



SPEC[®] CFP2006 Result

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Tyan

(Test Sponsor: Advanced Micro Devices)

Tyan YR190-B8228,
AMD Opteron 4228 HE

SPECfp[®]_rate2006 = 176

SPECfp_rate_base2006 = 164

CPU2006 license: 49

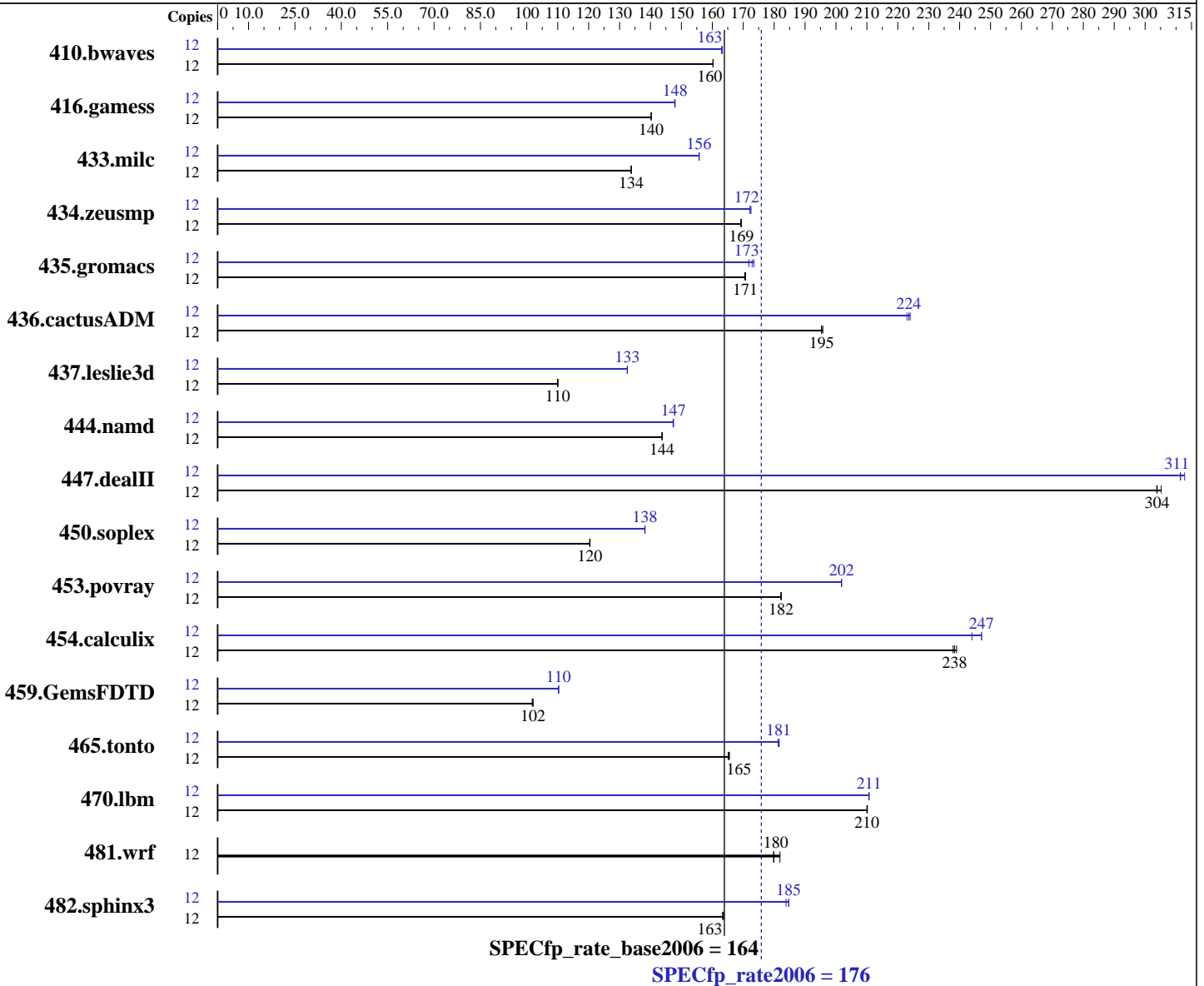
Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Dec-2011

