# SPEC® CINT2006 Result

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## Hewlett-Packard Company

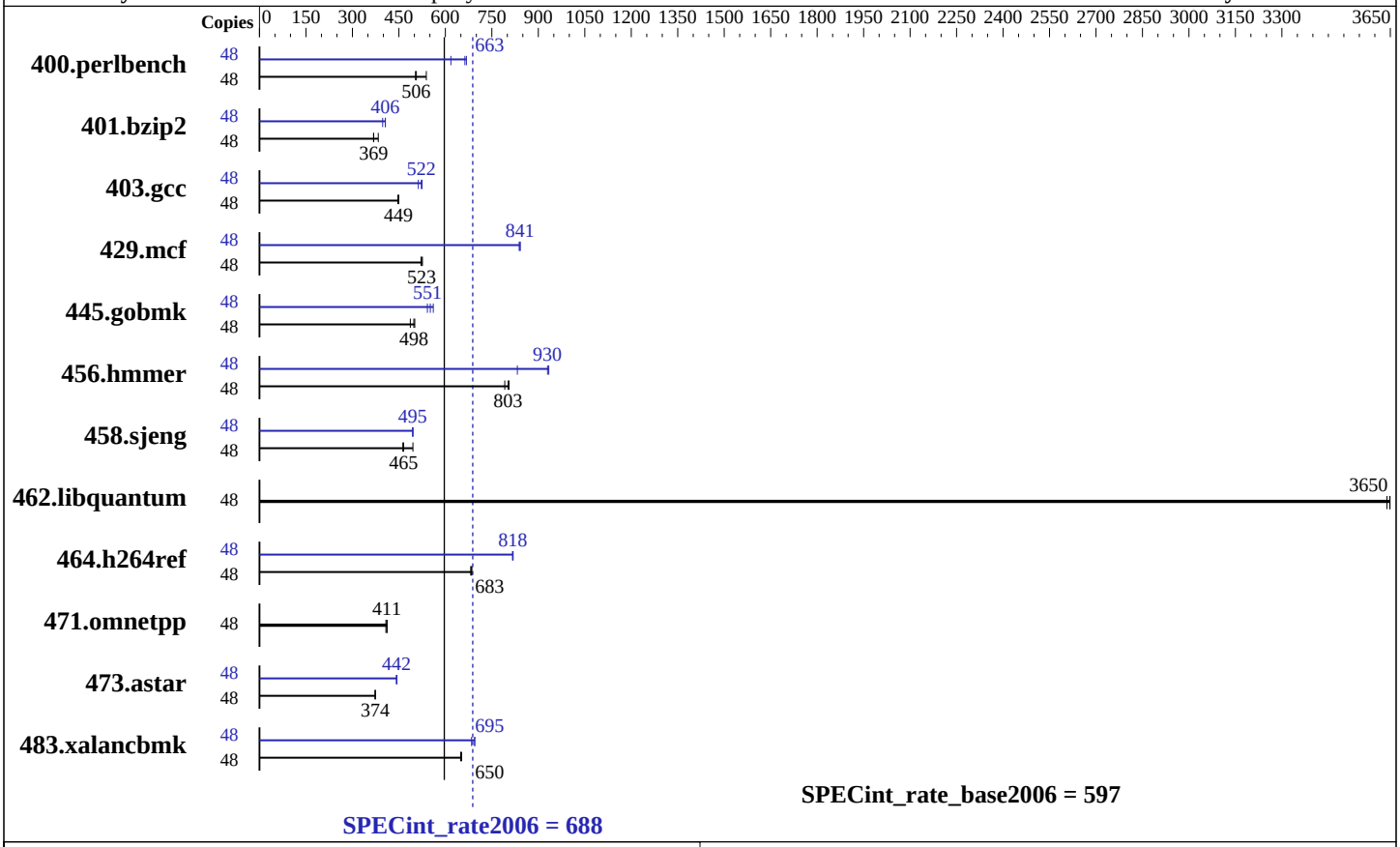
ProLiant BL685c G7
(1.70 GHz AMD Opteron 6164 HE)

