



# SPEC® CINT2006 Result

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Dell Inc.

SPECint®\_rate2006 = 101

PowerEdge T605 (AMD Opteron 2356, 2.30 GHz)

SPECint\_rate\_base2006 = 88.2

CPU2006 license: 55

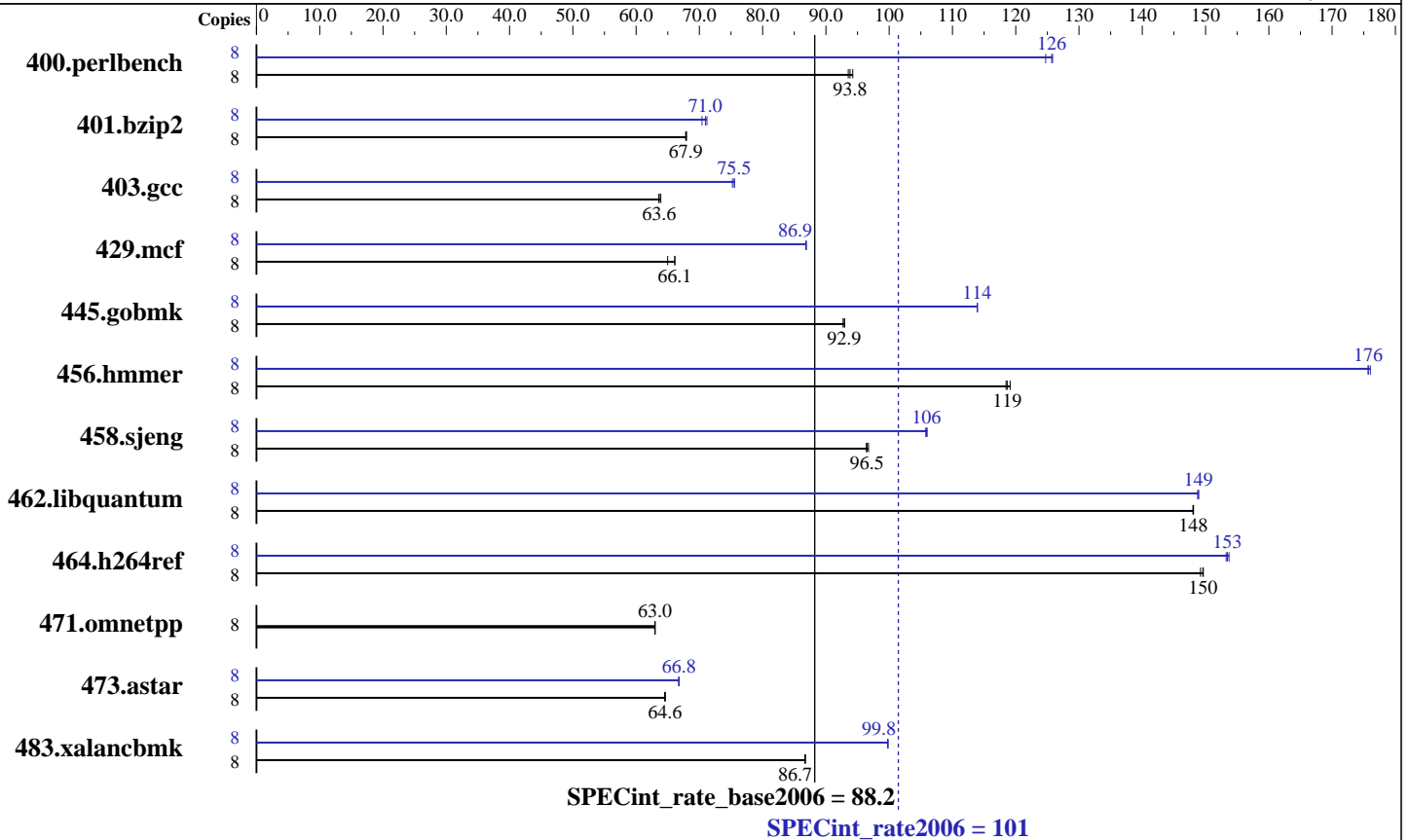
Test date: Mar-2008

Test sponsor: Dell Inc.

Hardware Availability: Apr-2008

Tested by: Dell Inc.

Software Availability: May-2008



### Hardware

CPU Name: AMD Opteron 2356  
 CPU Characteristics:  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 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: 2 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 16 GB (4 x 4 GB, DDR2-667, CL5, Reg, Dual Rank)  
 Disk Subsystem: 2 x 250 GB 7200 RPM SATA (RAID 0)  
 Other Hardware: None

