



# SPEC® CINT2006 Result

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## Hewlett-Packard Company

SPECint®\_rate2006 = 368

ProLiant BL465c G7  
(1.6 GHz AMD Opteron 6262 HE)

SPECint\_rate\_base2006 = 326

CPU2006 license: 3

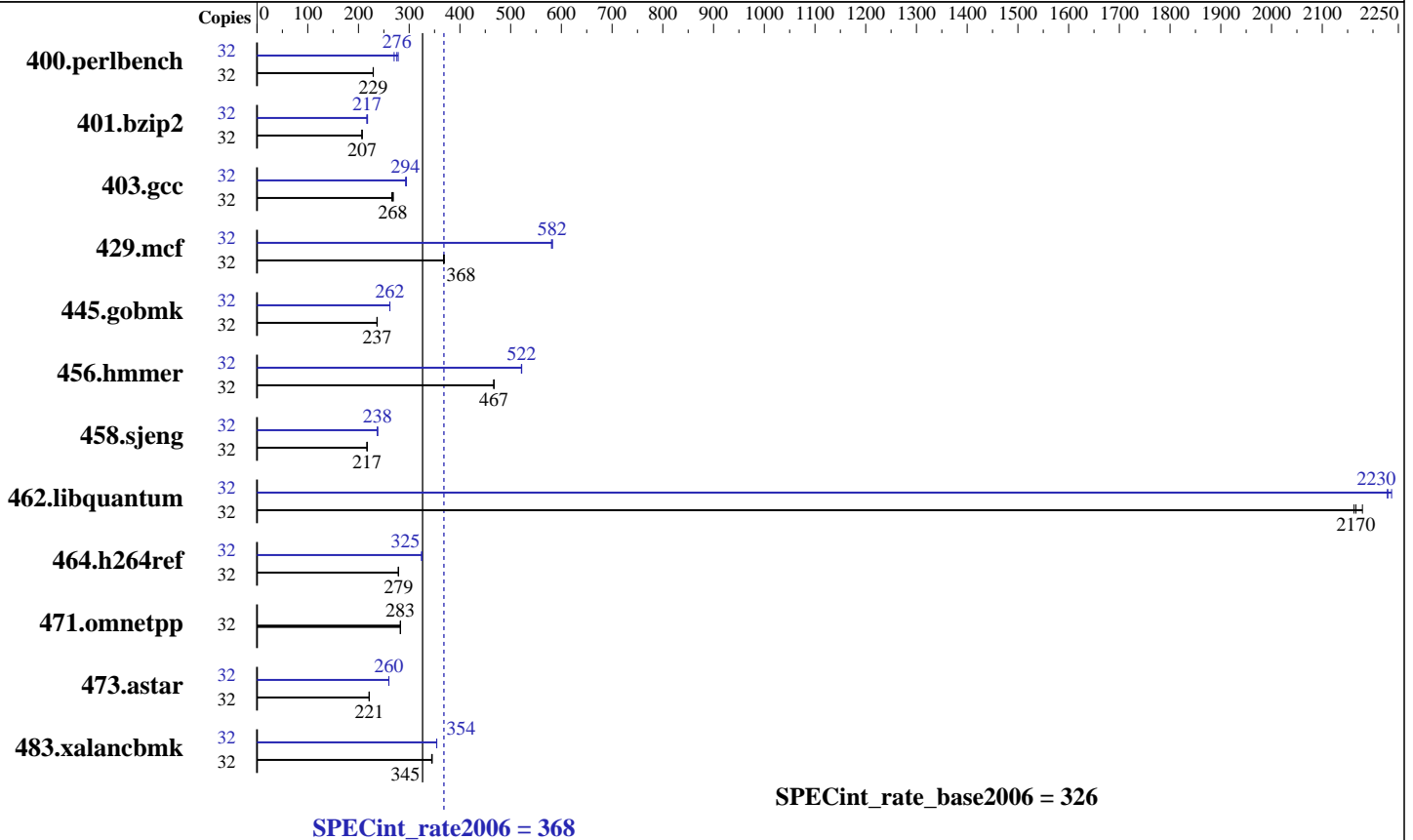
Test date: Oct-2011

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2011

Tested by: Hewlett-Packard Company

Software Availability: Jul-2011



### Hardware

CPU Name: AMD Opteron 6262 HE  
 CPU Characteristics: AMD Turbo CORE technology up to 2.90 GHz  
 CPU MHz: 1600  
 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 146 GB 10 K SAS  
 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	1366	229	1363	229	<b>1364</b>	<b>229</b>	32	1123	278	1157	270	<b>1134</b>	<b>276</b>
401.bzip2	32	1488	208	1494	207	<b>1491</b>	<b>207</b>	32	<b>1422</b>	<b>217</b>	1417	218	1426	217
403.gcc	32	<b>962</b>	<b>268</b>	970	266	959	269	32	879	293	874	295	<b>876</b>	<b>294</b>
429.mcf	32	<b>794</b>	<b>368</b>	794	368	790	369	32	<b>502</b>	<b>582</b>	503	580	501	582
445.gobmk	32	<b>1417</b>	<b>237</b>	1416	237	1421	236	32	1282	262	1282	262	<b>1282</b>	<b>262</b>
456.hammer	32	640	467	<b>639</b>	<b>467</b>	639	467	32	573	521	572	522	<b>572</b>	<b>522</b>
458.sjeng	32	<b>1784</b>	<b>217</b>	1780	218	1788	217	32	<b>1630</b>	<b>238</b>	1629	238	1631	237
462.libquantum	32	307	2160	<b>306</b>	<b>2170</b>	304	2180	32	298	2230	296	2240	<b>297</b>	<b>2230</b>
464.h264ref	32	2543	279	2538	279	<b>2540</b>	<b>279</b>	32	2182	325	<b>2181</b>	<b>325</b>	2180	325
471.omnetpp	32	<b>708</b>	<b>283</b>	707	283	708	283	32	<b>708</b>	<b>283</b>	707	283	708	283
473.astar	32	1016	221	1016	221	<b>1016</b>	<b>221</b>	32	865	260	<b>864</b>	<b>260</b>	864	260
483.xalancbmk	32	641	344	<b>640</b>	<b>345</b>	640	345	32	623	354	624	354	<b>623</b>	<b>354</b>

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 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

## 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  
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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=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 -lsmartheap

## Peak Compiler Invocation

C benchmarks:  
  opencc  
  
C++ benchmarks:  
  openCC



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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=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

456.hmmer: -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

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## Peak Optimization Flags (Continued)

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 -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>

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

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