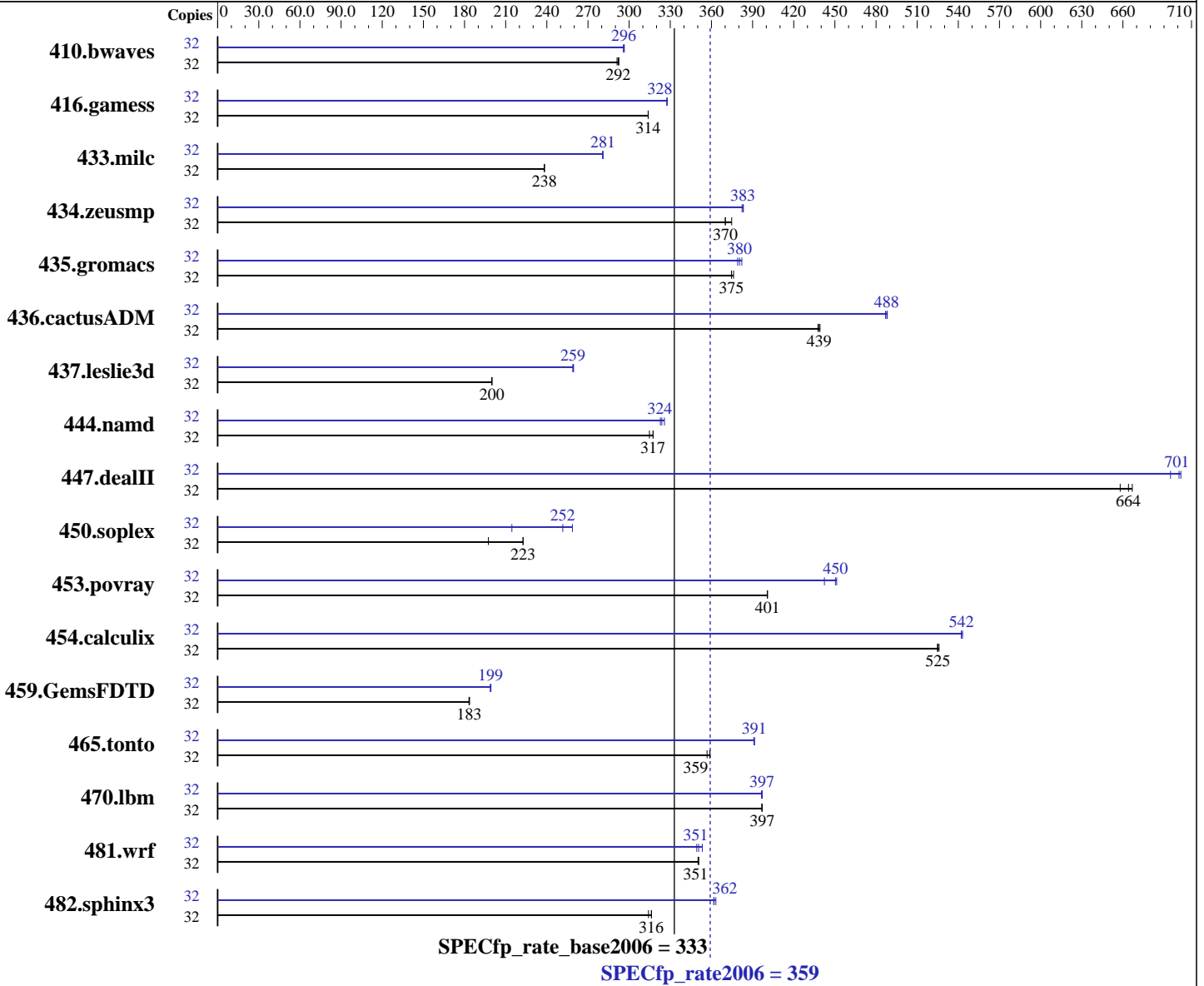
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Nov-2011

Hardware Availability: Dec-2011

Software Availability: Jul-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: 32 cores, 2 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: ext4
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Nov-2011
Hardware Availability: Dec-2011
Software Availability: Jul-2011

