



SPEC® CINT2006 Result

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Dell Inc.

SPECint®_rate2006 = 182

PowerEdge R805 (AMD Opteron 2427, 2.20 GHz)

SPECint_rate_base2006 = 144

CPU2006 license: 55

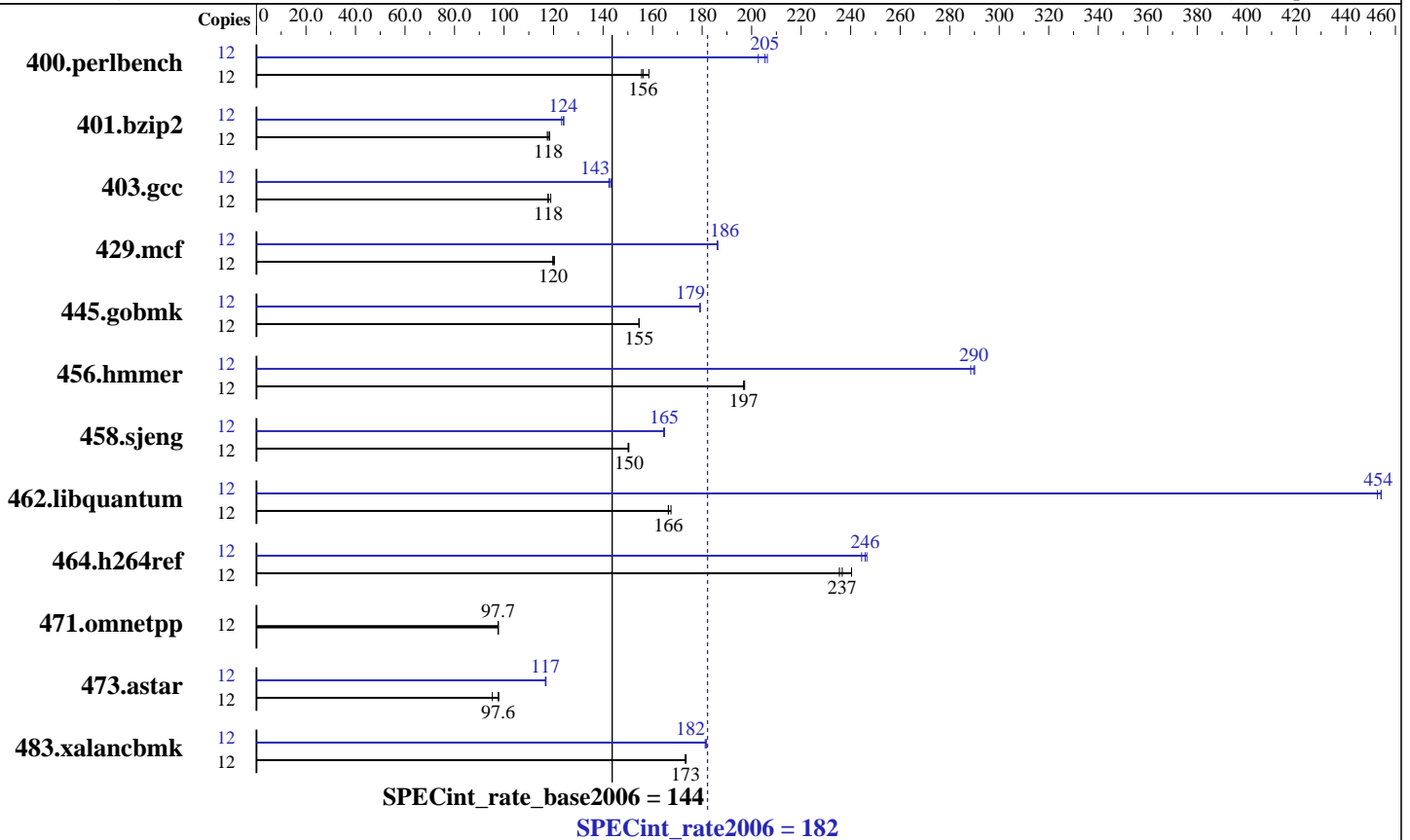
Test date: Jun-2009

Test sponsor: Dell Inc.

Hardware Availability: Jul-2009

Tested by: Dell Inc.