Hardware Availability: Nov-2011

Software Availability: Jul-2011



Hardware

CPU Name: AMD Opteron 4228 HE
 CPU Characteristics: AMD Turbo CORE technology up to 3.60 GHz
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip
 CPU(s) orderable: 1,2 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

Continued on next page



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Primary Cache: 192 KB I on chip per chip,
64 KB I shared / 2 cores;
16 KB D on chip per core
Secondary Cache: 6 MB I+D on chip per chip, 2 MB shared / 2 cores
L3 Cache: 8 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (4 x 8 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 1 x 120 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	12	<u>1018</u>	<u>160</u>	1018	160	1018	160	12	999	163	<u>1000</u>	<u>163</u>	1000	163
416.gamess	12	<u>1675</u>	<u>140</u>	1676	140	1675	140	12	1588	148	<u>1588</u>	<u>148</u>	1589	148
433.milc	12	<u>824</u>	<u>134</u>	824	134	823	134	12	707	156	<u>707</u>	<u>156</u>	707	156
434.zeusmp	12	<u>645</u>	<u>169</u>	645	169	645	169	12	633	173	<u>634</u>	<u>172</u>	634	172
435.gromacs	12	<u>502</u>	<u>171</u>	502	171	503	170	12	494	173	<u>496</u>	<u>173</u>	499	172
436.cactusADM	12	733	196	734	195	<u>734</u>	<u>195</u>	12	643	223	640	224	<u>641</u>	<u>224</u>
437.leslie3d	12	1025	110	<u>1025</u>	<u>110</u>	1026	110	12	851	133	852	132	<u>851</u>	<u>133</u>
444.namd	12	669	144	<u>670</u>	<u>144</u>	670	144	12	653	147	653	147	<u>653</u>	<u>147</u>
447.dealII	12	450	305	<u>452</u>	<u>304</u>	452	304	12	439	313	441	311	<u>441</u>	<u>311</u>
450.soplex	12	831	120	832	120	<u>831</u>	<u>120</u>	12	724	138	724	138	<u>724</u>	<u>138</u>
453.povray	12	<u>350</u>	<u>182</u>	350	182	350	182	12	<u>316</u>	<u>202</u>	316	202	316	202
454.calculix	12	<u>415</u>	<u>238</u>	416	238	414	239	12	406	244	401	247	<u>401</u>	<u>247</u>
459.GemsFDTD	12	1251	102	<u>1248</u>	<u>102</u>	1248	102	12	1155	110	<u>1154</u>	<u>110</u>	1154	110
465.tonto	12	<u>714</u>	<u>165</u>	715	165	713	166	12	651	181	650	182	<u>651</u>	<u>181</u>
470.lbm	12	<u>785</u>	<u>210</u>	785	210	785	210	12	782	211	783	211	<u>783</u>	<u>211</u>
481.wrf	12	<u>745</u>	<u>180</u>	737	182	745	180	12	<u>745</u>	<u>180</u>	737	182	745	180
482.sphinx3	12	1429	164	1432	163	<u>1431</u>	<u>163</u>	12	1272	184	1266	185	<u>1266</u>	<u>185</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



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Operating System Notes (Continued)

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

Set vm/nr_hugepages=5760 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 = "480"

LD_LIBRARY_PATH = "/root/work/cpu2006v1.2/amd1104-rate-libs-revB/32:/root/work/cpu2006v1.2/amd1104-rate-libs-revB/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 6282SE chips + 64GB 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



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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



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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

```

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Peak Optimization Flags (Continued)

450.soplex (continued):

```
-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
-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
```

Continued on next page

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Page 6



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Peak Optimization Flags (Continued)

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd-platform-rate-revB.20120103.html>

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

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

<http://www.spec.org/cpu2006/flags/amd-platform-rate-revB.20120103.xml>

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

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For other inquiries, please contact webmaster@spec.org.

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