SPEC® CINT2006 Result

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Hewlett-Packard Company

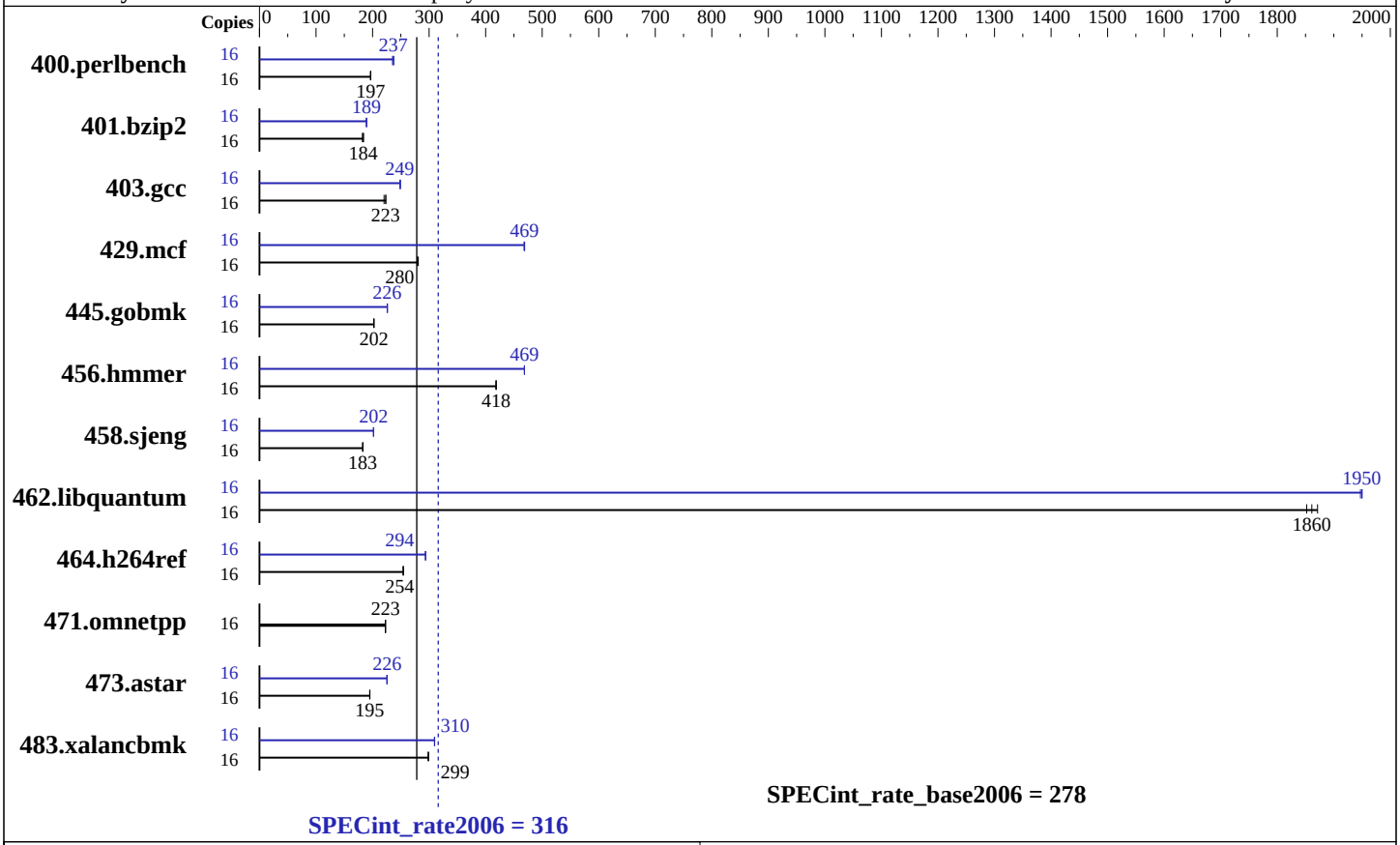
ProLiant DL385 G7
(3.0 GHz AMD Opteron 6220)

SPECint®_rate2006 = 316

SPECint_rate_base2006 = 278

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

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



Hardware

CPU Name:	AMD Opteron 6220
CPU Characteristics:	AMD Turbo CORE technology up to 3.60 GHz
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 cores/chip
CPU(s) orderable:	1,2 chips
Primary Cache:	256 KB I on chip per chip, 64 KB I shared / 2 cores; 16 KB D on chip per core
Secondary Cache:	8 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 / 4 cores
Other Cache:	None
Memory:	64 GB (16 x 4 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem:	2 x 146 GB 7.2 K SATA
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.1, Kernel 2.6.32-131.0.15.el6.x86_64
Compiler:	C/C++: Version 4.2.5.2 of x86 Open64 Compiler Suite (from AMD)
Auto Parallel:	No
File System:	ext3
System State:	Run level 3 (multi-user)
Base Pointers:	32-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	16	797	196	794	197	**795**	**197**	16	**660**	**237**	665	235	658	238
401.bzip2	16	849	182	**841**	**184**	839	184	16	**815**	**189**	815	190	817	189
403.gcc	16	585	220	576	223	**577**	**223**	16	517	249	518	249	**518**	**249**
429.mcf	16	522	279	**521**	**280**	520	281	16	311	469	**311**	**469**	312	468
445.gobmk	16	830	202	**829**	**202**	829	203	16	741	226	743	226	**742**	**226**
456.hmmer	16	**357**	**418**	357	418	356	419	16	319	468	318	469	**319**	**469**
458.sjeng	16	1059	183	1061	182	**1059**	**183**	16	961	201	958	202	**959**	**202**
462.libquantum	16	179	1850	177	1870	**178**	**1860**	16	170	1950	**170**	**1950**	170	1950
464.h264ref	16	**1393**	**254**	1391	254	1393	254	16	**1206**	**294**	1206	294	1206	294
471.omnetpp	16	449	223	**449**	**223**	449	223	16	449	223	**449**	**223**	449	223
473.astar	16	**576**	**195**	576	195	575	195	16	**497**	**226**	499	225	497	226
483.xalancbmk	16	370	298	**370**	**299**	369	299	16	**357**	**310**	357	309	356	310

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 "echo never > /sys/kernel/mm/redhat_transparent_hugepage/enabled"
Set "kernel/randomize_va_space=0" in /etc/sysctl.conf

Set vm/nr_hugepages=14336 in /etc/sysctl.conf
Set mount -t hugetlbfs nodev /mnt/hugepages in /etc/fstab
```

Platform Notes

```
 BIOS configuration:
  HP Power Profile set to Maximum Performance
  Thermal Configuration set to Increased Cooling
```

General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "896"
LD_LIBRARY_PATH = "/cpu2006/amd1104-rate-libs-revA/32:/cpu2006/amd1104-rate-libs-revA/64"
```

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General Notes (Continued)

```
The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
http://developer.amd.com/cpu/open64
```

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
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
-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:bd=2m:heap=2m
-WOPT:sib=on

462.libquantum: -march=bdver1 -Ofast -mso -OPT:unroll_size=512
-OPT:unroll_times_max=16 -LNO:prefetch=2
-LNO:prefetch_ahead=4 -LNO:pf2=0 -CG:local_sched_alg=1
-INLINE:aggressive=on -IPA:plimit=15000 -IPA:small_pu=100
-HP:bdt=2m:heap=2m,limit=300

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
-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 -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/x86-open64-425-flags-rate-revA.html
http://www.spec.org/cpu2006/flags/hp-amd-linux-flags.20100330.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/hp-amd-linux-flags.20100330.xml

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