SPEC® CINT2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

$SPECint^{®}\_rate2006 =$ 388

PowerEdge R715 (AMD Opteron 6174, 2.20 GHz)

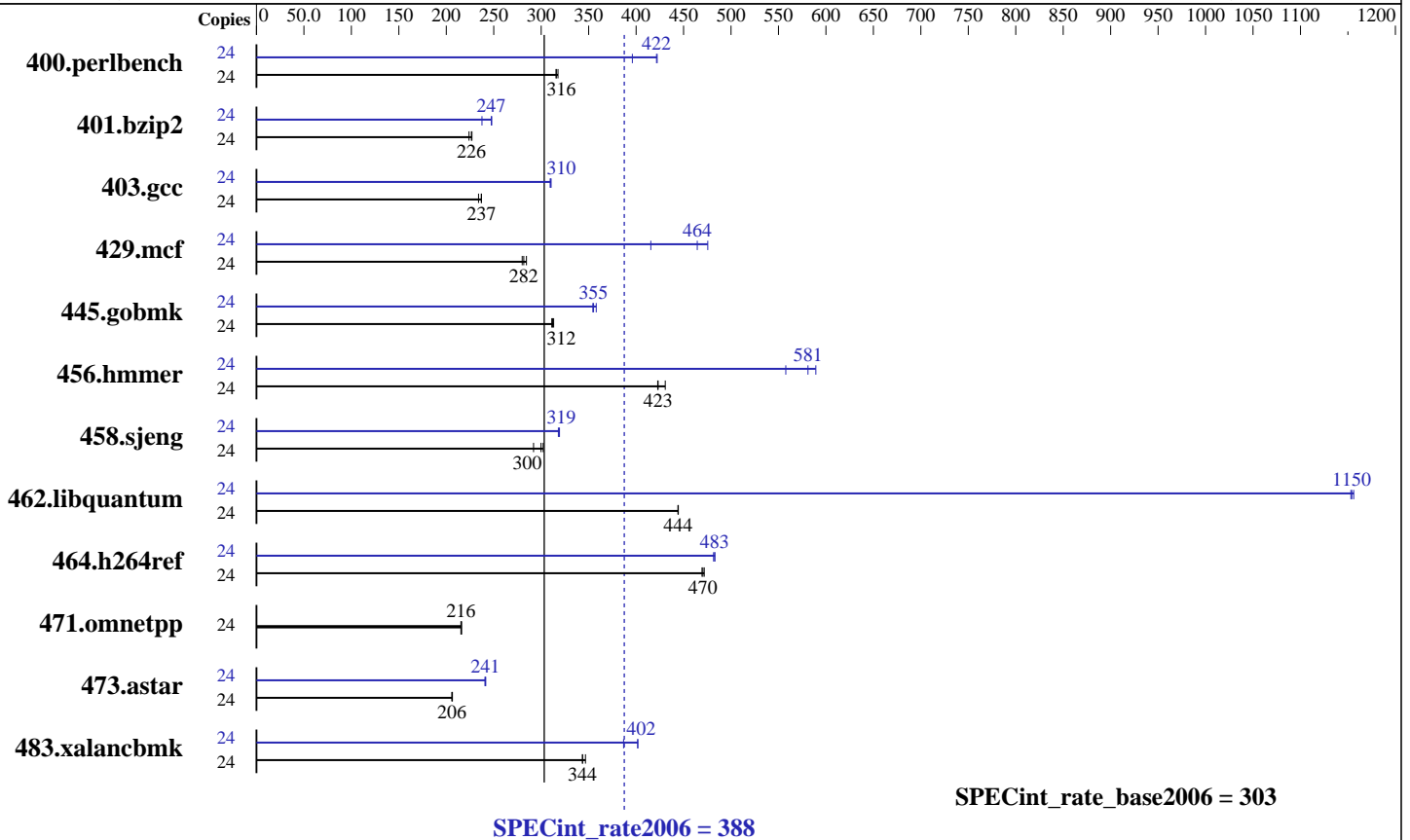$SPECint\_rate\_base2006 =$ 303

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

Test date: Jun-2010
Hardware Availability: May-2010
Software Availability: Feb-2010

	Copies	
400.perlbench	24	422
	24	316
401.bzip2	24	247
	24	226
403.gcc	24	310
	24	237
429.mcf	24	464
	24	282
445.gobmk	24	355
	24	312
456.hmmer	24	581
	24	423
458.sjeng	24	319
	24	300
462.libquantum	24	1150
	24	444
464.h264ref	24	483
	24	470
471.omnetpp	24	216
473.astar	24	241
	24	206
483.xalancbmk	24	402
	24	344

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Hardware

CPU Name:	AMD Opteron 6174
CPU Characteristics:	
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 cores/chip
CPU(s) orderable:	2,4 chips
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	12 MB I+D on chip per chip, 6 MB shared / 6 cores
Other Cache:	None
Memory:	64 GB (16 x 4 GB DDR3-1333 DR RDIMM, CL9, ECC)
Disk Subsystem:	1 x 148 GB 10000 RPM SAS
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64), Kernel 2.6.27.19-5-smp
Compiler:	x86 Open64 4.2.3 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 8.1 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	24	**742**	**316**	743	316	738	318	24	592	396	555	422	**556**	**422**
401.bzip2	24	1034	224	1020	227	**1023**	**226**	24	975	238	**936**	**247**	934	248
403.gcc	24	826	234	815	237	**815**	**237**	24	622	310	624	310	**624**	**310**
429.mcf	24	782	280	**777**	**282**	770	284	24	527	416	460	476	**471**	**464**
445.gobmk	24	804	313	**807**	**312**	809	311	24	710	354	**709**	**355**	703	358
456.hmmer	24	**529**	**423**	530	423	520	431	24	**385**	**581**	380	589	402	558
458.sjeng	24	961	302	995	292	**969**	**300**	24	910	319	913	318	**911**	**319**
462.libquantum	24	**1119**	**444**	1120	444	1119	444	24	431	1150	430	1160	**431**	**1150**
464.h264ref	24	**1129**	**470**	1131	469	1126	472	24	1103	482	1100	483	**1100**	**483**
471.omnetpp	24	**696**	**216**	696	215	694	216	24	**696**	**216**	696	215	694	216
473.astar	24	816	206	818	206	**817**	**206**	24	700	241	**699**	**241**	697	242
483.xalancbmk	24	478	347	482	344	**482**	**344**	24	428	387	**412**	**402**	412	402