### Software

Operating System: SuSE Linux Enterprise Server 10 (x86\_64) SP1, Kernel 2.6.16.46-0.12-smp  
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.1  
 Auto Parallel: No  
 File System: ReiserFS  
 System State: Run Level 3 (multi-user)  
 Base Pointers: 32/64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: SmartHeap 8.0 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  | 8      | 836         | 93.5        | <b>833</b>  | <b>93.8</b> | 829         | 94.2        | 8      | 627        | 125         | <b>622</b>  | <b>126</b>  | 621         | 126         |
| 401.bzip2      | 8      | 1136        | 68.0        | 1138        | 67.8        | <b>1137</b> | <b>67.9</b> | 8      | 1096       | 70.4        | <b>1088</b> | <b>71.0</b> | 1084        | 71.2        |
| 403.gcc        | 8      | 1008        | 63.9        | 1012        | 63.6        | <b>1012</b> | <b>63.6</b> | 8      | 853        | 75.5        | <b>853</b>  | <b>75.5</b> | 856         | 75.2        |
| 429.mcf        | 8      | 1123        | 65.0        | <b>1104</b> | <b>66.1</b> | 1103        | 66.1        | 8      | <b>840</b> | <b>86.9</b> | 840         | 86.9        | 840         | 86.9        |
| 445.gobmk      | 8      | 905         | 92.7        | 903         | 92.9        | <b>903</b>  | <b>92.9</b> | 8      | <b>737</b> | <b>114</b>  | 737         | 114         | 736         | 114         |
| 456.hmmer      | 8      | 630         | 118         | 627         | 119         | <b>629</b>  | <b>119</b>  | 8      | <b>425</b> | <b>176</b>  | 425         | 176         | 424         | 176         |
| 458.sjeng      | 8      | <b>1003</b> | <b>96.5</b> | 1004        | 96.4        | 1001        | 96.7        | 8      | 913        | 106         | 915         | 106         | <b>914</b>  | <b>106</b>  |
| 462.libquantum | 8      | 1120        | 148         | <b>1119</b> | <b>148</b>  | 1119        | 148         | 8      | 1113       | 149         | <b>1113</b> | <b>149</b>  | 1114        | 149         |
| 464.h264ref    | 8      | 1187        | 149         | <b>1184</b> | <b>150</b>  | 1183        | 150         | 8      | 1155       | 153         | 1152        | 154         | <b>1154</b> | <b>153</b>  |
| 471.omnetpp    | 8      | 793         | 63.0        | 794         | 63.0        | <b>794</b>  | <b>63.0</b> | 8      | 793        | 63.0        | 794         | 63.0        | <b>794</b>  | <b>63.0</b> |
| 473.astar      | 8      | <b>870</b>  | <b>64.6</b> | 870         | 64.5        | 869         | 64.6        | 8      | <b>841</b> | <b>66.8</b> | 842         | 66.7        | 841         | 66.8        |
| 483.xalancbmk  | 8      | 636         | 86.7        | 637         | 86.7        | <b>636</b>  | <b>86.7</b> | 8      | 553        | 99.8        | 553         | 99.7        | <b>553</b>  | <b>99.8</b> |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Operating System Notes

```
'numactl' was used to bind copies to the cores
Environment variable PGI_HUGE_PAGES set to 150
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2457600' was used to set environment locked pages in memory quantity
Set /proc/sys/vm/nr_hugepages=1200
mount -t hugetlbfs nodev /mnt/hugepages
```

## Base Compiler Invocation

C benchmarks:  
pgcc

C++ benchmarks:  
pgcpp

## 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
```

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## Base Portability Flags (Continued)

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:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed  
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-fastsse -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed  
-Msmartalloc=huge:150 --zc\_eh -tp barcelona -Bstatic\_pgi

## Base Other Flags

C benchmarks:

-w

C++ benchmarks:

-w

## Peak Compiler Invocation

C benchmarks (except as noted below):

pgcc

400.perlbench: pathcc

403.gcc: pathcc

445.gobmk: pathcc

C++ benchmarks (except as noted below):

pathCC

471.omnetpp: 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
               -WOPT:if_conv=0 -CG:local_sched_alg=1

401.bzip2: -Mpfi(pass 1) -Mpfo(pass 2) -fast -O4
           -Msmartalloc=huge:150 -Mnounroll -tp barcelona-64
           -Bstatic_pgi

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
          -fb_opt fbdata(pass 2) -m32 -O3 -OPT:Ofast

429.mcf: -fastsse -Mipa=jobs:4 -Mipa=fast -Mipa=inline:1
         -Msmartalloc=huge:150 -tp barcelona -Bstatic_pgi

445.gobmk: -march=barcelona -fb_create fbdata(pass 1)
           -fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict -LNO:opt=0
           -CG:p2align=on

456.hmmer: -fastsse -Munroll=n:8 -Msmartalloc=huge:150 -Mfprelaxed
           -Mvect=partial -Msafeptr -Mipa=jobs:4 -Mipa=const
           -Mipa=ptr -Mipa=arg -Mipa=inline -tp barcelona-64
           -Bstatic_pgi

458.sjeng: -Mpfi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
           -Mipa=inline:1(pass 2) -Mipa=noarg(pass 2) -Mpfo(pass 2)
           -fastsse -Msmartalloc=huge:150 -Mfprelaxed
           -tp barcelona-64 -Bstatic_pgi

462.libquantum: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Munroll=m:8
               -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mipa=noarg
               -tp barcelona-64 -Bstatic_pgi

464.h264ref: -Mpfi=indirect(pass 1) -Mipa=jobs:4(pass 2)
             -Mipa=fast(pass 2) -Mipa=inline(pass 2)
             -Mpfo=indirect(pass 2) -fastsse -Msmartalloc=huge:150
             -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

```

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## Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -march=barcelona -Ofast -TENV:frame\_pointer=off  
-WOPT:if\_conv=0 -GRA:optimize\_boundary=on -IPA:plimit=525  
-m32 -lsmartheap

483.xalancbmk: -march=barcelona -Ofast -m32 -OPT:unroll\_times\_max=8  
-CG:push\_pop\_int\_saved\_regs=off -CG:ptr\_load\_use=0  
-lsmartheap

## Peak Other Flags

C benchmarks (except as noted below):

-w

400.perlbench: No flags used

403.gcc: No flags used

445.gobmk: No flags used

C++ benchmarks (except as noted below):

-L/root/work/cpu2006/amd123GH.libs/32

471.omnetpp: -w

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.xml>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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