



# SPEC® CINT2006 Result

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## Hewlett-Packard Company

SPECint®\_rate2006 = 462

ProLiant DL385 G7  
(2.2 GHz AMD Opteron 6274)

SPECint\_rate\_base2006 = 404

CPU2006 license: 3

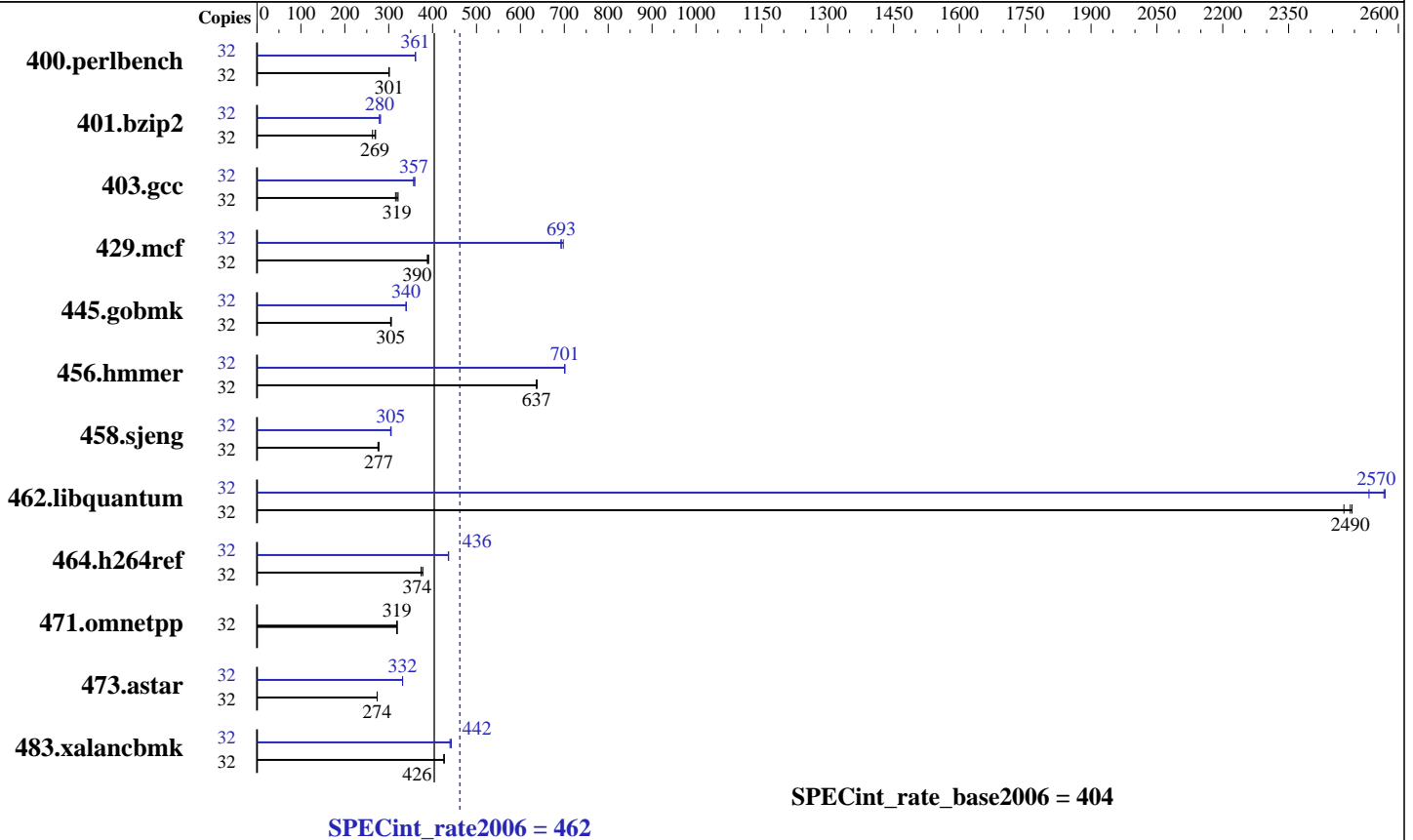
Test date: Oct-2011

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2011

Tested by: Hewlett-Packard Company

Software Availability: Jul-2011



### Hardware

CPU Name: AMD Opteron 6274  
 CPU Characteristics: AMD Turbo CORE technology up to 3.10 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 2 chips, 16 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 512 KB I on chip per chip,  
64 KB I shared / 2 cores;  
16 KB D on chip per core  
 Secondary Cache: 16 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 / 8 cores  
 Other Cache: None  
 Memory: 128 GB (16 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
 Disk Subsystem: 1 x 300 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: 32/64-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	32	<b><u>1039</u></b>	<b><u>301</u></b>	1039	301	1039	301	32	<b><u>867</u></b>	<b><u>361</u></b>	867	360	865	361
401.bzip2	32	1174	263	<b><u>1149</u></b>	<b><u>269</u></b>	1143	270	32	1108	279	<b><u>1105</u></b>	<b><u>280</u></b>	1097	281
403.gcc	32	<b><u>808</u></b>	<b><u>319</u></b>	802	321	816	316	32	721	357	716	360	<b><u>721</u></b>	<b><u>357</u></b>
429.mcf	32	752	388	<b><u>749</u></b>	<b><u>390</u></b>	746	391	32	422	692	418	698	<b><u>421</u></b>	<b><u>693</u></b>
445.gobmk	32	1097	306	1103	304	<b><u>1100</u></b>	<b><u>305</u></b>	32	<b><u>988</u></b>	<b><u>340</u></b>	988	340	987	340
456.hammer	32	469	636	<b><u>469</u></b>	<b><u>637</u></b>	468	638	32	426	701	<b><u>426</u></b>	<b><u>701</u></b>	426	701
458.sjeng	32	1395	278	<b><u>1396</u></b>	<b><u>277</u></b>	1405	276	32	<b><u>1271</u></b>	<b><u>305</u></b>	1267	306	1272	304
462.libquantum	32	266	2490	<b><u>266</u></b>	<b><u>2490</u></b>	268	2480	32	262	2530	258	2570	<b><u>258</u></b>	<b><u>2570</u></b>
464.h264ref	32	1875	378	<b><u>1892</u></b>	<b><u>374</u></b>	1894	374	32	<b><u>1625</u></b>	<b><u>436</u></b>	1625	436	1622	437
471.omnetpp	32	<b><u>627</u></b>	<b><u>319</u></b>	627	319	627	319	32	<b><u>627</u></b>	<b><u>319</u></b>	627	319	627	319
473.astar	32	820	274	<b><u>820</u></b>	<b><u>274</u></b>	821	274	32	677	332	<b><u>678</u></b>	<b><u>332</u></b>	678	331
483.xalancbmk	32	<b><u>518</u></b>	<b><u>426</u></b>	519	426	518	426	32	<b><u>500</u></b>	<b><u>442</u></b>	499	443	502	440

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=28672 in /etc/sysctl.conf  
Set "nodev /mnt/hugepages hugetlbfs defaults 0 0" in /etc/fstab

### Platform Notes

BIOS settings:  
HP Power Profile set to Maximum Performance  
Thermal Configuration set to Increased Cooling  
HPC Optimization set to Enabled



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## 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"

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 -lsmarheap

## Peak Compiler Invocation

C benchmarks:  
  opencc

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## Peak Compiler Invocation (Continued)

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:bd=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:bd=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:bd=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
```

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## Peak Optimization Flags (Continued)

456.hmmcr: -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:bd=2m:heap=2m

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:bd=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:bd=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:bd=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 -lsmarheap

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>  
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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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