Software Availability: Apr-2009



Hardware

CPU Name: AMD Opteron 2427
 CPU Characteristics:
 CPU MHz: 2200
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip
 CPU(s) orderable: 1,2 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: 6 MB I+D on chip per chip
 Other Cache: None
 Memory: 32 GB (8 x 4 GB DDR2-800)
 Disk Subsystem: 1 x 73 GB 15000 RPM SAS
 Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 5.3, Kernel 2.6.18-128.el5
 Compiler: PGI Server Complete Version 8.0 x86 Open64 4.2.2 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: binutils 2.18 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	12	740	159	754	156	<u>751</u>	<u>156</u>	12	578	203	568	206	<u>571</u>	<u>205</u>
401.bzip2	12	978	118	<u>983</u>	<u>118</u>	986	117	12	940	123	<u>934</u>	<u>124</u>	933	124
403.gcc	12	813	119	<u>820</u>	<u>118</u>	821	118	12	675	143	679	142	<u>678</u>	<u>143</u>
429.mcf	12	914	120	909	120	<u>913</u>	<u>120</u>	12	588	186	587	186	<u>588</u>	<u>186</u>
445.gobmk	12	815	155	<u>814</u>	<u>155</u>	814	155	12	703	179	702	179	<u>703</u>	<u>179</u>
456.hammer	12	568	197	<u>569</u>	<u>197</u>	569	197	12	388	289	386	290	<u>386</u>	<u>290</u>
458.sjeng	12	967	150	965	150	<u>967</u>	<u>150</u>	12	883	164	<u>881</u>	<u>165</u>	881	165
462.libquantum	12	1485	167	1495	166	<u>1494</u>	<u>166</u>	12	547	454	<u>547</u>	<u>454</u>	549	453
464.h264ref	12	1105	240	<u>1122</u>	<u>237</u>	1128	235	12	1086	244	1077	247	<u>1080</u>	<u>246</u>
471.omnetpp	12	<u>768</u>	<u>97.7</u>	768	97.7	769	97.6	12	<u>768</u>	<u>97.7</u>	768	97.7	769	97.6
473.astar	12	861	97.9	<u>863</u>	<u>97.6</u>	884	95.3	12	720	117	722	117	<u>721</u>	<u>117</u>
483.xalancbmk	12	<u>477</u>	<u>173</u>	477	174	478	173	12	456	182	457	181	<u>456</u>	<u>182</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 vm/nr_hugepages=5400 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 = "/root/cpu2006-1.1/amd0905is-libs/64:/root/cpu2006-1.1/amd0905is-libs/32"
PGI_HUGE_PAGES = "450"

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



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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.hmmcr: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalanbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-march=barcelona -Ofast -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

C++ benchmarks:
-march=barcelona -Ofast -m32 -INLINE:aggressive=on
-L/root/work/libraries/SmartHeap-8.1/lib -lsmartheap

Peak Compiler Invocation

C benchmarks (except as noted below):
opencc

456.hmmcr: pgcc

C++ benchmarks (except as noted below):
openCC

473.astar: pgcpp



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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.xalanbmk: -DSPEC_CPU_LINUX

```

Peak Optimization Flags

C benchmarks:

```

400.perlbench: -march=barcelona -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 -fb_create fbdata(pass 1)
           -fb_opt fbdata(pass 2) -O3 -OPT:alias=disjoint
           -OPT:unroll_size=0 -OPT:Ofast -OPT:goto=off
           -INLINE:aggressive=on -CG:local_sched_alg=1 -m3dnw
           -HP:bdt=2m:heap=2m

403.gcc: -march=barcelona -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

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

445.gobmk: -march=barcelona -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: -fastsse -Mvect=partial -Munroll=n:8 -Msmartalloc=huge
           -Msafeptr -Mprefetch=t0 -Mfprelaxed -Mipa=const -Mipa=ptr
           -Mipa=arg -Mipa=inline -tp shanghai-64 -Bstatic_pgi

```

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Peak Optimization Flags (Continued)

```
458.sjeng: -march=barcelona -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
          -IPA:pu_reorder=2 -CG:ptr_load_use=0
          -OPT:unroll_times_max=8 -INLINE:aggressive=on
          -HP:bdt=2m:heap=2m
```

```
462.libquantum: -march=barcelona -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 -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 -HP:bdt=2m:heap=2m
```

C++ benchmarks:

```
471.omnetpp: basepeak = yes
```

```
473.astar: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
           -Mipa=inline:6(pass 2) -fastsse -O4 -Msmartalloc=huge
           -Msafeptr=global -Mfprelaxed --zc_eh -tp shanghai-32
           -Bstatic_pgi
```

```
483.xalancbmk: -march=barcelona -Ofast -INLINE:aggressive=on -m32
               -CG:cmp_peep=on -GRA:unspill=on -TENV:frame_pointer=off
               -L/root/work/libraries/SmartHeap-8.1/lib -lsmarheap
```

Peak Other Flags

C benchmarks:

```
456.hmmmer: -Mipa=jobs:4
```

C++ benchmarks:

```
473.astar: -Mipa=jobs:4(pass 2)
```

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

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.html
<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags.html>
<http://www.spec.org/cpu2006/flags/amd-platform.html>

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

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.xml
<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags.xml>
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For other inquiries, please contact webmaster@spec.org.

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