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 PC3-10600R-11, ECC)
Disk Subsystem: 1 x 600 GB SATA, 15000 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	32	1494	291	<u>1489</u>	<u>292</u>	1487	293	32	1467	297	1470	296	<u>1469</u>	<u>296</u>		
416.gamess	32	1996	314	<u>1996</u>	<u>314</u>	1996	314	32	1913	328	1911	328	<u>1913</u>	<u>328</u>		
433.milc	32	1234	238	<u>1233</u>	<u>238</u>	1233	238	32	1047	281	<u>1046</u>	<u>281</u>	1045	281		
434.zeusmp	32	777	375	<u>787</u>	<u>370</u>	787	370	32	<u>760</u>	<u>383</u>	760	383	762	382		
435.gromacs	32	610	375	607	376	<u>610</u>	<u>375</u>	32	<u>601</u>	<u>380</u>	603	379	598	382		
436.cactusADM	32	871	439	874	438	<u>872</u>	<u>439</u>	32	783	488	785	487	<u>784</u>	<u>488</u>		
437.leslie3d	32	1505	200	1504	200	<u>1504</u>	<u>200</u>	32	<u>1161</u>	<u>259</u>	1162	259	1159	260		
444.namd	32	815	315	808	317	<u>808</u>	<u>317</u>	32	795	323	<u>793</u>	<u>324</u>	788	326		
447.dealII	32	549	667	556	658	<u>551</u>	<u>664</u>	32	<u>522</u>	<u>701</u>	527	695	521	702		
450.soplex	32	1352	197	1198	223	<u>1199</u>	<u>223</u>	32	1244	215	<u>1061</u>	<u>252</u>	1032	259		
453.povray	32	425	401	<u>425</u>	<u>401</u>	425	401	32	385	442	377	451	<u>378</u>	<u>450</u>		
454.calculix	32	503	525	<u>503</u>	<u>525</u>	502	526	32	486	543	487	542	<u>487</u>	<u>542</u>		
459.GemsFDTD	32	1853	183	1849	184	<u>1851</u>	<u>183</u>	32	1704	199	1708	199	<u>1706</u>	<u>199</u>		
465.tonto	32	877	359	882	357	<u>878</u>	<u>359</u>	32	805	391	<u>805</u>	<u>391</u>	805	391		
470.lbm	32	1108	397	1108	397	<u>1108</u>	<u>397</u>	32	1107	397	1109	396	<u>1108</u>	<u>397</u>		
481.wrf	32	<u>1020</u>	<u>351</u>	1019	351	1021	350	32	1023	349	1012	353	<u>1019</u>	<u>351</u>		
482.sphinx3	32	1986	314	1972	316	<u>1973</u>	<u>316</u>	32	1724	362	1717	363	<u>1723</u>	<u>362</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
Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Nov-2011
Hardware Availability: Dec-2011
Software Availability: Jul-2011

Operating System Notes (Continued)

Set kernel/randomize_va_space=0 in /etc/sysctl.conf

Set vm/nr_hugepages=28672 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/speccpu-rate-rev1104A4/amd1104-rate-libs-revA/32:/root/speccpu-rate-rev1104A4/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:
 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

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Nov-2011

Hardware Availability: Dec-2011

Software Availability: Jul-2011

Base Portability Flags (Continued)

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

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:

openc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

openc openf95

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Nov-2011
Hardware Availability: Dec-2011
Software Availability: Jul-2011

Peak Portability Flags (Continued)

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
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: -march=bdver1 -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:ignore_feedback=off
-CG:local_sched_alg=2 -CG:load_exe=0 -OPT:unroll_size=256
-fno-exceptions -HP:bdt=2m:heap=2m

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

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Nov-2011
Hardware Availability: Dec-2011
Software Availability: Jul-2011

Peak Optimization Flags (Continued)

450.soplex (continued):

-OPT:fold_unsigned_relops=on -fno-exceptions -m32
-HP:bd=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
-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:bd=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:bd=2m:heap=2m -WOPT:sib=on

434.zeusmp:

-march=bdver1 -Ofast -LNO:blocking=off -LNO:interchange=off
-HP:bd=2m:heap=2m

437.leslie3d:

-march=bdver1 -Ofast -CG:pre_minreg_level=2 -LNO:simd=0
-LNO:fusion=2 -HP:bd=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:bd=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:bd=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:bd=2m:heap=2m

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3755 M3
(AMD Opteron 6276)

SPECfp_rate2006 = 359

SPECfp_rate_base2006 = 333

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Nov-2011
Hardware Availability: Dec-2011
Software Availability: Jul-2011

Peak Optimization Flags (Continued)

```
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
```

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>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.1.
Report generated on Mon Sep 22 18:33:10 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 3 January 2012.