SPECint®_rate2006 = 688

SPECint_rate_base2006 = 597

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

**Test date:** Oct-2011
**Hardware Availability:** Jun-2010
**Software Availability:** Jul-2011




### Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 6164 HE |
| CPU Characteristics: | |
| CPU MHz: | 1700 |
| FPU: | Integrated |
| CPU(s) enabled: | 48 cores, 4 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: | 128 GB (32 x 4 GB 2Rx4 PC3-10600R-9, ECC) |
| Disk Subsystem: | 1 x 146 GB 10 K SAS |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 (x86_64) SP1, Kernel 2.6.32.12-0.7-default |
| 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: | 32/64-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 | 48 | 871 | 539 | 931 | 503 | **926** | **506** | 48 | 759 | 618 | **707** | **663** | 702 | 668 |
| 401.bzip2 | 48 | 1208 | 383 | **1257** | **369** | 1258 | 368 | 48 | 1165 | 398 | **1141** | **406** | 1140 | 406 |
| 403.gcc | 48 | 860 | 449 | 865 | 446 | **861** | **449** | 48 | **740** | **522** | 737 | 525 | 754 | 513 |
| 429.mcf | 48 | 832 | 526 | 840 | 521 | **836** | **523** | 48 | **521** | **841** | 520 | 842 | 522 | 838 |
| 445.gobmk | 48 | 1005 | 501 | 1034 | 487 | **1011** | **498** | 48 | 929 | 542 | **913** | **551** | 898 | 561 |
| 456.hmmer | 48 | 566 | 792 | 556 | 805 | **558** | **803** | 48 | 480 | 934 | 538 | 832 | **482** | **930** |
| 458.sjeng | 48 | 1173 | 495 | 1255 | 463 | **1249** | **465** | 48 | **1174** | **495** | 1174 | 495 | 1174 | 495 |
| 462.libquantum | 48 | 273 | 3640 | **273** | **3650** | 273 | 3650 | 48 | 273 | 3640 | **273** | **3650** | 273 | 3650 |
| 464.h264ref | 48 | 1558 | 682 | **1555** | **683** | 1549 | 686 | 48 | 1300 | 817 | 1297 | 819 | **1299** | **818** |
| 471.omnetpp | 48 | **729** | **411** | 729 | 412 | 735 | 408 | 48 | **729** | **411** | 729 | 412 | 735 | 408 |
| 473.astar | 48 | 903 | 373 | **902** | **374** | 902 | 374 | 48 | 762 | 442 | **762** | **442** | 759 | 444 |
| 483.xalancbmk | 48 | **510** | **650** | 508 | 652 | 510 | 649 | 48 | 484 | 685 | 477 | 695 | **477** | **695** |

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=21600 in /etc/sysctl.conf
mount -t hugetlbfs ndev /mnt/hugepages
```

## 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 = "450"
LD_LIBRARY_PATH = "/opt/x86_open64-4.2.5.2/open64-gcc-4.2.0/lib:/opt/x86_open64-4.2.5.2/
open64-gcc-4.2.0/lib64/lib"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
```

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## General Notes (Continued)

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=barcelona -mso -Ofast -CG:local_sched_alg=1
-INLINE:aggressive=on -IPA:plimit=8000 -IPA:small_pu=100
-HP:bdt=2m:heap=2m

C++ benchmarks:
-march=barcelona -mso -Ofast -m32 -INLINE:aggressive=on
-CG:cmp_peep=on -L/cpu2006/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
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

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# Peak Optimization Flags (Continued)

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
-IPA:pu_reorder=2 -CG:ptr_load_use=0
-OPT:unroll_times_max=8 -INLINE:aggressive=on

462.libquantum: basepeak = yes

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/cpu2006/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-open64-425-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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For other inquiries, please contact webmaster@spec.org.

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