SPEC® CINT2006 Result

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Dell Inc.

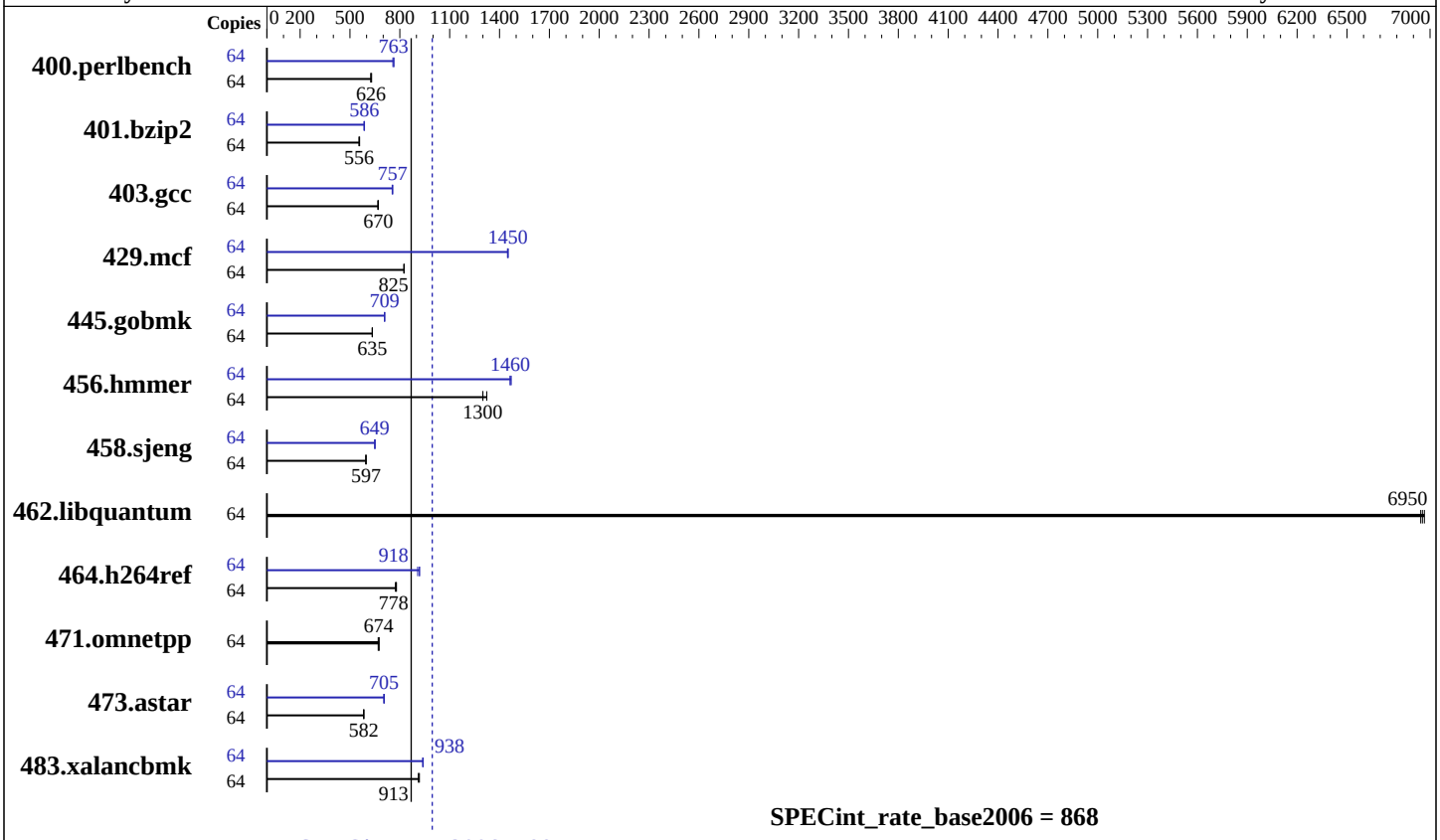
PowerEdge M915 (AMD Opteron 6276, 2.30 GHz)

SPECint®_rate2006 = 995

SPECint_rate_base2006 = 868

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jul-2012
Hardware Availability: Nov-2011
Software Availability: Dec-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:	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 PC3-12800R-11, ECC)
Disk Subsystem:	1 x 300 GB SAS 15000 RPM
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.2 Kernel 2.6.32-220.el6.x86_64
Compiler:	C/C++: Version 4.5.1 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	992	630	1000	625	**998**	**626**	64	825	758	**819**	**763**	818	764
401.bzip2	64	**1111**	**556**	1114	554	1106	558	64	**1053**	**586**	1057	584	1051	587
403.gcc	64	**769**	**670**	768	671	772	667	64	683	754	680	757	**681**	**757**
429.mcf	64	707	826	708	825	**707**	**825**	64	403	1450	**402**	**1450**	402	1450
445.gobmk	64	1058	635	1060	634	**1058**	**635**	64	947	709	**947**	**709**	949	708
456.hmmer	64	**459**	**1300**	451	1320	459	1300	64	408	1460	**408**	**1460**	406	1470
458.sjeng	64	**1297**	**597**	1296	597	1302	595	64	**1192**	**649**	1189	651	1193	649
462.libquantum	64	**191**	**6950**	190	6970	191	6940	64	**191**	**6950**	190	6970	191	6940
464.h264ref	64	**1820**	**778**	1833	773	1816	780	64	1561	907	1541	919	**1543**	**918**
471.omnetpp	64	**594**	**674**	592	675	597	670	64	**594**	**674**	592	675	597	670
473.astar	64	771	582	769	584	**771**	**582**	64	639	703	636	706	**637**	**705**
483.xalancbmk	64	484	912	**484**	**913**	481	918	64	469	941	471	938	**471**	**938**

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 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/cpu2006/amd1104-rate-libs-revC/32:/root/cpu2006/amd1104-rate-libs-revC/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 6274 chips + 64GB Memory using RHEL 6.1
```

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 -lsmartheap

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:bdt=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:bdt=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 -CG:dsched=on
-GRA:prioritize_by_density=on -m32 -HP:bdt=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:bdt=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:heap=2m:bd=2m`
`-WOPT:sib=on`

462.libquantum: `basepeak = yes`

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:bdt=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`
`-CG:p2align=1 -CG:dsched=on -GRA:optimize_boundary=on`
`-OPT:alias=disjoint -INLINE:aggressive=on`
`-IPA:small_pu=3000 -IPA:plimit=3000 -m32`
`-HP:bdt=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 -CG:p2align=1 -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/amd-platform-speed-revA-I.html
http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/amd-platform-speed-revA-I.xml
http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC.xml

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