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 vm/nr_hugepages=10800 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 = "450"
LD_LIBRARY_PATH = "/cpu2006/amd1002mc-rate-revA-libs/64:/cpu2006/amd1002mc-rate-revA-libs/32"

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

Binaries were compiled on SLES10 SP2 with binutils 2.18
```

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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=barcelona -mso -Ofast -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

C++ benchmarks:
    -march=barcelona -mso -Ofast -m32 -INLINE:aggressive=on
    -CG:cmp_peep=on -L/root/work/libraries/SmartHeap-8.1/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
```

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Peak Portability Flags (Continued)

```
      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=barcelona -mso -fb_create fbdata(pass 1)
                  -fb_opt fbdata(pass 2) -Ofast -IPA:plimit=20000 -LNO:opt=0
                  -OPT:unroll_times_max=8 -OPT:unroll_size=256
                  -OPT:unroll_level=2 -OPT:keep_ext=on -WOPT:if_conv=0
                  -CG:local_sched_alg=1 -CG:unroll_fb_req=on
                  -HP:bdt=2m:heap=2m

      401.bzip2: -march=barcelona -mso -fb_create fbdata(pass 1)
                  -fb_opt fbdata(pass 2) -O3 -OPT:alias=disjoint
                  -OPT:goto=off -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

        403.gcc: -march=barcelona -mso -fb_create fbdata(pass 1)
                  -fb_opt fbdata(pass 2) -Ofast -LNO:trip_count=256
                  -LNO:prefetch_ahead=10 -CG:cmp_peep=on -m32
                  -HP:bdt=2m:heap=2m -GRA:unspill=on -IPA:small_pu=200

        429.mcf: -march=barcelona -mso -O3 -ipa -INLINE:aggressive=on
                  -CG:gcm=off -GRA:prioritize_by_density=on -m32
                  -HP:bdt=2m:heap=2m

      445.gobmk: -march=barcelona -mso -fb_create fbdata(pass 1)
                  -fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict
                  -OPT:unroll_times_max=8 -OPT:unroll_size=256
                  -OPT:unroll_level=2 -OPT:keep_ext=on -ipa -IPA:plimit=750
                  -IPA:min_hotness=300 -IPA:pu_reorder=1 -LNO:prefetch=1
                  -LNO:ignore_feedback=off -CG:p2align=on
                  -CG:unroll_fb_req=on -HP:bdt=2m:heap=2m

      456.hmmer: -march=barcelona -mso -fb_create fbdata(pass 1)
                  -fb_opt fbdata(pass 2) -Ofast -LNO:prefetch=0
                  -OPT:alias=disjoint -OPT:unroll_times_max=8
                  -OPT:unroll_size=256 -OPT:unroll_level=2 -OPT:keep_ext=on
                  -CG:local_sched_alg=1 -CG:cflow=0
                  -CG:push_pop_int_saved_regs=off -CG:cmp_peep=on
                  -HP:bdt=2m:heap=2m

      458.sjeng: -march=barcelona -mso -fb_create fbdata(pass 1)
                  -fb_opt fbdata(pass 2) -O3 -ipa -LNO:ignore_feedback=off
                  -LNO:full_unroll=10 -LNO:fusion=0 -LNO:fission=2
```

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Peak Optimization Flags (Continued)

458.sjeng (continued):
```
-IPA:pu_reorder=2 -CG:ptr_load_use=0
-OPT:unroll_times_max=8 -INLINE:aggressive=on
```

462.libquantum:
```
-march=barcelona -mso -Ofast -LNO:pf2=0 -CG:gcm=off
-CG:use_prefetchnta=on -CG:cmp_peep=on -WOPT:aggstr=0
-HP:bdt=2m:heap=2m -OPT:alias=disjoint
-INLINE:aggressive=on -IPA:space=1000 -IPA:plimit=20000
```

464.h264ref:
```
-march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -IPA:plimit=20000
-OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr_load_use=0
-CG:push_pop_int_saved_regs=off
```

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar:
```
-march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -TENV:frame_pointer=off
-WOPT:if_conv=0 -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=barcelona -mso -Ofast -INLINE:aggressive=on -m32
-CG:cmp_peep=on -GRA:unspill=on -TENV:frame_pointer=off
-fno-emit-exceptions
-L/root/work/libraries/SmartHeap-8.1/lib -lsmartheap
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/x86-open64-4.2.3-flags-revA.20100721.html
http://www.spec.org/cpu2006/flags/amd-platform-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/x86-open64-4.2.3-flags-revA.20100721.xml
http://www.spec.org/cpu2006/flags/amd-platform-revA.xml

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

Tested with SPEC CPU2006 v1.1.
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